



# MANAGEMENT COMMITTEE MEETING

Zagreb, March 3<sup>rd</sup> 2017

**José C. Matos**  
Chairman



ESF provides the  
COST Office through a  
European Commission contract



COST is supported by  
the EU Framework  
Programme



# 1. WELCOME

**Good afternoon to everybody !**

Acknowledgments to Local Organizers and to University of Zagreb.

Ana Mandić Ivanković (UZagreb)



Alex Kindij (UZagreb)



# 1. WELCOME

**Tour de Table / Introduction of new MC members.** Those MC members who were not in Geneva and Belgrade, please stand-up and say your first and last name, affiliation and in what WG are you involved.



# 1. WELCOME

## Establishment of Quorum





# 1. WELCOME

## Reimbursement Policies

- In order to be reimbursed you need to receive the e-COST invitation by e-mail and accept it in due time. Otherwise you cannot be reimbursed.
- Then, you need to fill a reimbursement form in e-COST platform. After filling the form, you will have to print, sign and send it to the COST Action TU 1406 secretary (Ms Lara Leite).
- All **originals invoice/ticket** must be sent to the secretary by e-mail or, in case of some original tickets without e-version, mailed to University of Minho, Grant Holder (Ms. Lara Leite), within **30 calendar days**.
- Use the following address for sending the **original invoices/tickets**:

University of Minho  
Att/ Ms. Lara Leite  
Department of Civil Engineering  
Campus Azurém  
4800-058 Guimarães  
PORTUGAL



# 1. WELCOME

## Reimbursement Policies

- **Eligibility for reimbursement:** Provide your signature in such attendance list, or you are not eligibility for reimbursement.
- **Accommodation:** Flat rate: 120€ /per night + The number of nights to be reimbursed are equal to the attending meeting days plus one.
- **Meals:** Flat rate: 20€ /per person/per eligible meal + Meals provided by LOS are deducted from the number of meals to be reimbursed.
- **Airplane, Train or Bus, Car and Ferry:** Maximum: EUR 1 200 + Only economy class tickets are eligible for reimbursement + In the applicable case, the participants must submit as a supporting document the original ticket and view trip mentioning the name of the passenger, the price, dates of travel, departure and arrival times and the booking class (essentially the full itinerary of the trip) + For Train or Bus, business and economy class tickets are eligible for reimbursement; and supplements for fast trains and sleepers are eligible expenses + Car travel is limited to a maximum distance of 2 000 km and is reimbursed at EUR 0.20 per km.
- **Local transport expenses:** Include any transport costs (including shuttle, buses, trains, metro, tramway, taxis, car costs (up to 2000 km) and parking costs), incurred on the normal route between home and local of event + If the claimed amount is less than EUR 25, no tickets are required + If the claimed amount exceeds EUR 25, receipts justifying the total amount claimed must be provided.

# 1. WELCOME

*The objective of COST is to support networking in a topic of excellence ...*



## Some REMARKS:

- (i) COST do not support any company promoting activities;
- (ii) In order to be reimbursed you need to receive an e-COST invitation by email and accept it within two weeks. There exist two hypothesis:
  - You are a MC member and you are automatically invited for MC meeting;
  - You are a WG member and you are considered eligible, *according to the criteria previously established by the Core Group*;
- (iii) In case you do not accept the e-COST invitation, your invitation will be automatically cancelled and you will not receive another invitation for the same meeting;
- (iv) For MC members, if you cannot attend, and want to be replaced by your MC substitute, *you should inform the Grant Holder (Ms. Lara Leite) about this by email, in due time as time does not stop (2 weeks)*.

## 2. ADOPTION of AGENDA

1. Welcome
2. Adoption of agenda
3. Approval of minutes and matters arising of last meeting
4. Update from the Action Chair
  - a. Action Status, *including Participating Countries*
  - b. Dissemination
  - c. Action budget status
  - d. STSM status
5. Promotion of gender balance and Early Stage Researchers (ESR)
6. Update from the Grant Holder
7. Update from the COST Association
8. Follow-up of MoU objectives
  - a. Progress report of working groups
9. Scientific planning
  - a. Scientific strategy
  - b. Action Budget Planning
  - c. Long-term planning (including anticipated locations and dates of future activities)
  - d. Dissemination planning (Publications and outreach activities)
10. Requests for new members
11. Non-COST applications to the Action
12. Any Other Business (AOB)
13. Location and date of next meeting
14. Summary of MC decisions
15. Closing



# 3. APPROVAL OF MINUTES and MATTERS arising of LAST MEETING

- Belgrade meeting minutes were approved by e-voting procedure. They can be downloaded in the following link:

<http://www.tu1406.eu/wp-content/uploads/2016/10/COST-TU1406-3rd-MC-MEETING-Minutes.pdf>

- Matters arising of last meeting ...



Minutes of 2<sup>nd</sup> MC Meeting

Circle:	MC Members
Date:	01-04-2016
Time:	13:30 CET
Location:	Room B, Metropol Palace, Belgrade
Participants:	Listed in Appendix A

## Minutes of 3<sup>rd</sup> MC Meeting – BridgeSpec – 01.04.2016

### Topic 1 - Opening by Prof. Dr. José Matos, Chair of the Action (16:15 CET)

- Tour de Table/Introduction of new MC members: Maria Pina Limongelli, MC Substitute from France, has joined the Action and attended the meeting;
- Establishment of Quorum: quorum was not established;
- Reimbursement Policies: due to the end of the 1<sup>st</sup> grant period, it is highly recommended that MC members send their reimbursement requests in 10 days.

### 3. APPROVAL OF MINUTES and MATTERS arising of LAST MEETING

- An **Advisory Board** from Industry was constituted with the following five colleagues: Poul Linneberg (DK); Niels Peter Hoj (CH); Joao Amado (PT); Giel Klanker (NL); and Ralph Holst (GE). This board will provide recommendations about liaison between COST Action TU 1406 results and industry.
- An email asking for interests and participations in research projects was sent to MC members. Now the objective of the **Research & Development Subgroup** is to identify and inform about potential calls, as well as to introduce innovative topics on future EU calls. However, there are some restrictions with respect to the COST TU 1406 support letter.
- It is highly recommended that all MC members who are actively participating in ongoing research projects (national or international), related to this Action, or who just receive the notification that their projects were accepted for funding, inform the R&D subgroup leader and the Action Chair, so that their projects can be disseminated at the COST Action website. In order to do so, please send a resume and a representative image of the project.

## 4. UPDATE FROM ACTION CHAIR

### Action Status including Participating Countries

CSO Approval: 13-11-2014

Start of the Action: 16-04-2015

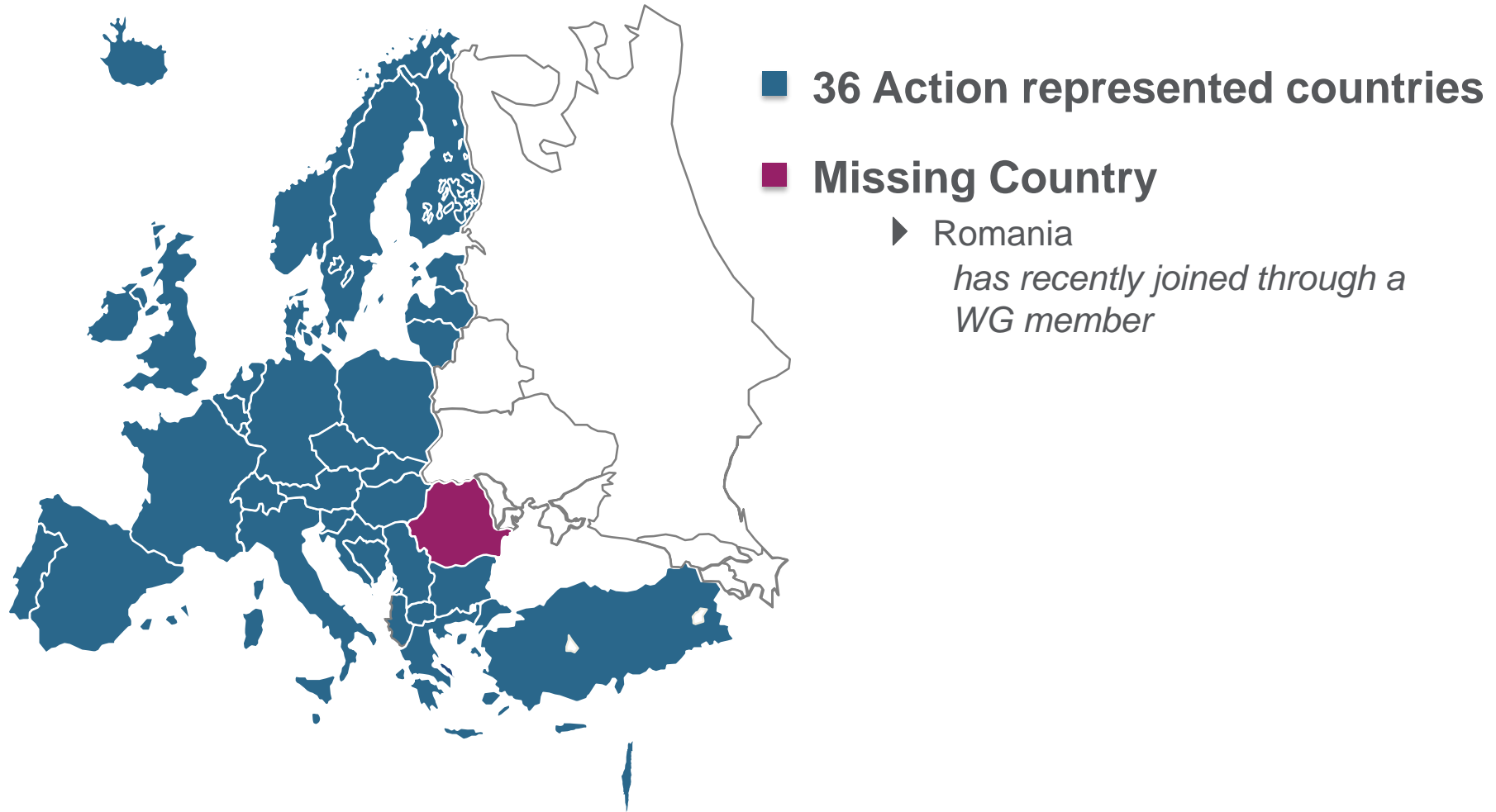
End of Action: 15-04-2019

Total Number of COST countries accepting MoU: **36**

Total Number of COST countries intending to accept MoU: 0

## 4. UPDATE FROM ACTION CHAIR

### Action Status including Participating Countries



## 4. UPDATE FROM ACTION CHAIR

### Action Status including Participating Countries

Recently nominations:

- Lennart Elfgren
  - MC Member for Sweden

*To be elected Vice-Leader of the Research & Development Subgroup*

- Maria Pina Limongelli
  - MC Member for France

*To be elected as Vice-Leader of the Innovation Subgroup*

## 4. UPDATE FROM ACTION CHAIR

### Action Status including Participating Countries

The main objective of the Action is to

**develop a guideline for the establishment of QC plans in roadway bridges**

by integrating the most recent knowledge on performance assessment procedures with the adoption of specific goals. This guideline will focus on bridge maintenance and life-cycle performance at two levels: (i) performance indicators, (ii) performance goals.

