BORDERLINK

Newsletter

Issue 2 | 2026

ADVANCING OUR
10 Innovations

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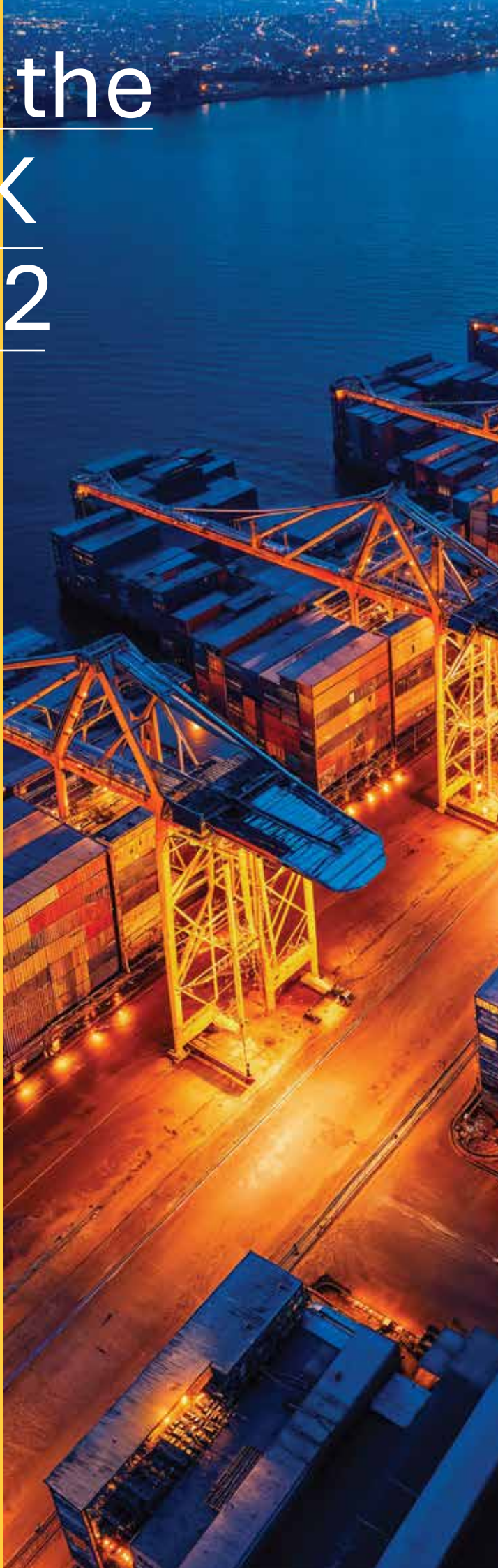
This project has received funding from the European Union's Horizon Europe Framework Programme (HORIZON) under the Grant Agreement No 101167589 and from the Swiss State Secretariat for Education, Research and Innovation (SERI) under Contract No 25.00001 and from UKRI Horizon Europe Guarantee Funding under Project No 10130279.

2026
Issue 2

Welcome to the BORDERLINK Newsletter #2



Dear reader,

Since our last update, the BORDERLINK project has made significant progress across its ten innovations, moving from design and concept development towards implementation and testing. This edition highlights the concrete advancements achieved so far and the next steps as we prepare for upcoming validation activities, including the mid-term trials.

In this issue, you will discover how each innovation is evolving—from data interoperability and advanced training solutions to new tools supporting Green Customs and intelligence-driven approaches. You will also find updates on our recent participation in international events, as well as our growing collaboration with other EU-funded initiatives.

We are also pleased to introduce the BORDERLINK Observatory, now live, which serves as a central platform for knowledge sharing and stakeholder engagement. We warmly invite you to explore it and become part of our growing community.

We hope you enjoy this edition and encourage you to stay connected as BORDERLINK continues to advance innovation in customs and border management.

Frank Janssens
BORDERLINK Coordinator

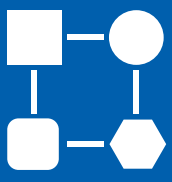
About BORDERLINK

BORDERLINK is a Horizon Europe project funded by the European Union, the UK, and Switzerland that enhances customs and border management by pioneering innovative technologies, developing reference databases, and establishing standards to improve interoperability and interconnectivity.

