



IM-SAFE^{.EU}

**Harmonised Transport Infrastructure Monitoring
in Europe for Optimal Maintenance and Safety**

IM-SAFE (ref. 958171)

www.im-safe-project.eu

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

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



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

WELCOME

IM-SAFE Symposium introduction

A.J. Bigaj-van Vliet (H2020 CSA IM-SAFE project coordinator, TNO, the Netherlands)



Dr.ir. Agnieszka Bigaj-van Vliet

- IM-SAFE Project Coordinator
- TNO Department of Structural Reliability
- Senior Scientist Concrete Structures
- Presidium & Technical Council 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)

WELCOME



IM-SAFE^{.EU}

November 5th
09:00-18:00
UTC+1 2021

Surveying technologies, data-informed safety evaluation and risk management for bridges and tunnels

From the needs to the standardization



SYMPOSIUM SCHEDULE

Morning Session Moderated by P. Darò (SACERTIS Ingegneria S.r.l., Italy)

09:00-09:15 Welcome and IM-SAFE project progress

09:15-10:15 Surveying technologies

Contributors: A. Sánchez Rodríguez ⁴, M. Longo ³, J. Zach ⁵, M. Solla ⁴ and J. Martínez ⁴

10:15-10:30 Coffee Break

10:30-11:30 Damage indicators and vulnerable elements

Contributors: B. Riveiro Rodríguez ⁴, A. Sánchez Rodríguez ⁴ and A. Strauss ²

11:45-12:45 Performance indicators

Contributors: A. Strauss ², K. Bergmeister ² and L. Ptacek ²

12:45-13:00 Conclusions and outlook

Afternoon Session Moderated by A.J. Bigaj-van Vliet (TNO, the Netherlands)

14:00-14:15 Welcome and IM-SAFE project progress

14:15-15:30 Data-informed structural performance assessment

Contributors: P. Darò ³, G. Mancini ³, A. Strauss ², D.L. Allaix ¹, A.J. Bigaj-van Vliet ¹

15:30-16:00 Coffee Break

16:00-17:30 Risk assessment and risk-based framework for maintenance management

Contributors: H. van Meerveld ¹, A.J. Bigaj-van Vliet ¹, B. Cerar ¹, A. Strauss ²

17:30-18:00 Conclusions and outlook

Symposium Organizers:

¹ TNO, Delft, the Netherlands

² University of Natural Resources and Life Sciences, Vienna, Austria

³ SACERTIS Ingegneria S.r.l., Turin, Italy

⁴ University of Vigo, Vigo, Spain

⁵ Mostostal, Warszawa, Poland

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H2020 CSA IM-SAFE context

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

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**.

UNITE ITALIANO DI NORMAZIONE

Home | Chi siamo | Associazione | Normazione | Catalogo | Formazione | Arree

Home > Catalog > Standards Catalog > ICS > 91 > 91.010 > **UNI/TR 11634:2016**

NOVITA' Occhio alle norme...anche in preview! Cerca la norma, vai nella scheda bibliografica e clicca su per

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.

FSV Die FSV Publikationen Veranstaltungen Zulassungen Zertifizierung

RVS Richtlinien & Merkblätter

13 Qualitätssicherung basierte Erhaltung

13.03 Überwachung, Kontrolle und Prüfung von Kunstbauten

RVS 13.03.01 Monitoring von Brücken und anderen Ingenieurbauwerken Februar 2012

Beschreibung Diese Richtlinie ist für das Monitoring von Brücken und anderen Ingenieurbauwerken anzuwenden und richtet sich sowohl an die Erhaltungsausschüsse und Bauherren als auch an die Anbieter von Monitoringssystemen.

Die beschriebene die Grundlagen für folgende Problemfelder:

- Wissenschaftliche Erfassung und Bewertung des aktuellen Zustandes
- Beurteilung von Tragfähigkeit, Gebrauchstauglichkeit und Dauerhaftigkeit (z.B. in Bezug auf Ermüdung)
- Erstellung von Berichten
- Dringlichkeit der Einleitung von Instandsetzungsmaßnahmen
- Ermittlung von Lebensdauerabschätzungen

Inhaltsgänge

1. Anwendungsbereich
2. Begrifflichkeiten
3. Allgemeines
4. Ziele und Verfahrensaufbau
5. Konfiguration einer Monitoringanlage (Messsystem)
6. Messgrößen
7. Aufbauelemente und Beispiele
8. Qualifikation des Monitoringpersonals
9. Aufbau: Engineering des Monitorings in das Lebenszyklusmanagement
10. Angeführte Normen und Literatur
11. Zusätzlich zu beachtende Normen und Literatur

Seiten 20

Ausgabedatum 1. Februar 2012

Verfasser Von BENT zur Anwendung empfohlen!

