



ENHANCED INTERFACES AND TRAIN CATEGORIES FOR DYNAMIC COMPATIBILITY
ASSESSMENT OF EUROPEAN RAILWAY BRIDGES

D7.1 – Dissemination, exploitation and communication (D&E&C) plan

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1 EXECUTIVE SUMMARY

The present deliverable D7.1 is included within Work Package 7 (WP7) entitled “*Technical coordination, scientific quality assurance and dissemination, exploitation and communication*” and aims to establish a common strategy among all the consortium for the Dissemination, Exploitation and Communication (D&E&C) activities within InBridge4EU. This document is, therefore, an action plan to ensure the correct coordination between all the partners in terms of D&E&C to maximize the project’s impact among the different stakeholders from the field.

This deliverable identifies in detail the main stakeholders that will benefit from the project’s results, as well as the main Key Performance Indicators (KPI) used to monitor those expected results. Moreover, it also presents the main strategies for communication and dissemination, starting with a detailed presentation of the visual identity of InBridge4EU, which will be the backbone of all dissemination activities performed throughout the project, followed by the description of the internal and external communication procedures. Regarding the former, a three-level communication within the consortium (Work Package Leaders, Technical Management Committee and Project Coordinator) is presented to ensure a smooth communication between all partners. In terms of external communication, the main channels, including website, social media, participation and organization in events and publication of scientific articles, are thoroughly described.

Finally, the document ends with the presentation of the exploitation methodology to explore the main results from the project with high potential of being exploited, denominated Key Exploitation Results (KER). This methodology consists of identifying these KERs and define the way to exploit them after the end of the project (exploitation roadmap). This exploitation routes can follow different ways, such as use the KERs to create innovative solutions that can be commercialized and put in the market or, for the particular case of InBridge4EU, use its main results to enhance the codes related with bridge dynamics in future short/medium-term revisions.









The results obtained from the strategy presented here will be published in two different phases, namely in *D7.3 - Project coordination mid-term report*, with due date in at the mid of the project in M20, and in *D7.7 - Project coordination final report*, expected to the end of the project in M36, both coordinated by UPORTO.

2 OBJECTIVES OF THE D&E&C ACTIVITIES

2.1 Definitions

According to the Horizon Europe programme (European Research Executive Agency, 2023), D&E&C are three essential components to show to the society the impacts and outcomes of the project. Table 1 summarizes the definitions of these three components as well as their main differences.

Table 1: Definitions of dissemination, exploitation and communication according to the Horizon Europe programme (adapted from European Research Executive Agency (2023)).

	Dissemination 	Exploitation 	Communication 
Definition 	<p>Make knowledge and results publicly available free-of-charge. The public disclosure of the results by appropriate means, other than resulting from protecting or exploiting the results, including by scientific publications in any medium.</p>	<p>Make concrete use of results for commercial, societal and political purposes. The use of results in further research and innovation activities, including commercial exploitation such as developing, manufacturing and marketing a product or process, creating and providing a service, or in standardisation activities.</p>	<p>Inform, promote and communicate activities and results. Taking strategic and targeted measures for promoting the action itself and its results to a multitude of audiences, including the media and the public, and possibly engaging in a two-way exchange.</p>
Target audience 	<p>For those who can learn and benefit from the results, such as: scientists, industry, public authorities, policymakers, civil society.</p>	<p>For those who can take the results forward or invest in them, such as: researchers, stakeholders, industry, public authorities, policymakers, civil society.</p>	<p>Citizens, stakeholders and the media.</p>
How to do it 	<p>Scientific magazines, scientific and/or targeted conferences, databases.</p>	<p>Creating roadmaps, prototypes, software, normative guidelines and recommendations, sharing knowledge, skills, data.</p>	<p>Having a well-designed strategy, conveying clear messages and using the right channels.</p>
When to do it 	<p>Anytime, as soon as results become available and up to four years after the end of the project</p>	<p>Towards the end of the action and beyond, as soon as exploitable results are available and up to four years after the end of the project</p>	<p>From the start until the end of the action.</p>
Why do it 	<p>Maximise the impact of the action, allow other researchers to go a step forward, contribute to the advancement of world class knowledge and make scientific results a common good.</p>	<p>Lead to new legislation or recommendations, benefit the innovation, the economy and society, help to tackle problems and respond to an existing demand.</p>	<p>Engage with stakeholder, attract the best expert, raise awareness of how public money is spent and show the success of European collaboration.</p>

2.2 Deliverable objectives

D&E&C is an important part of the Horizon Europe projects, and in particular those funded by Europe’s Rail Joint Undertaking (EU-Rail), that all partners must take part in. Thus, the present deliverable presents the strategy plan for these three components to ensure the maximum impact, visibility and accessibility of the results arising from InBridge4EU among the different stakeholders from the railway field and the general

public and society. In that sense, the objectives intended to achieve with this strategic plan can be summarized as follows:

- To define an effective and efficient communication and dissemination strategy plan for the project.
- To identify the target audience of the project.
- To identify the expected impact from the project through Key Performance Indicators (KPI).
- To present the visual identity of InBridge4EU that will be used to disseminate it.
- To identify the most efficient communication and dissemination channels, including digital communication (website and social media), important international conferences and scientific journals.
- To define the exploitation strategy and identify the Key Exploitable Results (KER) that can be used to further enhance the current European normative documents related to bridge dynamics.

3 TARGET AUDIENCES

The target audiences are a group of people that will use or further up-take the results of the project and benefit from it, i.e., the audience to whom the D&E&C messages are addressed. An analysis of the main target stakeholders has been performed during the proposal and specified in Section 2.1.3 from the Part B of the project’s Description of Action (DoA – Part B) specified in the Grant Agreement (GA). Therefore, in addition to the partners that compose of the consortium and parties involved in research activities within EU-Rail, other important actors must be aware of the project developments, aiming to maximise the benefits for the railway community. Figure 1 presents a summary of the main stakeholders benefited by InBridge4EU.

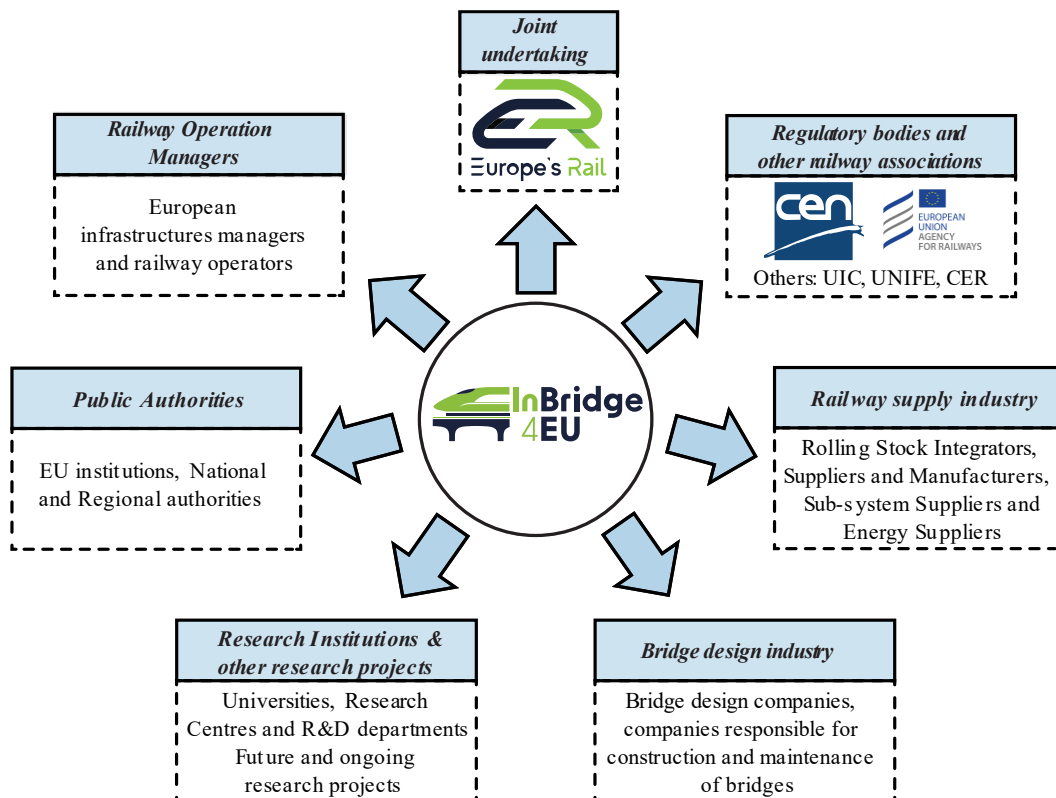


Figure 1: Target groups benefited by the project.

The main purpose of the dissemination activities and exchange of information is to guarantee that all groups of partners presented in Figure 1 are kept well informed on the project outcomes. The justification for selecting each of these target groups as the main audience of InBridge4EU is the following:

- **Europe's Rail Joint Undertaking:** funding provider of InBridge4EU and main Joint Undertaking (JU) in the railway sector that aims to join the forces from industry and academia to build and integrated European railway network and eliminate barriers to interoperability. Naturally, by aiming to enhance the main normative codes and regulations, namely the Technical Specifications for Interoperability (TSI), InBridge4EU will make a strong contribute to the EU-Rail's main objectives.
- **Regulatory bodies:** the European Union Agency for Railways (ERA) and the European Committee for Standardization (CEN) are some of the main target groups of this project, since they are primarily responsible for producing the normative documents that will benefit from the research carried out in InBridge4EU, thus, the main stakeholders that will exploit the project's results.
- **Railway operation managers:** both Infrastructure Managers (IM) and Railway Operators (RO) will benefit from the results achieved in the project, since the impact in the normative documents will positively affect both the infrastructure (both new and existing) and the railway operation in terms of European interoperability. Note that, according to ERA regulations, the IMs are responsible for publishing the compatibility checks between trains and bridges, while the RO are in charge of carrying out these checks.
- **Railway supply industry:** another important target group is the railway supply industry, including the rolling stock manufactures, since the normative enhancements that are expected to arise from the research performed within InBridge4EU's, namely the Dynamic Train Categories (DTC) to allow a faster train-bridge compatibility check, will depend on the train configurations currently circulating in Europe.
- **Research institutions and other R&D projects:** the involvement with other R&D projects from the railway field, such as those identified in Section 1.2.2 from Part B of the project's DoA specified in the GA, is crucial for the InBridge4EU's success and to avoid research overlapping. Particular attention has been given to establishing contacts with the researchers from the complimentary projects, namely EU-Rail's FP3-IAM4RAIL (2024) and Shift2Rail's IN2TRACK3 (2023).
- **Bridge design industry:** the industry responsible for building new bridges or perform maintenance in existing ones, especially the bridge designers, should be targeted because they apply, in a daily basis, the codes addressed in this project, namely EN 1990-Annex A2 (2001) and EN 1991-2 (2003), making them directly and positively affected by the project's outcomes.
- **General society:** it is also important to take into consideration that all the improvements made in the normative documents involving bridge dynamics will end up having not only direct impact in the aforementioned target groups, but also an indirect impact in the society in general that depends on the railway transport in its daily life.