By improving interoperability, BORDERLINK enables seamless cooperation between customs administrations, border control agencies, and security stakeholders.

EXPECTED OUTCOMES

More efficient and quicker availability, for EU customs practitioners, of reference data (such as spectra) on threats and dangerous and/or illicit materials.



Increased interoperability of existing (and foreseeable upcoming) customs control equipment at tactical level, multi-supplier, multi-authority and cross-border.

Building capabilities for a more harmonized European application of customs controls based on risk management and trade facilitation.

Advancing our 10 innovations

At the core of BORDERLINK are ten innovations addressing key challenges in customs and border management, ranging from data interoperability and advanced inspection technologies to training, sustainability, and intelligence-driven approaches.

These innovations are designed to enhance operational capabilities, improve risk assessment, support decision-making, and foster collaboration across authorities and stakeholders.

Our articles provide a closer look at key events, technological trends, and expert perspectives shaping the future of customs and border management.

IN THE FOLLOWING PAGES, DISCOVER EACH INNOVATION'S PROGRESS, CURRENT STATUS, AND NEXT STEPS.

Innovation 1: Data interoperability in the inland waterways domain

WHAT IS THIS INNOVATION ABOUT?

This innovation focuses on enabling secure and real-time data exchange between authorities along inland waterways, supporting customs risk assessment for river traffic, particularly along the Danube.

WHAT HAS BEEN ACHIEVED SO FAR?

Over the past months, the project has established the foundations for the BORDERLINK interoperability solution, with a strong focus on Hungary as the pilot country. User requirements were collected from Hungarian Customs, leading to the definition of operational use cases at the Mohács entry point on the Danube.

In parallel, the technical specifications and high-level system architecture were developed, including the design of CISE-based connectivity services to enable data exchange across authorities. Key datasets for risk assessment—such as vessel movement (AIS), navigation routes, and cargo origin information—were identified and analysed.

The project also mapped relevant legacy systems and data sources to be integrated into the platform. In addition, the architecture of a blockchain-based component was defined to ensure secure and tamper-proof data exchange within the system.

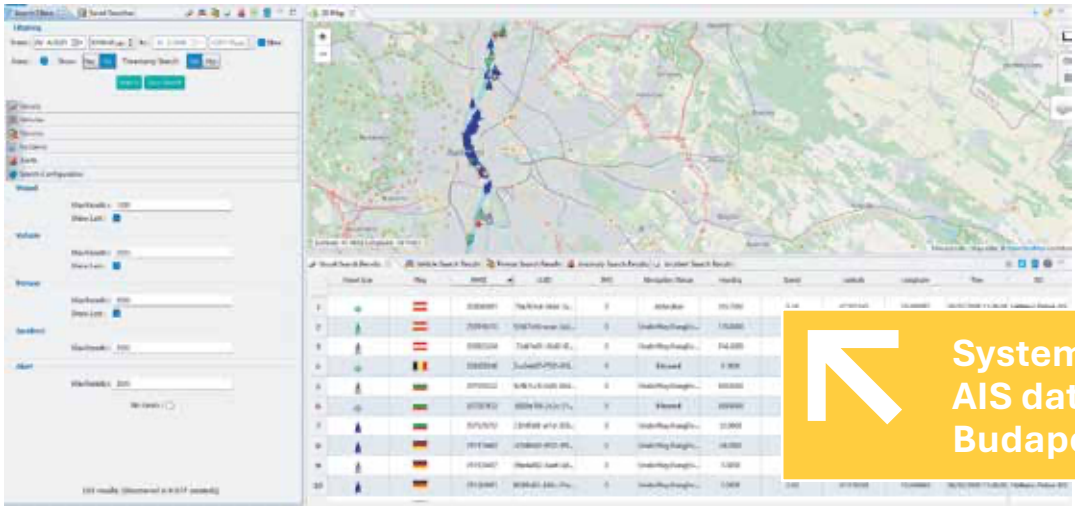
CURRENT STATUS

System design is completed, and initial development of core components is underway.

NEXT STEPS

The next phase will focus on validation and integration. A virtual pilot will be conducted to test system functionalities and data exchange through CISE using simulated operational scenarios. This will be followed by the integration of blockchain capabilities and further refinement of data usability for risk management.

