## Pan-EU CoP Forum meeting 25-2-2021

# Please introduce yourself in the chat, we have already done so



# IM-SAFE

<u>www.IM-safe-project.eu</u> <u>https://www.linkedin.com/company/im-safe-project/</u> <u>https://cordis.europa.eu/project/id/958171</u>

IM-SAFE (ref. 958171)



## Pan-EU CoP Forum meeting 25-2-2021

# Please introduce yourself in the chat, we have already done so



### **SPEAKERS**





**I-SAFE** 

### Dr.ir. Agnieszka Bigaj-van Vliet

- IM-SAFE Project Coordinator
- TNO Department of Structural Reliability
- Senior Scientist Concrete Structures
- Presidium member of *fib* (International Federation for Structural Concrete)
- Deputy Convener of *fib* T10.1 Model Code 2020 for Concrete Structures
- Head of the National Delegation of NL to fib
- Member of ACI-318 (subcommittee L)

#### Jos Wessels MSc, MBA

- IM-SAFE WP Leader (Stakeholder Engagement)
- CROW
- Senior project manager
- Coordinator platform Inner City Quay Walls
- Coordinator platform Geotechnics
- Project manager CROW Program Advisory Board Hydraulics and Geotechnics
- Involved in establishing NL platform Bridges & NL platform Inspections



## Agenda

Time	Subject
9:50	Log on
10:00 - 10:10	Welcome (AB)
10:10 - 10:40	Introduction IM-SAFE, Q&A (AB)
10:40 - 11:05	Stakeholder engagement and role Pan-EU CoP Forum, Q&A (JW)
11:05 – 11:25	Timeline of the project and interaction with CoP, Q&A (AB)
11:25 - 11:45	Short term activities, Q&A (AB)
11:45 – 12:00	Summary and outlook (JW)





H2020 CSA IM-SAFE (Grant agreement ID: 958171)

Harmonised Transport Infrastructure Monitoring in Europe for Optimal Maintenance and Safety



### H2020 CSA IM-SAFE context

Transport infrastructure is facing **major challenges** due to ageing, rapid growth of traffic loads and natural and man-made resilience threats.

Safety risks have become

**critical** in the recent years and manifested in major disasters caused a.o. by structural failures due to maintenance deficiencies.



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### H2020 CSA IM-SAFE context





JRC SCIENCE FOR POLICY REPORT

#### Research and innovation in bridge maintenance, inspection and monitoring



Europe's aging transport infrastructure needs effective and proactive maintenance in order to continue its safe operation during the entire life cycle. This report focuses on research and innovation (R&I) in bridge maintenance, inspection and nonitoring in Europe in the last quarter of a century. The assessment follows the methodology developed by the European Commission's Transport Research and Information Monitoring and Information System (TRIMIS). The report critically addresses issues and techniques, and also highlights new technological developments and future oriented approaches.



## H2020 CSA IM-SAFE context

**Optimal maintenance** is only possible with the right policies and decisions enabled by **timely and accurate information from monitoring.** 

Standardisation in monitoring is a key enabler for optimal maintenance strategies, strengthening or retrofitting measures to be applied for ensuring the safety of the infrastructure.







### H2020 CSA IM-SAFE set-up

IM-SAFE aims to support the European Commission and the European Committee for Standardization (CEN) to preparing a new standard in monitoring for optimal maintenance and safety of transport infrastructure based on a comprehensive insight into the trends, challenges, best practices, and technology developments, including the integration of digital innovations.

IM-SAFE aims to achieve broad acceptance for new standardization and to enable public authorities and industries to contribute to standardisation, roll-out, and implementation.