In summary, a robust communication strategy is planned within InBridge4EU to engage with all relevant stakeholders, with the aim of understanding the views of all interested parties.

4 EXPECTED IMPACT

The outcomes of InBridge4EU will have a clear impact on the current European normative documents related with bridge dynamics and on the harmonisation of working methods across European countries. Naturally, the outcomes will consequently influence the design of new railway bridges and the evaluation/monitoring of existing ones. In addition, InBridge4EU results will influence over time several critical aspects related to railway bridges and respective interaction with rolling stock. Table 2 presents the expected impacts of InBridge4EU identified in Section 2.3.2 from Part B of the project's DoA specified in the GA, the respective KPIs that will be used to monitor them and the main stakeholders that will benefit from the results achieved in the project.

Table 2: Expected impacts of InBridge4EU and KPIs to monitor it.

Expected impact	KPI	Stakeholders
Close TSI open points identified by ERA on bridge dynamic	Drafting a document (Deliverable D6.1 - Recommendations for updating Eurocodes and TSIs) with proposed recommendations to upgrade and enhance the normative criteria and the EU railway legislation (INF TSI, 2019) identified in the ERA Technical Note (2022).	<ul style="list-style-type: none"> • Regulatory bodies ERA/CEN • Infrastructure managers • Railway operators • Rolling stock manufactures
Harmonization of standards and working methods	Proposal of recommendations based on calculations performed over a wide portfolio of European bridges from 5 different countries will contribute to consolidate a trend in different European countries towards the adoption of a decision-making policy based on similar grounds.	<ul style="list-style-type: none"> • Infrastructure managers • Railway operators • Bridge design industry
Development of wide databases of rolling stock and bridges representative of the European railway reality that will benefit the IMs.	Development of Europe-wide databases of both rolling stock (Deliverable D1.1 - Database of rolling stock and definition of critical parameters) and bridges (D2.1 - Bridge database)	<ul style="list-style-type: none"> • Infrastructure managers • Railway operators • Rolling stock manufactures
Development of DTC easily understood by structural engineers to facilitate and speed up the dynamic compatibility checks.	Development of a document proposing a DTC methodology (Deliverable D1.3 - Dynamic Train Categories) and the limits of validity of the current static compatibility checks (Deliverable D1.4 - Limits of validity of static compatibility checks) to be adopted in the European norm EN 15528 (2021).	<ul style="list-style-type: none"> • Regulatory bodies ERA/CEN • Infrastructure managers • Railway operators
Cheaper and more optimized bridge solutions for both new and existing structures.	Development of documents that justify the enhancement of the normative criteria stipulated in EN 1990-Annex A2 (2001) and EN 1991-2 (2003), such as dynamic factors (Deliverable D3.1 - Revised formulae for the dynamic factors ϕ' and ϕ''), damping (Deliverable D4.1 - Revision of damping) and deck acceleration limit (Deliverables D5.1 - Revised acceleration criteria for railway bridges with ballastless tracks and D5.2 - Revision of the acceleration limits in bridges with ballasted tracks).	<ul style="list-style-type: none"> • Regulatory bodies ERA/CEN • Infrastructure managers • Bridge design industry • Public authorities • General society

The monitoring of the proposed KPIs will be monitored throughout the project and discussed with the Advisory Board in a final meeting in M35-36 to assess the KPIs of the project, as specified in Milestone (MS) 20 described in Part A from the project’s DoA included in the GA.

5 DISSEMINATION AND COMMUNICATION STRATEGY

5.1 Objectives

Dissemination and communication are a contractual obligation stated in Art. 17 of the project’s GA. Thus, the purpose of this section is to present the strategy that will guide the dissemination and communication activities throughout the project lifetime. The main goal of the dissemination and communication strategy is to raise awareness of the project’s research and results in order to make InBridge4EU a successful project that firmly supports the exploitation of results by the European regulatory bodies to enhance the normative codes that address the dynamic effects in the design of railway bridges. This strategy will aim to disseminate the key findings and outcomes of the project in a way that maximises its impact and outreach to target audiences identified in Section 3. The objectives of dissemination and communication are summarized in Table 3.

Table 3: Objectives of dissemination and communication.

Objectives	Way to do achieve it
Reach the main target audiences that may benefit with the project’s outcomes and increase its impact	<ul style="list-style-type: none"> • Use the social media to reach the main stakeholders from the project, both from academia and industry. • Update the news in both the website and social media pages to get the stakeholder’s attention. • Cooperate with other projects from the field, preferably from EU-Rail, to reach other partners. • Identify the most strategic conferences, fairs and events from the field to ensure that all the target audiences, academia and industry, are all reached.
Definition and development of the tools to achieve an effective dissemination	<ul style="list-style-type: none"> • Development of the website and ensure that is updated regularly with news, upload of the public deliverables and other relevant documents. • Creation of social media pages and update it regularly with news and posts. • Publish all relevant results in scientific journals with high impact to reach the academic audiences.
Ensure that the message transmitted to the outside is effective to increase the project’s visibility	<ul style="list-style-type: none"> • Ensure that the main target audiences are invited to the workshops/meetings organized by the consortium. • Ensure strong participation of the consortium members in the main international conferences to present the most relevant results

5.2 Dissemination and communication plan management

Dissemination and communication activities using the project brand name will be boosted by UPORTO, which acts in InBridge4EU as leader of WP7 entitled “*Technical coordination, scientific quality assurance and dissemination, exploitation and communication*” and responsible for the tasks that address this topic, namely *Task 7.3 - Internal communication* and *Task 7.4 - Dissemination, exploitation and communication*

(D&E&C) activities. Thus, UPORTO will be the main responsible for developing and managing the dissemination and communication strategy, monitoring the results and respective KPIs and establishing contacts with other relevant projects. Moreover, the WP7 leader will also be in charge of organizing the meetings, workshops and other events relevant for the project’s promotion within the internal and external communication obligations, as will be detailed later in Sections 5.4 and 5.5, respectively.

It is also important to highlight that the coordination of the dissemination and communication activities with EU-Rail will also be object of great effort from UPORTO, ensuring that the funding entity is constantly updated on the project’s promotion actions towards the main stakeholders of the railway sector and the society in general. In that sense, and taking into consideration the EU-Rail Graphic Guidelines (2022) communicated to the project coordinators in the D&E&C meeting from September 21st 2023, InBridge4EU’s partners will follow and update permanently the Dissemination and Communication plan proposed by EU-Rail and presented in Figure 2. This plan will summarize the main dissemination and communication actions, namely scientific publications, participation in events, among others, and the corresponding target audience. To ensure that all partners from the consortium update the plan regularly, it is already uploaded into the project’s internal SharePoint to facilitate its filling. Naturally, and although UPORTO is responsible for monitoring the plan’s update and provide support and advice regarding the dissemination and communication strategy, it is the obligation of all consortium members to fill the plan regularly and provide accurate information in terms of their dissemination and communication activities.


 InBridge4EU Dissemination and Communication plan								
Date	Activity	Type (e.g. event, newsletter, article, etc.)	Name	Where (online/country)	Description of the activity (if an article, please input the DOI)	Target Group	Contact Person	Suggested Visual

Figure 2: Dissemination and Communication plan.

5.3 Visual identity of InBridge4EU

Immediately after the decision from EU-Rail and Horizon Europe to award the project to the InBridge4EU’s consortium, UPORTO, as leader of WP7, started working on the creation of a recognisable visual identity to the project that could offer to the target audiences a fast and clear idea of its main objectives.

5.3.1 Name

The projects acronym InBridge4EU derives from its full name entitled “Enhanced *Interfaces and train categories FOR dynamic compatibility assessment of EUROpean railway BRIDGES*”. The full title should be included the first time that is mentioned in a document and replaced by the acronym thereafter.

5.3.2 Logo

The project’s logo was developed based on the main topics addressed in InBridge4EU and on its acronym. It will be the main visual messenger of the project and it will be reflected in all the communication materials, such as website, templates, reports, newsletters, and dissemination activities during and after the project completion. Therefore, given its importance to define the project’s brand and disseminate it among the target audiences, the design team, based on the main keywords associated with the project, such as “bridges”, “high-speed”, “track”, “train”, developed a logo that aimed to reflect the InBridge4EU main objectives of

developing normative recommendations for bridge dynamics and, simultaneously, follow the EU-Rail Graphic Guidelines (2022) to ensure coherence between the project and the EU-Rail’s visual identity. Figure 3 describes how the visual image of each subsystem addressed in the project merged to create the final version of the InBridge4EU logo.