Arbeitsschritt B07 Überwachung, Kontrolle und Prüfung von Brücken und anderen Ingenieurbauwerken

SAMCO SAMCO Final Report 2006 F08a Guideline for the Assessment of Existing Structures

F08a
Guideline for the Assessment of Existing Structures

Dir. u. Prof. Dr. W. Rücker, Dipl.-Ing. F. Hüh, Dipl.-Ing. R. Rothmann
Federal Institute of Materials Research and Testing (BAM),
Division VII.2 Buildings and Structures
Unter den Eichen 87, 12205 Berlin, Germany

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GB 50982-2014
Translated English of Chinese Standard: GB50982-2014
www.ChineseStandard.net
Sales@ChineseStandard.net

UDC

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

P **GB 50982-2014**

Technical code for monitoring
of building and bridge structures
建筑与桥梁结构监测技术规范

Issued on: October 09, 2014 Implemented on: August 01, 2015
Issued by: Ministry of Housing and Urban-Rural Development of PRC;
General Administration of Quality Supervision, Inspection
and Quarantine of the People's Republic of China.

www.ChineseStandard.net Page 1 of 64

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., Marquis Des Sarts, F.L.,
van Boven, M., Takashima, A., Orús-
Hortelano, A., Grossi, M., Hüb, G.,
Pérez, F.
2019



