

Pan-EU CoP Forum meeting 25-2-2021

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





IM-SAFE^{.EU}

www.IM-safe-project.eu

<https://www.linkedin.com/company/im-safe-project/>

<https://cordis.europa.eu/project/id/958171>

IM-SAFE (ref. 958171)



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

Pan-EU CoP Forum meeting 25-2-2021

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



SPEAKERS



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

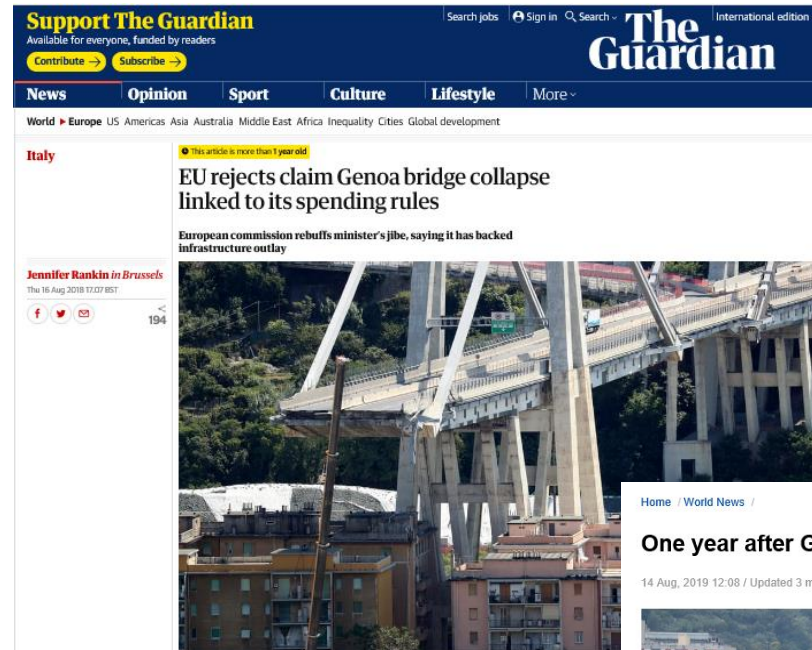
(Grant agreement ID: 958171)

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.



One year after Genoa tragedy: Are Europe's bridges any safer?

14 Aug, 2019 12:08 / Updated 3 months ago

[Get short URL](#)



The collapsed Morandi bridge, Genoa © Reuters / Stefano Rellandini



Follow RT on [Google News](#)

H2020 CSA IM-SAFE context



JRC SCIENCE FOR POLICY REPORT

Research and innovation in bridge maintenance, inspection and monitoring

A European perspective based on the Transport Research and Innovation Monitoring and Information System (TRIMIS)

Gkoumas, K., Marques Dos Santos, F. L., van Balen, M., Tsakalidis, A., Ortega Montelano, A., Grosso, M., Haq, G., Pekár, F., 2019.



JRC Research Cycle

EUR 29650 EN

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Italy

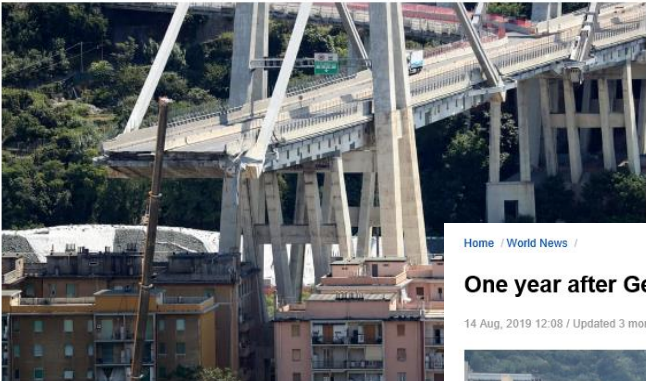
This article is more than 1 year old

EU rejects claim Genoa bridge collapse linked to its spending rules

European commission rebuffs minister's jibe, saying it has backed infrastructure outlay


Jennifer Rankin in Brussels
Thu 16 Aug 2018 13:07 BST

194



EU COMMISSION ISSUES STUDY ON BRIDGE MAINTENANCE, INSPECTION AND MONITORING

Feb 26, 2019 | Policy News



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 monitoring 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.

THE IRISH TIMES

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GENOA BRIDGE COLLAPSE / ANALYSIS
ANALYST BY DAVID GOODMAN, THE IRISH TIMES

Genoa bridge collapse: Is the EU to blame for Italy's infrastructure problems?

THE IRISH TIMES, GENOA



The European Commission has rejected Italian claims that spending constraints imposed from Brussels played a part in the collapse of the Genoa road bridge.

Matteo Salvini, Italy's deputy prime minister, has claimed that EU pressure to cap government budgets has prevented vital infrastructure improvements. His attempt to link the deaths in Genoa to EU budget rules follows months of attacks on Brussels by his party, the League, which has formed Italy's first populist administration in alliance with the anti-establishment Five Star movement.

Home / World News /

One year after Genoa tragedy: Are Europe's bridges any safer?

14 Aug, 2019 12:08 / Updated 3 months ago

Get short URL



The collapsed Morandi bridge, Genoa © Reuters / Stefano Rellandini

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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.**



UNI Standard

Standard Number : UNI/TR 11634:2016

Title : Guidelines for structural health monitoring

ICS : [91.010]

Status : CURRENT

Technical Committees : [Structural engineering]

Start Validity Date : april 28, 2016

End Validity Date :

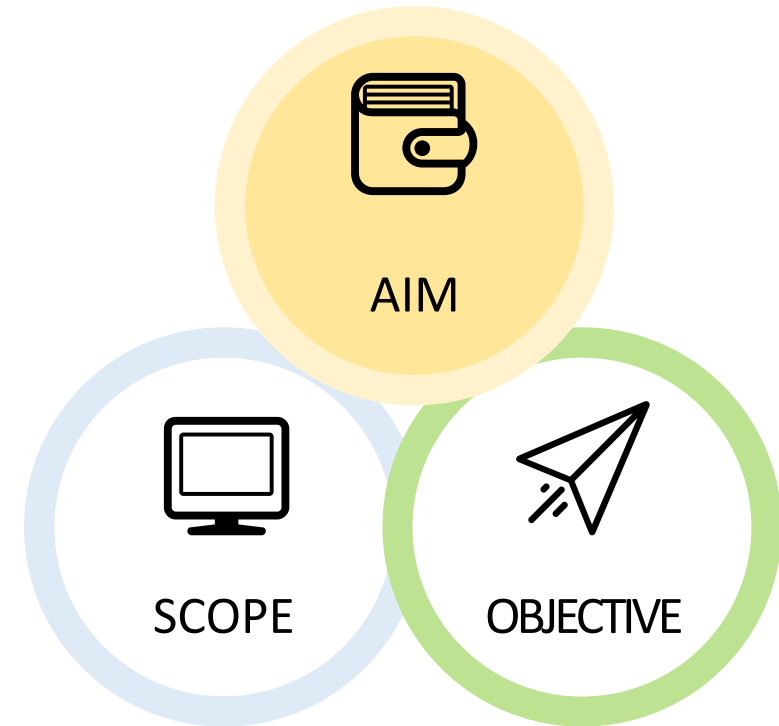
Summary : The scope of this Technical Report is to define guidelines for the structural health monitoring, identifying the design criteria for structural health monitoring systems, the methods for identification of the state of the structures, on the basis of classes and structural codification for which it is recommended the use of structural health monitoring. This document identifies characteristics and requirements of logical components of the system and methods for data acquisition and data analysis, in addition to methods for identifying damages and materials degradation.