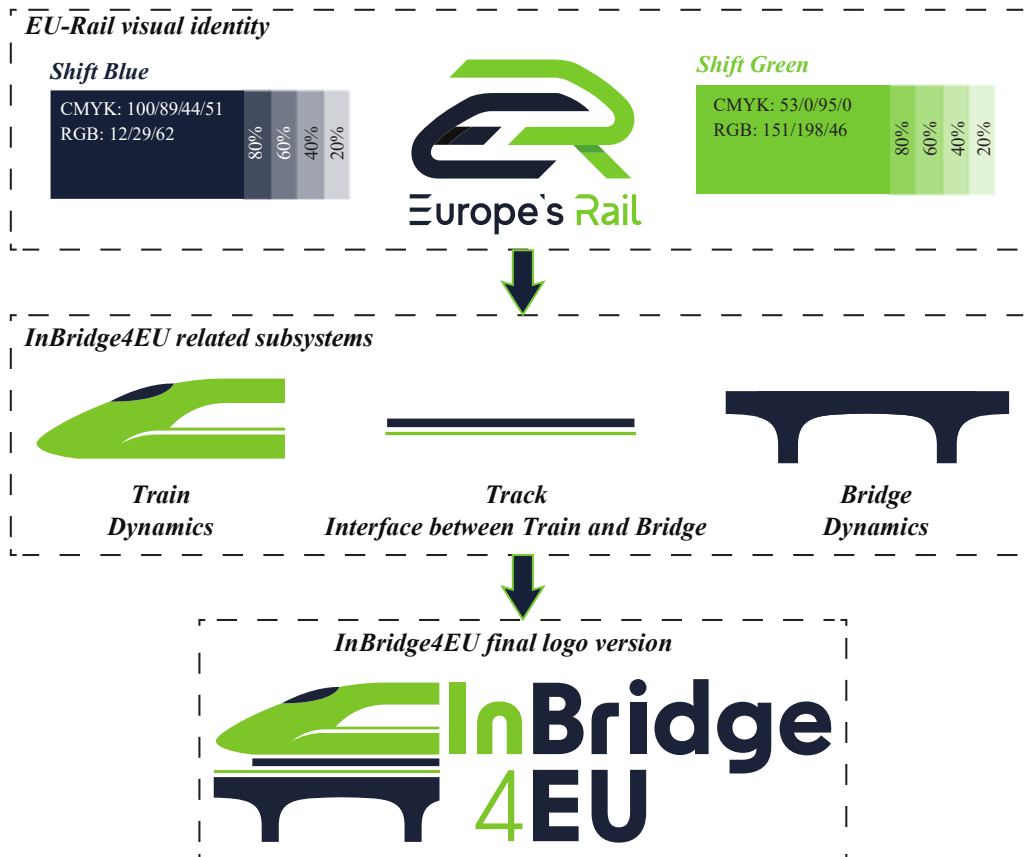


Figure 3: InBridge4EU logo construction.

Based on the proposed logo, several variants were also developed that can be adopted under different circumstances depending on the intended graphic context, as can be seen in Figure 4.



Figure 4: InBridge4EU logo variants.

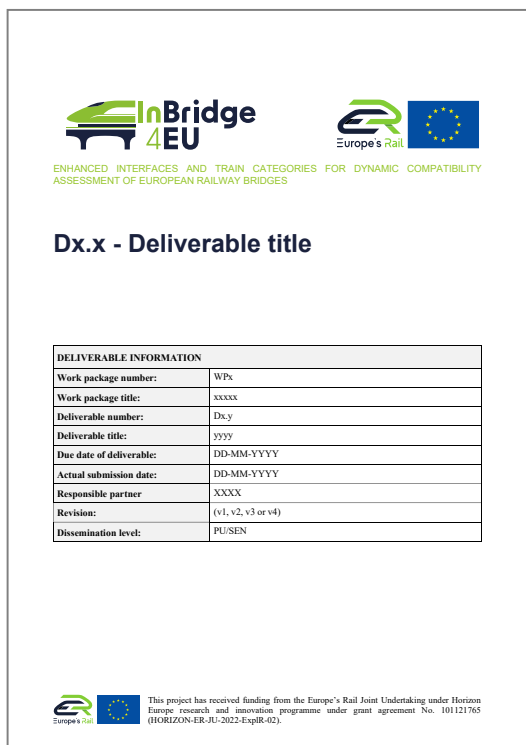
5.3.3 Visual guidelines

The objective of the project’s visual guidelines consists of providing visual unity to the dissemination and communication materials by establishing templates, design elements and images coherent with the InBridge4EU’s visual entity. Thus, the guidelines defined below have the following main objectives:

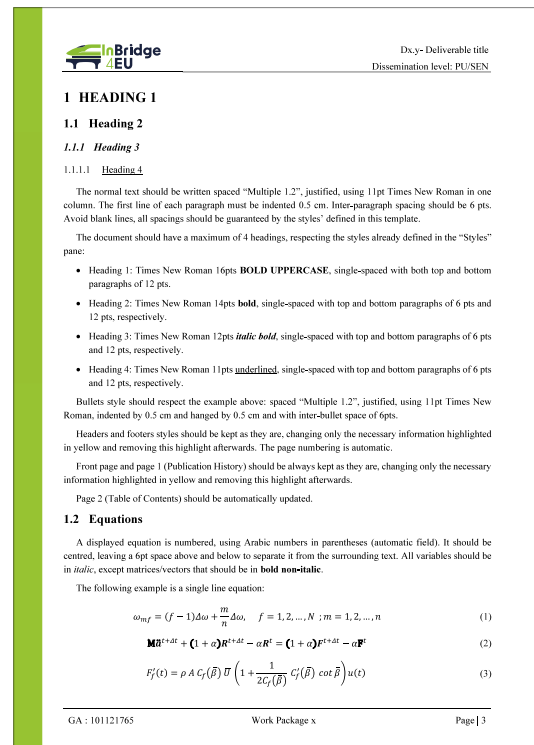
- **Ensure consistency within the different external communication channels:** these guidelines will help to standardize and normalize all the communication materials, such as documents and presentations.
- **Ensure fast recognition of the project by the target audiences:** adopting a uniform visual identity among all the partners will speed up the project’s recognition among external stakeholders interest in the project, thus enhancing its visibility.
- **Guide the project’s partners in their communication with the respective networks:** avoids that each partner produces its own visual materials, facilitating their communication activities with predefined templates and a single visual identity.

5.3.3.1 Document templates

Templates for documents in MS Word® (2024) have been developed by UPORTO within WP7 *Task 7.2 - Technical-scientific coordination and quality assurance* and made available to all the consortium through the project’s internal sharepoint. The template contains a full guideline to the document’s characteristics in terms of heading, figures and table styles, font type and size, among other information useful to produce normalized documents, including the deliverables. Figure 5 depicts, for exemplification purposes, the first page of the document template, as well as a typical page.



a)



b)

Figure 5: Document template in MS Word®: a) first and b) typical page.

5.3.3.2 Presentation templates

Templates for presentations in MS PowerPoint® (2024) have also been developed by UPORTO and made available to the consortium. The same rules mentioned before for document templates were applied to the presentations, as shown in Figure 6.



Figure 6: Presentation template in MS PowerPoint®.

5.3.3.3 Acknowledgement for the EU funding and disclaimer

As specified in Article 17 from the InBridge4EU GA, all the material used for dissemination and communication (including scientific papers, conference proceedings and papers, seminars, information material, such as brochures, leaflets, posters, presentations, etc., in electronic form, via traditional or social media, etc.) must contain the acknowledgement for the EU-Rail/Horizon Europe funding, as shown in Figure 7.

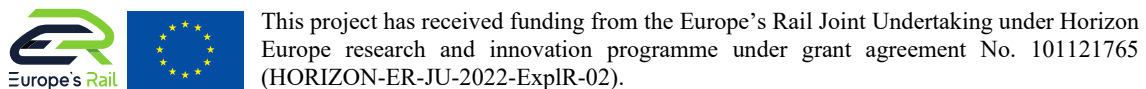


Figure 7: Acknowledgement for the EU-Rail/Horizon Europe funding.

In addition, and still according to article 17 from the GA, a disclaimer should also be added in all communication activities with the following information: “Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or Europe’s Rail Joint Undertaking. Neither the European Union nor the granting authority can be held responsible for them.”

5.4 Internal communication

5.4.1 Internal communication procedure

The project is structured into 5 technical-scientific WPs that aim to cover the 11 work streams (WS) defined in the ERA Technical Note (2022), plus an additional WP6 that summarises the recommendations for reviewing and updating the codes and a WP7 related with the project coordination and with the D&E&C activities. To ensure a smooth interconnection between the WPs, a strong internal communication must be guaranteed by the project management structure. This structure follows up and supports day-to-day operation, organize project functions and meetings, establishes efficient coordination and communication between the project partners and the project officer and manages financial and administrative aspects related to InBridge4EU. Figure 8 depicts the organization of the project management structure, which can be divided in the following three main vertical levels that should communicate with each other whenever necessary:

- **Level 1 – Project Coordinator (PC):** UPORTO serves as PC in InBridge4EU, which will act as the main intermediary between the consortium and EU-Rail. Its roles in the project are: i) report the project’s progress to the EU-Rail; ii) chair the Technical Management Committee; iii) manage the financial funding from the project.
- **Level 2 – Technical Management Committee (TMC):** the TMC role is to coordinate all technical aspects between WPs and ensure the link among them. It is composed by one representative from each WP leader, affiliated entity and associated partner and chaired by the PC. Its main responsibilities are: i) ensure delivery of results according to the milestones and deliverables; ii) ensure the correct implementation of the actions stipulated in the GA; iii) ensure harmonisation between WPs in terms of data management; iv) coordinate technical and scientific aspects between WPs; v) review the deliverables and ensure their quality before sending them to the EU-Rail; vi) make the link between the consortium and the external regulatory bodies, namely CEN and ERA; vii) support the PC in the preparation of internal and external project meetings; viii) resolve conflicts between partners that escalated from the WPs; ix) propose and negotiate amendments to the GA if needed.
- **Level 3 – WP Leaders:** each WP will have an assigned leader, who will ensure the achievement of the objectives of the respective WP and the involvement of all the involved partners. Their main responsibilities are: i) coordinate the work in each WP; ii) ensure that milestones are met and the deliverables submitted in due time; iii) manage the task leaders; iv) report to the TMC eventual delays and measures to mitigate the deviations; v) report progresses of the respective WP to the TMC; vi) escalate to the TMC issues that could not be solved within the WP