- ✓ Developing a state-of-art report;
- ✓ Creation of a database;
- ✓ Incorporation of sustainable indicators.



## 4. UPDATE FROM ACTION CHAIR

### Action Status including Participating Countries

- ✓ (i) Systematize knowledge on QC plans for bridges, which will help to achieve a **state-of-art report that includes performance indicators** and respective goals;
- ✓ (ii) Collect and contribute to up-to-date **knowledge on performance indicators, including technical, environmental, economic and social indicators**;
- ✓ (iii) Establish a wide set of quality specifications through the definition of performance goals, aiming to assure an expected performance level;
- (iv) Develop detailed examples for practicing engineers on the assessment of performance indicators as well as in the establishment of performance goals, to be integrated in the developed guideline;

## 4. UPDATE FROM ACTION CHAIR

### Action Status including Participating Countries



(v) Create a database from COST countries with **performance indicator values** and respective goals, that can be useful for future purposes;



(vi) Develop a **webpage with information about the Action and its participants**, as well as, video-streaming from presentations at training schools, workshops and conferences, e-lectures, **written material (e.g. technical reports)**, etc.;



(vii) **Support the development of technical/scientific committees;**



(viii) Disseminate activities, such as **Short-Term Scientific Missions (STSM)**, **training schools** and other teaching activities (e.g. e-lectures), for practicing engineers and researchers, **regular workshops**, a conference and **special sessions at international conferences**.

## 4. UPDATE FROM ACTION CHAIR

### Action Status including Participating Countries

Activity/Months	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Meeting	✕		✕	✕		✕		X		X		X		X		X
Workshop	✕			✕				X				X				
Conference																X
Training school								✕				X				X
STSM	✕	✕	✕	✕	✕	✕	✕	X	X	X	X	X	X	X	X	X
Website	✕			✕		✕		X		X		X		X		X
Milestone				<del>M1</del>				M2		M3				M4		M5

- MC meeting – ~~3 (GEN, CH)~~, ~~12 (BEL, SB)~~, 24 (ZG, HR), 36 and 48 months
- WG meeting – ~~3 (GEN, CH)~~, ~~9 (BUD, HU)~~, ~~12 (BEL, SB)~~, ~~18 (DFT, NL)~~, 24 (ZG, HR), 30, 36, 42 and 48 months

## 4. UPDATE FROM ACTION CHAIR

### Action Status including Participating Countries

- The 1<sup>st</sup> Training School occurred in Stockholm, Sweden, on 12<sup>th</sup> – 16<sup>th</sup> September 2016, in KTH - Royal Institute of Technology.



E-Book: <http://www.tu1406.eu/wp-content/uploads/2016/10/COST-TU1406-TRAINING-SCHOOL-Stockholm.pdf>

## 4. UPDATE FROM ACTION CHAIR

### Action Status including Participating Countries

- WG meeting of COST Action TU1406 Workshop (*BridgeSpec*) occurred in Delft (NL), on 20<sup>th</sup> – 21<sup>st</sup> October 2016.



E-Book: *to be submitted soon by I. Stipanovic and G. Klanker*

## 4. UPDATE FROM ACTION CHAIR

### Action Status including Participating Countries



~~WG1: Performance indicators~~

~~Report of Performance Indicators (incorporating new indicators)~~

~~[http://www.tu1406.eu/wp-content/uploads/2016/10/COST\\_TU1406\\_WG1\\_TECH\\_REPORT.pdf](http://www.tu1406.eu/wp-content/uploads/2016/10/COST_TU1406_WG1_TECH_REPORT.pdf)~~



WG2: Performance goals

Report of Performance Goals (incorporating new indicators)

WG3: Establishment of a QC plan

European Survey and Recommendations for the Establishment of a QC plan (with detailed examples for practicing engineers)

WG4: Implementation in a Case Study

Database from Benchmarking (from COST countries)

WG5: Drafting of guideline / recommendations

Guideline for the Establishment of a QC plan



# 4. UPDATE FROM ACTION CHAIR

## Action Status including Participating Countries

WG		Year 1				Year 2				Year 3				Year 4			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WG1	Technical indicators	✖	✖	✖	✖												
	Environmental indicators	✖	✖	✖	✖												
	Other indicators	✖	✖	✖	✖												
WG2	Technical goals	✖	✖	✖	✖	✖	✖	✖	✖								
	Environmental goals	✖	✖	✖	✖	✖	✖	✖	✖								
	Other goals	✖	✖	✖	✖	✖	✖	✖	✖								
WG3	Survey of European roadway QC plans	✖	✖	✖	✖	✖	✖										
	Procedures for the establishment of a QC plan							✖	✖	✖	✖						
WG4	Selection of case studies							✖	✖	✖							
	Benchmarking										✖	✖	✖	✖	✖		
	Application on a QC plan											✖	✖	✖	✖		
WG5	Standardized performance indicators				✖	✖	✖	✖									
	Standardized goals							✖	✖	✖	✖						
	Standardized QC plan										✖	✖	✖	✖	✖	✖	✖
WG6	Dissemination	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖

## 4. UPDATE FROM ACTION CHAIR

### Action Status including Participating Countries

Activity/Months	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Milestone				<del>M1</del>				<b>M2</b>		<b>M3</b>				<b>M4</b>		<b>M5</b>



#### ~~M1 – Report on performance indicators~~

- ~~— General description~~
- ~~— Assessment methods (e.g. visual inspection, non-destructive tests, monitoring systems, etc.)~~
- ~~— Frequency of assessment~~
- ~~— Obtained values~~
- ~~— General recommendations~~
- ~~— Publication in refereed scientific journal papers (special issue) and in international conferences~~
- ~~— Workshop at the end of this task (Belgrade, Serbia)~~

#### **M2 – Report on performance goals**

- Description of technical, environmental, economic and social factors
- Goals computation methods
- Frequency assessment
- General recommendations
- Publication in refereed scientific journal papers (special issue) and in international conferences
- Workshop/Training School at the end of this task

## 4. UPDATE FROM ACTION CHAIR

### Action Status including Participating Countries

Activity/Months	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Milestone				<del>M1</del>				<b>M2</b>		<b>M3</b>				<b>M4</b>		<b>M5</b>

#### M3 – Recommendations for the establishment of a QC plan

- Bayesian nets or other heuristic rules (used worldwide)
- Establishment of a procedure for the definition of QC plan for each individual bridge/component
- Publication in refereed scientific journal papers (special issue) and in international conferences
- Workshop/Training School at the end of year 3

#### M4 – Preparation of a database from benchmarking

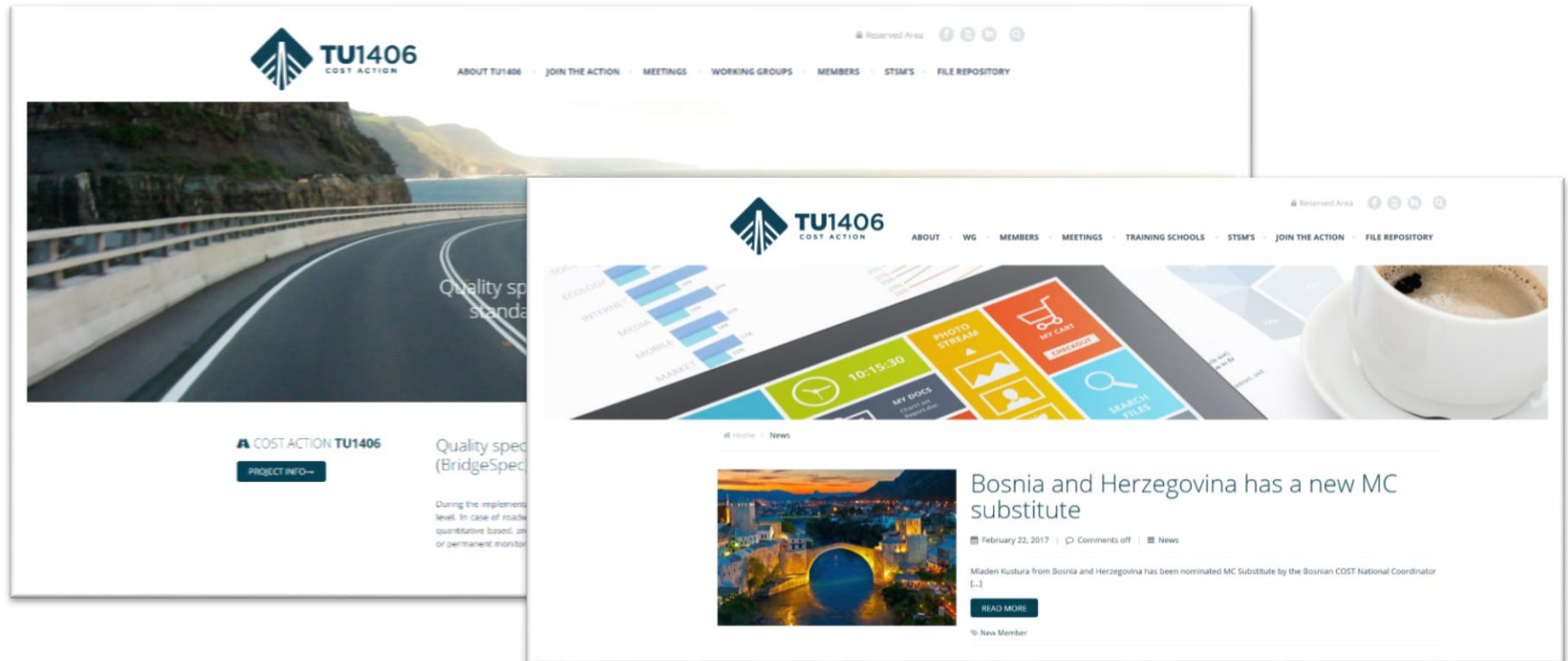
- Obtained results will validate the outcomes of WG1, WG2 and WG3
- Publication in refereed scientific journal papers (special issue) and in international conferences
- Conference/Training School at the end of year 4

#### M5 – Guideline/recommendations

- Development of a new guideline for the establishment of QC plans
- Publication in refereed scientific journal papers (special issue) and in international conferences
- Conference/Training School at the end of this task

## 4. UPDATE FROM ACTION CHAIR Dissemination

TU 1406 Website Maintenance - [www.tu1406.eu](http://www.tu1406.eu)



## 4. UPDATE FROM ACTION CHAIR

### Dissemination

TU 1406 WG1 Report  
(w/ USB Flash)

TU 1406 Pins

TU 1406 Brochures



## 4. UPDATE FROM ACTION CHAIR

### Dissemination

Activity	Location	Date
IABSE Conference 2016 <a href="http://www.iabse.org">www.iabse.org</a>	Guangzhou (CN)	8 -11 May 2016 (4D)
IABMAS Conference 2016 <a href="http://www.iabmas2016.org">www.iabmas2016.org</a>	Foz do Iguaçu (BR)	26 – 30 Jun 2016 (5D)