The innovation will be showcased during the Mid-term Trials in 2026 and later demonstrated in real operational conditions in Mohács, Hungary.



System with anonymized AIS data from Mohacs and Budapest regions

Innovation 2: Standard Test Units

WHAT IS THIS INNOVATION ABOUT?

This innovation develops standardized testing units designed to simulate realistic smuggling scenarios, supporting training and performance testing of Non-Intrusive Inspection (NII) systems.

WHAT HAS BEEN ACHIEVED SO FAR?

During the first phase of the project, the design of all Standard Test Units (STU) was completed, incorporating user needs and operational requirements. The innovation includes four types of units: the Standard Test Container (STC), Standard Test Truck (STT), Standard Test Van (STV), and ANSI Trailer, each equipped with dynamic and staged threat scenarios such as explosives, firearms, drugs, tobacco, and concealment methods.

The development has now moved into the production phase, with significant progress achieved across the different units. In addition, the STU concept and design were presented to the international customs community during the WCO Technology Conference & Exhibition in Abu Dhabi.

CURRENT STATUS

Production of the Standard Test Units is ongoing, with several components already at advanced stages of completion.

NEXT STEPS

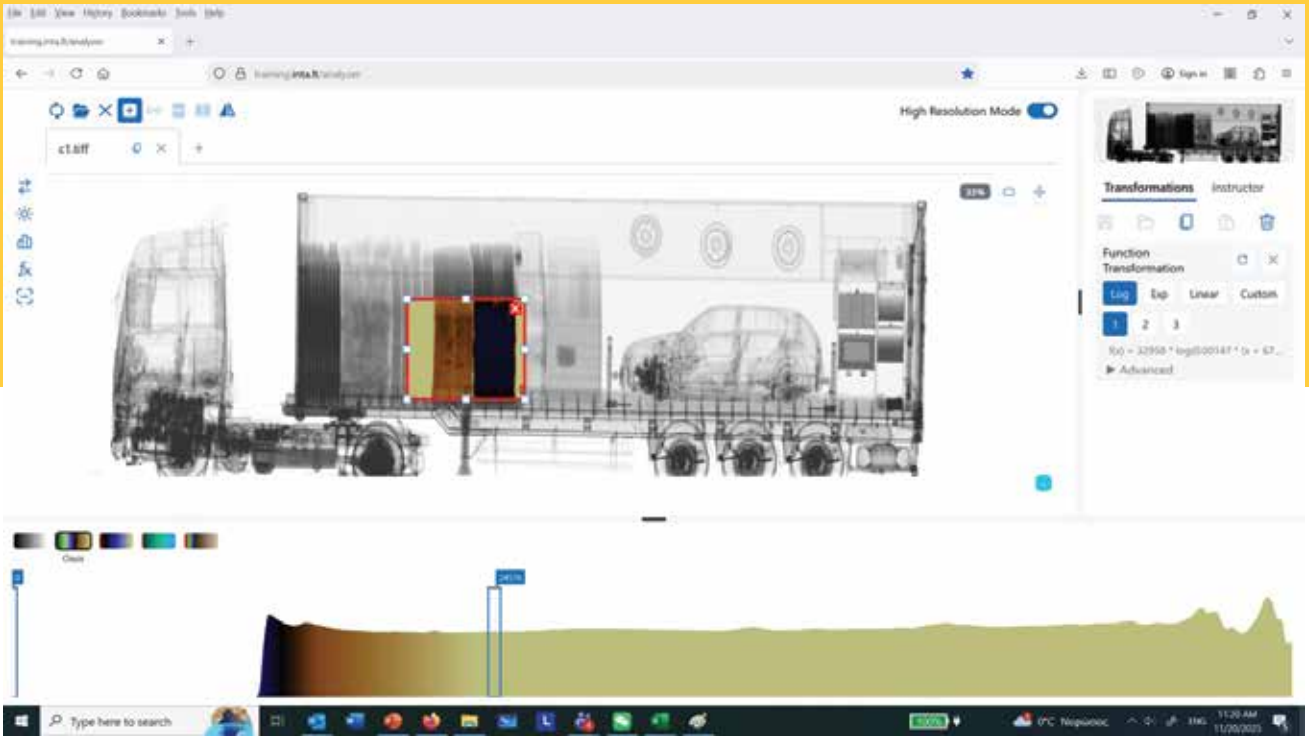
The next phase will focus on completing production and initiating testing activities in collaboration with Norwegian and Irish Customs authorities. Feedback from these trials will support further refinement and optimization of the units.