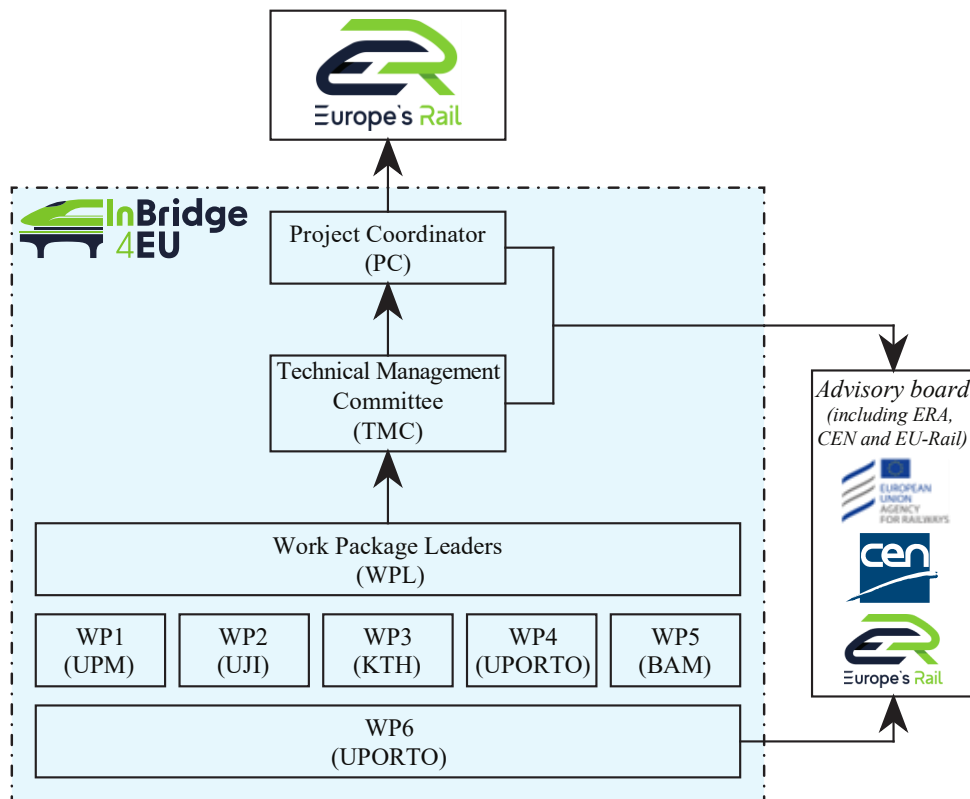


Figure 8: Project management structure.

The project management of InBridge4EU will create and distribute material continuously to project partners, for further distribution in their proper channels. The material will be possible to alter, translate and modify to suit the local audience.

In addition to the communication between the members of the InBridge4EU consortium, it is important to emphasise that the project also requires constant interaction with the funding body EU-Rail, and the project's Advisory Board, which also includes the regulatory bodies ERA and CEN (see its full composition in Section 5.4.4). Although external to the consortium, the communication between InBridge4EU and these entities is considered internal, since their inputs will contribute directly to the project's outcomes. It is expected that the feedback received from these experts may lead to reorientations of the research strategy to better reach the expected outcomes. A collaborative SharePoint in MS OneDrive® (2024) has been established within the consortium and the Advisory Board to allow the exchange of data and facilitate the internal communication (see Figure 9).

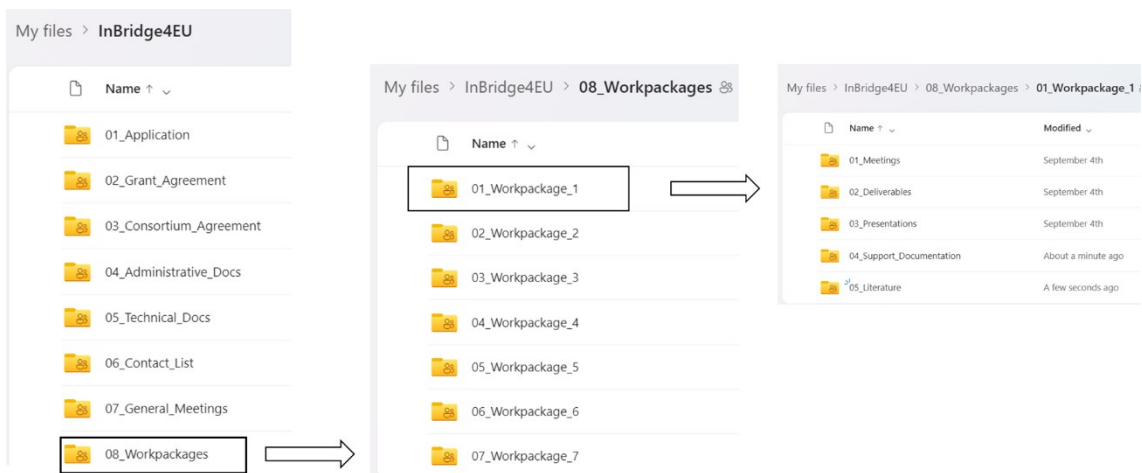


Figure 9: Structure of the project's collaborative SharePoint.

5.4.2 Internal meetings schedule

The main basis for internal communication consist of the several internal meetings that will take place throughout the project. Apart from the technical meetings that may take place between partners for discussing specific issues from the project, three official types of meetings will be held recurrently: i) the periodic WP meetings, where the partners working in each WP discuss the work updates, ii) the regular technical meetings, where all the partners and Advisory Board discuss the results achieved so far, and iii) the TMC meetings, where the TMC discuss the management and coordination of the project. Table 4 summarizes the schedule and periodicity of the aforementioned internal meetings that took (Kickoff Meeting, see Figure 10) and will take place throughout the project. While the WP meetings are convened by the respective WP leader and occur, generally, every month, the other two take place every 6 month. The first part of the mid-term and final events will be opened to the scientific community, thus also making part of the external communication plan (see later Section 5.5).

Intermediate meetings with the regulatory bodies ERA and CEN are also scheduled to take place every 3 months, if required, to ensure that the results are fulfilling their expectations to integrate the proposed recommendations in the future revisions of the codes related with bridge dynamics. Finally, the Project Coordinator and the EU-Rail Project Officer have also regular meetings every two weeks to ensure a smooth follow-up of the project by the funding entity.

Table 4: Summary of the main internal meetings.

Meeting type	Meeting name	Date	Format	Location	Attendees
Periodic monthly WP meetings	WP1 meeting	3 rd Wednesday	Online	-	WP1 partners
	WP2 meeting	Last Monday	Online	-	WP2 partners
	WP3 meeting	Last Friday	Online	-	WP3 partners
	WP4 meeting	1 st Wednesday	Online	-	WP4 partners
	WP5 meeting	1 st Thursday	Online	-	WP5 partners
Regular Technical meetings	Kickoff Meeting (Meeting 1)	October 9 th , 2023	Face-2-Face	Porto, Portugal (host: UPORTO)	Consortium + Advisory Board
	Meeting 2	March 20 th , 2024	Online	-	Consortium + Advisory Board
	Meeting 3	Sep ~ Oct 2024	Face-2-Face	Berlin, Germany (host: BAM)	Consortium + Advisory Board
	Mid-term event (Meeting 4)	Feb ~ Mar 2025	Online	-	Consortium + Advisory Board + Scientific community
	Meeting 5	Sep ~ Oct 2025	Face-2-Face	Madrid, Spain (host: UPM)	Consortium + Advisory Board
	Meeting 6	Feb ~ Mar 2026	Online	-	Consortium + Advisory Board
	Final event (Meeting 7)	Jun ~ Jul 22026	Hybrid	To be defined	Consortium + Advisory Board + Scientific community
TMC meetings	Same schedule and format as the Regular Technical meetings				Project's TMC
EU-Rail meetings	Follow-up	Every 2 weeks	Online	-	Project Coordinator + Project Officer


Figure 10: The consortium and part of the Advisory Board gathered in Faculty of Engineering of the University of Porto, Portugal, during the InBridge4EU Kickoff Meeting in October 9th 2023.

5.4.3 Work progress chart

The TMC will discuss the work progress in every TMC meeting to ensure that the project’s objectives and deliverables are within the stipulated timeline. To do that, each WP leader should communicate the progress of the respective WP’s deliverables and milestones and fill in advance the work progress chart already included in the project’s internal SharePoint. Figure 11 depicts, for exemplification purposes, a print screen of the work progress chart relative to WP1.

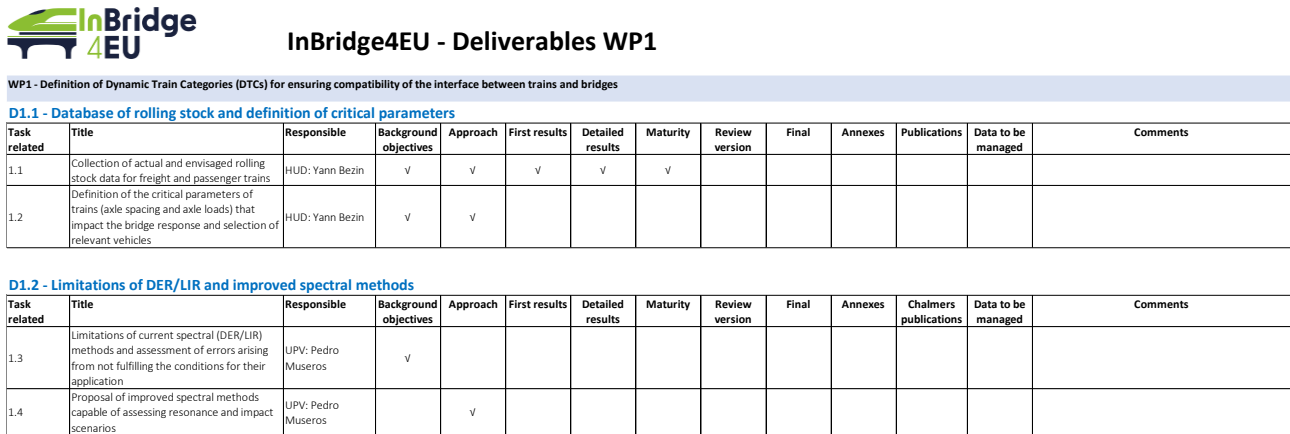








Figure 11: Work progress chart (WPI for exemplification purposes).