## 4. UPDATE FROM ACTION CHAIR

### Action budget status – 1<sup>st</sup> Grant Period

Description	Predicted	Realized
A – COST Networking Tools		
A.1 – Meetings	128.880,00 €	111.285,73 €
A.2 – Training Schools	0,00 €	0,00 €
A.3 – Short Term Scientific Missions (STSM)	10.000,00 €	10.920,00 €
A.4 – Dissemination	8.460,00 €	11.250,00 €
A.5 – OERSA	486,00 €	0,00 €
B – Total Science Expenditure (sum A.1-A.5)	147.826,00 €	133.455,73€
C – FSAC (máx. 15% of B)	22.174,00 €	20.018,36 €
D – Total Expenditure (B + C)	170.000,00 €	153.474,09 € *

\* More than 90% execution rate

## 4. UPDATE FROM ACTION CHAIR

### Action budget status – 2<sup>nd</sup> Grant Period

Description	Predicted	Dispended	Balance
A – COST Networking Tools			
A.1 – Meetings	88.150,00 €	37.351,06 €	50.798,94 € *
A.2 – Training Schools	19.650,00 €	19.743,70 €	-93,70 € **
A.3 – Short Term Scientific Mission (STSM)	10.000,00 €	12.000,00 €	- 2.000,00 € ***
A.4 – Dissemination	4.308,69 €	2.000,00 €	2.308,69 €
A.5 – OERSA	500,00 €	0,00 €	500,00 €
B – Total Science Expenditure (sum A.1-A.5)	122.608,69 €	71.094,76 €	51.513,93 €
C – FSAC (máx. 15% of B)	18.391,30 €	10.664,22 €	7.727,84 €
D – Total Expenditure (B + C)	140.999,99 €	81.758,98 €	59.241,01 €

\* Zagreb & Luxembourg meetings

\*\* Covered by OERSA – approved by Core-Group

\*\*\* Covered by meetings – approves by Core-Group

## 4. UPDATE FROM ACTION CHAIR

### STSM status – 1<sup>st</sup> Grant Period

STSM Applicant	<b>Nikola Tanasić</b>
Home Institution	Faculty of Civil Engineering, University of Belgrade, Serbia
Host Institution	University of Natural Resources and Life Sciences, Vienna, Austria
STSM proposed start date	28/09/2015 - 13/10/2015
Topic	Quality control plans for roadway bridges affected by flooding hazard
STSM Applicant	<b>Ivan Zambon</b>
Home Institution	University of Natural Resources and Life Sciences, Vienna, Austria
Host Institution	University of Minho, Guimarães, Portugal
STSM proposed start date	02/11/2015 - 22/12/2015
Topic	Performance indicators associated with degradation of bridges
STSM Applicant	<b>João Fernandes</b>
Home Institution	University of Minho, Guimarães, Portugal
Host Institution	Technical University of Catalonia (UPC)
STSM proposed start date	29/02/2016 - 01/04/2016
Topic	Performance indicators for the assessment of existing bridges

## 4. UPDATE FROM ACTION CHAIR

### STSM status – 1<sup>st</sup> Grant Period

STSM Applicant	Ciarán Hanley
Home Institution	University College Cork, Cork, Ireland
Host Institution	University of Minho, Guimarães, Portugal
STSM proposed start date	07/03/2016 - 28/03/2016
Topic	Quality specifications for roadway bridges, standardization at a European level (BridgeSpec)

STSM Applicant	Nina Serdar
Home Institution	University of Montenegro, Podgorica, Montenegro
Host Institution	University Federico II, Naples, Italy
STSM proposed start date	22/03/2016 - 29/03/2016
Topic	Non destructive methods for defining roadway bridge performance indicators

<http://www.tu1406.eu/stsms>

## 4. UPDATE FROM ACTION CHAIR

### STSM status – 2<sup>nd</sup> Grant Period

STSM Applicant	<b>Mariano Zanini</b>
Home Institution	University of Padova, Italy
Host Institution	Universitat Politècnica de Catalunya. UPC – BarcelonaTech, Spain
STSM proposed start date	03/10/2016 - 01/12/2016
Topic	Analysis of the existing environmental/economic/social performance indicators & goals and correlation with technical ones
STSM Applicant	<b>Dimosthenis Kifokeris</b>
Home Institution	Aristotle University of Thessaloniki, Thessaloniki, Greece
Host Institution	University of Minho, Guimarães, Portugal
STSM proposed start date	09/01/2017 - 17/02/2017
Topic	Calibration and adaptation of the SB Method and Tool for bridge projects
STSM Applicant	<b>Marija Petronijevic</b>
Home Institution	Faculty of Civil Engineering, Belgrade, Serbia
Host Institution	Faculty of Civil and Environmental Engineering, Haifa, Israel
STSM proposed start date	30/01/2017 - 18/02/2017
Topic	Framework for creating BrIM model from point cloud data

## 4. UPDATE FROM ACTION CHAIR

### STSM status – 2<sup>nd</sup> Grant Period

STSM Applicant	Sérgio Fernandes
Home Institution	ANSER, Lda
Host Institution	University of Natural Resources and Life Sciences, Vienna, Austria
STSM proposed start date	06/02/2017 - 17/02/2017
Topic	WG1 Performance Indicators and Glossary Database Repository

STSM Applicant	Zaharah Allah Bukhsh
Home Institution	University of Twente, Enschede, Netherlands
Host Institution	Trinity College Dublin, The University of Dublin, Dublin, Ireland
STSM proposed start date	06/02/2017 - 26/02/2017
Topic	Multi-objective decision support model to optimize bridge performance goals

<http://www.tu1406.eu/stsms>



# 5. PROMOTION OF GENDER BALANCE AND EARLY STAGE REASEARCHERS (ESR)

## COST Policies



## 5. PROMOTION OF GENDER BALANCE AND EARLY STAGE RESEARCHERS (ESR)

### Excellence and Inclusiveness

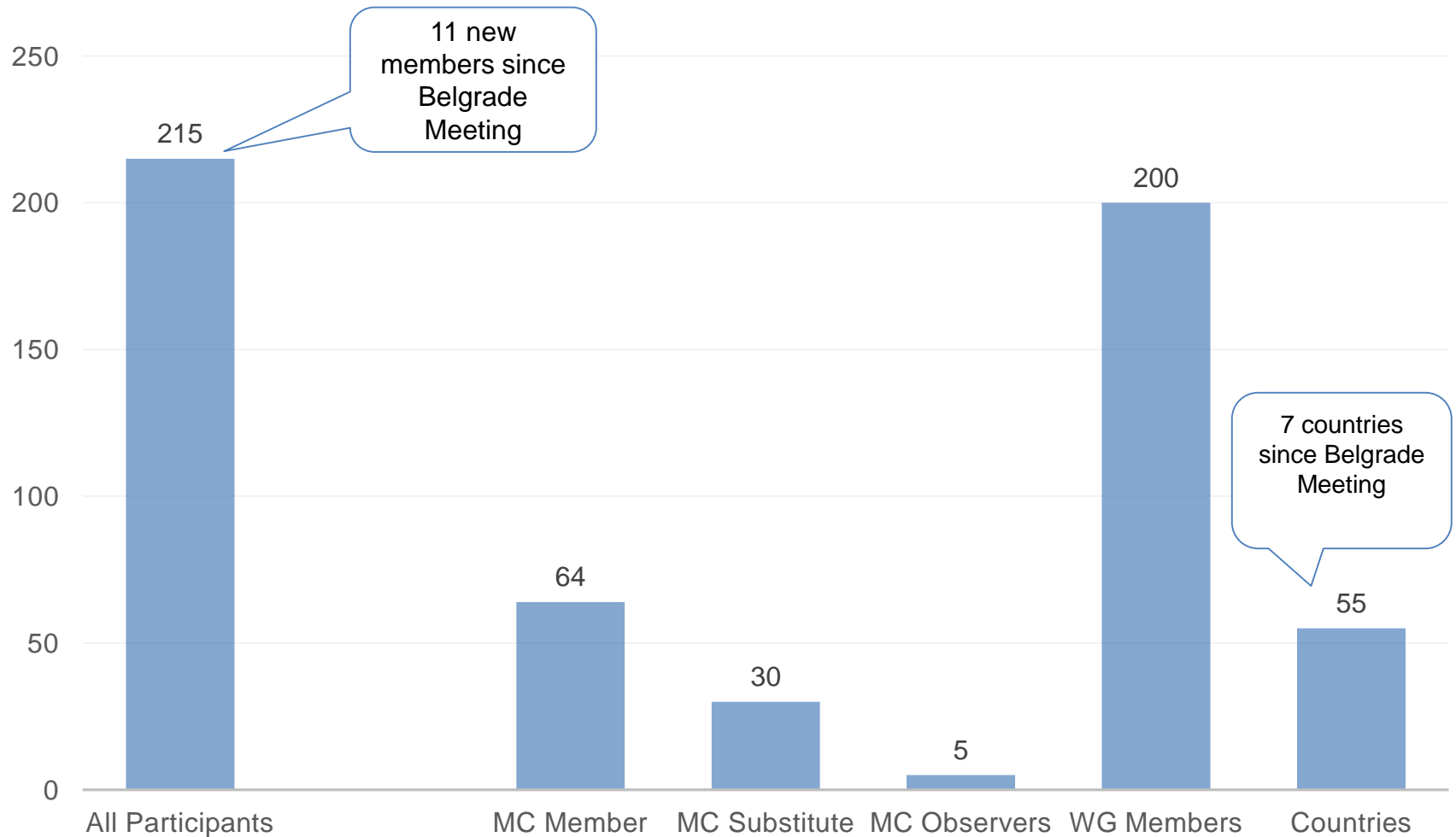
#### Gender Balance

- ESR females are using STSM's;
- Increase the number of female WG members;
- Involve more female for the next Workshop (LOS);
- Invite a female to be a Keynote in the next Workshop (LOS).