ANSI trailer with penetration, spatial resolution, contrast sensitivity, wire detection and material discrimination test kits for transmission and backscatter x-ray scanner's performance testing.

Innovation 3: Certified X-ray operator training

WHAT IS THIS INNOVATION ABOUT?

This innovation aims to develop a standardized and certified training programme for customs officers, focusing on X-ray image analysis and threat recognition.



WHAT HAS BEEN ACHIEVED SO FAR?

The design phase of the training programme has been completed, including the development of methodologies for X-ray image analysis, practical exercises, and testing scenarios. Harmonized training standards and certification approaches have also been defined.

In parallel, significant progress has been made in the development of the supporting E-learning platform. A web-based X-ray image analysis tool has already been developed and successfully tested, enabling interactive and practical training experiences for users.

CURRENT STATUS

Training content and the E-learning platform are under active development, with key components already available.

NEXT STEPS

An initial version of the training programme will be delivered through the E-learning platform, including a teaser session showcasing its functionalities and content. Following the mid-term trials, user feedback will be collected to refine the training and support the release of an improved second version.

Innovation 4: Library of synthetic X-ray images

WHAT IS THIS INNOVATION ABOUT?

The Threat Image Projection (TIP) capability developed within the BORDERLINK program provides a powerful and flexible approach to generating high-quality synthetic data for operator training. The TIP system enables customs and border authorities to simulate realistic smuggling scenarios while maintaining full control over operational imagery and sensitive data.

At the core of the solution is a dedicated TIP graphical user interface (GUI) that allows authorised users to create custom TIP images tailored to their specific needs. Through this interface, users can select real-world X-ray scan images from their own datasets and insert threat items into these images in a controlled and configurable manner. This process ensures that the resulting images closely reflect

WHAT HAS BEEN ACHIEVED SO FAR?

One exciting achievement has been the successful inclusion of non-firearm threat items into the threat library. Illicit drugs, alcohol shipments and other items of interest have been found to adapt well to TIP methods originally designed for firearms alone, greatly increasing the potential use cases for synthetic data enhanced operator training. Technical progress has also been made towards incorporating more complex situations into the TIP library – synthetic human trafficking and modular non-illicit bulk cargo are proving particularly promising and pave the way to a universal tool for tackling ever changing smuggling scenarios.

CURRENT STATUS

The TIP application is operational and continues to be expanded with new scenarios.

NEXT STEPS

Further development will focus on enriching the library and enhancing its use as a practical tool for training and operational readiness.

Example of a synthetic AR15 threat weapon.

Innovation 5: Federated database for sharing of X-ray images

WHAT IS THIS INNOVATION ABOUT?

The BORDERLINK Federated Database introduces a secure and privacy-preserving way for customs and border authorities to discover and share X-ray imagery across borders, while ensuring that data always remains under national control.

At the heart of the innovation is a federated architecture that connects autonomous national databases through a single web portal. Images are transferred only when explicitly requested by an authorised user, and only if authentication and local access permissions allow it. This ensures that every image download is intentional, auditable, and fully controlled by the data-owning authority. Border operative end-users within the consortium have expressed demand for such a technical innovation to aid their effectiveness in border traffic screening.

WHAT HAS BEEN ACHIEVED SO FAR?

Over the past year, the project has made strong technical progress. The core system architecture is now largely complete, including secure API endpoints and a Zero Trust authentication model based on Microsoft Entra ID. This allows users to authenticate once and securely query permitted datasets across multiple countries, while all access decisions are enforced locally.