5.4.4 Composition of the Advisory Board

The Advisory Board’s objective is to support the consortium in achieving the best results possible throughout the project’s execution. Therefore, it is important to have experts belonging to the most important target audiences defined in Sector 3 to ensure that the project’s outcomes fulfil the expectations of the main stakeholders from the sector. In this sense, the Advisory Board is composed by representatives of the European IMs that are not part of the consortium, the regulatory bodies ERA and CEN, coordinators from complementary projects and the InBridge4EU Project Officer from EU-Rail, as detailed in Table 5.

Table 5: Composition of the InBridge4EU’s Advisory Board.

Group	Institution	Logos	Country	Members
European IMs	SNCF Réseau		France	Frédéric Durot Quentin Jungers
	Infraestruturas de Portugal		Portugal	Hugo Patrício
	Trafikverket		Sweden	Anders Carolin
	Network Rail		UK	Ben Wilkinson
Regulatory bodies	European Union Agency for Railways (ERA)		EU	Desislava Dimitrova Gianvittorio Tavola Gaetano Imperato Pedro Mestre
	European Committee for Standardization (CEN) - CEN/TC 250/Bridge Dynamics		EU	Günther Grunert Ian Bucknall Bridget Eickhoff

	European Committee for Standardization (CEN) - CEN/TC 256/Rolling Stock		EU	Hinnerk Stradtman Michael Seibert
Complementary projects	DZSF project		Germany	Tomás Arana
Project Officer	EU-Rail		EU	Carolina Cardea

5.5 External communication

The external communication aims to reach the main stakeholders from the railway sector, in particular those defined as the main target audiences described in Section 3. Thus, to maximize the project's impact among these audiences, a series of communication channels have been identified and put into practice in the first weeks of the project's execution. Table 6 summarizes those main channels and the respective tools adopted to implement them, while a detailed description of each channel is presented in the following subsections. The table also shows the main stakeholders targeted by these channels (see target audiences in Section 3), as well as the KPIs associated to each one.

Table 6: InBridge4EU communication channels and respective tools to implement them, target audiences and KPIs.

Channel	Tool	Target audience	KPI and target values
Digital communication	Website	All	No. of visits M18: 500 / M36: 1500
	Social media	All	No. of followers M18: 300 / M36: 400
Printable and digital documents	Templates	Consortium	-
	Posters	All	-
Organization of events	Project's mid-term event	EU-Rail, regulatory bodies, railway operational managers, railway supply industry, bridge design industry, R&D partners	No. of participants (including external to the consortium): 50
	Project's final event	EU-Rail, regulatory bodies, railway operational managers, railway supply industry, bridge design industry, R&D partners	No. of participants (including external to the consortium): 75
	Special sessions (SS) or mini-symposia (MS) in conferences	R&D partners, railway operational managers, bridge design industry	No. of SS/MS organized in the field of railway infrastructure dynamics: 5
Participation of events	Conferences	R&D partners, railway operational managers, bridge design industry,	No. of conferences attended: 10 No. of individual participations: 30
	Fairs	All	No. of fairs attended: 2 No. of individual participations: 10
Scientific publications	Peer-reviewed journals	R&D partners, bridge design industry	No. of articles published: 10
	Conference articles	R&D partners, bridge design industry	No. of presentations: 15
	Thesis	R&D partners, bridge design industry	No. of thesis related with the project: 3

5.5.1 Digital communication

5.5.1.1 Website

The InBridge4EU project website was developed at the beginning of the project, registered in the domain www.inbridge4eu.eu, and went online on October 2023. The website is the central digital tool to disseminate the project and aims to reflect the project’s objectives, advances, news and research performed by the consortium and show them to the main stakeholders and target audiences. The modern design adopted for the website is aligned with the InBridge4EU visual identity (see Figure 12), namely in terms of the colours and the figures adopted in each page.

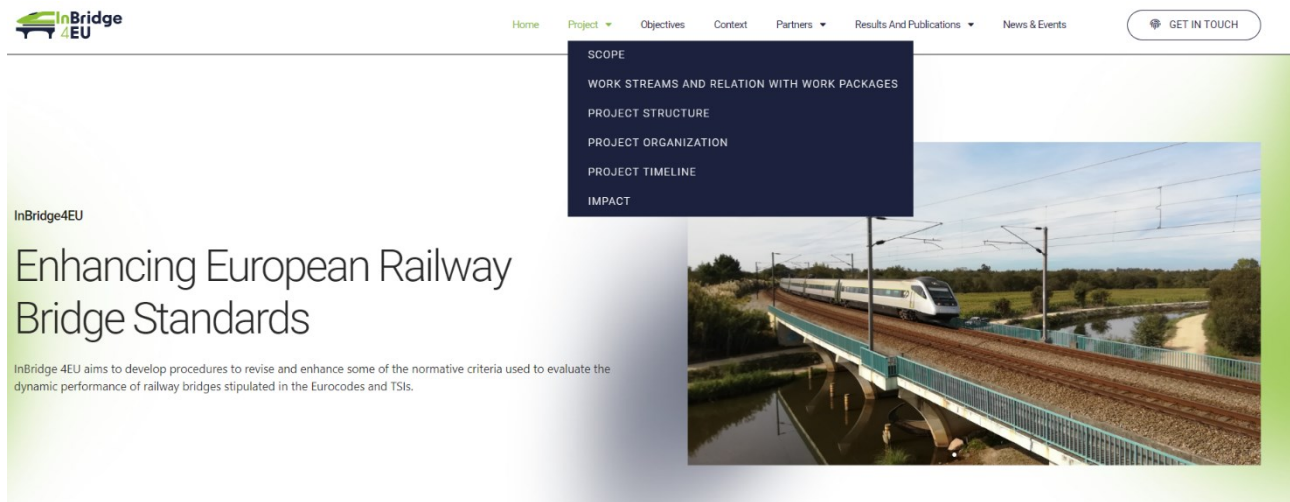


Figure 12: Homepage from the InBridge4EU website.

The structure of the website is simple and clear to allow the viewers to quickly find the intended information. Table 7 presents the webpage’s structure and a summary of the main contents in each section.

Table 7: Structure of the InBridge4EU website.

Section	Sub-sections	Content
Home	-	Short description of the project and hyperlinks to the remaining sections
Project	Scope	Scope and motivation of the project.
	WSs and relation with WPs	Connection between the WSs defined in the call topic and the project’s WPs that address them.
	Project structure	Project’s division in WPs and short description of each one.
	Project organization	Project’s management description
	Project timeline	Project’s timeline, including the duration of each task and the respective milestones and deliverables.
	Impact	Description of the main impacts in terms of normative regulation and main audiences targeted by the project
Objectives	-	Description of the project’s general objectives and specific objectives from each WP.
Context	-	Description of the context within EU-Rail and ERA and reference to the complementary projects.

Partners	General	Reference to the 11 partners from the consortium (logos and map)
	One for each partner	Detailed description of each partner, including origins, main R&D fields and previous projects related with the railway area.
Results And Publications	Deliverables	Table where the public deliverables will be made available after revision.
	Other documents	Section where documents other than deliverables may be made available to the public.
News & Events	-	Section in which the main news related with the project are published.
Get in touch	-	Location for posing questions to the project coordinator.

It is important to highlight that all the news are posted in the respective section in the website (see Figure 13) and directly connected with the social media platforms described next in Section 5.5.1.2, thus maximizing its impact among the different target audiences. Moreover, although the webpage is being managed by the project’s coordinator UPORTO, all the partners from the consortium will actively contribute to this section throughout the project to show the dynamics among all the partners.

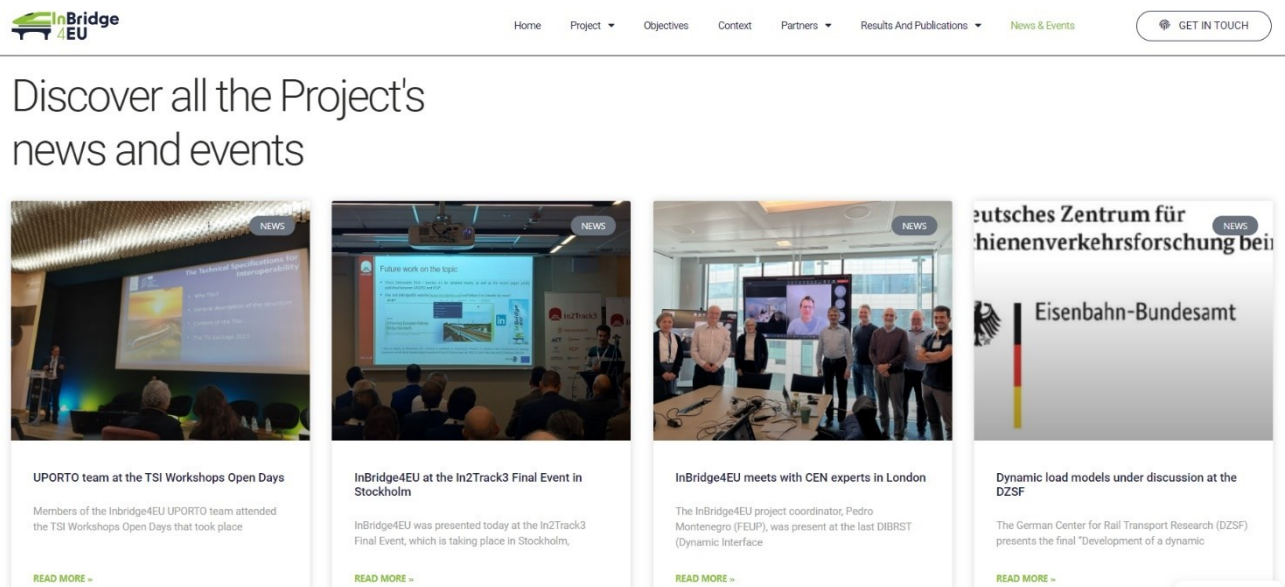


Figure 13: News & Events section from the InBridge4EU website.