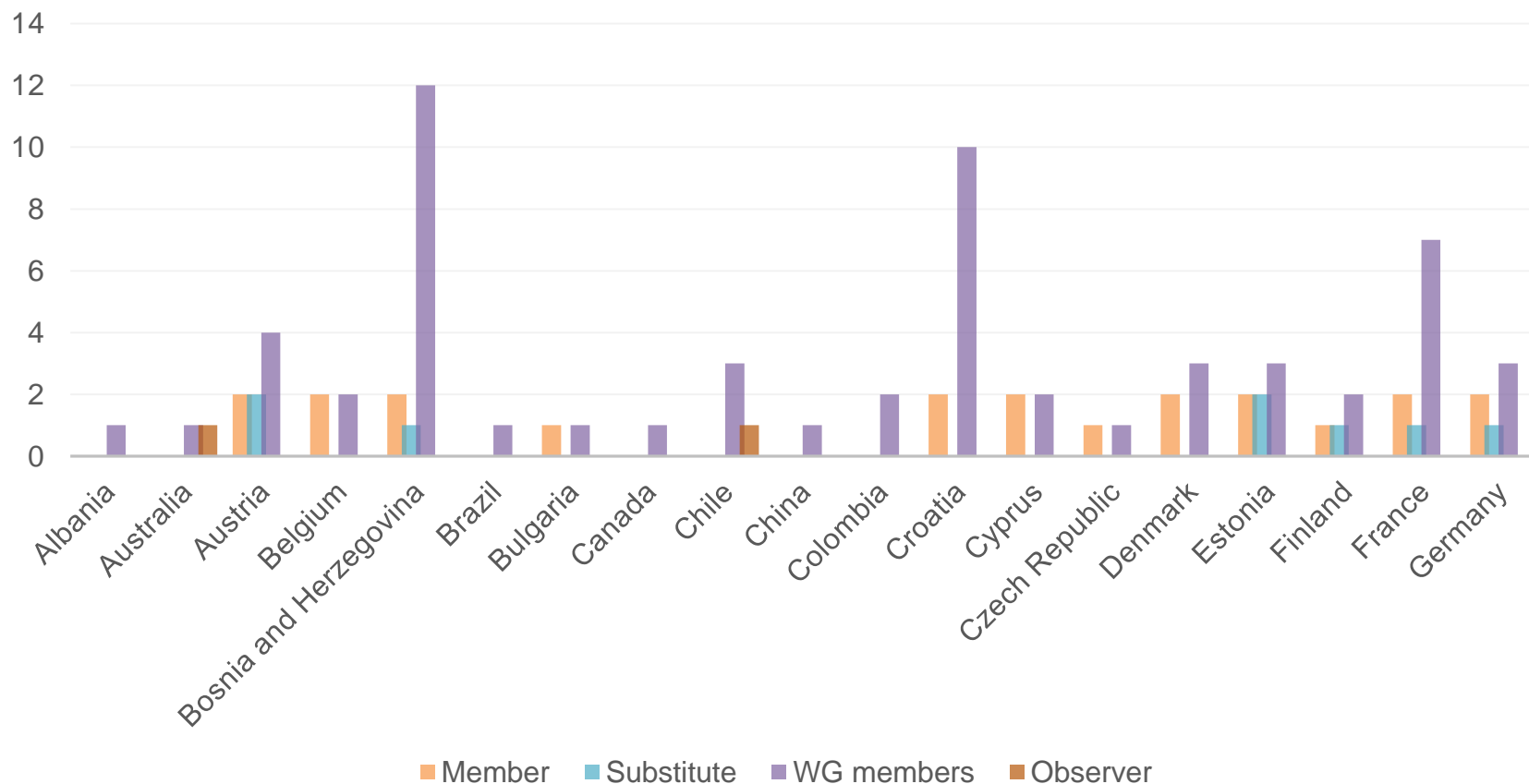
#### SME & Industry Cooperation

- Involve more SME & Industry for the next Workshop (LOS);
- Invite SME & Industry to be keynoters in the next Workshop (LOS);
- Involvement of SME & Industry in joint applications to research projects.

