TECHNICAL DESCRIPTION (PART B)

COVER PAGE

Part B of the Application Form must be downloaded from the Portal Submission System, completed and then assembled and re-uploaded as PDF in the system. Page 1 with the grey IMPORTANT NOTICE box should be deleted before uploading.

***Note:** Please read carefully the conditions set out in the Call document (for open calls: published on the Portal). Pay particular attention to the award criteria; they explain how the application will be evaluated.*

PROJECT	
Project name:	Barcode ticketing for public transport
Project acronym:	BT4PT
Project Duration	24 months
Project Start Date	Signature of the agreement
Retroactive start date Justification:	
Coordinator contact:	Kursley Alairy – CEN

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#@APP-FORM-SMPSTAND@#
#@PRJ-SUM-PS@# [This document is tagged. Do not delete the tags; they are needed for the processing.]

PROJECT SUMMARY

Project summary

The BT4PT project aims to develop a European Standard (EN) for barcode ticketing that enables seamless multimodal and multi-operator travel across Europe. While rail ticketing is already regulated through ERA specifications (TAP TSI, Technical Docs B.11/B.12), other transport modes rely on fragmented and incompatible barcode formats. This lack of interoperability hampers the development of integrated mobility services. BT4PT proposes a modular, secure barcode structure usable on smartphones and printed tickets, supporting various transport modes and ensuring backward compatibility with existing systems. The project will deliver a CEN Technical Specification (CEN/TS) for the barcode format and a CEN Technical Report (CEN/TR) for governance and maintenance. Supported by stakeholders from rail, public transport, and MaaS platforms, BT4PT will be executed under the coordination of CEN and AFNOR, involving CEN/TC 278/WG3 experts. The outcome will directly support EU policies on digital mobility, sustainable transport, and single market integration by 2030.

#§PRJ-SUM-PS§# #@REL-EVA-RE@# #@PRJ-OBJ-PO@#

1. RELEVANCE

1.1 Background and general objectives

Background and general objectives

Describe the background and rationale of the project.

How is the project relevant to the scope of the call? How does the project address the general objectives of the call? What is the project's contribution to the priorities of the call?

The goal of the European Commission is to allow for seamless multimodal passenger transport by 2030, facilitated by integrated electronic ticketing including an EU interoperable barcode standard for mobility.

While rail is already subject to mandatory specifications for barcodes through TAP TSI Regulation referring to ERA TAP Technical Document B.11 (Layout for electronically issued rail ticket) and B.12 (Digital security elements for rail passenger ticketing), plenty of different formats are used to represent digital barcode tickets for mobility services of other modes of transport. This diversity is an important constraint for a cost effective and open distribution of mobility services across modes, as it introduces an unnecessary complexity on distribution platforms and strongly limits the issuance of a single ticket (or wallet of tickets) for multimodal journeys. Considering this current state, the development of a CEN Technical Specification (CEN/TS) for the barcode format combined to a CEN Technical Report (CEN/TR) for governance and maintenance are stepping stones toward the development of a EN in a further step.

BT4PT project item aims at standardizing multi-modal ticketing with modular barcodes on smartphones and on paper tickets for mobility services.

A CEN/TS will be developed based on the business needs that should be described through uses cases and will take into account existing specifications from other organisations (ERA/UIC) and existing national (and local) barcode specifications for public transport, with the mid-term ambition to create a EN standard.

Specifications will address digital usages with modular barcodes on smartphones and the layout for electronically issued paper tickets.

The project will also explore the convergence of barcode standards with emerging technologies such as NFC and innovative check-in/check-out solutions (e.g., Be-In Be-Out), ensuring **future-proof and scalable ticketing solutions.**

In addition, A CEN/TR will provide governance and maintenance guidelines.

This initiative builds on coordination efforts led by CEN and CENELEC since 2020, uniting key European stakeholders—including the European Commission, UIC, UITP, Shift2Rail, and Allrail—to foster alignment and interoperability between rail-specific data models (Transmodel EN12896) and multimodal ticketing solutions.
BT4PT directly supports the EU Sustainable and Smart Mobility Strategy (adopted December 2020), which mandates integrated electronic ticketing for seamless multimodal travel by 2030. It also supports the Single Digital Booking and Ticketing Regulation, MDMS initiative, and Green Deal. It anticipates and contributes to upcoming regulatory revisions of TAP TSI and the Multimodal Ticketing Interoperability Specification (MMTIS), scheduled for adoption in late 2022.
By standardizing multi-modal ticketing barcodes and establishing governance mechanisms, BT4PT will significantly reduce complexity and costs for mobility service providers and ticket distributors, **while enhancing the passenger experience in line with the priorities of the call.**

1.2 Needs analysis and specific objectives

Needs analysis and specific objectives

Describe how the objectives of the project are based on a sound needs analysis in line with the specific objectives of the call. What issue/challenge/gap does the project aim to address?