5.5.1.2 Social media

The social media adopted to externally communicate and disseminate the project is LinkedIn, given its main focus on business and professional activities. Moreover, most of the stakeholders that are intended to be reached within InBridge4EU are generally connected to this social network, thus boosting the impact of this channel. The InBridge4EU LinkedIn profile (Figure 14) has been set in October 2023 and aimed to be an extension of the website, helping to drive traffic to the latter and offering extra promotion to the project through the previously established networks between the members of the consortium and the main stakeholders from the sector. Finally, and as mentioned before, all the news posted on the website produced by the different consortium partners are also published in LinkedIn.

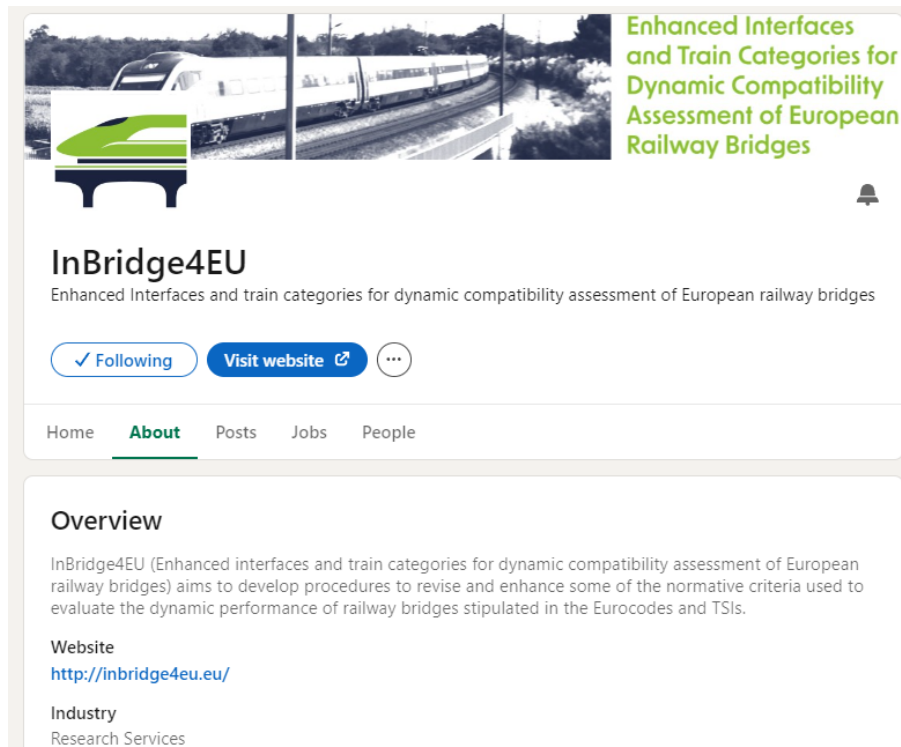


Figure 14: InBridge4EU LinkedIn profile.

5.5.2 Organization of events

As presented in Table 4, there will be 7 main meetings throughout the project, where the consortium will have the opportunity to share the most recent results obtained in the project to different target audiences. Among these meetings, two of them will have a different format, namely the Mid-term and Final events, since they will not be exclusively open to the consortium and the Advisory Board, but also to the scientific and industrial community interested in the results from InBridge4EU. While the former, which will take place in February/March 2025, will be in an online format, the latter, held in June/July 2026, will be in a hybrid format, where the consortium and the Advisory Board will meet in person in a place to be defined and the scientific community will be able to participate online and have the chance to put questions and discuss the results with the InBridge4EU consortium. It is expected that such approach will help the project's dissemination among the main stakeholders from the railway sector.

In addition to the two aforementioned events/workshops, the partners from the consortium will also contribute to the organization of mini-symposia or special sessions in international conferences dedicated not only to railways, but also in more generic conferences related with civil engineering structures or structural dynamics, such as EURO DYN, EVACES or IABMAS (see list of target conferences in Section 5.5.3).

5.5.3 Participation in events

Participation in events, such as conferences, congresses, workshops, among others, is a key part of the dissemination and communication strategy, since they encourage the networking between the partners and stakeholders from the railway field and allows the consortium to show the main and most recent advances and results of the project. Moreover, the participation in this kind of events also provides important contents to some of the communication channels and tools, such as the website news section and the social media, enhancing the project's impact on different audiences. Therefore, given the importance of this part of the dissemination strategy, a preliminary list of events where the partners will participate to disseminate the

project’s results is presented in Table 8. Nevertheless, all partners will continue to regularly identify new events throughout the project. It is important to highlight that all the participations should be registered in the Dissemination and Communication plan presented in Section 5.2.

Table 8: Preliminary list of events that will take place throughout the project.

Event name	Type	Estimated date and location
TRA 2024 10 th Transport Research Arena	Conference	15-18 Apr 2024 Dublin, Ireland
IABMAS 2024 12 th Conference on Bridge Maintenance, Safety and Management	Conference	24-28 Jun 2024 Copenhagen, Denmark
ICRT 2024 3 rd International Conference on Rail Transportation	Conference	7-9 Aug 2024 Shanghai, China
RAILWAYS 2024 6 th International Conference on Railway Technology: Research, Development and Maintenance	Conference	1-5 Sep 2024 Prague, Czech Republic
INNOTRANS 2024 International Trade Fair for Transport Technology	Fair	24-27 Sep 2024 Berlin, Germany
EVACES 2025 11 th International Conference on Experimental Vibration Analysis for Civil Engineering Structures	Conference	2-4 Jul 2025 Porto, Portugal
WCRR 2025 14 th World Congress on Railway Research	Conference/Fair	2025 Colorado, USA
EURODYN 2026 13 th International Conference on Structural Dynamics	Conference	2026 Hannover, Germany
IABMAS 2026 13 th Conference on Bridge Maintenance, Safety and Management.	Conference	2026 TBD

5.5.4 Scientific publications

In addition to disseminate the project’s technical advances in conferences, the consortium, in particular the academia partners, will put a strong effort in publishing the technical and scientific outputs in high-impact scientific journals. As for the events, a preliminary search has been made to identify the most suitable journals (but not limited to) to publish the outputs of InBridge4EU, which are described in Table 9.

Table 9: Preliminary list of scientific journals.

Journal name	Publisher	Topics addressed complementary to InBridge4EU
International Journal of Rail Transportation	Taylor and Francis Ltd	Dynamics and mechanics of rail vehicle, track, and bridge system; Planning and design, construction, operation, inspection, and maintenance of rail infrastructure.
Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit	SAGE Publications Ltd	Passenger and freight; Track systems; Interaction of vehicles with the infrastructure and the environment; System infrastructure and interfaces; Reliability and safety; Inspection and maintenance; Data and the digital railway; Railway engineering trends.
Railway Engineering Science	Springer Nature Switzerland AG	Fundamental engineering science and emerging technologies in rail transit systems; Design theory and construction technology; System dynamics and safety; Operation and maintenance; System health monitoring and reliability; Environmental impact and sustainability; Cutting-edge technologies
Engineering Structures	Elsevier BV	Infrastructure engineering; Earthquake engineering; Structural dynamics; Wind engineering; Structural reliability/stability; Life assessment/integrity; Structural health monitoring; Structural optimization; Digital design methods; Data-driven analysis methods; Experimental methods; Performance-based design.
Structure and Infrastructure Engineering	Taylor and Francis Ltd	Recent advances in maintenance, management and life-cycle performance of a wide range of infrastructures, including bridges and railways; Mathematical modelling; Computer and experimental methods; Practical infrastructure applications in the areas of assessment and evaluation; Field testing; Sustainability, inspection and diagnostic; Loads; Specifications and codes; Rehabilitation, repair, replacement;
Journal of Bridge Engineering	ASCE - American Society of Civil Engineers	Publishes papers about all aspects of the art and science of bridge engineering., namely research that advances the practice and profession of bridge engineering and papers about issues, projects, materials, design, fabrication, construction, inspection, evaluation, safety, performance, management, retrofitting, rehabilitation, repair, and demolition.
Structures	Elsevier BV	Areas relating to materials; Structural mechanic; Structural engineering; Structural design; Construction engineering; Structural innovation; Eextreme events; Sustainability; Performance-based design.
Engineering Failure Analysis	Elsevier BV	Comprehensive critical reviews on failure mechanisms; Failure analysis of engineering components or structures coupled with computational methods, including bench tests, numerical simulations, artificial intelligence, digital twins and virtual reality modelling; Case studies detailing failures in major industrial sectors, including transportation (aerospace, automotive, railway) and civil construction.

6 EXPLOITATION STRATEGY

The present section presents the strategy adopted in InBridge4EU to exploit its results after the end of the project. The main objectives of the project's exploitation are generally presented in Section 2.2, while the exploitation methodology, based on Key Exploitable Results (KER), is explained in more detail in Section 6.2.

6.1 Objectives

As defined in Section 2, the main objective of the exploitation is to define how the results achieved in the project may be exploited after its conclusion for the benefit of the society in general. Thus, the development of an exploitation strategy at the beginning of the project is of the utmost importance to maximize its impact among the main stakeholders.