## 6. UPDATE FROM GRANT HOLDER



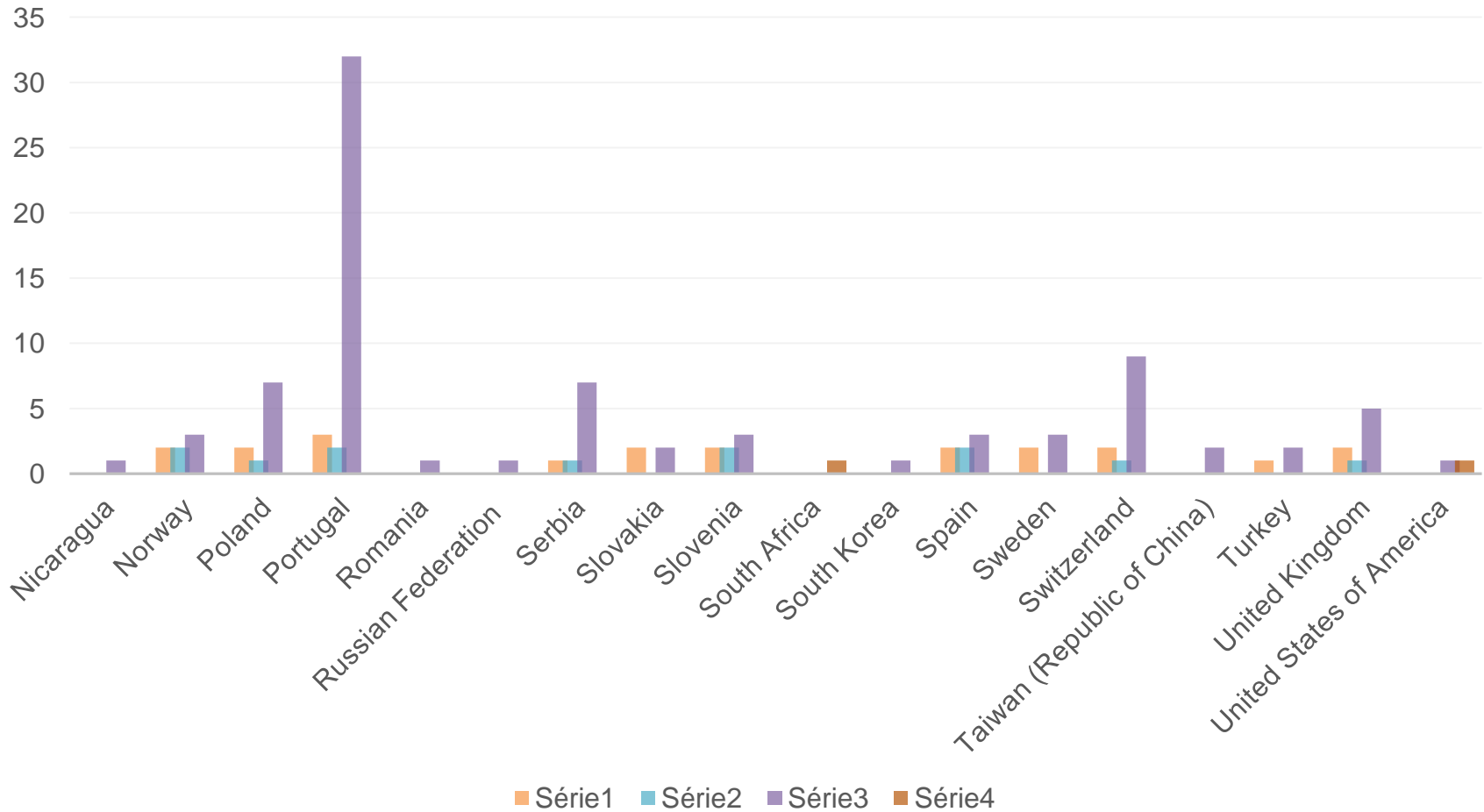
## 6. UPDATE FROM GRANT HOLDER



## 6. UPDATE FROM GRANT HOLDER

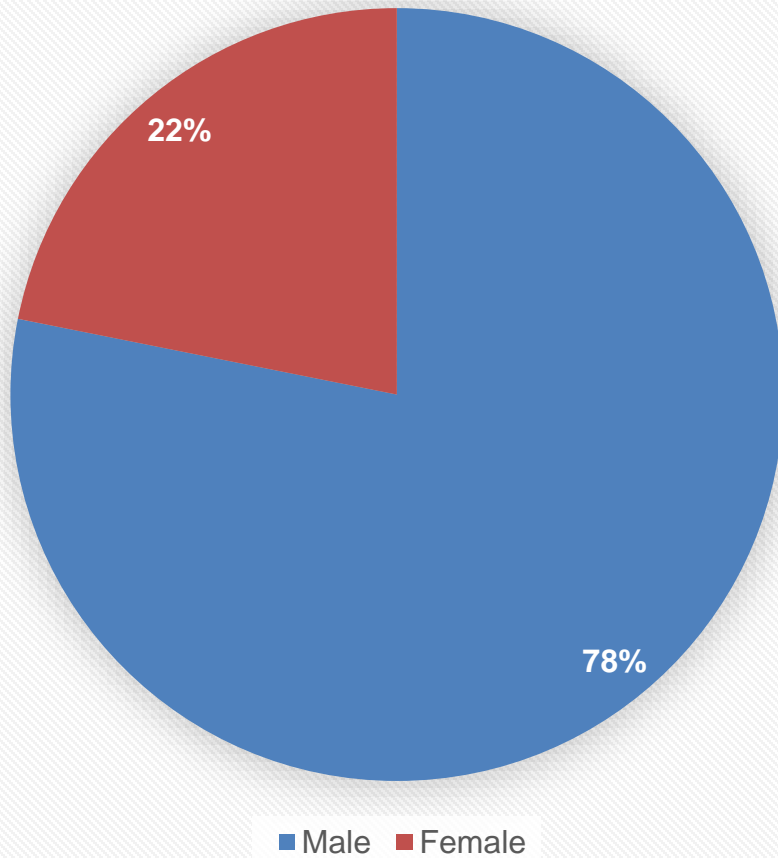


## 6. UPDATE FROM GRANT HOLDER

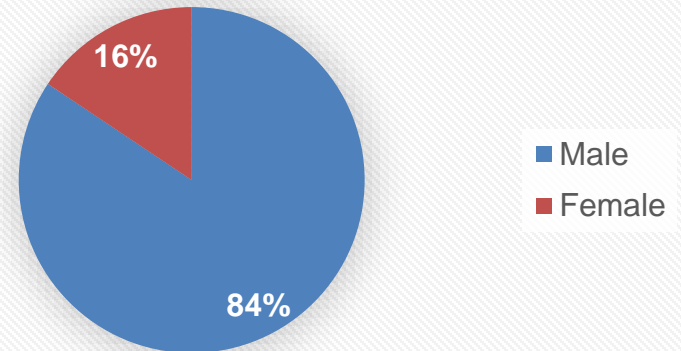


## 6. UPDATE FROM GRANT HOLDER

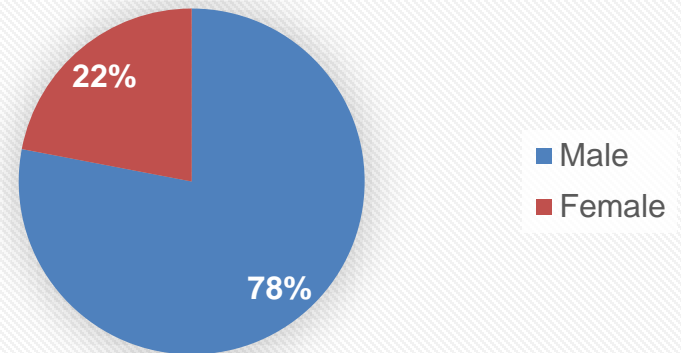
Members TU1406



MC Members

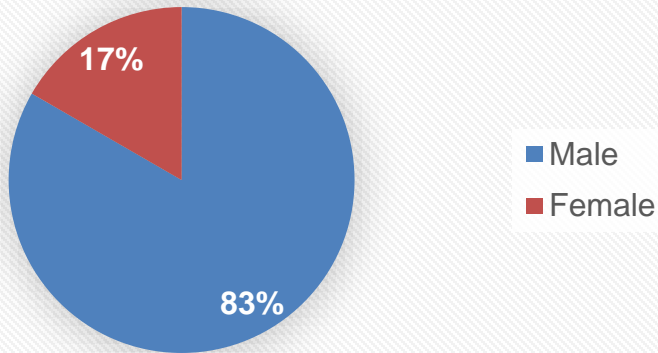


WG Members

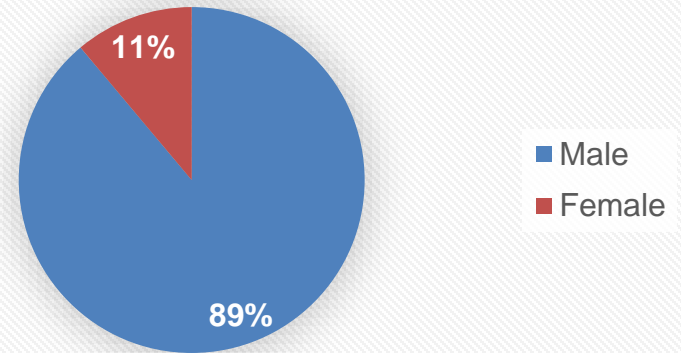


## 6. UPDATE FROM GRANT HOLDER

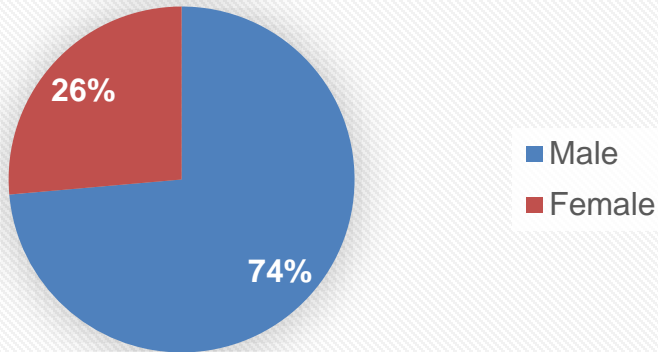
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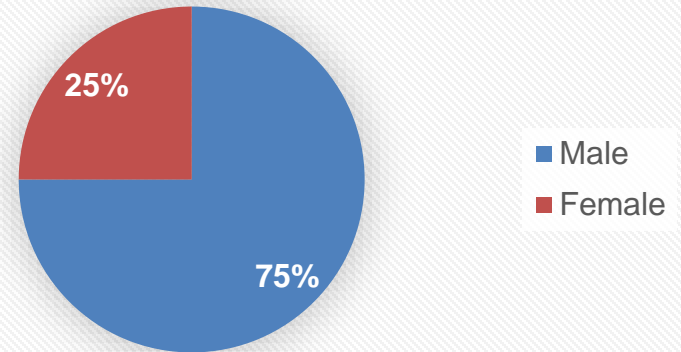
Budapest



Belgrade



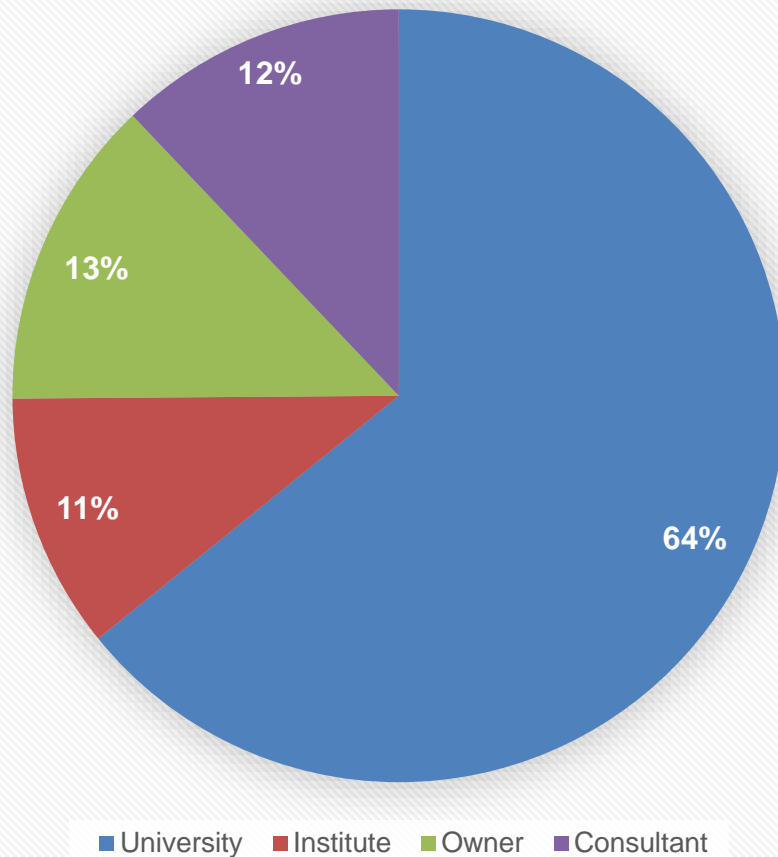
Delft



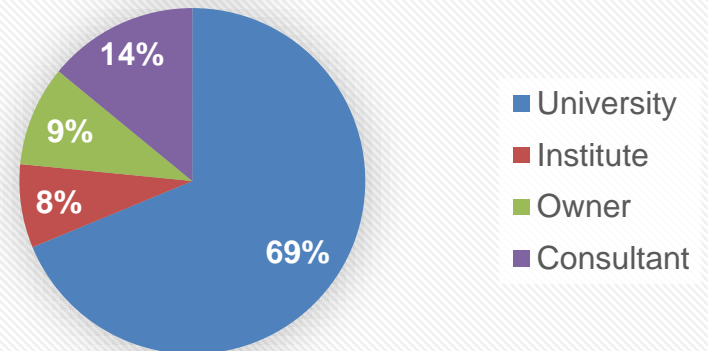


## 6. UPDATE FROM GRANT HOLDER

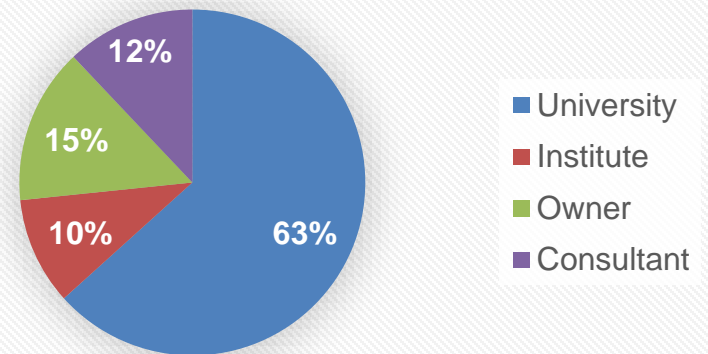
Members TU1406



MC Members

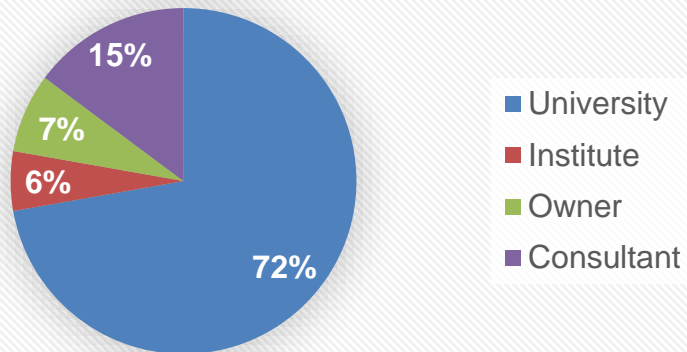


WG Members

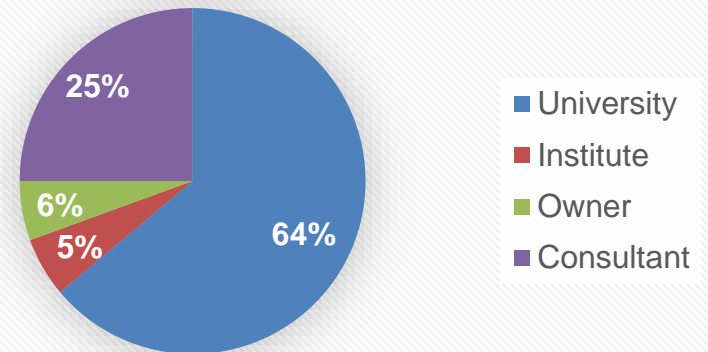


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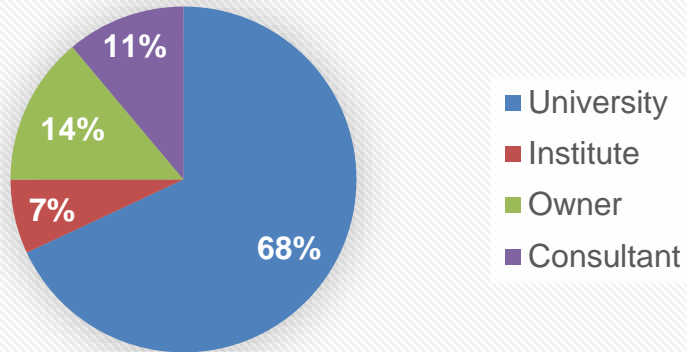
Geneve



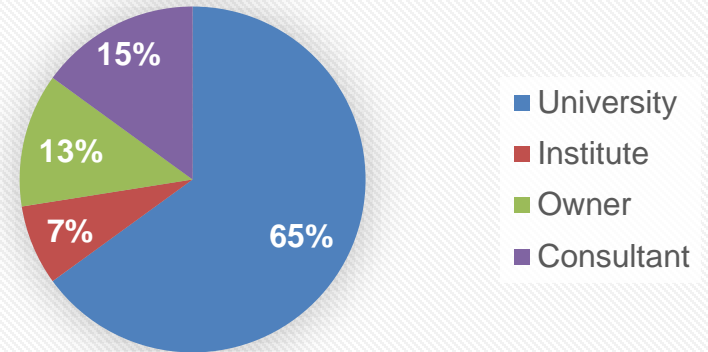
Budapest



Belgrade



Delft



## 7. UPDATE FROM COST ASSOCIATION

- The overall budget for the 3<sup>rd</sup> Grant Period is of **181 000 EUR**, a considerable increase in relation to the 2<sup>nd</sup> Grant Period – 141 000 EUR!
- The COST TU 1406 results will be assessed remotely by the **Rapporteur by the end of April 2017**. Therefore, **the website should be updated with all reports and other material until then (WG6)**;
- The Intermediary Report should be submitted online in the platform until **16-04-2017**, also to be assessed by the Rapporteur. Your contribution for this is essential (deadline 03-03-2017, by email to E. Chatzi & S. Fernandes), and a core group meeting will be held in Luxembourg on 23-03-2017 to finalize this.

