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DRAFT

Project Plan for the CEN-CENELEC Workshop on
Steps to measure and set targets for the, the levels of service to be provided by, and the resilience of, transport infrastructure

CEN/CLC/WS 018
Workshop
(to be approved during the Kick-off meeting)

1. Status of the Project Plan

The first draft will be based on the research developed within the FORESEE H2020 project, in particular the following reports:

- Guideline to **measure** Levels of Service and resilience in infrastructures
- Guideline to set **target levels** of service and resilience for infrastructures

The goal is to provide guidelines to measure and set target levels of service and resilience for transport systems, such as roads and railways. These systems are, in many cases, critical to ensure the provision of basic services in the event of intentional or unintentional disruptions.

In these reports, the following organizations have participated:

1. FUNDACION TECNALIA RESEARCH & INNOVATION (Spain)
2. RINA CONSULTING SPA (Italy)
3. FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V. (Germany)
4. UNIVERSIDAD DE CANTABRIA (Spain)
5. FUTURE ANALYTICS CONSULTING LIMITED (Ireland)
6. FERROVIAL AGROMAN SA (Spain)
7. UNIVERSITY OF BATH (United Kingdom)
8. LOUIS BERGER SPAIN SA (Spain)

9. INFRAESTRUTURAS DE PORTUGAL SA (Portugal)

10. AISCAT SERVIZI SRL (Italy)

11. Autostrade per l'Italia S.p.A. (Italy)

12. EUROPEAN UNION ROAD FEDERATION (Belgium)

13. EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH (Switzerland)

A draft will be submitted before the kick-off meeting.

2. Background to the Workshop

The functioning of society depends on the functioning of multi-modal transport infrastructure networks. These networks are designed and managed to be used to transport persons and goods in specific ways, e.g. within specific amounts of time, and with the probabilities of being hurt or injured being below specified thresholds.

Natural or man-made hazards are strongly impacting on the citizen's safety and generate increasing economic loses year by year. The transport system is particularly sensitive and critical assets are extremely fragile in the face of unanticipated events. Infrastructure managers and operators have to ensure that transport assets and services function continually and safely against increasing extreme events which will require important investments to upgrade them in order to improve their resilience.

Hazards impacting the transportation network include Extreme Weather Events (mainly flooding & heavy rainfalls, snow and wind), landslides, earthquakes and Man-made hazards (intentional and accidental), These may impact the transport assets (bridges, tunnels, pavement, slopes, terminals), the citizens & freight transport, as well as have cascading effects affecting the transport system (mainly road, rail, multimodal and transport hubs).

When extreme events occur, their ability to provide this service can be diminished. In order for managers to determine how to optimally allocate resources to help ensuring these networks continue to subsequently provide acceptable levels of service, or provide acceptable levels of service as quickly as possible following the occurrence of the events, it is useful to be able to measure the service provided by, and the resilience of, these networks.

Transportation systemic risks are not well understood across modes, regions, and critical interdependent sectors, creating uncertainty about risks resulting from a major system disruption. There is a need for comparable and reliable methodologies to assess the risks, as a necessary step to provide solutions.

The goal of this WS is to define steps for managers to follow properly measure the Level of Service (LoS) provided by, and the resilience of, their transport infrastructure to natural hazards. These steps will ensure that infrastructure managers (National Transport Authorities or transport infrastructure operators) can systematically identify appropriate resilience enhancing actions and ensure the effective allocation of limited resources.

Setting of targets for service and resilience of infrastructure implies the ability to

1. measure service and resilience;

2. define a process to set the targets

use the above-mentioned process to define specific targets.

Some works exists already on each of these research areas. Literature for the general process of setting targets is, however, scarce.

How service is measured

The service to be provided by transportation infrastructure is the safe and sustainable mobility of persons and goods. This service can be operationalised, for example, as the ability to transport from A to B, goods and persons within a specific amount of time, and goods without being damaged and persons without being hurt or losing their lives.

The provision of this service requires, the construction of the infrastructure, and the execution of interventions to counteract gradual deterioration, to restore the infrastructure so that it provides the required service following the occurrence of extreme events, and to accommodate changing needs.

Once it is determined how service is to be measured, the reductions in service due to the occurrence of extreme events, and therefore resilience, can be measured.

How resilience is measured

Resilience encompasses all aspects of how the services provided by the infrastructure may be negatively affected by the occurrence of natural hazards, including the probability that it will be affected by specific hazard events, its vulnerability to the hazard events, and how quickly and easily it can be restored following the occurrence of the hazard events.

The definition of resilience in this context is to be developed during the WS.