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## H2020 CSA IM-SAFE aim



- To support the European Commission (EC) and the European Committee for Standardisation (CEN) in preparing new standards in monitoring, maintenance and safety of transport infrastructure
  - > To provide the EC with the input for formulating a mandate for CEN and a plan of approach for the execution of the mandate
  - > To provide the CEN working groups with the technical background materials for the development of new standards on monitoring and maintenance of transport infrastructure, and the further amendment of Eurocodes on the use of inspection, monitoring and testing for assessing the safety of structures
  - > To present a **comprehensive insight** concerning the ageing transport infrastructure and a gap analysis both within the **existing standards as well as between the available standards and the actual practice**
  - > To consolidate the vision, facilitate inclusive dialogs, and reach a consensus on future trends and the relevant technological advancements, addressing the changing demands and resilience challenges as well as the **digital innovations** for monitoring, data analytics and back analysis with safety evaluation.





## H2020 CSA IM-SAFE aim



- > To **raise the awareness** and empower all key public and industrial stakeholders through an inclusive change management plan to create broad societal acceptance.
- > To accelerate the process for enabling public authorities and supply-chain stakeholders in transport infrastructure **to commit** to the development and adoption of the new standards
  - To mobilise, expand and harmonise the stakeholder platforms already established by national and EU initiatives, to become a pan-European Community of Practice (CoP) actively involved in the development and implementation processes of the new standards on monitoring of transport infrastructure
  - To ensure a broad societal acceptance from all key public and industrial stakeholders and a smooth transition from the current practice to the new approach by enabling the stakeholders to anticipate the implications of the new standards and equipping them with the essential tools and guidelines
  - To integrate, analyse and disseminate the best practices and lessons-learned in Europe and worldwide as the basis for an evidence-based approach to develop new standards and create confidence among the stakeholders for the follow-up adoption in real practice





### H2020 CSA IM-SAFE set-up

IM-SAFE covers bridges, tunnels and other large infrastructures on the road and railway networks. IM-SAFE deals with the structural / civil engineering part of transport infrastructure and, where relevant, complementary other infrastructure elements, e.g. railway electrical







### H2020 CSA IM-SAFE set-up

IM-SAFE enables paradigm shift from the time-based/corrective maintenance towards **risk-based/predictive maintenance through data-informed decision-making,** benefiting from digital transformation.

New and harmonised European standards provide for **meeting safety and availability demands and improved costeffectiveness of transport infrastructure.** 

The **new standardization is supported and implemented coherently** by the public authorities and the industrial stakeholders across Europe.







## H2020 CSA IM-SAFE objectives



To enable transition from corrective and timebased maintenance approaches towards the condition-based and risk-based approaches

- > To standardize principles & requirements for:
  - structural monitoring
  - safety assessment taking into account inspections, monitoring and testing
  - data-informed decision-making in condition-based and risk-based maintenance







## H2020 CSA IM-SAFE results

- To collect the technical input for standards for inspection, monitoring and testing, safety assessment, pro-active maintenance of bridges, tunnels and other relevant transport infrastructures
  - Review of national guidelines and standards in all EU and international research activities related to monitoring of bridges and maintenance
  - Evaluation of the gaps between the state-of-practice on inspection, monitoring, testing, safety assessment and decision-making with regard to pro-active maintenance in the EU.
- To prepare the mandate for CEN incl.:
  - further amendment to the existing EU standards on safety assessment taking into account inspections, monitoring and testing
  - new standard on structural monitoring
  - new standard for condition-based and risk-based maintenance of transport infrastructures
- To support CEN by:
  - proposing a plan of approach for the execution of the mandate by CEN
  - collaborating with the CEN working groups





- To prepare the mandate for CEN incl.:
  - further amendment to the existing EU standards on safety assessment taking into account inspections, monitoring and testing
  - new standard on structural monitoring
  - new standard for condition-based and risk-based maintenance of transport infrastructures
- To collect the technical input for standards for inspection, monitoring and testing, safety assessment, pro-active maintenance of bridges, tunnels and other relevant transport infrastructures
  - reviewing national guidelines and standards in all EU and international research activities related to monitoring of bridges and maintenance
  - evaluating the gaps between the state-of-practice on inspection, monitoring, testing, safety assessment and decision-making with regard to pro-active maintenance in the EU.
  - formulating frameworks and principles for the mandates
  - providing background material to CEN for translating the framework and principles into practical clauses for the implementation in standards