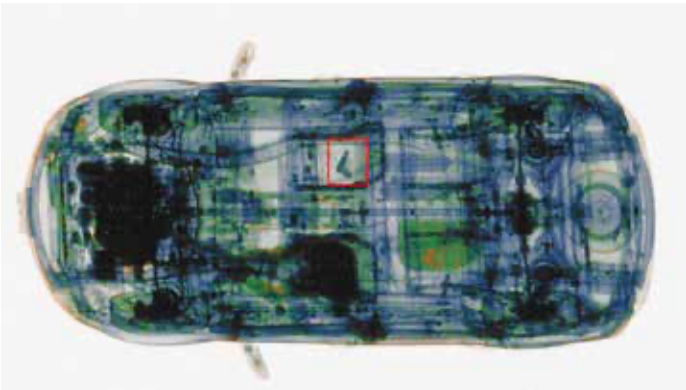
A major milestone has been the delivery of a functional web frontend prototype, featuring pages for Search, Upload, Manage, Access, Audit, Help, and Settings. This interface has been demonstrated to the consortium, and end-user feedback has already been incorporated into the design following structured questionnaires
and discussions. An agile software development approach has allowed rapid prototyping and continuous integration.

CURRENT STATUS

Development of the core components is ongoing.

NEXT STEPS

Next steps will focus on completion of the backend software and extensive testing using mock datasets, including Rapiscan data, exchanged between local and federated nodes. These activities will feed directly the upcoming mid-term consortium demonstrations, where the federated database will be shown as a working, end-to-end system supporting secure, permission-based cross-border collaboration.



X-ray image of a vehicle with a concealed handgun; colours indicate material types.

Innovation 6: Cloud library for reference Raman spectra

WHAT IS THIS INNOVATION ABOUT?

This innovation develops a shared Raman spectra data space, enabling customs administrations to securely access and exchange spectral data to support the identification of materials and detection of emerging threats.

WHAT HAS BEEN ACHIEVED SO FAR?

Over the past year, the project has focused on defining system requirements, designing the platform architecture, and developing the initial user interface. Core functionalities have been implemented, including secure user access, dashboards, and data management tools to support the storage and visualization of Raman spectra.

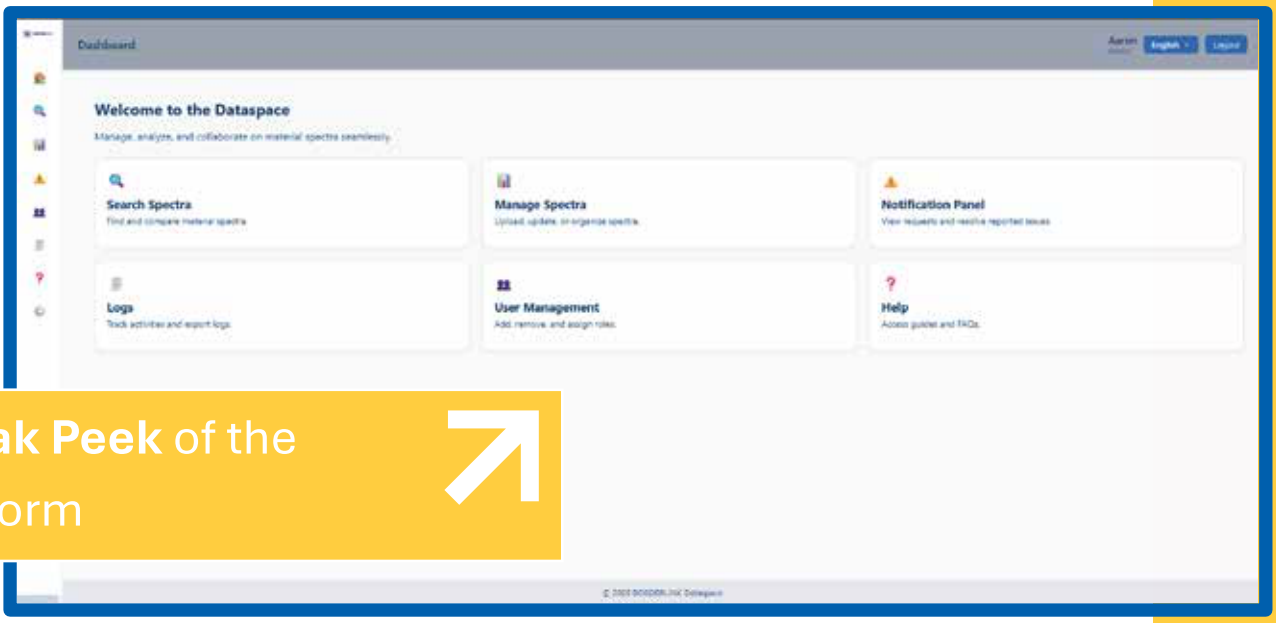
The infrastructure required to host the platform has also been prepared, and key modules for managing and viewing spectral data are now in place. The current version of the platform has been demonstrated to project partners, allowing for the collection of feedback and refinement of user requirements for the next development phase.