The objectives should be clear, measureable, realistic and achievable within the duration of the project. For each objective, define appropriate indicators for measuring achievement (including a unit of measurement, baseline value and target value).

The emergence of a single standard for public transport in digital and paper tickets (that can be read electronically) format is a needed prerequisite to enable seamless door to door multimodal journey purchase from a single distribution platform, whatever the retailer and issuer are.

Such a standard may substantially impact all the validation and access control equipment already in the field. A phased approach is then needed to give a medium-term vision about a unified and single standard. This must consider legacy specifications to develop a first set of common assets to allow a progressive upgrade, if relevant, on the existing barcode ticketing infrastructure. The standard must provide interoperability and backward compatibility with existing specifications mandatory applicable for rail (ERA TAP Technical Documents B.11 and B.12) and any other specification if relevant. Specifications developed in relation to 2D barcodes shall refer to existing standard (considering compatibility, scanner availability, size efficiency) ISO/IEC 24778 (AZTEC) and/or ISO/IEC 18004 (QR code) and shall ensure interoperability and backward compatibility with ISO/IEC 15438 (PDF417) for some specific use-cases.

Public transport ticketing systems in Europe currently operate with fragmented and often incompatible formats for both paper and digital tickets. This fragmentation limits the ability of passengers to plan and purchase seamless, door-to-door multimodal journeys through a single, unified platform. It also creates interoperability challenges for transport operators, mobility providers, and system integrators—hindering the realization of Mobility-as-a-Service (MaaS) and cross-border travel integration.
The Annual Union Work Programme 2025, Action 18, explicitly identifies the need for European standard supporting multimodal digital mobility services, with a focus on interoperability and ease of integration across systems and providers. The emergence of a unified standard covering both digital and paper formats—usable across validation and access control systems regardless of the retailer or issuer—is a foundational step in achieving this vision. However, such a standard must take into account existing infrastructure and regulatory obligations, in particular the ERA TAP TSI Technical Documents (B.11 and B.12), to ensure compatibility and facilitate phased implementation.

Consultations with stakeholders across the public transport ecosystem have confirmed that the absence of such a harmonised, pan-European standard remains a key barrier to operational efficiency and service integration. Establishing this common framework through the formal European standardisation process (via CEN) is therefore both necessary and urgent.
To address these challenges, the project has two main objectives to be achieved within a 24-month timeframe, in accordance with the CEN standardization process:
The first objective is to define and publish a **CEN Technical Specification (CEN/TS)** for a multimodal barcode ticketing standard that supports door-to-door travel across all modes of transport. This specification will detail the necessary data elements and describe security mechanisms to ensure interoperability, trust, and alignment with existing regulatory frameworks such as the ERA TAP TSI Technical Documents (B.11 and B.12). It will be developed with a focus on backward compatibility to support progressive deployment across existing barcode ticketing infrastructures. Progress will be measured by the delivery of the CEN/TS and a final assessment report both to be finalised by month 24 while an intermediate interim report on the progress of work by 12 months.
The second objective is to develop and publish a **CEN Technical Report (CEN/TR)** that provides governance and maintenance guidelines for the specification. This report will outline procedures for technical artefact publication, registration, and key management, and will define a long-term framework for sustainability and standard evolution. Achievement of this objective will be measured by the delivery of the CEN/TR and a final assessment report both to be finalised by month 24 while an intermediate interim report on the progress of work by 12 months.

#§PRJ-OBJ-PO§# #@COM-PLE-CP@#

1.3 Complementarity with other actions and innovation

Complementarity with other actions and innovation

Explain how the project builds on the results of past activities carried out in the field and describe its innovative aspects. Explain how the activities are complementary to other activities carried out by other organisations.