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.**



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.

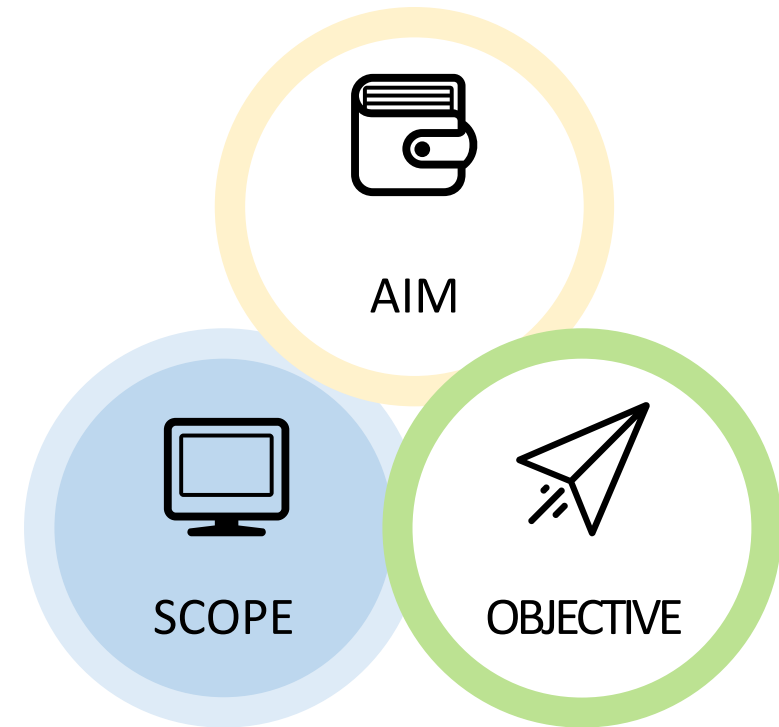
H2020 CSA IM-SAFE aim



- › 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

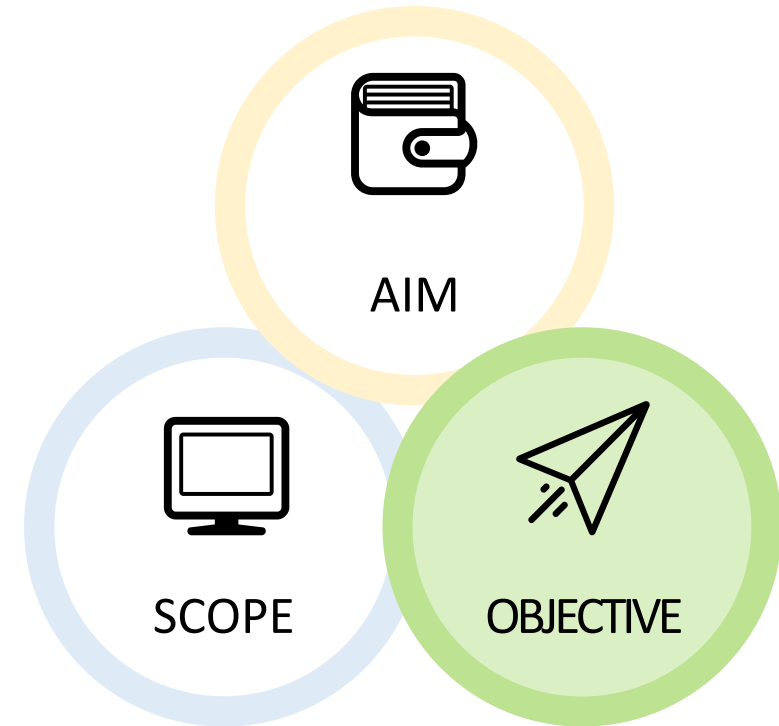


H2020 CSA IM-SAFE set-up

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 cost-effectiveness 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

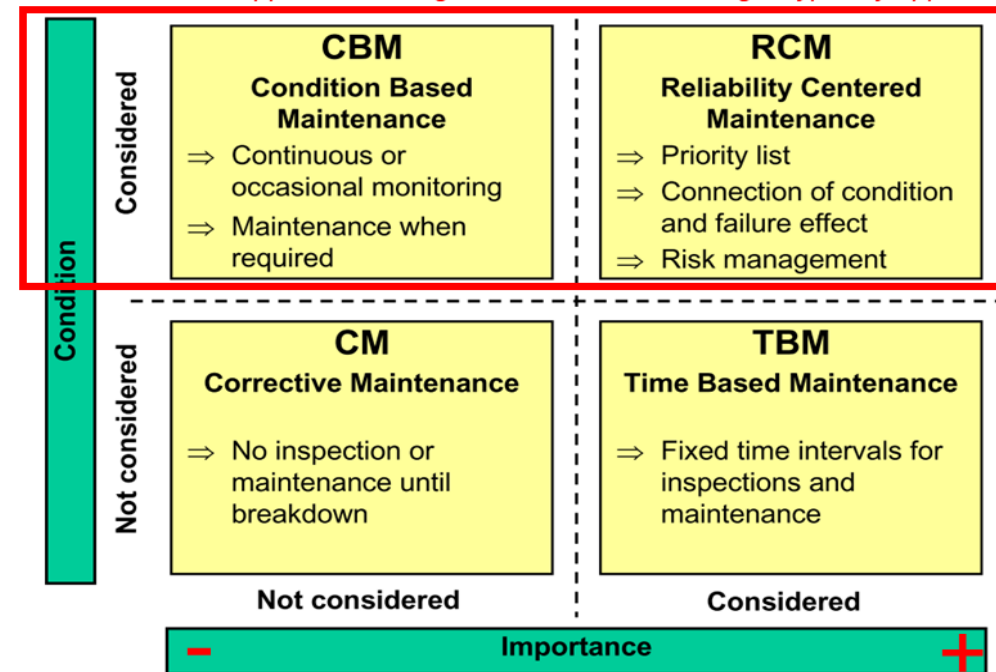


- › To enable transition from corrective and time-based maintenance approaches **towards the condition-based and risk-based approaches**



- › 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**

Context in which application of digital twins and monitoring is typically applied



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

H2020 CSA IM-SAFE deliverables

- 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

H2020 CSA IM-SAFE deliverables

- 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**

H2020 CSA IM-SAFE deliverables

- To prepare the **mandate for CEN** incl.:
 - **further amendment to the existing EU standards** on safety assessment taking into account inspections, monitoring and testing
 - 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**