EUR 28828 EN

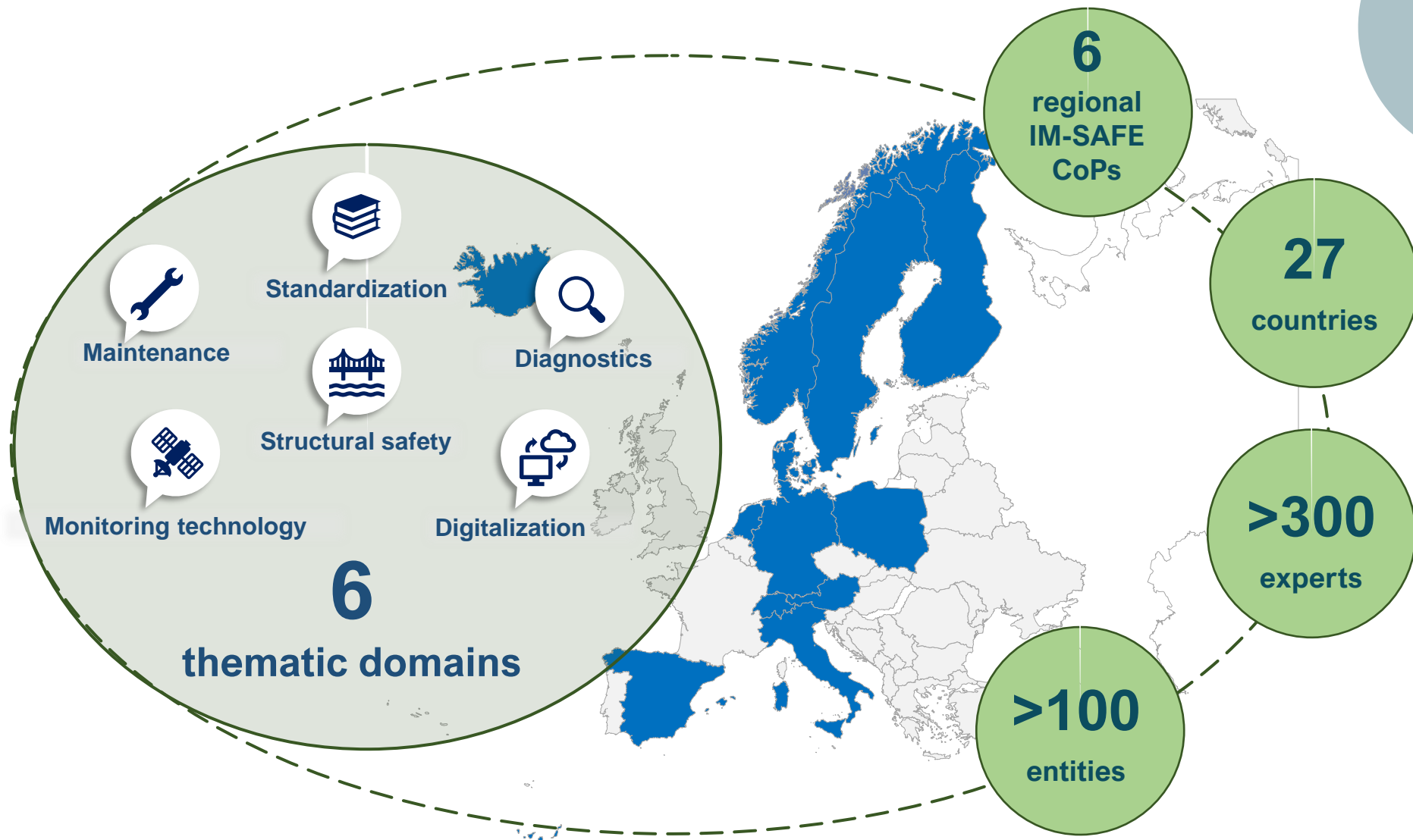
H2020 CSA IM-SAFE aim

- **Support the European Commission and the European Committee for Standardization (CEN) in preparing new standards enabling monitoring for optimal maintenance and safety of transport infrastructure**
 - › **deliver input for mandate for CEN incl.:**
 - › **new standard on structural monitoring of transport infrastructures**
 - › **further amendment to the existing EU standards on safety assessment taking into account inspections, monitoring and testing**
 - › **new standard on maintenance of transport infrastructures**
- **Enable transition from corrective maintenance towards risk-based maintenance management & preventive maintenance strategies**
 - › **standardize principles & requirements for:**
 - › **structural monitoring**
 - › **data-informed safety assessment** taking into account inspections, monitoring and testing
 - › **risk-based maintenance management and condition-based maintenance strategies**
- **Achieve broad acceptance for new standardization**
- **Enable Community of Practice to contribute to standardization, roll-out, and implementation**