#### • To support CEN by:

- proposing a plan of approach for the execution of the mandate by CEN
- collaborating with the CEN working groups





- To prepare the **mandate for CEN** incl.:
  - further amendment to the existing EU standards on safety assessment taking into account inspections, monitoring and testing
  - new standard on structural monitoring
  - new standard for condition-based and risk-based maintenance of transport infrastructures



- To prepare the mandate for CEN incl.:
  - further amendment to the existing EU standards on safety assessment taking into account inspections, monitoring and testing
    - o to enable the **use of structure-specific data** in the safety assessment of existing structures
    - to formulate the **framework for including information from diagnostics** of structures based on data from inspection, monitoring and testing
    - to provide **background material to CEN** for translating the framework into practical clauses for the assessment at the semi-probabilistic level
  - new standard on structural monitoring
  - new standard for condition-based and risk-based maintenance of transport infrastructures





- To prepare the mandate for CEN incl.:
  - further amendment to the existing EU standards on safety assessment taking into account inspections, monitoring and testing
  - new standard on structural monitoring
    - o to promote best practices for monitoring of transport infrastructure
    - to maintain the openness to innovations (i.e. in sensing technology and data analysis methods)
    - o to formulate the principles of setting the **objectives of structural** monitoring
    - to formulate **essential principles of design of the monitoring system** incl. requirements related to the reliability of sensor systems
    - to provide essential requirements of methodologies for translating data into useful and meaningful information for diagnostics of structures, safety assessment and maintenance approaches
  - new standard for condition-based and risk-based maintenance of transport infrastructures





- To prepare the mandate for CEN incl.:
  - further amendment to the existing EU standards on safety assessment taking into account inspections, monitoring and testing
  - new standard on structural monitoring
  - new standard for condition-based and risk-based maintenance of transport infrastructures
    - to promote transition from corrective and time-based maintenance approaches towards the condition-based and risk-based approaches
    - o to formulate the principles of the condition-based and risk-based approaches
    - o to provide principles and requirements for data-informed (inspection, monitoring and testing) decision-making





### H2020 CSA IM-SAFE set-up

### **PROJECT FOCUS AREAS**



Co-funded by the Horizon 2020 Framework Programme of the European Union



## H2020 CSA IM-SAFE set-up

### **PROJECT PARTNERS**

#### **The Netherlands**

TNO Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek CROW Kennisplatform voor Infrastructuur, Verkeer, Vervoer en Openbare Ruimte Norway

NTNU Norges Teknisk-Naturvitenskapelige Universitet

#### Spain

UVIGO Universidad De Vigo FER Ferrovial Construction

#### Austria

BOKU Universität für Bodenkultur Wien

#### Italy

SAC SafeCertifiedStructure Ingegneria S.r.l

#### Germany

AEC AEC 3 Deutschland GMBH

#### Switzerland

**IBM** IBM Research GmbH

#### Poland

**MOW** Mostostal Warszawa S.A.











## **Q&A:**

- Aim, scope and objectives of IM-SAFE
- IM-SAFE set-up and deliverables







## Importance of stakeholder engagement

- 1. Improvement of standards for monitoring of constructions
- 2. EU standards => to be implemented in EU countries
- 3. Common practise to be included
  - Country specific circumstances to be taken into account
  - Good practise exchange => best practise in standard
- 4. New developments / innovation to be included
  - Country specific innovation to be taken into account
  - Feasible standards for EU wide implementation





## **Benefit for stakeholders**

### **Exchange of information (inter)nationally:**

- Current practice and approaches,
- Experiments and pilots,
- Barriers for implementation