CURRENT STATUS

The platform has been developed in its initial version and is undergoing iterative improvements based on user feedback.

NEXT STEPS

Further development will focus on expanding the data space features, enhancing interoperability, and refining governance principles to ensure secure and trusted data exchange. Continued user testing will support the evolution of the platform towards operational deployment.



Sneak Peek of the platform

Innovation 7: Eco-friendly recycling services for seized cigarettes

WHAT IS THIS INNOVATION ABOUT?

This innovation provides an on-site, eco-friendly solution for recycling seized cigarettes, enabling customs authorities to recover valuable materials while reducing environmental impact.

WHAT HAS BEEN ACHIEVED SO FAR?

Over the past year, the solution has been further developed and prepared for wider deployment across Europe. Building on existing operations with Irish Customs, user requirements were collected and analysed through surveys and workshops with customs authorities across multiple countries.

Technical improvements have been defined to enhance the system's performance, while an emissions and cost calculator was developed to demonstrate the environmental and economic benefits of the solution. In parallel, data collection processes have been aligned with the BORDERLINK Intelligence Database to support integration and intelligence analysis.

In addition, successful trials and demonstrations have been carried out, confirming the effectiveness of the recycling process, including the separation of materials such as tobacco and filters.

CURRENT STATUS

The system is operational in real conditions and is being further refined for broader deployment.

NEXT STEPS

The next phase will focus on analysing user feedback, finalising technical upgrades, and deploying improved units for operational testing with additional customs authorities. Further work will support data integration with the Intelligence Database and scaling the solution across Europe.

INSULATION MADE FROM RECYCLED CIGARETTE FILTERS

Innovation 8: Intelligence database of seized cigarettes

WHAT IS THIS INNOVATION ABOUT?

This innovation strengthens the fight against illicit cigarette trafficking by combining intelligence and forensic analysis. It enables authorities to link seizures across countries and improve traceability of cigarette production sources.

WHAT HAS BEEN ACHIEVED SO FAR?

Over the past year, significant progress has been made in developing both the intelligence database and the supporting analytical framework. A harmonised data model is being designed to ensure that seizure information can be captured and compared consistently across participating countries, including Ireland, the United Kingdom, Norway, and Hungary.

In parallel, a specialised laboratory has been selected to conduct advanced chemical and physical analyses of cigarette filters, with a focus on identifying distinctive characteristics of acetate tow and production features. Exploratory analytical methodologies have been defined for the screening phase, with the aim of supporting seizure linkage and traceability.

In addition, cigarette filters and acetate tow samples have been collected to establish a comparative library, enabling proof-of-concept analyses and supporting the development of the system.

CURRENT STATUS

Database design is close to completeness, and laboratory screening phases are actively processing.

NEXT STEPS

The next phase will focus on conducting laboratory analyses on selected samples and finalising the database architecture. A structured workflow will be established to integrate laboratory results into the system, supporting cross-border intelligence analysis and operational use.

Innovation 9: Educational games on Green Customs

WHAT IS THIS INNOVATION ABOUT?

This innovation develops a simulation-based educational game to train customs officers on Green Customs, circular economy principles, and the use of Digital Product Passports (DPPs) in inspections.

WHAT HAS BEEN ACHIEVED SO FAR?

The development of the educational game has reached a key milestone, the firt version of the contect is now completed. The game is designed as a realistic, scenario-based training experience in which participants take on the role of customs officers inspecting a shipment of toys entering the EU.

All game materials have been developed, including shipment documentation, Digital Product Passport (DPP) mock-ups, and interactive elements.

CURRENT STATUS

The first version of the content has been developed.

NEXT STEPS

The next phase will focus on pilot testing with selected users to identify bugs and improve the game before the mid-term trial.

Sneak Peek of the Digital Product Passport (DPP)

Innovation 10: BORDERLINK Observatory

WHAT IS THIS INNOVATION ABOUT?