H2020 CSA IM-SAFE deliverables

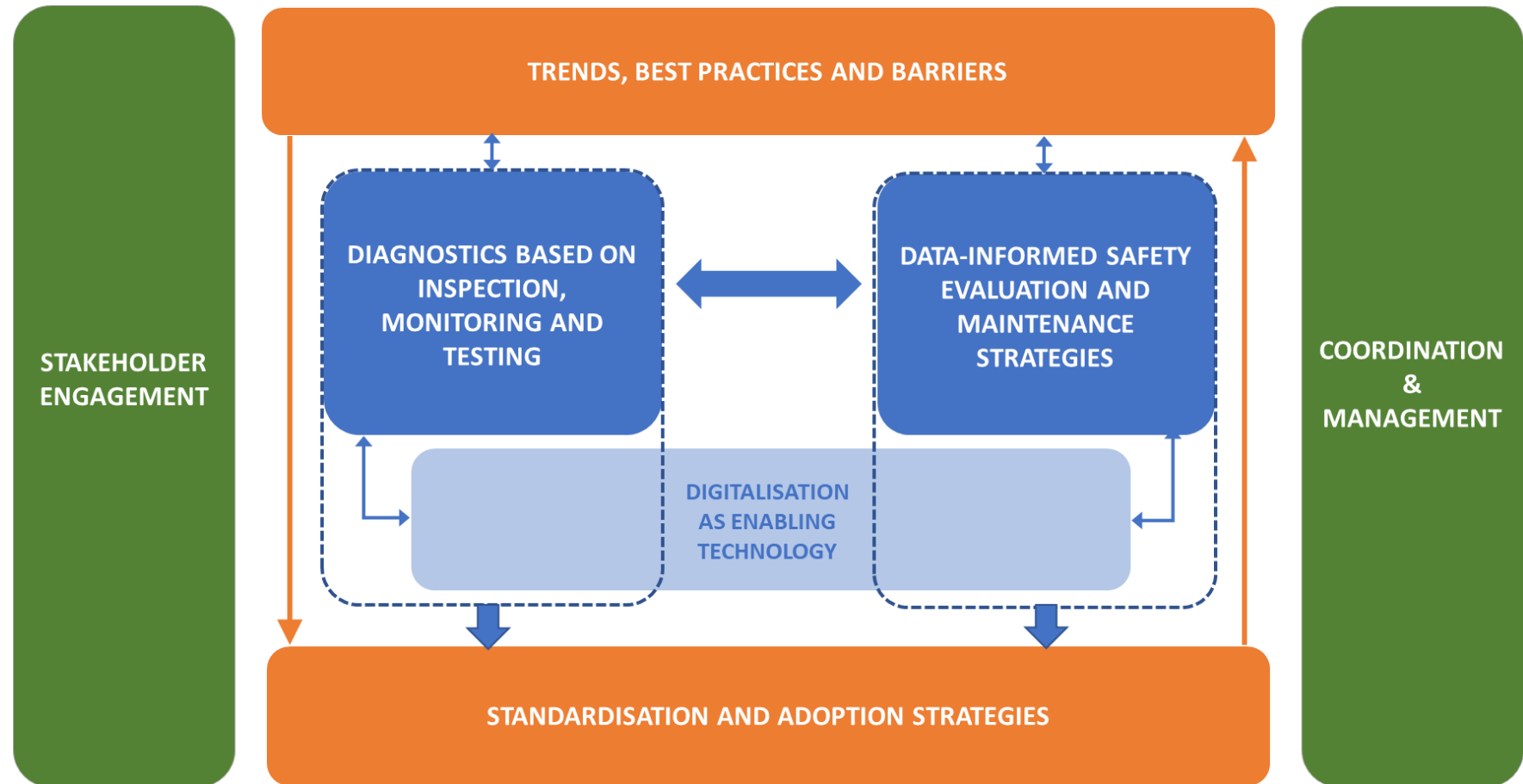
- To prepare the **mandate for CEN** incl.:
 - **further amendment to the existing EU standards** on safety assessment taking into account inspections, monitoring and testing
 - **new standard on structural monitoring**
 - to promote best practices for monitoring of transport infrastructure
 - to maintain the openness to innovations (i.e. in sensing technology and data analysis methods)
 - 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**

H2020 CSA IM-SAFE deliverables

- 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
 - to formulate the principles of the condition-based and risk-based approaches
 - to provide principles and requirements for data-informed (inspection, monitoring and testing) decision-making