# 8. FOLLOW-UP OF MoU OBJECTIVES

## Progress report of Working Groups



*COST TU1406 KPI  
Database  
@ [www.tu1406.eu](http://www.tu1406.eu)*



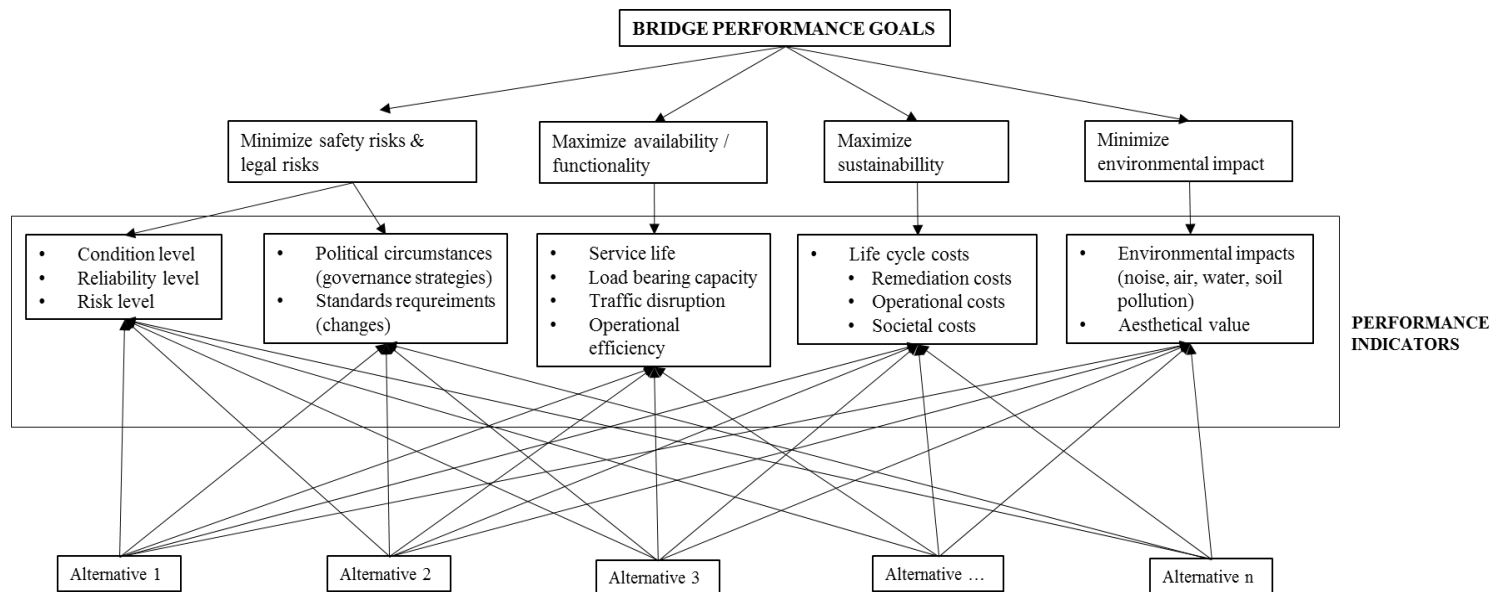
# **8. FOLLOW-UP OF MoU OBJECTIVES**

## **Progress report of Working Groups**

### **WG2 – Performance Goals**

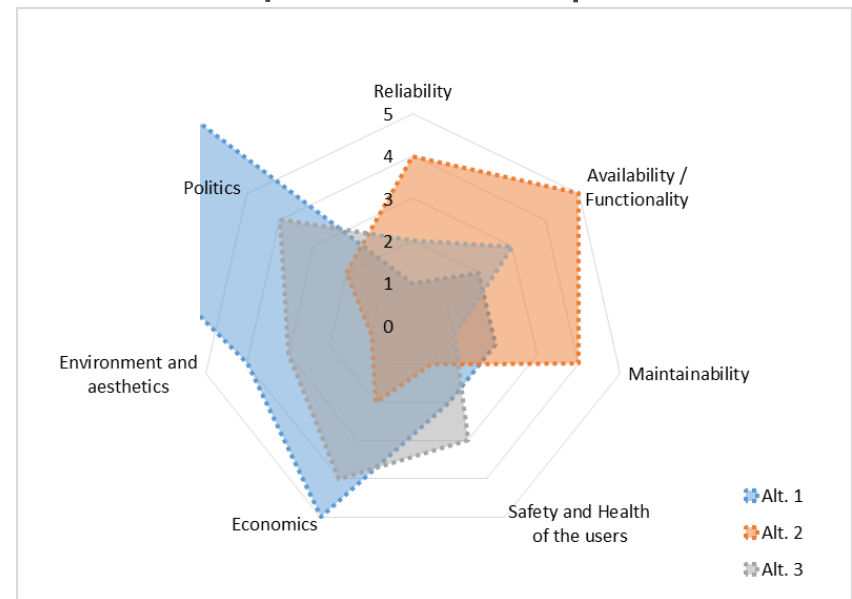
## WG2: Main Objectives

- To provide an overview of existing performance goals based on the performance indicators identified in WG1;
- Performance goals vary by technical, environmental, economic and social aspects, and on the component, system and network level;
- Deliver a Report which will specify the performance goals, linked to the Performance Indicators.



## WG2: Performance Goals

- Different aspects of performance should be taken into account for the initial situation and for a situation with remediate measures.
  - RAMS SHEEP was taken as basis for „spider” development:
    - Reliability;
    - Availability;
    - Maintainability;
    - Safety;
    - Security;
    - Environment;
    - Costs;
    - Health;
    - Politics.
- The "aspects" will be quantified as a probability and a "consequence".
- The various "aspects" will be normalised with "weight factors".



## ***WG2: Where are we now?***

- Core Group (10- 15 people) is collaborating very well;
- 1 STSM performed → UT (Netherlands) to TCD (Ireland);
- There were three papers from WG 2 in Zagreb;
- The report is under development;
- The WG 2 paper is prepared for the IABSE Conference in Vancouver;
- The pre-workshop meeting in Zagreb was dedicated to discussion about the WG 2 report and missing chapters:
  - Content list of the document;
  - Chapter leaders;
  - Literature study;
  - Examples how to apply multi-objective utility function for bridge prioritization.



## WG2: Road Map

		2016				2017			
Task	Description	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Development of the multi-objective performance goals (PG) framework								
2	Collaboration with WG 1 – integrating Performance indicators (PI) in the PG framework								
3	Framework for multi-criteria decision model for bridge prioritization and case studies			*		**			
4	Development of the Guideline document								
5	Guideline Document delivered								
6	Presentation of the Guideline document							***	

\* 20- 21 October 2016 - WG meeting + Workshop, TNO, Delft, the Netherlands,

\*\* 2-3 March 2017 - WG & MC meeting + Joint COST TU 1402 / 1406 / IABSE Workshop, University Zagreb, Zagreb, Croatia

\*\*\* Meeting in Q3 of 2017 (Riga)

## ***WG2: Where do we go?***

- Propose case studies for WG4;
- Report from STSM – Z. Allah Bukhsh (MAUT and application on case studies);
- Reepport preparation:
  - Chapter leaders coordinating chapters development;
  - Draft of report by the end of May 2017;
  - Presentation of the report in Q3.

# **8. FOLLOW-UP OF MoU OBJECTIVES**

## **Progress report of Working Groups**

### **WG3 – Quality Control Plan**

## ***WG3: Main Objectives***

- Based on the results of the WG 1 and 2 as well as on survey of existing approaches in practice the objective of this group is to provide a methodology with detailed step-by-step explanations for establishment of QC plans for different types of bridges. The QC plans will address the dynamics and uncertainty of the processes that may significantly comprises the bridge performance;
- The QC plan has to relate to performance goals, which are defined according to the Dutch RAMSSHEEP approach:
  - Safety, Reliability, Security;
  - Availability, Maintainability;
  - Costs;
  - Environment, Health;
  - Politics.

## WG3: Breakdown of Tasks

- Focus on most common bridge types and systems;
- No landmark bridges.

			Girder bridges	Arch bridges	Frame bridges	Etc.
Interceptable processes (Observable processes)	Damaging processes	Corrosion	Task 2 (Masovic. Linneberg)	Task 3 (Amado)	Task 2 (Masovic, Linneberg)	
		Alkali Aggregate				
		Sulphate				
		Fatigue				
	Demand	Traffic volume				
		Traffic loading				
		Climate				
Non-interceptable processes	Sudden events	Earthquake	Task 4 (Tanasic)			
		Gravitational hazards				
		Fire				
		Accidents				
	Non-observable	Fatigue				
		Hidden damaging processes				

## ***WG3: Where are we now?***

- All Task Group are working;
- There were three papers from WG3 in the Zagreb workshop from Task Group 1, Task Group 3 and Task Group 4;
- The overall methodology is clear;
- The interface with WG 4 is established;
- There is a need for coordination with WG 2 and to lesser extent with WG 1;
- The dissemination paper is submitted for the IABSE Conference in Vancouver;
- COST 1406 in particular the work from WG 3 will be presented at the International Bridge and Structure Management Conference in Mesa, AZ, USA;
- The pre-workshop meeting in Zagreb was dedicated to unifying approaches in Task Groups.

# WG3: Road Map

ID	Task Name	2015			2016				2017				2018				2019
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1	Survey of European QC Plans																
2	Ground work for task groups																
3	Task Groups Coordination																
4	<i>Matrix tasks 1 - N</i>																
5	Definition of performance indicators																
6	Monitoring equipment																
7	Inspection scheduling																
8	Maintenance strategy																
9	Draft for Guidelines																
10	Guidelines for the establishment of QC Plans																

## ***WG3: Where do we go?***

- Prepare a report/guidelines;
- Propose case studies for WG4;
- Coordinate with WG 2 with regards to performance goals;
- Task group reports are going to be ready for the next Work Group meeting;
- Final decisions with regards to content of report/guidelines should be taken in next Working Group meeting;
- Draft of report/guidelines by the end of September;
- Finalizing guidelines by the end of the year 2017.



# **8. FOLLOW-UP OF MoU OBJECTIVES**

## **Progress report of Working Groups**

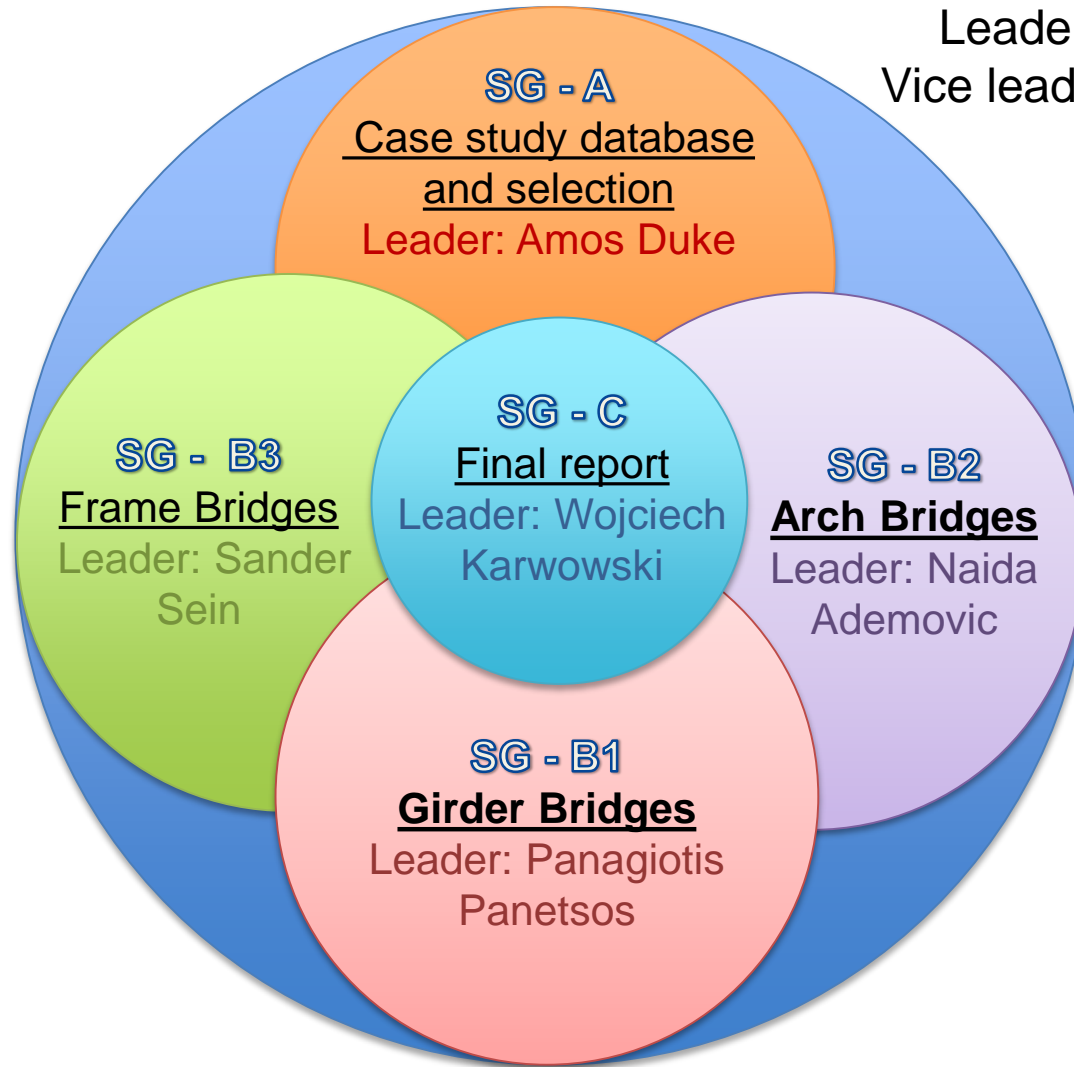
### **WG4 – Implementation in a Case Study**