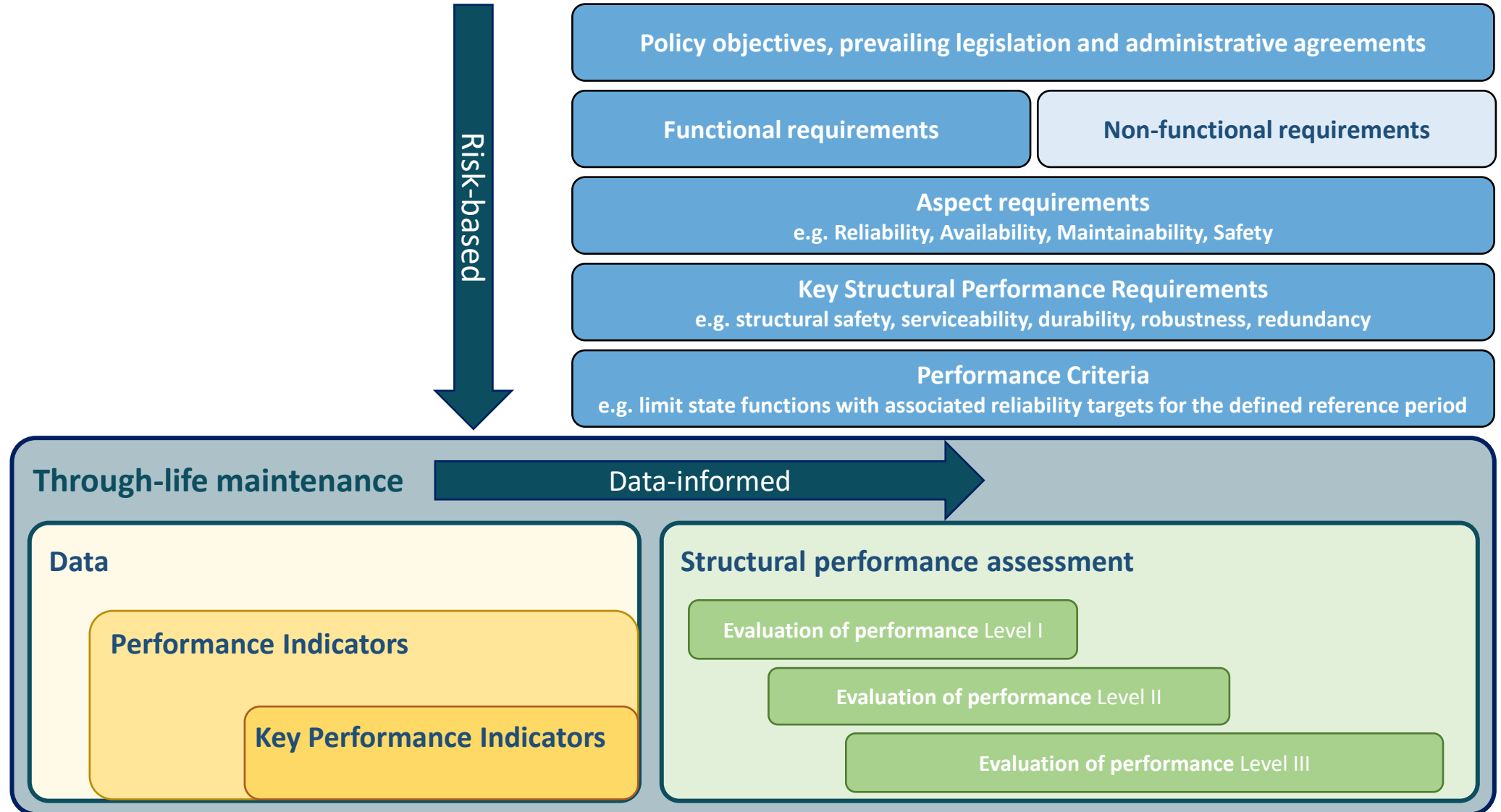
H2020 CSA IM-SAFE results

- **Input for 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**
- **Background for provisions :**
 - review of national guidelines and standards in all EU and international research activities related to monitoring, data-informed safety assessment and condition- and risk-based maintenance
 - evaluation of the PEST barriers & state-of-practice in inspection, monitoring, testing, diagnostics, data-informed safety assessment, risk management and decision-making with regard to maintenance
 - evaluation of the needs of standardization for enabling digital solutions for monitoring and data analytics
 - technical background to the mandate
- Plan of **approach for the execution** of the mandate by CEN

H2020 CSA IM-SAFE Community of Practice



H2020 CSA IM-SAFE Symposium Scope





MORNING SESSION

Moderated by P. Darò (SACERTIS Ingegneria S.r.l., Turin, Italy)

Surveying technologies

Contributors:

A. Sánchez Rodríguez¹, M. Longo², S. Negri², J. Zach³, P. Sanecka³, M. Solla¹ and J. Martínez ¹

Damage indicators & vulnerable elements

Contributors:

B. Riveiro Rodríguez ¹, A. Sánchez Rodríguez ¹ and A. Strauss ⁴

Performance indicators for bridges and tunnels

Contributors:

A. Strauss ⁴, K. Bergmeister ⁴ and L. Ptacek ⁴

¹ University of Vigo, Vigo, Spain

² SACERTIS Ingegneria S.r.l., Turin, Italy

³ Mostostal, Warszawa, Poland

⁴ University of Natural Resources and Life Sciences, Vienna, Austria





AFTERNOON SESSION

Moderated by A.J. Bigaj-van Vliet (TNO, the Netherlands)

Data-informed structural performance assessment

Contributors:

P. Darò ¹, G. Mancini ¹, A. Strauss ², D.L. Allaix ³, A.J. Bigaj-van Vliet ³

Risk assessment and risk-based framework

Contributors:

H. van Meerveld ³, B. Cerar ³, A.J. Bigaj-van Vliet ³, A. Strauss ², L. Ptacek ²

¹ SACERTIS Ingegneria S.r.l., Turin, Italy

² University of Natural Resources and Life Sciences, Vienna, Austria

³ TNO, Delft, the Netherlands



CONCLUSIONS & OUTLOOK



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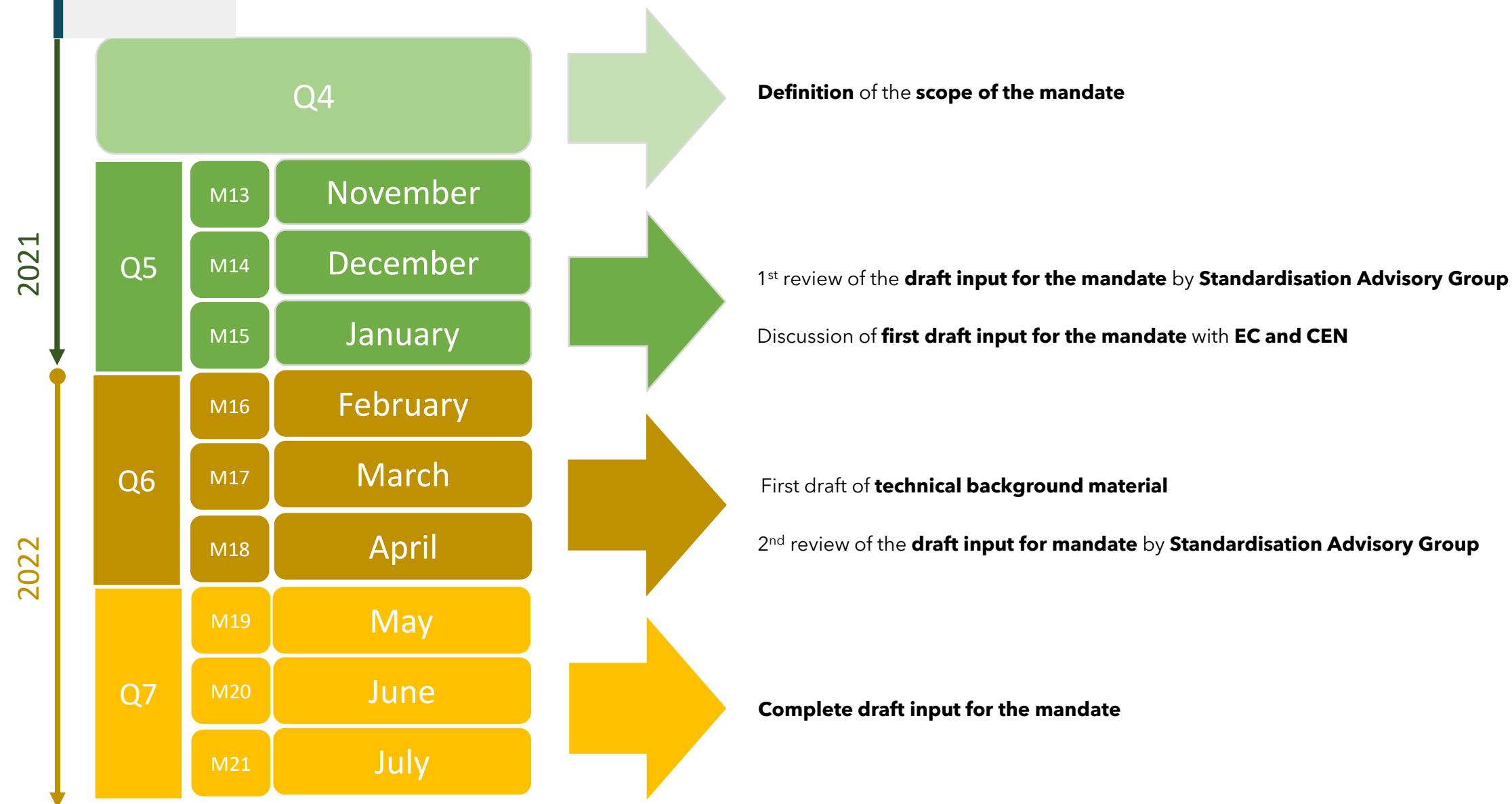
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TIMELINE OF IM-SAFE ACTIVITIES