H2020 CSA IM-SAFE set-up

PROJECT FOCUS AREAS



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



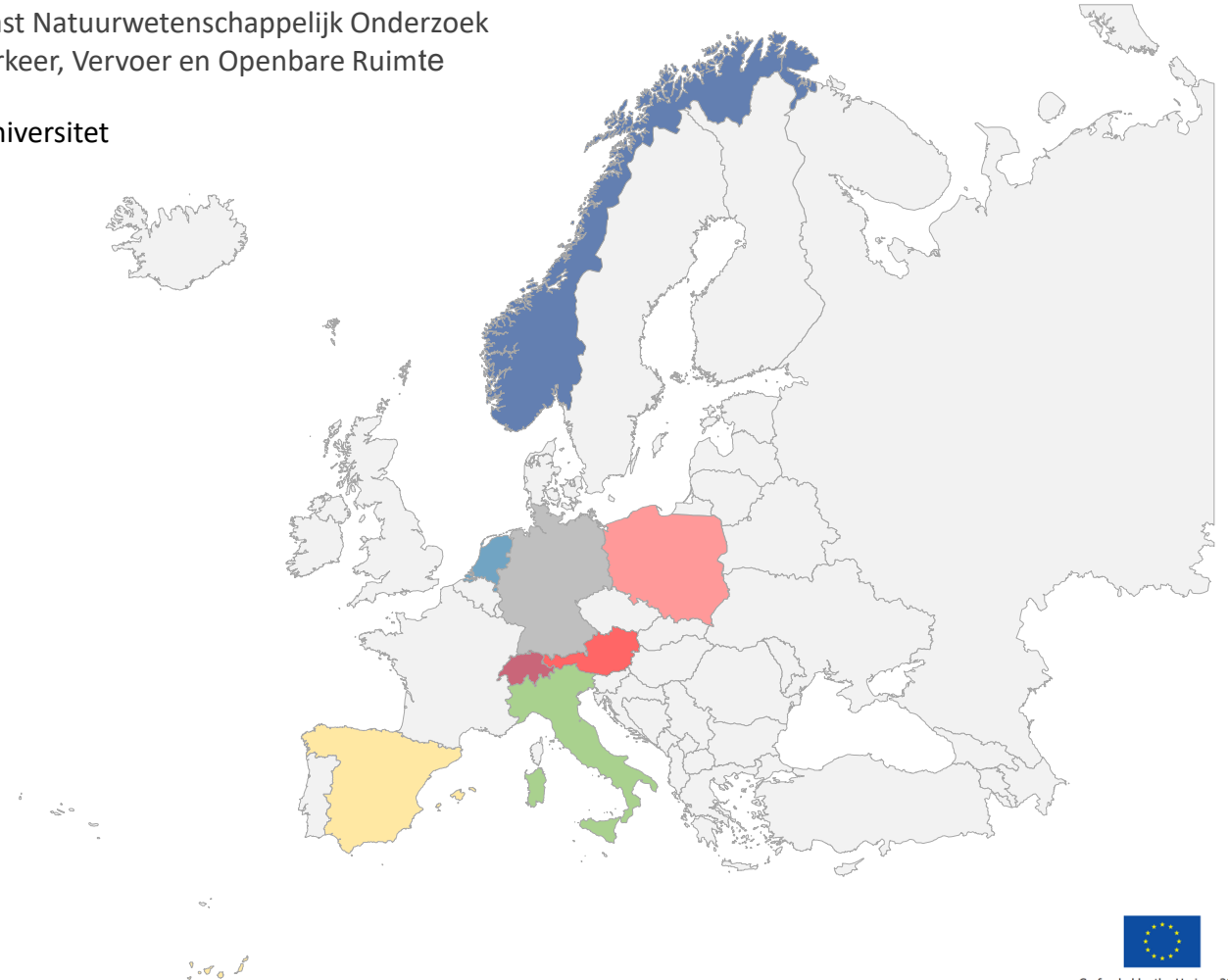
Switzerland

IBM IBM Research GmbH



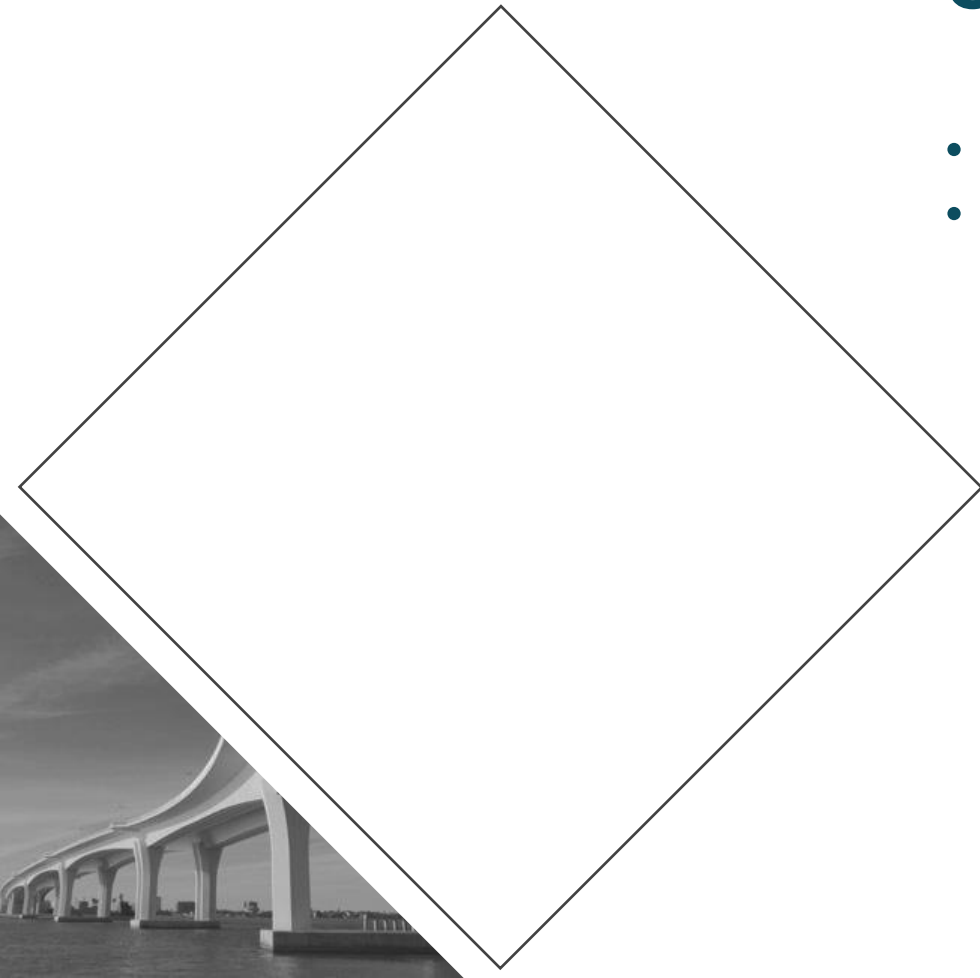
Poland

MOW Mostostal Warszawa S.A.



Q&A:

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





Stakeholder engagement

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:

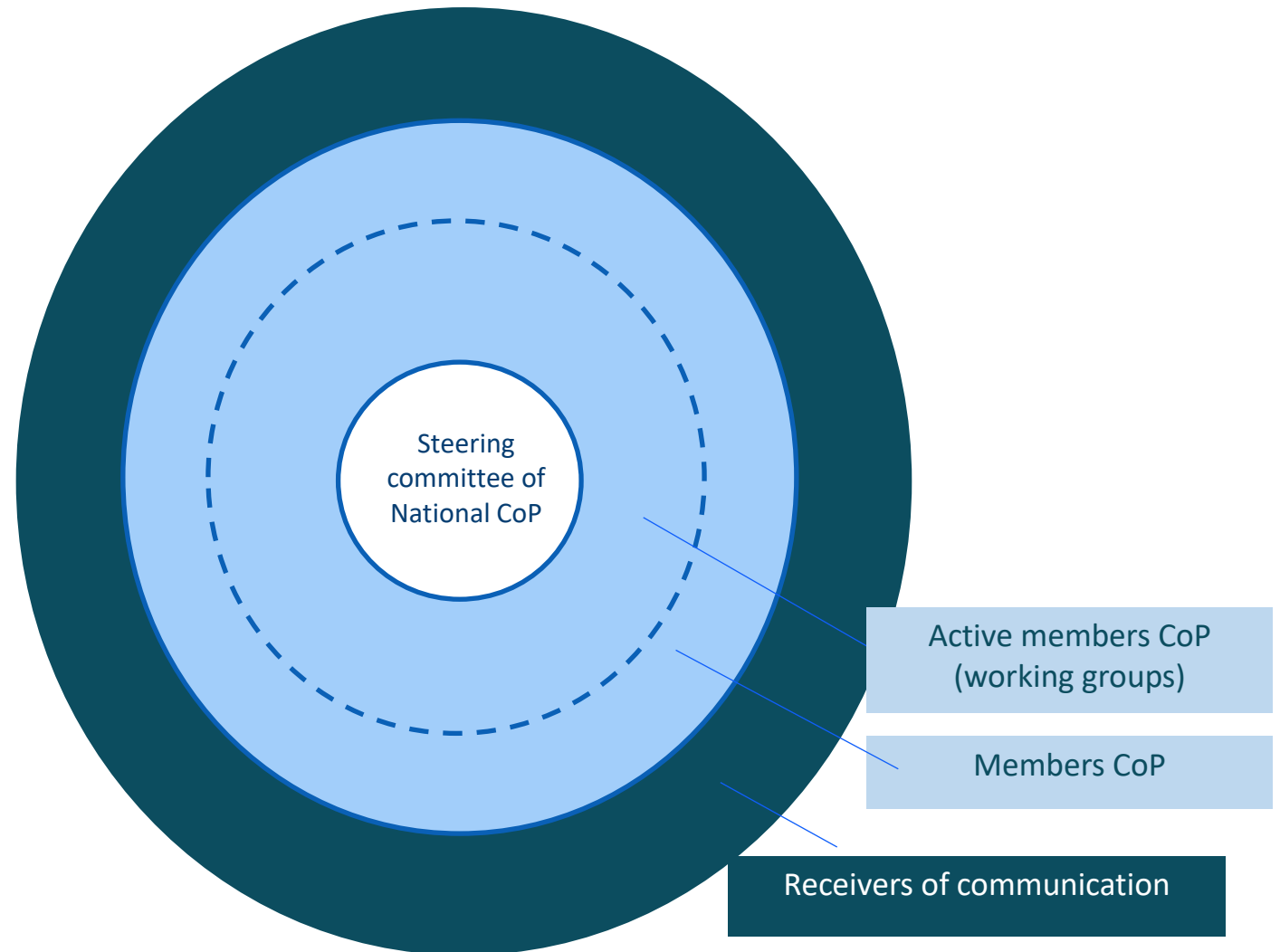
- Improve service level
- Understanding needs of owners, operators, industry
- Start transition to new standards during creation

How to organise?