## ***WG4: Main Objectives***

- Based on the results of the WG 2 and 3 the objective of this group is to implement the QCP methodology suggested by WG3 in a real case studies with detailed step-by-step explanations and comparing the results with the existing practice.
- Demonstrate the applicability of the developed guideline, and other recommendations, with typical case studies.
- Identify the gaps between existing data and needed data in order to help bridge owners to improve their bridge management processes.
- Implement the results within TU1406 report by transferring results to WG5.

## WG4: Breakdown of Tasks

Leader – Amir Kedar  
Vice leader – Sander Sein



## ***WG4: Where are we now?***

- Task Group A is working and the case study database established in its basic format.
- Request for case study data collection was distributed between the COST participating countries and other countries.
- To date data was received from 14 countries.
- Subgroups B1, B2, B3 and C leaders had core group meeting here in Zagreb and first coordination performed and work flow agreed.
- First Girder Bridge case study was chosen to be 'Strimonas river bridge' in Greece
- First Arch Bridge case study was suggested to be 'Carinski most, Mostar' in Bosnia and Herzegovina, however some data is missing and another options are still considered.
- First Frame Bridge case study was chosen to be 'Unterführung SBB bridge', Switzerland.
- The overall methodology is not yet structured as we need more structured material from WG2 and WG3.
- There is a need for coordination with WG 2 and WG3 to a more detailed extent.

## WG4: Where are we now?



Girder Bridge  
Strimonas River Bridge  
Greece

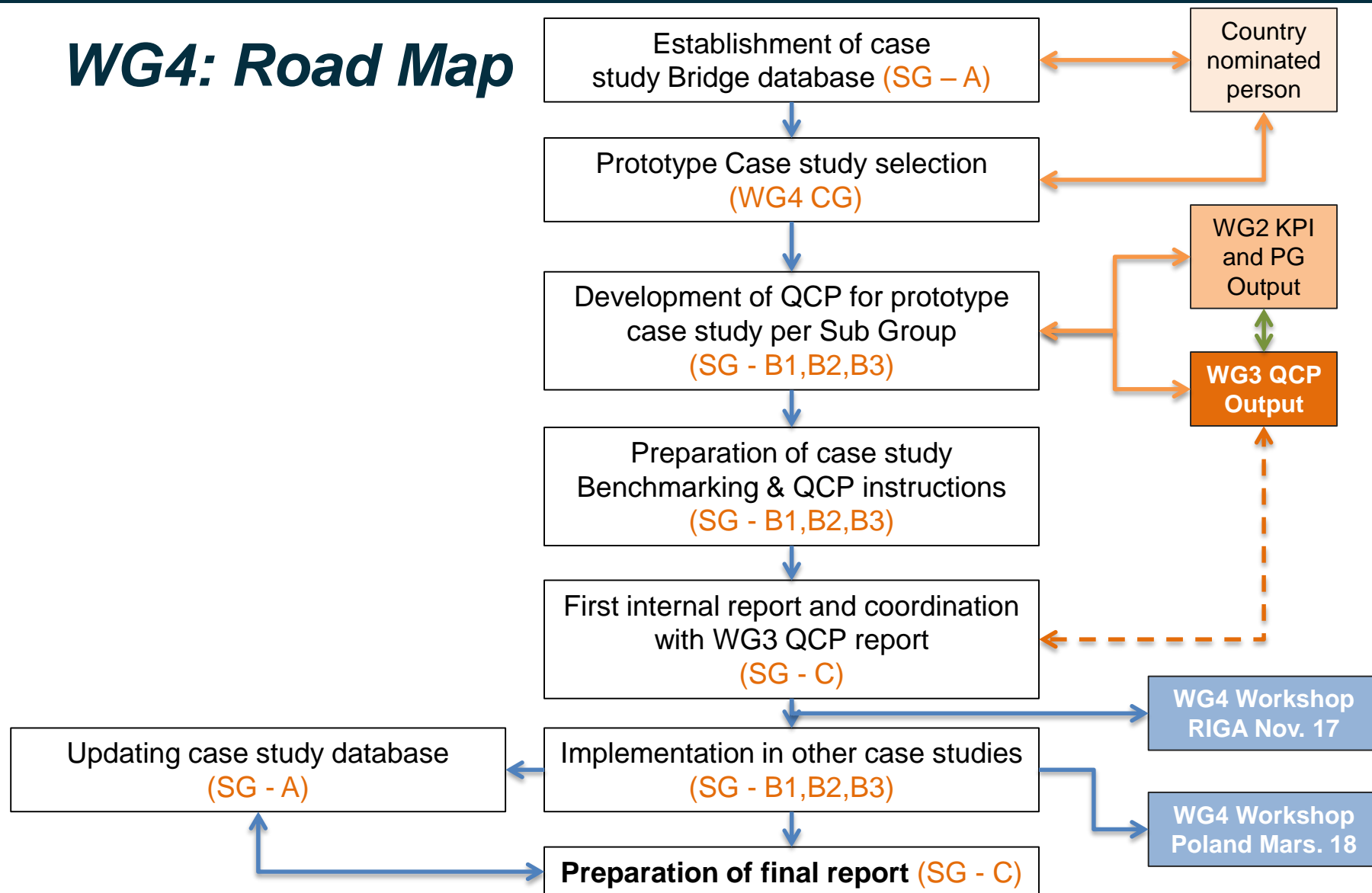


Arch Bridge  
Carinski most, Mostar Bridge  
Bosnia and Herzegovina



Frame Bridge  
Unterführung SBB Bridge  
Switzerland

# WG4: Road Map



# WG4: Road Map

ID	Task Name	2015			2016				2017				2018				2019
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1	Establishment of Case study Bridge database																
2	Prototype Case study selection																
3	Development of QCP for prototype case study per Sub Group																
4	Preparation of case study Benchmarking & QCP instructions																
5	First internal report and coordination with WG3 QCP report																
6	Implementation in other case studies																
7	Updating case study database																
8	Preparation of final report																

## ***WG4: Where do we go?***

- Collecting additional case study candidates per country and nominate country responsible person for this case studies.
- Enhance the data quality for the first three case studies.
- Receiving of mature written document from WG2 and WG3
- Implement in the first three case studies.
- Creating short guidelines document and coordinate the suggested process with WG3.
- Implementing in the country case studies.
- Creating final report.

.



# 9. SCIENTIFIC PLANNING

## Scientific Strategy

WG		Year 1				Year 2				Year 3				Year 4			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WG1	Technical indicators	✖	✖	✖	✖												
	Environmental indicators	✖	✖	✖	✖												
	Other indicators	✖	✖	✖	✖												
WG2	Technical goals	✖	✖	✖	✖	✖	✖	✖	✖								
	Environmental goals	✖	✖	✖	✖	✖	✖	✖	✖								
	Other goals	✖	✖	✖	✖	✖	✖	✖	✖								
WG3	Survey of European roadway QC plans	✖	✖	✖	✖	✖	✖										
	Procedures for the establishment of a QC plan							✖	✖	x	x						
WG4	Selection of case studies							✖	✖	x							
	Benchmarking										x	x	x	x	x		
	Application on a QC plan											x	x	x	x		
WG5	Standardized performance indicators				✖	✖	✖	✖									
	Standardized goals								✖	x	x	x					
	Standardized QC plan										x	x	x	x	x	x	x
WG6	Dissemination	✖	✖	✖	✖	✖	✖	✖	✖	x	x	x	x	x	x	x	x

## 9. SCIENTIFIC PLANNING

### Scientific Strategy

- ~~• WG2 will finalize the work by the end of the second Grant Period (WG2 Technical Report);~~
- **WG3 will continue with the work until the end of the year 2017;**
- **WG4 started collecting case studies ...**
- **WG5 is working in cooperation with WG1, using the developed data for standardization purposes;**
- **WG5 will start to cooperate with WG2, using the developed data for standardization purposes;**
- **WG6 is running in parallel such as a subgroup ...**

# 9. SCIENTIFIC PLANNING

## Scientific Strategy

Activity/Months	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Milestone				<del>M1</del>				<del>M2</del>		<b>M3</b>				<b>M4</b>		<b>M5</b>



### ~~M1~~ — Report on performance indicators

- ~~— General description~~
- ~~— Assessment methods (e.g. visual inspection, non-destructive tests, monitoring systems, etc.)~~
- ~~— Frequency of assessment~~
- ~~— Obtained values~~
- ~~— General recommendations~~
- ~~— Publication in refereed scientific journal papers (special issue) and in international conferences~~
- ~~— Workshop at the end of this task (Belgrade, Serbia)~~



### ~~M2~~ — Report on performance goals

- ~~— Description of technical, environmental, economic and social factors~~
- ~~— Goals computation methods~~
- ~~— Frequency assessment~~
- ~~— General recommendations~~
- ~~— Publication in refereed scientific journal papers (special issue) and in international conferences~~
- ~~— Workshop/Training School at the end of this task~~

# 9. SCIENTIFIC PLANNING

## Scientific Strategy

Activity/Months	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Milestone				<del>M1</del>				<del>M2</del>		<b>M3</b>				<b>M4</b>		<b>M5</b>

### M3 – Recommendations for the establishment of a QC plan

- Bayesian nets or other heuristic rules (used worldwide)
- Establishment of a procedure for the definition of QC plan for each individual bridge/component
- Publication in refereed scientific journal papers (special issue) and in international conferences
- Workshop/Training School at the end of year 3