### In order to:

- Improve service level
- Understanding needs of owners, operators, industry
- Start transition to new standards during creation

## How to organise?





## **National network Structure**



### **CoP Groups**

- 1. IM-SAFE national CoP
- 2. Working Group(s)
- 3. Steering Committee of CoP
- 4. Pan European CoP Forum





## **Example CoP and network organisations (NL)**







## **PAN European structure**









## **Working group themes**

- 1. Best practices in monitoring, data-informed safety assessment and condition-based and risk-based maintained
  - Input to case studies, feedback on analysis results
- 2. Barriers & impact of standardization
  - Input for identification PEST barriers and impact analysis, feedback on analysis results and translation into plan of approach for the execution of the mandate

### 3. Surveying technologies and diagnostics of structures

 Input for review and analysis of detection (testing, inspection, monitoring) techniques and diagnostic methods, feedback on analysis results and translation into mandate

### 4. Risk management & decision making

 Input for appraisal of methods for safety evaluation and risk management, feedback on analysis results and implementation of decision-making regarding maintenance strategies in mandate

### 5. Digitalization

• Input for guidelines on digital solutions (data handling, quality assurance, integration of IoT, BIM and GIS for transport infrastructure, IT platforms, data analytics), feedback on analysis results

Themes set for all project focus areas.

For each theme national groups can be established



## **Role and tasks steering committee**

- 1. Be the representative of your country
- 2. Propagate national interests of your country in Pan-EU CoP Forum
- 3. Think along about the structure of your national CoP and who should be a member
- 4. Think along about how to organise the communication of input and output
- 5. Attend meetings (Pan-EU CoP Forum, working groups, ...)





## **CoP** activities

### 1. Meetings / workshop

- a. Pan-EU meetings / workshops
- b. Local CoP steering committee meetings
- c. Local CoP working group meetings / workshops
- d. International CoP working group meetings / workshops

### 2. By E-mail

- a. Questionnaires
- b. Review of results

Best strategy for a specific communication / input to be decided by IM-SAFE constortium





## International networking organisations

- ECTP
- CEDR
- ENCORD
- FEHRL
- ECCREDI
- Shift2Rail
- bSI building SMART
- fib

- IABSE
- Eurostruct
- IALCCE
- IABMAS
- RILEM
- JCCS
- ITA-COSUF
- ?







## **Q&A:**

Stakeholders engagement and CoP



# Timeline of the project and interaction with CoP



## H2020 CSA IM-SAFE CoP

### **Timeline of project activities**





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2022		M22	August	Discussion of complete draft with EC
	Q8	M23	September	
		M24	October	Final draft of technical background material (standard on structural
		M25	November	monitoring)
			November	Formulation of mandate and PoA
	Q9	M26	December	Final draft of technical background material (new standard on
		M27	January	maintenance and amendment to Eurocodes)
2023		M28	February	
	Q10	M29	March	
		M30	April	Submission of deliverables

Guidelines for **adoption plan of** new standards, change management and pilot project setup

Action plan and recommendations for complementary standardisation in digitalisation

of deliverables





## H2020 CSA IM-SAFE CoP

### **INVOLVEMENT IN COMMUNICATION & DISSEMINATION ACTIVITIES**









## H2020 CSA IM-SAFE CoP



### **Timeline of CoP involvement**



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• technical background material to standard on maintenance







Co-funded by the Horizon 2020 Framework Programme of the European Union

## **Working group activities**

- 1. Best practices in monitoring, data-informed safety assessment and condition-based and risk-based maintained
  - Input to case studies (ongoing), feedback on analysis results (May/June 2021)
- 2. Barriers & impact of standardization
  - Input for current status of standardization, identification of PEST barriers and impact analysis (March/April2021, May 2021)
- 3. Surveying technologies and diagnostics of structures
  - Input for review and analysis of detection techniques and diagnostic methods (May 2021)