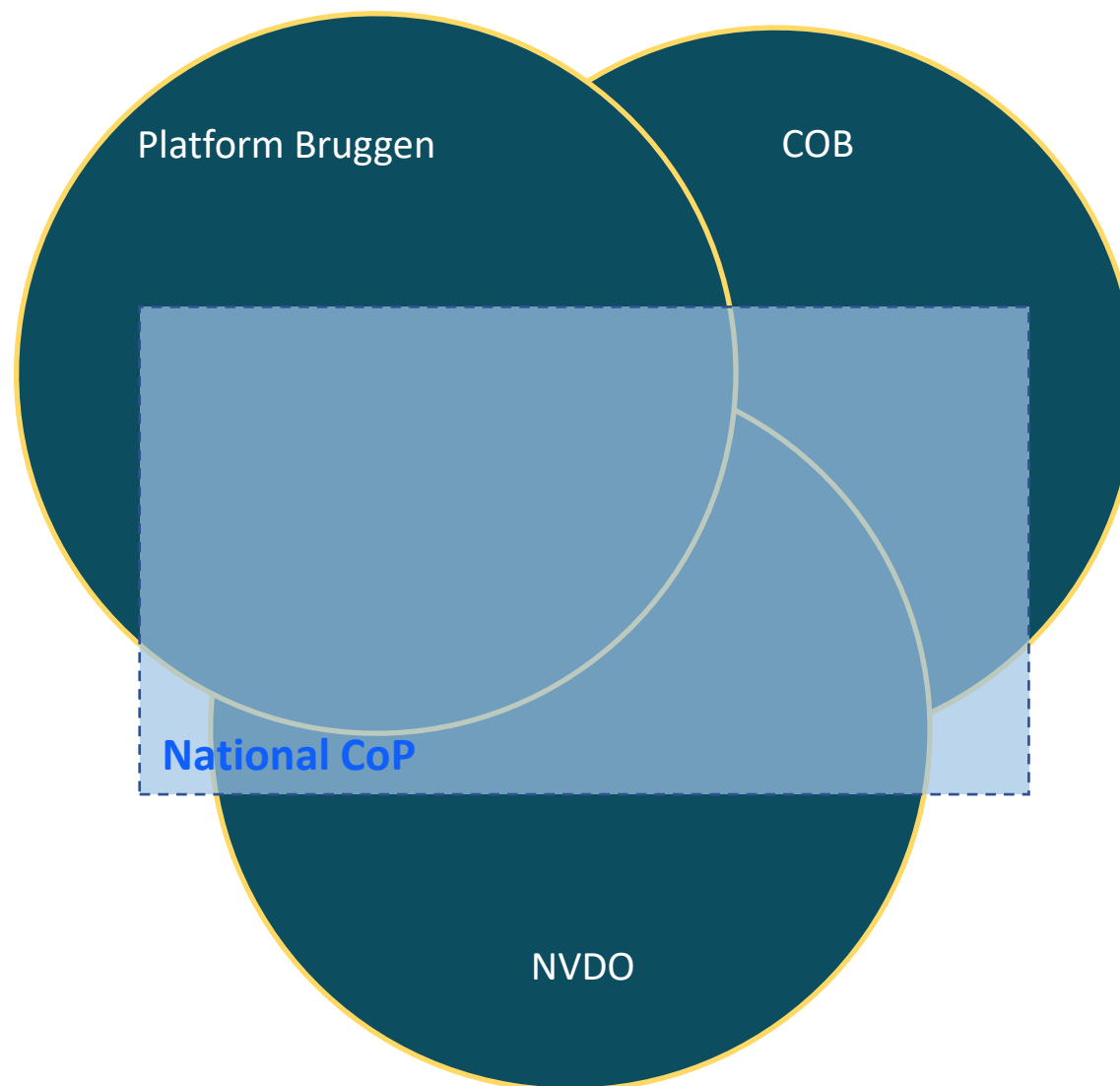
National network Structure

CoP Groups

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



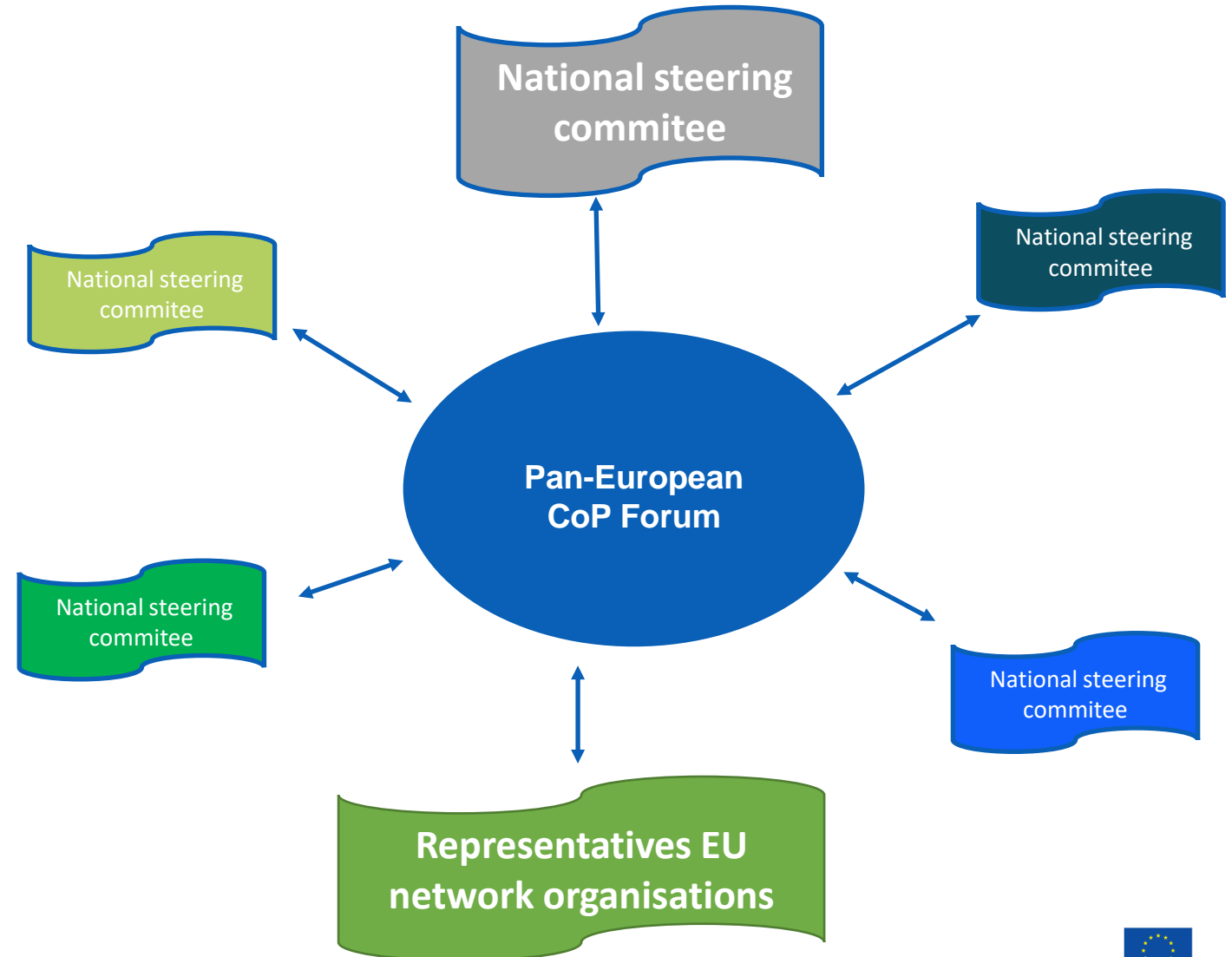
Example CoP and network organisations (NL)