BT4PT project is of significant strategic importance for CEN to strengthen leadership and influence of CEN in multiple mobility subsectors.
The project objectives are part of the Rolling plan for ICT standardisation: “To take full advantage of the benefits that ICT-based systems and applications can bring to the mobility sector it is necessary to ensure interoperability and continuity of the services among the different systems throughout Europe [and] to increase the number of multimodality options and improve travel and traffic management. contributing to the EU’s single market, competitiveness and the Green Deal objectives”. In particular action 12i on ITS – Multimodal Services: “Development of European standards for application programming interfaces (APIs) for the distribution of transport tickets, barcodes to enable interoperable ticketing”.
BT4PT project is an answer to EC request based on preliminary workshop initiated in 2021 by CEN-CENELEC in the frame of harmonization of rail and mobility standardisation.
The project will support the Sustainable and Smart Mobility Strategy, adopted last December 2020 and in particular the revisions of both TAP TSI and MMTIS regulations (Commission Delegated Regulation (EU) 2024/490 amending (EU) 2017/1926 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of EU-wide Multimodal Travel Information Services).
A visual or table summarizing synergies with TAP TSI, MMTIS, Transmodel, UIC IRS specs, and national initiatives may be elaborated to highlight such complementarities.

The project will be based on the following documents (issued by other organizations than ISO/IEC) :

- ERA TAP Technical Document B.11 (Layout for electronically issued rail ticket) / UIC IRS 90918-8 (Layout for electronically issued rail passenger tickets)
- ERA TAP Technical Document B.12 (Digital security elements for rail passenger ticketing) / UIC IRS 90918-9 (Flexible content barcode)
- ERA TAP Technical Document B.14 (e-Ticket Exchange for Control)
- ‘ERA Vocabulary’ covering the ontology of the rail system
- National (and local) barcode specifications for public transport

The proposed project will leverage on the roles defined in the Transmodel framework (EN12896) and in ISO 24014-1 Public transport — Interoperable fare management system — Part 1: Architecture.
It aims to go beyond existing specifications (e.g. combines multimodal journeys in one code, supports post-sale changes).

CEN is playing a strategic role though its convening power to bridge rail (UIC/ERA) and urban (UITP/ITxPT) communities and position the project as a hub for long-term convergence

#§COM-PLE-CP§# #§REL-EVA-RE§# #@QUA-LIT-QL@# #@CON-MET-CM@#

2. QUALITY

2.1 Concept and methodology

Concept and methodology

Outline the approach and methodology behind the project. Explain why they are the most suitable for achieving the project's objectives.

The scope of work will address the following key areas for representing a barcode ticket:

- the "container" layout: the dataset / datasets defining the contracts (incl. encoding used) : structured and sealed barcode data contents.
- how the container is secured : security elements, including digital signatures with encrypted seals and decryption keys (including for issuer – online or counter - and ticket control), anti-cloning mechanisms as key cryptography, based on an appropriate and certified security infrastructure
- the public key exchange
- how to comply with the privacy rules and GDPR requirements

The work will also include :

- Modularity to allow the combination of interoperable and local barcode data coding between transport modes
- Data exchanged for all ticket status changes (ticket-check, cancellation,…)

Specifications developed in relation to 2D barcodes shall refer to existing standard (considering compatibility, scanner availability, size efficiency) ISO/IEC 24778 (AZTEC) and/or ISO/IEC 18004 (QR code) and shall ensure interoperability and backward compatibility with ISO/IEC 15438 (PDF417) for some specific use-cases.

The work will not include :

- Personal modes of operation, private vehicle integration or personal device tracking

Two deliverables will be produced :

- CEN/TS : multimodal barcode specification : description of elements supporting door to door travel and related security mechanisms
- CEN/TR : governance and maintenance guidelines : technical artefacts publication, registration and key management process

The European Committee for Standardization (CEN) will develop European standards based on its extensive experience, following internal regulations and adapting as needed.
The work will be carried out under CEN/TC 278 "Intelligent Transport Systems," specifically by Working Group 3 "Public Transport." As a recognized European Standardization Organization, CEN's involvement ensures consistency with established processes.
CEN manages the committee to involve stakeholders and member countries, developing deliverables by consensus within set timelines and quality controls. National experts participate, and external subcontractors may be hired for specialized tasks.
This transparent framework ensures broad acceptance, practical relevance, and alignment with European transport policies, promoting harmonized and interoperable public transport standards across member states.