Exploitation should contribute to the concrete use of results for commercial, societal and political purposes through diverse routes, such as the development, creation and marketing of processes or products for commercialization, or through the development of recommendations and guidelines to create or enhance standardization and legislation in the various sectors of the society. In the particular case of InBridge4EU, the exploitation strategy will mainly focus on the latter, since the expected outcomes imposed in this specific call are fully aligned with the improvement of the current normative criteria related with bridge dynamics, namely those presented in the codes EN 1990-Annex A2 (2001), EN 1991-2 (2003) and EN 15528 (2021) and in the Technical Specifications for Interoperability (INF TSI, 2019).

The exploitation strategy will mainly focus on the KERs selected by all the consortium to define the measures to exploit the results at the end of InBridge4EU. Thus, the present section aims to describe the activities that need to be carried out (how and by whom) to prepare the exploitation process of the project, allowing a smooth transfer of knowledge between the normative recommendations expected to be produced during the project and their medium-term incorporation into the aforementioned codes.

6.2 Exploitation methodology

The methodology adopted to exploit the results obtained in InBridge4EU is based in KERs and involves the following steps: i) identification of the KERs by the consortium; ii) definition of a roadmap that explains how these KERs will be further exploited after the end of the project; iii) a risk assessment to identify the main risks that may pose a threat to the project's objectives; and iv) deal with the Intellectual Property Rights (IPR) during the results' exploitation. These four steps are described in more detail in the next subsections.

6.2.1 Key Exploitable Results (KERs) definition

According to Art. 16 of the project's GA, "*results*" means any tangible or intangible effect of the action, such as data, know-how or information, whatever its form or nature, whether or not it can be protected, as well as any rights attached to it, including IPR. Among the results achieved in a project, some may have a greater potential for further research enhancements or for being applied to concrete solutions for the benefit of the directly involved stakeholders and the society in general. These particular results are designated KERs and consist of an identified important result that has been prioritized given its high potential of exploitation beyond the project's lifespan. Hence, it is expected that an identified KER should be exploited to create solutions that can be commercialized, used to delineate new standards or legislation or act as an input to further research or education.

When identifying a KER, it should be described not only the result itself, but also its characteristics, namely:

- Description of the result;
- Description of the problem solved by the result;
- Alternative solutions;
- List of competitors;
- Involved partners;
- Competitive advantages (unique selling points);
- Description of the involved market;
- Explain business model;
- Sources of financing and time needed after the end of the project to exploit the result.

In the particular case of the InBridge4EU project, the exploitation will not focus on the commercialization of solutions that emerge from the KERs, but on the preparation of guidelines to be further incorporated in normative codes. Therefore, all the aforementioned characteristics related with business and commercial issues will not be addressed in this project and referred in the KERs identification in Section 6.2.2. The routes that will be followed for exploiting the KERs is described later in Section 6.2.3.

6.2.2 Identified KERs in InBridge4EU

Several KERs have been identified during the application phase that aim to answer the objectives proposed in the call topic and set in the ERA Technical Note (2022) to close normative open points on bridge dynamics. These KERs, which consist mainly in guidelines and recommendations to enhance the current codes and legislation related with railway bridges, namely EN 1990-Annex A2 (2001), EN 1991-2 (2003) and EN 15528 (2021) and INF TSI (2019), will be further exploited to be incorporated into those codes. Hence, the identified KERs and their characteristics are summarized in Table 10.

Table 10: Identified KERs of InBridge4EU and their characteristics.

KER	Description
Improved spectral methods for dynamic analysis of bridges	<p><u>Description:</u> development of an enhanced spectral method for obtaining the bridge dynamic response including possible critical effects of the train while on the bridge and the contribution of more than one frequency.</p> <p><u>Related WP and responsible partner:</u> WP1, UPV</p> <p><u>Advantage and problem solved by the KER:</u> method that allows a fast computation of bridge dynamic responses not limited to simply supported bridges and to bridges whose dynamic responses cannot be accurately described only by the first mode of vibration.</p> <p><u>Alternative solution available:</u> DER and LIR methods.</p>
Dynamic Train Categories (DTC)	<p><u>Description:</u> development of DTCs which can be easily understood by structural engineers and may be used for dynamic compatibility studies.</p> <p><u>Related WP and responsible partner:</u> WP1, UPM</p> <p><u>Problem solved by the KER:</u> train-route compatibility check considering dynamic effects.</p> <p><u>Alternative solution available:</u> perform individual dynamic analysis in each bridge to ensure dynamic compatibility between the vehicle and infrastructure.</p> <p><u>Advantage:</u> allows a fast and simplified dynamic compatibility check while ensuring safety without the need to performing time-consuming dynamic analysis in each bridge from a specific existing line.</p>

<p>Worst-case combination of critical parameters of existing bridges</p>	<p><u>Description:</u> identification of the most critical combinations of parameters that influence the bridge dynamic response.</p> <p><u>Related WP and responsible partner:</u> WP2, UJI</p> <p><u>Advantage and problem solved by the KER:</u> avoid the need for superfluous follow up vehicle / individual bridge compatibility checks considering parameters with low influence in the dynamic response of the system.</p> <p><u>Alternative solution available:</u> more complex and time-consuming parametric studies with unnecessary bridge parameters when performing bridge compatibility checks.</p>
<p>New formulae for dynamic amplification factors ϕ' and ϕ''</p>	<p><u>Description:</u> revision of the formulae for ϕ' and ϕ'' present in EN 1991-2 (2003).</p> <p><u>Related WP and responsible partner:</u> WP3, KTH</p> <p><u>Advantage and problem solved by the KER:</u> lead to more realistic amplifications defined by ϕ' and ϕ''. While the former's formula leads to underestimated amplifications (studies that gave origin to it did not fully account the resonant effects due to the consideration of short trains and high damping values in the dynamic analysis), the latter's overestimate the amplification caused by the track irregularities</p> <p><u>Alternative solution available:</u> use the current formulas stipulated in the code that lead to underestimated values of ϕ' and overestimated values of ϕ''.</p>
<p>New damping definition for bridge dynamics</p>	<p><u>Description:</u> revision of bridge structural damping present in EN 1991-2 (2003).</p> <p><u>Related WP and responsible partner:</u> WP4, UPORTO</p> <p><u>Advantage and problem solved by the KER:</u> better estimation of damping to not overestimate the railway bridge response and lead to more expensive structures prone to resonance phenomena.</p> <p><u>Alternative solution available:</u> use the current underestimated values of damping stipulated in the code.</p>
<p>Revised deck acceleration criterion</p>	<p><u>Description:</u> revision of the deck acceleration criterion present in EN 1990-Annex A2 (2001).</p> <p><u>Related WP and responsible partner:</u> WP5, BAM</p> <p><u>Advantage and problem solved by the KER:</u> existing bridges do not often comply with the deck acceleration limit, which has limited, or no, experimental validation that support it. Thus, the revision of this criterion should define acceleration limits and safety margins backgrounded by scientific research, leading to more accurate train-bridge compatibility checks in existing and new bridges.</p> <p><u>Alternative solution available:</u> use the current conservative deck acceleration limits stipulated in the code.</p>

6.2.3 Exploitation roadmap

After identifying the KERs to be exploited, it is necessary to define the way to do it after the end of the project. To do so, an exploitation roadmap is proposed, which defines the main routes to be followed for successfully exploit the results. As mentioned before, several routes may be adopted depending on the type of results and the project's objectives. These are:

- Development of products or services to be commercialized in a business level;
- Creation of spin-off activities or joint ventures;
- Selling or licencing IP rights;

- Producing guidelines or normative recommendations for standards;
- Use the results for further research.

In InBridge4EU, since the KERs are not related with marketable solutions, only the two latter routes will be followed in the project. Hence, the following roadmap, presented in Table 11, will be adopted in this project for each KER identified in Section 6.2.2. It is important to remind that the direct users of most of the KERs from InBridge4EU will be the regulatory bodies ERA and CEN, since they are the final responsible for implementing changes in the codes addressed in the project. However, other stakeholders that may indirectly benefit from the results achieved are also identified at this stage. Since ERA and CEN are members of the Advisory Board (see Section 5.4.4) and are actively following the project, the link between the consortium and the regulatory bodies is already made, which will facilitate the exploitation of the results beyond the project’s timeline through the integration of the normative recommendations (proposed in WP6) into the codes.

Table 11: Exploitation routes for the InBridge4EU KERs.

KER	Exploitation route	Potential users
Improved spectral methods for dynamic analysis of bridges	Further research	R&D partners, railway operational managers
Dynamic Train Categories (DTC)	Normative recommendations	Regulatory bodies, railway operational managers, railway supply industry
Worst-case combination of critical parameters of existing bridges	Further research	R&D partners, railway operational managers
New formulae for dynamic amplification factors ϕ' and ϕ''	Normative recommendations	Regulatory bodies, railway operational managers, railway supply industry, R&D partners
New damping definition for bridge dynamics	Normative recommendations	Regulatory bodies, railway operational managers, railway supply industry, R&D partners
Revised deck acceleration criterion	Normative recommendations	Regulatory bodies, railway operational managers, railway supply industry, R&D partners

6.2.4 Risk assessment

Next step consists of assessing the risks associated with each result/objective to minimize, or eliminate, their impact in the project and in the results’ exploitation beyond it. To do that, a double entry risk matrix (see Figure 15) has been proposed in which the consequence/impact and likelihood of each risk is addressed.

		Consequence				
		1 Negligible	2 Minor	3 Moderate	4 Major	5 Extreme
Likelihood	5 Almost certain	5	10	15	20	25
	4 Likely	4	8	12	16	20
	3 Possible	3	6	9	12	15
	2 Unlikely	2	4	6	8	10
	1 Rare	1	2	3	4	5

Figure 15: Risk matrix adopted in InBridge4EU to assess the risk of each KER.