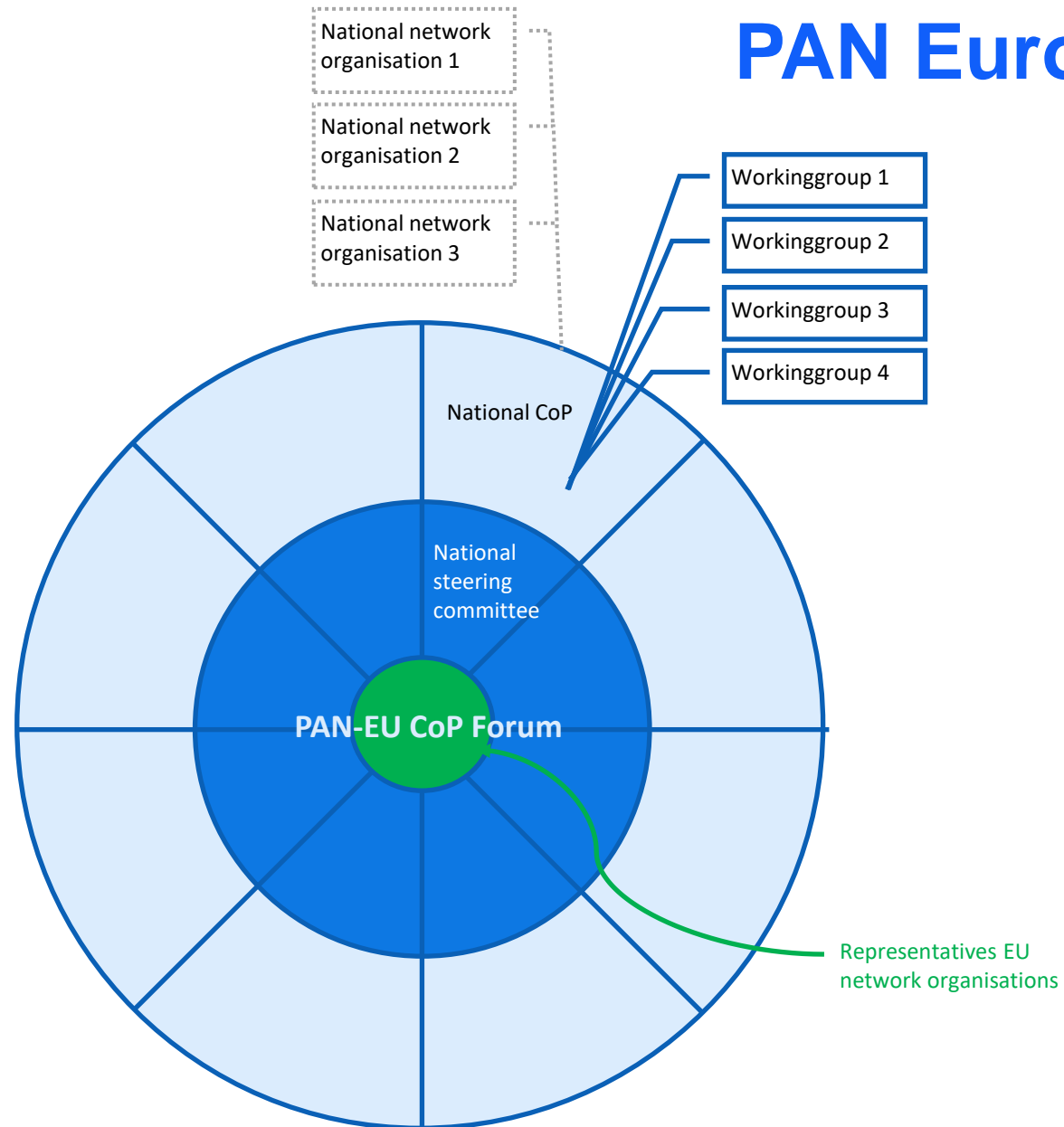
PAN European structure

CoP Groups

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



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, ...)

IM-SAFE country representative

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:

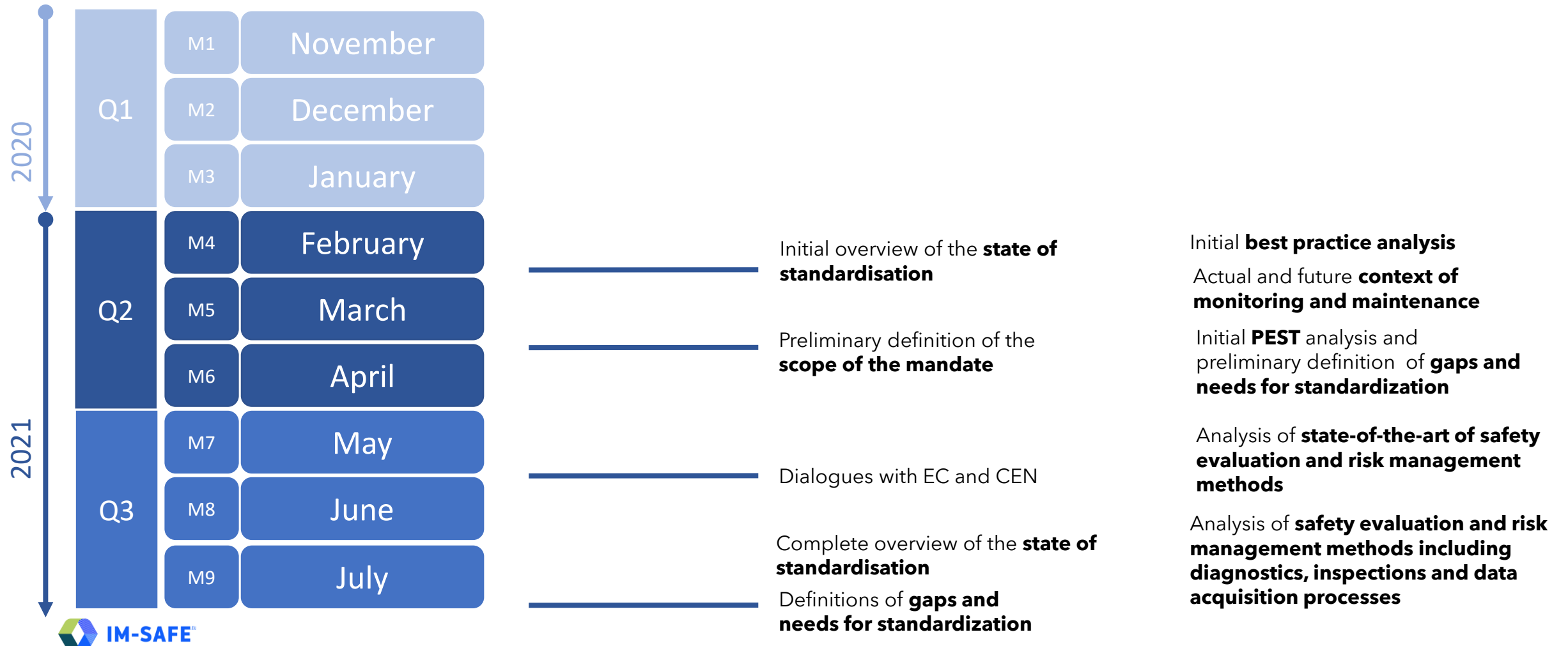
- **Stakeholders engagement and CoP**

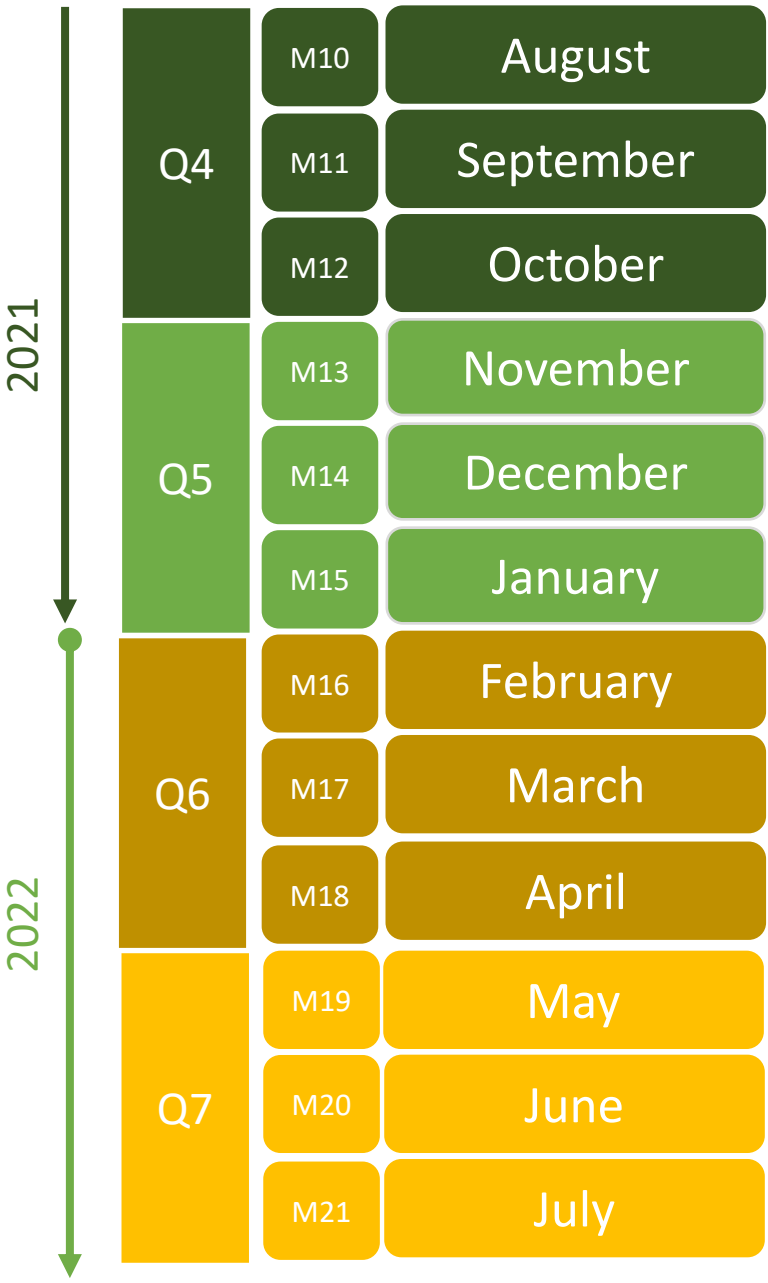


Timeline of the project and interaction with CoP

H2020 CSA IM-SAFE CoP

Timeline of project activities





Review of **surveying technologies and diagnostics of structures**

Recommendations to remove the **PEST** barriers

Guidelines for **data acquisition, processing, and quality assurance**

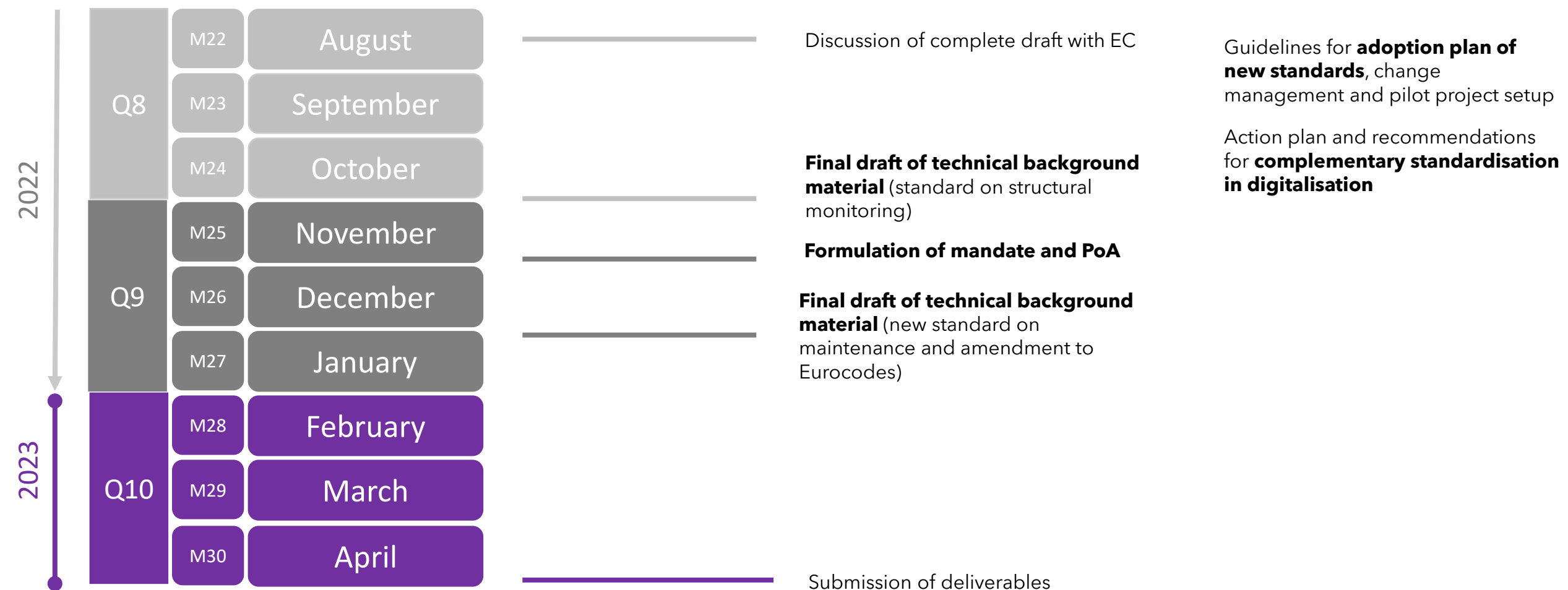
Review of **AI and Big data analytics**

Analysis of the **minimum maintenance level** and **Condition State Classification** in EU countries

Update on **safety evaluation and risk management methods including diagnostics, inspections and data acquisition processes**

Update on review of **methodologies and instruments for diagnostics of transport infrastructure**