### 4. Risk management & decision making

• Input for appraisal of methods for safety evaluation and risk management (May 2021)

### 5. Digitalization

Input for guidelines on digital solutions (May 2021)





## **Thematic workshops**

Organized for local CoP between 29.03.2021 - 9.04.2021

Online workshop, followed by a round table discussion:

### CURRENT STATE OF STANDARDIZATION IN MONITORING, DATA-INFORMED SAFETY EVALUATION AND MAINTENANCE OF TRANSPORT INFRASTRUCTURE

Participants of the workshop will receive up-to-date information about availability of national and European standards, guidelines and regulations. They will also be given an opportunity to engage in a discussion about the directions for future development of the harmonized European standards on :

- structural monitoring,
- condition-based and risk-based maintenance of transport infrastructure.
- data-informed safety assessment.

Opinions and viewpoints shared by the participants of the workshop will be taken into consideration in formulating the proposals for amendments and extensions to the existing CEN standards.





## **Pan-European CoP Forum**

### **Organized in May/June 2021**

### Online workshop, followed by a round table discussion:

### BARRIERS AND NEEDS FOR STANDARDIZATION AND PRELIMINARY SCOPE OF THE MANDATE FOR CEN

Participants of the workshop will be given opportunity to share their opinions on barriers and needs for standardization and will receive up-to-date information about the foreseen scope of the mandate for:

- amendment to the existing EU standards on data-informed safety assessment of infrastructure
- new standard on structural monitoring of infrastructure
- new standard for condition-based and risk-based maintenance of infrastructures

Information and viewpoints shared by the participants of the workshop will be taken into consideration in identification of the gaps in standardization and in setting the approach for motivating and formulating the mandate.





## Q&A

• Timeline of the project and interaction with CoP



## **Summary & outlook**

#### Communication

- 1. Website: <u>www.IM-SAFE-project.eu</u>, <u>www.IM-SAFE.eu</u>
- 2. LinkedIn: <u>https://www.linkedin.com/company/im-safe-project/</u>
- 3. IM-SAFE general information: info@im-safe-project.eu
- 4. National CoP => IM-SAFE country representative
- 5. National steering committee => IM-SAFE country representative
- Pan-EU CoP Forum => CROW (responsible IM-SAFE consortium partner), Jos Wessels <u>Jos.Wessels@crow.nl</u>
- IM-SAFE Pan-EU Forum membership managed by CROW, to be "appointed" by country representative
- Presentations of this Meeting will be sent to you by CROW





## **Summary & outlook**

### **Country representatives**

#### **Benelux:**

Agnieszka Bigaj van Vliet <u>agnieszka.bigajvanvliet@tno.nl</u> DACH:

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#### Scandinavia

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#### **East-Central Europe**

Julius Zäch J.Zach@mostostal.waw.pl

#### Southwest Europe

Sara Cuerva Navas <u>scuerva@ferrovial.com</u> Isabella Alovisi <u>isabella.alovisi@sacertis.com</u> Ana Sanchez Rodriquez<u>anasanchez@uvigo.es</u> Javier Royo <u>fjroyo@ferrovial.com</u>





## **Summary & outlook**

### Next steps:

#### Within Consortium and via direct contact:

- 1. Collecting input best practices monitoring & safety assessment
- 2. Collecting input barriers (PEST: political, economical, social, technical)
- 3. Analysis current state of standardisation
- 4. Contacting international network organisations for cooperation and / or Pan-EU CoP Forum membership

#### **Meetings:**

Theme 2: Barriers & impact of standardisation

Current state of **standardisation** in monitoring, data-informed safety evaluation and maintenance of transport infrastructure

- 1. March: National CoP meeting (invitation from IM-SAFE country representative)
- 2. April: IM-SAFE discuss results with CEN and EU
- **3. May**: input from CEN and EU will be processed and discussed in Pan-EU CoP Forum meeting (invitation from CROW)





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