Resilience be measured, using, each KPI deemed relevant, in order to assess how service is being affected, and the cost of the interventions required to ensure that the infrastructure once again provides an adequate service.

When considering extreme events, resilience is generally measured as the difference between:

1. the service provided by the infrastructure if no hazard event occurs and the service provided by the infrastructure if a hazard event occurs; and

2. the costs of intervention if no hazard event occurs and the costs of interventions if a hazard event occurs.

The document should also define **how service and resilience targets are set**.

The resulting CWA will contain a methodology for infrastructure managers who work either for public administrations or private operators (for example working under a PPP scheme). The methodology will enable a common European approach and thus the possibility of sharing experiences. It can also be used for investors to properly allocate resources to transport infrastructures. It is not intended to be used for certification purposes.

The CWA is to be used by managers to establish targets for the service provided by, and the resilience of, multi-modal transportation infrastructure, especially when the desire is to have a standardised, repeatable and comparable process. It can be used to ensure that there is complete and systematic way of setting service and resilience targets in any infrastructure management decision-making situation throughout its life cycle.

The standardization bodies with relation with this WS are defined in clause 8.

3. Workshop proposers and Workshop participants

The CEN-CENELEC Workshop is proposed by the FORESEE project consortium. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 769373.

The following members of the FORESEE project have stated their intention to participate in the WS:

- FUNDACION TECNALIA RESEARCH & INNOVATION (Spain)
- RINA CONSULTING SPA (Italy)
- FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V. (Germany)
- CEMOSA INGENIERÍA Y CONTROL (Spain)
- EUROPEAN UNION ROAD FEDERATION (Belgium)
- EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH (Switzerland)
- SPANISH ASSOCIATION FOR STANDARDIZATION (Spain)
- WSP

Participation in the CEN-CENELEC Workshop is open to everyone, and the opportunity to participate is advertised prior to the kick-off meeting by its proposers and the CEN-CENELEC official channels. In particular, the participation of representatives from Road and Rails Administrations or private transport operators is considered very valuable and contacts will be made to promote it.

The Secretariat will be hold by the Spanish Association for Standardisation (UNE).

4. Workshop scope and objectives

The purpose of this CEN-CENELEC Workshop is to provide guidelines to:

- Measure Levels of Service and resilience in infrastructures
- Set target levels of service and resilience for infrastructures

The tentative title is: **Levels of service and resilience of transport infrastructure — Guidelines for the assessment**

The tentative scope is:

These guidelines are to be used to determine 1) how to measure, the service provided by, and the resilience of, transport infrastructure, and 2) how to set service and resilience targets of transport infrastructure. It includes:

- the concepts of how service and resilience can be measured,
- the concepts of how service and resilience targets can be set,
- the steps to determine how to measure service and resilience, and
- the steps to set service and resilience targets.

The agreement will be formalized by one CEN-CENELEC Workshop agreements (CWA), which is intended to be available free of charge.

The proposed CWAs will not define requirements related to safety aspects.

5. Workshop programme

The WS is expected to publish one CWA defining the steps to measure and set targets for the, the levels of service to be provided by, and the resilience of, transport infrastructure in Europe. The CWA will be drafted and published in English.

The estimated duration of this workshop is 8-10 months (from the kick-off meeting).

Due to the travel restrictions related to COVID-19, all meetings are intended to be virtual. If a physical meeting is convened, the possibility of virtual participation will be granted, if possible.

The program to reach the CEN-CENELEC Workshop Agreements entails the following steps:

5.1. Invitation for the kick of meeting and call for experts

The CEN-CENELEC Management Centre (CCMC) will post the Project Plan, the invitation and the agenda for the kick-off meeting on the CEN-CENELEC Website for a period of 30 days. The interested parties will be able to register by email. In parallel, the invitation is forwarded to stakeholders or potentially interested experts previously identified.

Participation in the development of the CEN-CENELEC Workshop Agreement is open to anyone, and the opportunity to participate will be advertised in advance by its proposers and by CEN-CENELEC. The Workshop Secretariat will register all interested participants.

The kick-off meeting of the CEN-CENELEC Workshop is intended to take place on **2021-01-14**, by teleconference.

5.2. Circulation of the first draft

The first draft is intended to be circulated to the experts registered in December, before the meeting. The comments will be addressed during the kick-off meeting.

5.3. Kick-off meeting

During the kick-off meeting, the participants will:

- approve the Workshop Project Plan;
- appoint the Workshop Chair and Secretariat;
- approve the planning (tentative schedule) for the development of the CWA;
- present and discuss the first draft of the CWA, with the collated comments and any other comment from the attendances;
- decide further actions.