According to the Part A from the project’s DoA included in the GA, the risk will be assessed by each partner in a regular basis during the TMC meetings through the risk management chart depicted in Figure 16. This chart is divided into WPs and is not limited to the KERs, but also to other intermediate results that may jeopardize the final ones. Hence, each partner should fill the chart with the respective risk, together with the associated task in the project, its cause and consequence. Then, for each risk, the partner needs to define the likelihood and consequence based on the risk matrix presented in Figure 15. In this project, it is not necessary to fill the consequence box if the likelihood is less or equal than 2. On the other side, if the likelihood is higher than 2, the partner should define the consequences of that risk, in terms of time, quality and cost, and measures to avoid or mitigate it (see Table 12).



Risk and contingency document for WP1

ID	Task	Partner	Risk	Cause	Effect	Risk owner	Likelihood	Consequence			Risk response	Actions planned	Due	Date	Status	
								Time	Quality	Costs						
Ex	1.1	IPORTO	Risk that equipment will not be available for testing XX	Manufacturer might go bankrupt	Delayed start. Missing test times in track	Pedro Montenegro	2				Accept	If possible look out for other potential manufacturers	25-Oct-23	25-Oct-23	Open	
Ex	1.2	UPM	Risk that key personnel leaves the project	Other job opportunities	Loss of competence. gap while new persons are being taught, delays while recruiting.	José María Goicolea	3	4	2	2	Mitigate	Dialogue w individuals, improve working conditions within project	20-May-24	18-Apr-24	Closed	
1																
2																

Figure 16: Risk management chart.

Table 12: Consequences definition according to the risk management chart if likelihood greater than 2.

Consequence level	Description	Time	Quality	Cost
1	Negligible	Slightly affects the Task/Subtask's timely delivery	Negligible reduction in quality of final Task/WP outcome	No economic impact
2	Minor	Some impact on WP/Task/Subtask's timely delivery	Some reduction in quality of some task aspects	Costs are affected but can be managed within the available partner budget
3	Moderate	Moderate impact on the WP/Task's timely delivery	Reduction in quality of WP/Task as a whole	Potentially impacts partner(s) to the extent that they cannot fully fulfil their obligation(s)
4	Major	Impacts the timely delivery of the project	The final result will be at a level that affects the Task/WP outcome significantly	Potentially impacts partner(s) to the extent that budget changes will have to be made between partners
5	Extreme	Severe impact on the timely delivery of the project	The final result will be at a level that affects the project outcome significantly	Changes will have to be made in the project budget

6.2.5 Intellectual Property Rights (IPR) management

6.2.5.1 Legal framework

Exploitation activities, as well as communication and dissemination, are subject to the legal framework described in the Consortium Agreement (CA) and in the GA through the articles presented in Table 13. InBridge4EU aims to balance the maximization of access to results generated throughout the project with the protection of scientific information, IPR, privacy concerns, as well as data management and preservation questions.

Table 13: Articles in the CA and GA that address IPR matters and define the legal framework of D&E&C activities.

Consortium Agreement	Grant Agreement
<ul style="list-style-type: none"> • Section 8 – Results <ul style="list-style-type: none"> 8.1 Ownership of Results; 8.2 Joint ownership of Results; 8.3 Specific Provision on Project Data; 8.4 Transfer of Results; 8.5 Dissemination 	<ul style="list-style-type: none"> • Article 16 – Data Protection <ul style="list-style-type: none"> 15.1 Data processing by the granting authority; 15.2 Data processing by the beneficiaries; 15.3 Consequences of non-compliance
<ul style="list-style-type: none"> • Section 9 – Access Rights <ul style="list-style-type: none"> 9.1 Background included; 9.2 General Principles; 9.3 Access Rights for implementation; 9.4 Access Rights for Exploitation; 9.5 Access Rights for entities under the same control; 9.6 Additional Access Rights; 9.7 Access Rights for Parties entering or leaving the consortium; 9.8 Specific Provisions for Access Rights to Software 	<ul style="list-style-type: none"> • Article 16 – Intellectual Property Rights (IPR) – Background and Results – Access rights and rights of use <ul style="list-style-type: none"> 16.1 Background and access rights to background; 16.2 Ownership of results; 16.3 Rights of use of the granting authority on materials, documents and information received for policy, information, communication, dissemination and publicity purposes; 16.4 Specific rules on IPR, results and background; 16.5 Consequences of non-compliance.
<ul style="list-style-type: none"> • Section 10 – Non-disclosure of information 	<ul style="list-style-type: none"> • Annex 5 – Intellectual Property Rights (IPR) – Background and Results – Access rights and rights of use (Article 16)

6.2.5.2 IPR Management strategy

The IPR management strategy is an important part of the project’s exploitation plan. During the project, the internal results will be reviewed with the goal of identifying important ideas and defining an individual strategy for the positioning of these ideas in terms of possible recommendation for the current norms. The outcomes of a collaborative innovation project always differ from what partners individually bring to the project. Therefore, to clarify who owns the exploitation rights of such outcomes, an IPR strategy is set within the CA signed by all partners, indicating how partners should handle intellectual assets and property within the project.

Data management must comply with the FAIR Principles (Wilkinson et al., 2016) and the consortium data management policy established in the CA. The following procedure will be followed by the consortium regarding data management:

- **Data handling and storage:** each participant in the consortium will contribute to the data management plan (DMP with an overview of the data set, classification of data as relevant research outputs, data origination, workflow, ingest plan, consolidation, dissemination, roles, resources, and archiving) with detailed information on naming conventions, formatting, and metadata requirements according to the type of data collected or generated by the participant. The data will be made available to the consortium, to the EU-Rail and to the regulatory bodies ERA and CEN by sharing the data directly to ensure the highest level of transparency and availability of the data within the consortium. In this way, interested users can contact the owner of the data to get access to the full data. The data will be stored centrally and locally via external storage systems such as cloud-based services or network attached storages. The collection of national data on rail infrastructure from different sources and from different infrastructure managers (e.g. consortium partners DB and ADIF and consortium close links with TRV, SNCF and IP)

will allow representative data at European level, where appropriate in normalised/anonymous form, while preserving national safety interests.

- **Access:** The consortium defines access rights for the consortium staff via various roles.
- **Data documentation:** Data stored or generated within the consortium (analysis parameters, operating environment and software used, technology used and its specifications, explanations of labels and variables, information on data cleaning routines, licensing information and other supplementary material that could improve reusability) shall be documented in accordance with the DMP and standards, considering data protection standards where appropriate. During the project, an ontology for combining and qualifying data artefacts and research methods within the consortium will be progressively developed according to the state of the art at the beginning of the project and the developments within the different work packages during the project (description of methods and datasets to provide the general structure of the consortium's research ecosystem and metadata for describing the resulting research data).
- **Data publication:** The project's website provides information about the project, the research goals, the interim results, and the resulting publications in open-access journals. The standard form of publication is open-access publications with selected underlying data and methods on repository systems, stating the funding source and the origin of the underlying data and algorithms. Each participant has the right to publish own research results obtained within the project using own data sources. In this context, the interests of the other participants must also be considered. Therefore, the participants will inform each other in advance about planned publications and discuss their scientific content as well as the underlying data and methods. If common data from other consortium sources are used, each participant must agree to the publication.
- **Quality control:** The data owners are responsible for the accuracy of their data and metadata and for integration into the consortium ontology. Regular meetings of the consortium, including pre-peer review and discussions with the scientific community (peer review, participation in conferences) will improve the quality of the research data and results.

7 CONCLUSIONS

The present deliverable presents the strategy adopted in InBridge4EU for the D&E&C activities, which are mainly addressed in the project's WP7 led by UPORTO entitled "*Technical coordination, scientific quality assurance and dissemination, exploitation and communication*".

The main target audiences from the project have been presented, as well as the expected impact that will have on them. In this sense, several KPIs have been identified, including the way to monitor them (mainly through deliverables and milestones) according to MS20.

With respect to dissemination and communication, the present document presented the strategy to manage these activities through close interaction with EU-Rail. All aspects related with the visual identity of InBridge4EU have been presented, as well as all the details regarding the internal and external communication. Regarding the former, a three-level procedure within the consortium (WP leaders, TMC and Project Coordinator) has been presented to ensure a smooth communication between all partners. Moreover, the regular meeting schedule and the composition of the Advisory Board has been detailed, as well as the procedure to follow-up the project's progress through the discussion of a work progress chart in every TMC meetings. In relation to the external communication, a detailed list of the main communication channels has

been identified, namely the website, social media, organization and participation in events and scientific publications, as well as the procedures to maximize the project's impact among the main stakeholders from the field.

Finally, the exploitation strategy has also been presented through a methodology based on KERs. Exploitation is necessary to ensure that the main results achieved during the project may contribute to practical innovations, such as the commercialization of innovative products or services, enhancement of standards or creation of spin-off companies, or to allow further research and development in the specific topic. In InBridge4EU, since the main objectives are based on the development of normative recommendations to be incorporated, in a short/medium-term, in the codes related with bridge dynamics, the exploitation will fundamentally focus on the enhancement of standards and on allowing further research. In that sense, the project's KERs have been identified, as well as the routes (roadmap) to exploit them beyond the project duration. A procedure to assess the risks associated with the KERs, as well as the management of IPR according to the CA and GA specifications have been also presented at the end of the document.

The next steps in terms of D&E&C will consist of keep monitoring the main KPIs of the project, as well as encouraging all the partners to disseminate through the several channels the main achievements obtained throughout the project. Particular attention will be given to the continuous dissemination of news and reports through the website and Linkdin to demonstrate dynamism to the main stakeholders, as well as to the publication and presentation of results through prestigious scientific journals and participations in international conferences. Moreover, regarding communication, it is important to highlight the close relation between the consortium and the regulatory bodies ERA and CEN, to ensure that the proposed normative recommendations fulfil their expectations to be integrated in the future revision of codes. The consortium will be available to meet them every 3 months if required.

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