Online **catalogue of surveying technologies and maintenance methods** in EU



H2020 CSA IM-SAFE CoP

INVOLVEMENT IN COMMUNICATION & DISSEMINATION ACTIVITIES



CoP meetings



Conferenties



Website berichten



Nieuwsbrief



BIM and other ICT user forums en communities



Journals



Social Media

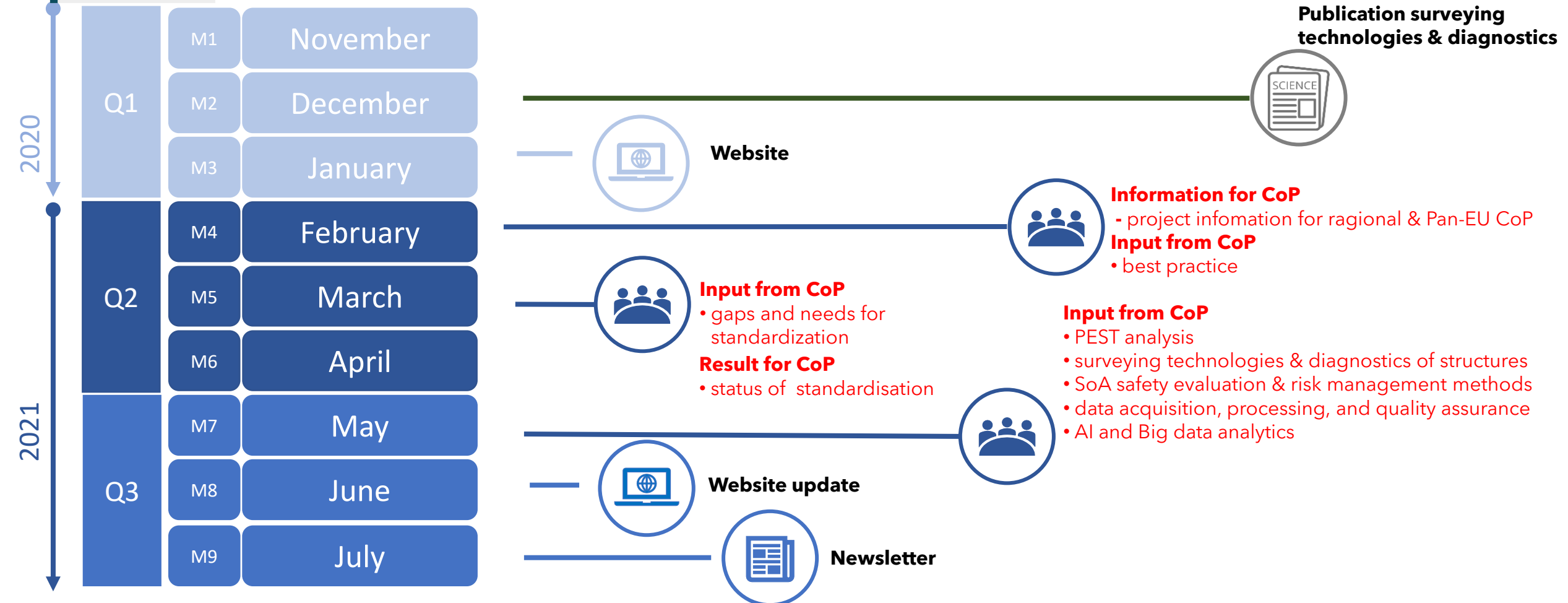


Onderwijs & Netwerken

H2020 CSA IM-SAFE CoP



Timeline of CoP involvement



2021

Q4

M10

August

M11

September

M12

October

Q5

M13

November

M14

December

M15

January

Q6

M16

February

M17

March

M18

April

Q7

M19

May

M20

June

M21

July



Website update

Education & Networking



EUROSTRUCT 2021



buildingSMART Forum

**Results for CoP**

- recommendations to remove PEST barriers
- guidelines for data acquisition, processing, & quality assurance



Website update

Symposium on Life- Cycle Civil Engineering

External event: IALCCE



Publication

**Input from CoP**

- feedback on first draft mandates



Newsletter



Website update / blog



Publication

**Input from CoP**

- methodologies & instruments for diagnostics
- surveying technologies & maintenance methods
- adoption plan of new standards



Website update



IABSE Symposium 2022



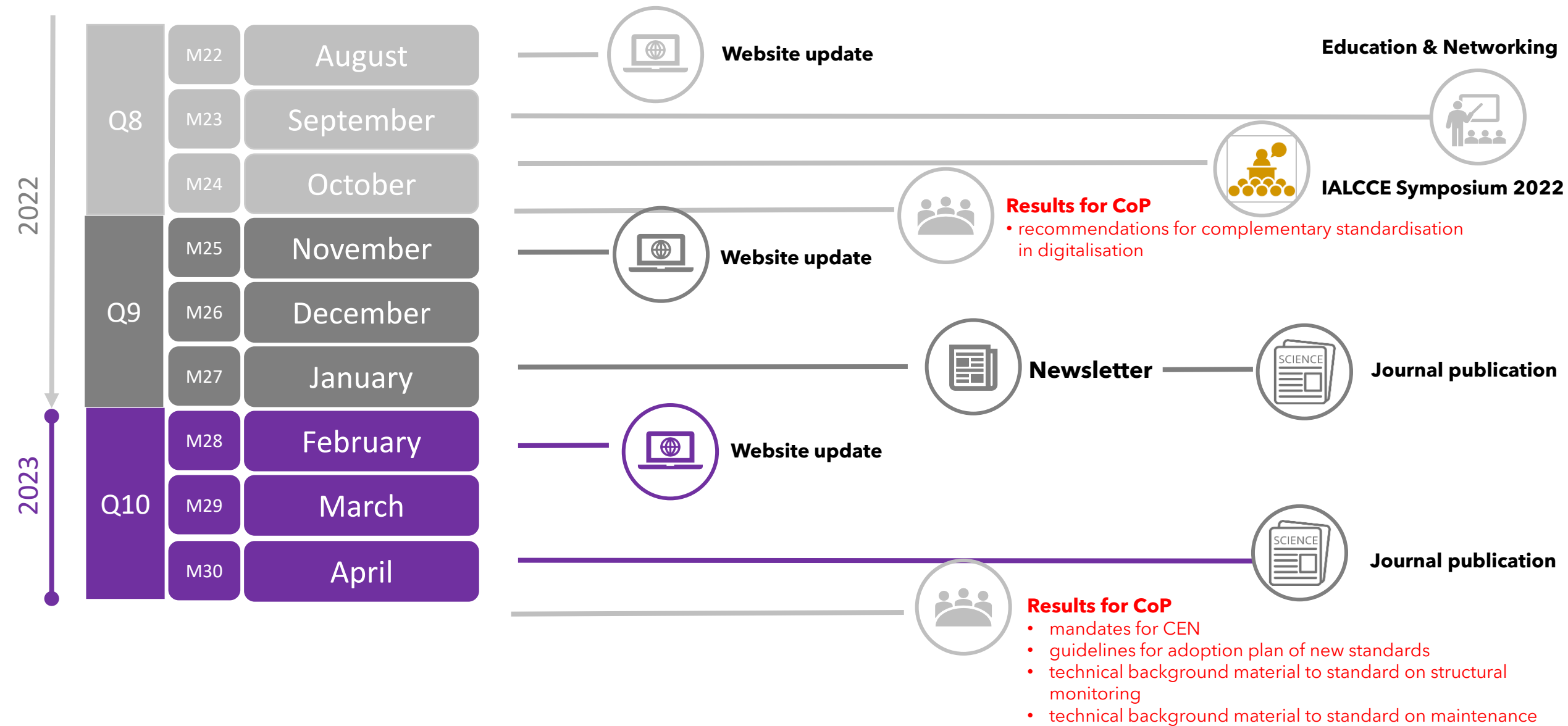
fib Congress 2022

**Results for CoP**

- review of methodologies & instruments for diagnostics of transport infrastructure
- online catalogue of surveying technologies & maintenance methods in EU



Newsletter





Short-term activities

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: www.IM-SAFE-project.eu, www.IM-SAFE.eu
 2. LinkedIn: <https://www.linkedin.com/company/im-safe-project/>
 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
 6. Pan-EU CoP Forum => CROW (responsible IM-SAFE consortium partner),
Jos Wessels Jos.Wessels@crow.nl
- 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 agnieszka.bigajvanvliet@tno.nl

DACH:

Alfred Strauss alfred.strauss@boku.ac.at,

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Konrad Bergmeister, konrad.bergmeister@boku.ac.at

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Southwest Europe

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Ana Sanchez Rodriguez anasanchez@uvigo.es

Javier Royo fjroyo@ferrovial.com

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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www.IM-safe-project.eu

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<https://cordis.europa.eu/project/id/958171>

IM-SAFE (ref. 958171)



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