5.4. 2nd meeting and other meetings, if necessary

After the kick-off meeting, a new draft will be circulated for comments. A new meeting will be convened to deal with the second round of comments issued by the WS participants. The date for this meeting will be established in the kick-off meeting.

- This step will be repeated until the Chair considers a consensus on the document has been reached among the WS participants.

5.5. Public commenting phase

CEN-CENELEC will publish the draft in its website and circulate it within the standardization environment, to gather comments for 60 days.

Comments received during the public commenting phase shall be addressed. A meeting can be organized if comments cannot be resolved via email.

5.6. Publication of the CWA

If consensus is achieved, the CWA will be published by CEN-CENELEC.

5.7 Schedule

The following table provides a tentative schedule, considering two meetings before the public commenting period. If more meetings are needed, the schedule will be updated.

Activities	Date
Official WS announcement and call for experts	November, 25th , 2020
Circulation of the first draft to experts.	Before end of December, 2020
Kick-off meeting,	January, 14th, 2021

Activities	Date
Circulation of the updated draft, based on the comments received and the feedback during the kick-off meetings	Before end of February, 2021
Second meeting,	March, 2021
If needed, circulation of the new draft, for comments	Before end of April, 2021
If needed, **third meeting for resolution of comments**	May, 2021
Circulation of the final draft, based on the comments received and the feedback during the kick-off meetings, to be approved by correspondence (if possible)	Before end of June, 2021
Opening of **public commenting phase** (60 days)	Before end of July, 2021
Closing of public commenting phase	Before end of September, 2021
Comments analysis and implementation (by correspondence or in a meeting) Delivery of CWAs to CCMC for **publication**	Before end of November, 2021

6. Workshop structure

The CEN-CENELEC Workshop will operate using the CEN-CENELEC rules for the CEN-CENELEC Workshop Agreement.

6.1 CEN-CENELEC Workshop Chair

The chairperson will be formally appointed at the kick-off meeting by the parties present. The chairperson has five main responsibilities.

1. Organization of communication with CEN-CENELEC Workshop participants via the Secretariat;
2. Monitoring CEN-CENELEC Workshop processes and CWA development progress;
3. Managing and accessing the consensus process;
4. Chairing the CEN-CENELEC Workshop meetings;
5. Representation of the CEN-CENELEC Workshop and its results towards the external interested parties.

6.2 CEN-CENELEC Workshop Secretariat

After the formal announcement of the proposed CEN-CENELEC Workshop, UNE (Spanish

Standardization Body, CEN-CENELEC national member) will assume the Secretariat with the next duties:

1. Is responsible for administrative tasks of the CEN-CENELEC Workshop Agreement;
2. Forming the administrative contact point for CWA projects;
3. Follow up of Workshop decisions
4. Advising on the requirements of the CEN-CENELEC Internal Regulations;
5. Keeping a list of parties to be consulted in view of the maintenance phase and updating it with new expressions of interest.

The Secretariat will ensure transparency, openness and equal treatment of all stakeholders.

7. Resource requirements

7.1 Costs of the CEN-CENELEC Workshop

Organizations participating in the Workshop's activities must cover all their costs, i.e. at their own expense. UNE will provide the Workshop Secretariat subject to formal approval of the Project Plan at the kick-off meeting. Secretariat costs will be covered by FORESEE.

The copyright of the final CEN-CENELEC Workshop Agreement will be at CEN-CENELEC.

7.2 Participation and registration fee

Registration as well as participation at the CEN-CENELEC Workshop described here are free of charge.

As stated above, electronic meetings will be preferred. Nevertheless, in case of physical meetings, they will be convened in Europe and each participant has to bear his/her own costs for travel, accommodation and subsistence.

8. Related activities, liaisons, etc.

UNE made an assessment of existing ENs and TSs and related to the scope of the WS. No standards or standards under development have been found, neither at European or International level, with the same scope. To avoid overlap with other standardization activities, contacts have been made with the following Committees.

Information has been sent to several technical bodies (CEN and ISO):

- CEN/TC 350/WG 6 and ISO/TC 59/SC 17/WG 5, covering sustainability for civil engineering works → presentations were made, in both WGs, in September 2020.
- ISO/TC 59/WG 4 *Resilience of buildings and civil engineering works*: a presentation of the FORESEE project was made in June 2020.
- ISO/TC 207 *Environmental management* Secretariat was contacted in April. A letter and a presentation were circulated as N1353.

- ISO/TC 262 *Risk assessment*: A letter and a presentation were circulated as N570.

9. Contact points

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