### M4 – Preparation of a database from benchmarking

- Obtained results will validate the outcomes of WG1, WG2 and WG3
- Publication in refereed scientific journal papers (special issue) and in international conferences
- Conference/Training School at the end of year 4

### M5 – Guideline/recommendations

- Development of a new guideline for the establishment of QC plans
- Publication in refereed scientific journal papers (special issue) and in international conferences
- Conference/Training School at the end of this task

# 9. SCIENTIFIC PLANNING

## Scientific Strategy



### ~~WG1 – Key Performance Indicators~~

~~Report in Key Performance Indicators, including Operators and Researchers KPI Database~~

~~Predicted date: end of April 2016.~~

~~[http://www.tu1406.eu/wp-content/uploads/2016/10/COST\\_TU1406\\_WG1\\_TECH\\_REPORT.pdf](http://www.tu1406.eu/wp-content/uploads/2016/10/COST_TU1406_WG1_TECH_REPORT.pdf)~~



### ~~WG2 – Performance Goals~~

~~Report in Performance Goals, including Operators and Researchers KPI Database~~

~~Predicted date: end of April 2017.~~

### **WG3 – Establishment of a QC Plan**

**Report in Establishing QC plans for different bridge types**

**Predicted date: end of October 2017.**

## 9. SCIENTIFIC PLANNING

### Action Budget Planning

Description	Value
A – COST Networking Tools	
<b>A.1 – Meetings</b>	109.670 €
<i>A.2 – Training Schools</i>	31.200 €
A.3 – Short Term Scientific Missions (4xSTSM)	10.000€
<i>A.4 – Dissemination</i>	6.021 €
A.5 – OERSA	500 €
B – Total Science Expenditure (sum A.1-A.5)	<b>157.391 €</b>
C – FSAC (máx. 15% of B)	23.609 €
<b>D – Total Expenditure (B + C)</b>	<b>181.000 €</b>

## 9. SCIENTIFIC PLANNING

### Action Budget Planning

- Meetings: (i) WG meeting, IFSTTAR, Paris, France, 12 May 2017 (LOS. A. Orcesi and M. Limongelli); (ii) Core Group meeting, University of Cyprus, Nicosia, Cyprus, 30 June 2017 (LOS. S. Pantazopoulou and D. Charmpis); (iii) WG meeting + **Workshop**, Riga University, Riga, Latvia, 23-24 November 2017 (LOS. A. Paeglitis and J. Barbars); (iv) Core Group meeting, Kedmor Engineers, Telavive, Israel, 16 February 2018 (LOS. A. Kedar); (v) MC & WG meeting + **Workshop**, Wroclaw University, Wroclaw, Poland, 22-23 March 2018 (LOS. J. Bien and W. Karwowski); and (vi) Two dissemination meetings.
- Training School: (i) Technical University of Prague, Prague, Czech Republic, 25-28 September 2017. Grant of 550 EUR for 15 trainees from COST countries and reimbursement for 4 trainers; (ii) BOKU, Wien, Austria, 18-21 December 2017. Grant of 650 EUR for 15 trainees from COST countries and reimbursement for 4 trainers.
- STSM: Predicted 4 STSMs, in WG3 and WG4 scope, with the first call for applications until the **31<sup>st</sup> May 2016** (second call for end Oct. 2016);
- Dissemination: (i) website maintenance; (ii) print more 100 brochures & pins (MC members please ask Ms. Lara Leite for brochures); and (iii) print 100 technical reports w/ 50 pages from WG3.

# 9. SCIENTIFIC PLANNING

## Long Term Planning

Activity	Location	Date	LOS
Integrated Training School BESTInfra 2017 - <a href="http://www.bestinfra.cz/">http://www.bestinfra.cz/</a>	Prague, Czech Republic (CZ)	25-28 Sep. 2017 (4D)	Pavel Ryjacek



**BESTInfra 2017**  
Czech Technical University, September 21 - 22, 2017, Prague, Czech Republic

- HOME
- INVITATION
- TOPICS/KEYNOTES
- VENUE
- REGISTRATION/SUBMISSION
- COMMITTEES
- CONFERENCE PARTNERS
- PRACTICAL HINTS
- CONTACTS



Building up Efficient and Sustainable Transport Infrastructure



# 9. SCIENTIFIC PLANNING

## Long Term Planning

Activity	Location	Date	LOS
Training School	Wien, Austria (AU)	18-21 Dec. 2017 (4D)	Alfred Strauss Helmut Wenzel



# 9. SCIENTIFIC PLANNING

## Long Term Planning

Activity	Location	Date	LOS
Integrated WG meeting + Workshop	Riga, Latvia (LV)	23-24 Nov. 2017 (2D)	Ainars Paeglitis Janis Barbars



# 9. SCIENTIFIC PLANNING

## Long Term Planning

Activity	Location	Date	LOS
WG & MC meeting + Workshop	Wroclaw, Poland (PL)	22-23 Mar. 2018 (2D)	Jan Bien Wojciech Karwowski





# 9. SCIENTIFIC PLANNING

## Dissemination Planning

Activity	Location	Date
Dissemination Meeting IABSE17 - <a href="http://www.iabse2017.org/">http://www.iabse2017.org/</a>	Vancouver, Canada (CN)	21-23 Sep. 2017 (3D)



**Special Session of COST TU 1406**

## 9. SCIENTIFIC PLANNING

### Dissemination Planning

Activity	Location	Date
Dissemination Meeting SECOND INTERNATIONAL BRIDGES CONGRESS - CHILE 2017	Santiago, Chile (CL)	17-20 Oct. 2017 (4D)

**Segundo Congreso Internacional de Puentes –  
Chile 2017: Diseño, Construcción y  
Mantenimiento**

**Second International Bridges Congress - CHILE  
2017: Design, Construction and Maintenance**



## 9. SCIENTIFIC PLANNING

### Dissemination Planning

- **e-BOOK.** The Workshop in Zagreb will be published in an e-BOOK (with ISBN) of our Action, w/ authorized material. Other e-BOOKs will be developed for Workshop in Riga and Wroclaw, as well as for the Training School in Prague and Wien (also recording is planned);
- **Journal.** There will be two special issues of an ISI Web of Knowledge international journal, one related to TU1406 – Performance Indicators, other related to Zagreb Workshop;
- Other individual participations as dissemination meetings, special session / mini symposium organizations, published documents, etc., even not reimbursed, but related to COST TU 1406, are welcome. Please inform Ms. Lara Leite in order to be included in the technical report and do not forget the dissemination rules of COST.

# 10. REQUESTS FROM NEW MEMBERS

## COST countries

**Romania.** There is a WG member from Romania but, so far, Romania is not in the MC. The main reason for this is the difficult communication with the CNC. Any support on this matter would be appreciated.

## NNC countries

We received applications for WG members from NNC (Albania, Lebanon, Libya, Russia). Any support extending this to other countries is appreciated (list: Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Jordan, Moldova, Morocco, the Palestinian Authority, Syria, Tunisia and Ukraine).

# 11. NON-COST APPLICATIONS

## IPC countries

We received several applications from International Partner Countries (IPC) for WG members. Namely, countries from North America (Canada), Central & South America and Asia (China, South Korea and India). Missing more members from Africa (Namibia, Botswana, ...), Central & South America (Panama, Costa Rica, Ecuador, ...), Asia (Malaysia, Indonesia, Sri Lanka, ...), Oceania (New Zealand, ...). Also, some countries may increase the participants number (e.g. USA, Japan, ...). Any support on this issue is welcome.



## 12. ANY OTHER BUSINESS (AOB)



## 13. LOCATION AND DATE OF NEXT MEETING

- The next MC meeting will take 1 hour and will be in **Wroclaw, Poland, on the 22-03-2017 (afternoon)**.
- The workshop will run on the 22-03-2017 and 23-03-2017.
- More information regarding this meeting will be sent soon by email.



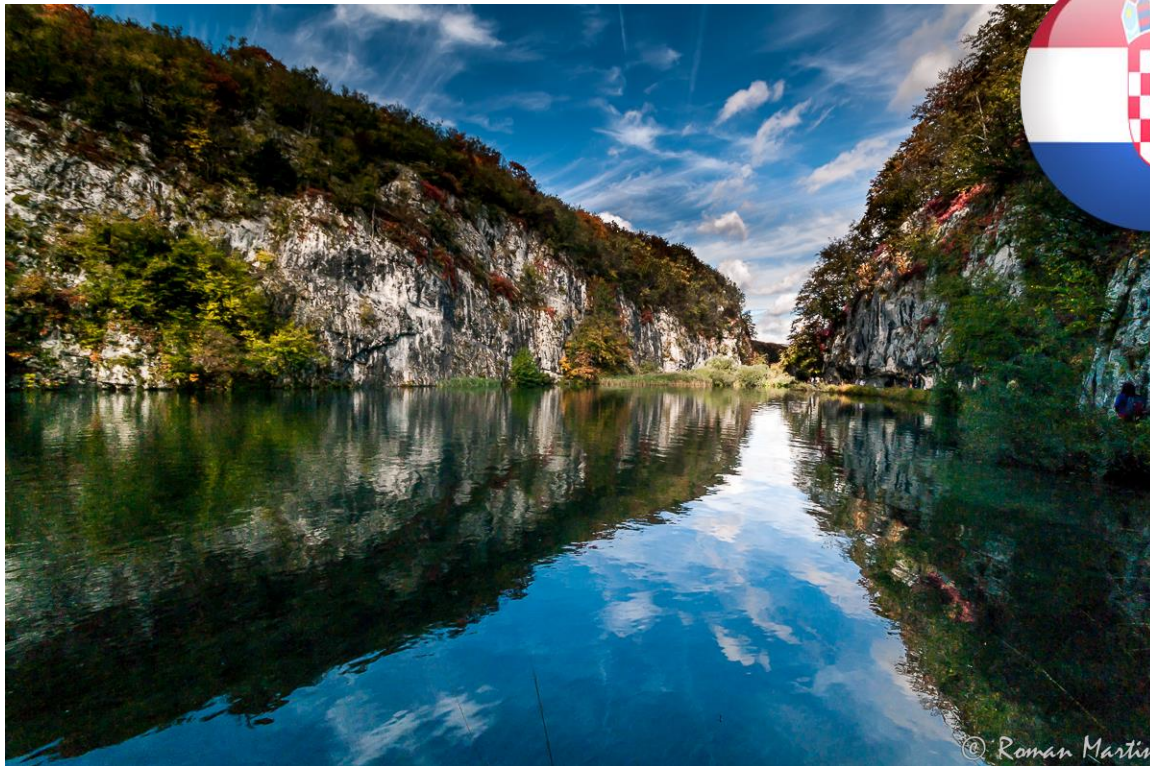
See you in Wroclaw !

## 14. SUMMARY OF MC DECISIONS

- **Adoption of Agenda;**
- **Approval of Last Meeting Minutes;**
- **Approval of nominations for Innovation and Research & Development Subgroup;**
- **Approval of WBP for the 3<sup>rd</sup> Grant Period.**

## 15. CLOSING

Thank you for the Support ! Again, I kindly ask you to be active and answer the WG leader requests ... The success of this Action depends on you!



*wish you a pleasant stay in Croatia ...*



# 15. CLOSING



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COST ACTION