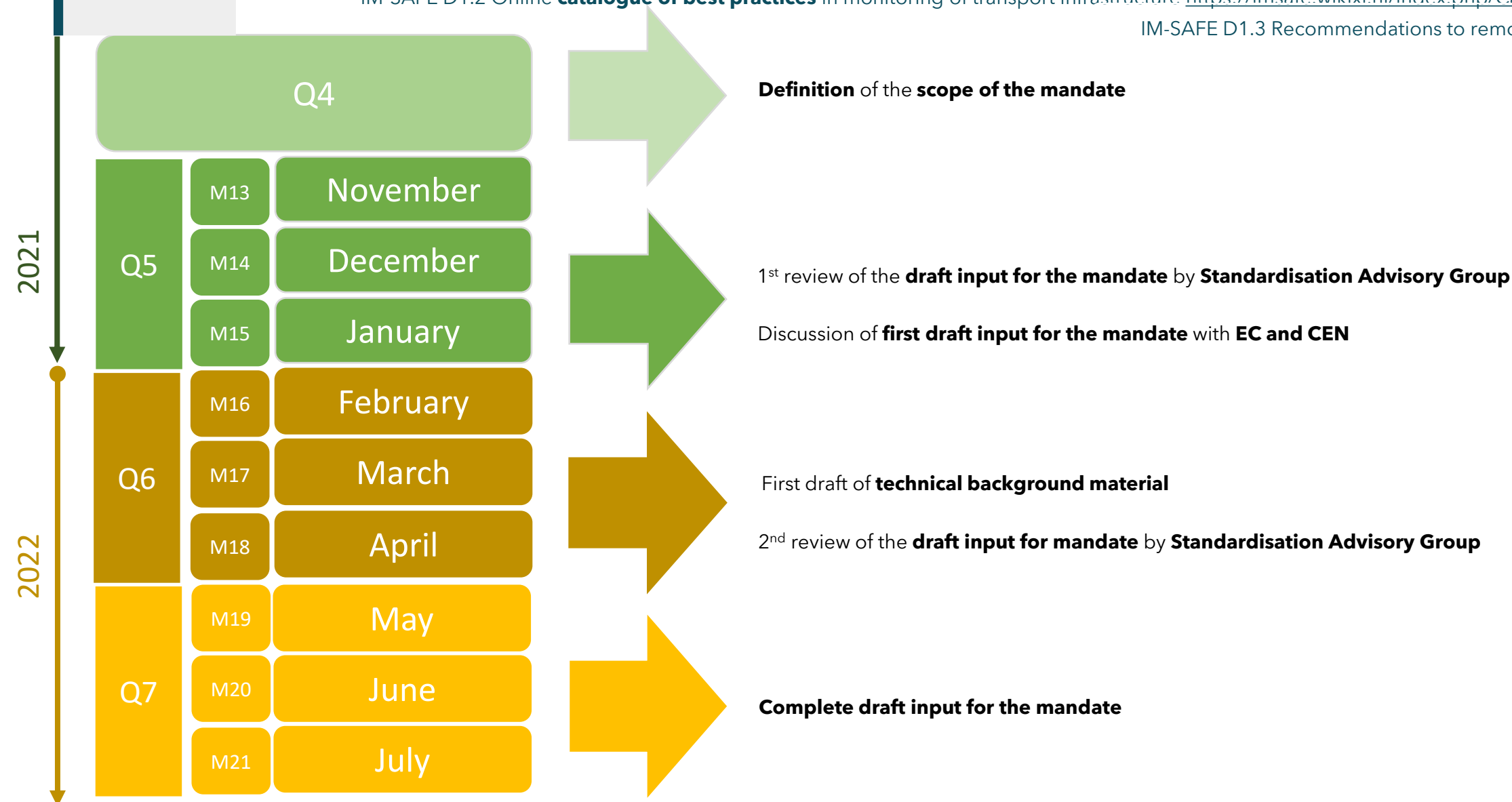


TIMELINE OF IM-SAFE ACTIVITIES

IM-SAFE D1.1 **Actual & future context** of transport infrastructure monitoring & maintenance

IM-SAFE D1.2 Online **catalogue of best practices** in monitoring of transport infrastructure https://imsafe.wikixl.nl/index.php/Case_studies_overview

IM-SAFE D1.3 Recommendations to remove the **PEST barriers**



**Thank you all for
attending, questions,
input, etc.**



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

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