#§CON-MET-CM§# #@CON-SOR-CS@#

2.2 Consortium set-up

Consortium cooperation and division of roles (if applicable)

Describe the participants (Beneficiaries, Affiliated Entities and Associated Partners, if any) and explain how they will work together to implement the project. How will they bring together the necessary expertise? How will they complement each other?

In what way does each of the participants contribute to the project? Show that each has a valid role and adequate resources to fulfil that role.

***Note:** When building your consortium you should think of organisations that can help you reach objectives and solve problems.*

The proposed project will be implemented through a well-structured and complementary consortium consisting of CEN (Beneficiary) and AFNOR (Affiliated Entity).

CEN, as the European Committee for Standardization, provides the overarching platform for standardization and coordination of technical committees, including CEN/TC 278 on Intelligent Transport Systems (ITS). Its role is essential in ensuring that the project outcomes align with existing European standardization frameworks.

AFNOR, a CEN member and national standardization body, will lead the project management, coordination, and administrative follow-up. AFNOR ensures the secretariat function for the relevant CEN/TC 278 working groups and will act as the operational lead throughout the project.

CEN and AFNOR will establish a Project Team (PT) through an open call for experts. Candidates must demonstrate strong expertise in intelligent transport systems, with a focus on public transport ticketing solutions, including international rail ticketing, local rail ticketing, and urban public transport ticketing. Proven experience with ASN.1 data structures and security mechanisms is considered an asset and will contribute to the project's objectives.

The work of the PT will be closely aligned with the formal CEN standardization process, particularly with the activities of CEN/TC 278/WG 3 (Public Transport).

The work plan of the PT will be synchronized with the meeting schedules and deliverable timelines of WG 3, ensuring that all draft texts and proposed updates are submitted in time for review and consensus-building. Key stakeholders will be directly involved through National Standardization Body (NSB) delegations in CEN/TC 278, ensuring national and sectoral perspectives are integrated. In addition, liaisons will be established with independent European or international organizations, whose recognized expertise will provide valuable input to the deliverables.

Both the experts and the liaisons affiliated with the CEN/TC 278 will contribute to the deliverables by bringing their knowledge and expertise to the table, participating in meetings, reviewing and contributing to texts and voting on ballots.

This PT will collaborate closely with CEN/TC 278/WG 3 and the secretary of CEN/TC 278 to ensure that the main milestones outlined in the NWIP are adhered to. At each relevant consultation and voting milestone, WG3 will provide the draft for review and approval by the CEN/TC.

Regular status reports will be provided to WG 3 for information and seeking assistance on issues where required. The PT will consider and take due account of inputs from the WG 3 and its members.

#@WRK-PLA-WP@#

3. WORKPLAN, WORK PACKAGES, ACTIVITIES, RESOURCES AND TIMING

3.1 Work plan

Work plan

Provide a brief description of the overall structure of the work plan (list of work packages or graphical presentation (Pert chart or similar)).

The project includes 3 Work Packages, to be conducted in parallel:

1. project management and coordination,
2. Technical developments of CEN/TR – governance and maintenance guidelines
3. Technical developments of CEN/TS – multimodal barcode specification

The relevant activities are listed as follows:

#	Activity	Due date
WP1	Signature of contract between CEN and AFNOR	Start (S)
WP1	Call for experts	S-2
WP1	Selection of the experts for the Project Team (PT)	S-1
WP1	Contracts with subcontractor and Kick-off meeting & Work plan for the Project Team	S+1
WP2 WP3	Definition of the deliverable scope (preparation and adoption by CEN members	S+4
WP2 WP3	Working draft (new CEN/TR – guidelines + CEN/TS – barcode)	S+11
WP2 WP3	Consensus and consolidation – Review of comments from CEN/TC 278 review and EC consultation	S+16
WP2 WP3	Preparation of the final draft for formal vote	S+19
WP2 WP3	Interim report to EC	S+12
WP2 WP3	Finalization of CEN/TR – guidelines + CEN/TS – barcode	S+21
WP2 WP3	Publication of CEN/TR – guidelines + CEN/TS – barcode by CEN (stage code 60.60)	S+23

WP2 WP3	Final report to the EC	S+24
WP2 WP3	Dissemination and visibility	S+24