The BORDERLINK Observatory is a central knowledge hub that provides structured, reliable, and up-to-date information on innovations in customs and border management, supporting both project partners and external stakeholders.

WHAT HAS BEEN ACHIEVED SO FAR?

The Observatory platform has been successfully launched and is now accessible online.

The platform is structured around two main areas:

- Thematic Observatory for BORDERLINK partners, offering curated content across key topics such as AI in customs, detection technologies, blockchain, and Green Customs;
- Stakeholder Area, providing access to selected, non-sensitive information on project innovations.

Initial content has been published and aligned with project priorities, while governance mechanisms for content validation, user management, and secure access have been implemented.

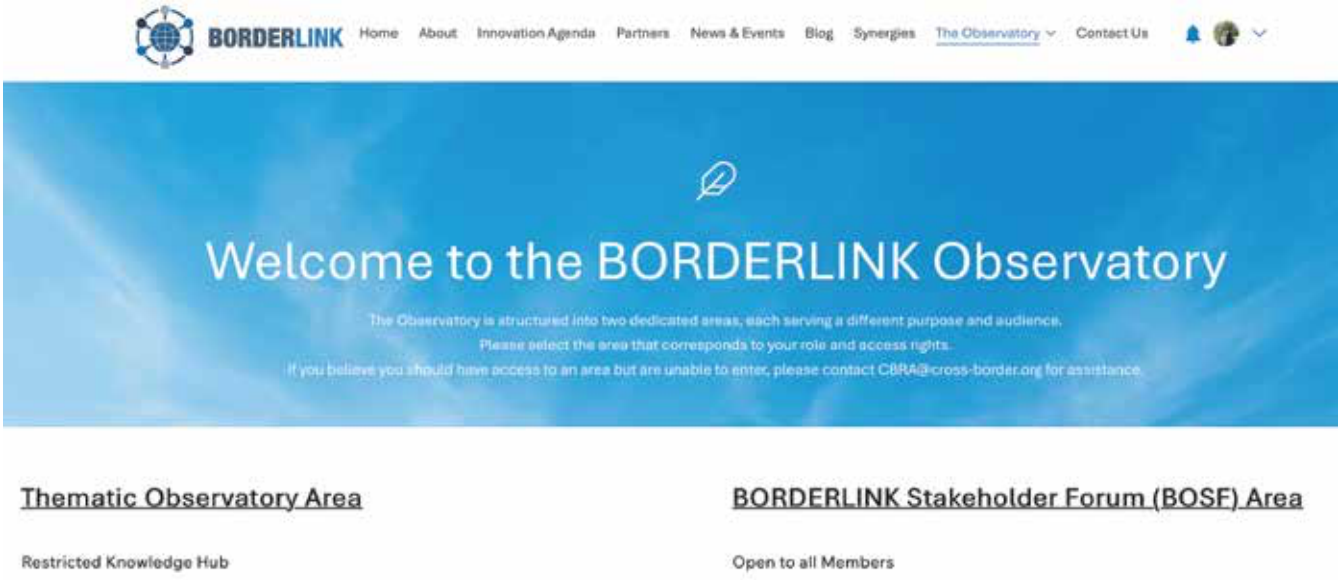
CURRENT STATUS

The platform has been developed in its initial version, is live, operational, and continuously updated with new content.

NEXT STEPS

The next phase will focus on continuously enriching the Thematic Observatory with monthly content updates to ensure relevance and alignment with emerging topics.

In parallel, content will be developed for the Stakeholder Forum, while efforts will also aim to expand the user community by encouraging stakeholder registration and engagement.



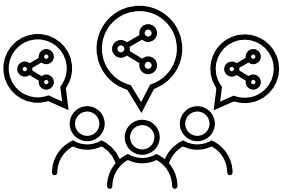
JOIN the BORDERLINK Observatory

For any questions, please contact us at cbra@cross-border.org.

👉 FOR BORDERLINK PARTNERS

Visit: https://www.borderlink.eu
Navigate to “The Observatory” and create your account.

Access the Thematic Observatory to stay up to date with the latest developments, curated insights, and innovation progress across key areas such as AI, detection technologies, Green Customs, and risk management.



👉 FOR EXTERNAL STAKEHOLDERS

Visit: https://www.borderlink.eu
Navigate to “The Observatory” and create your account.

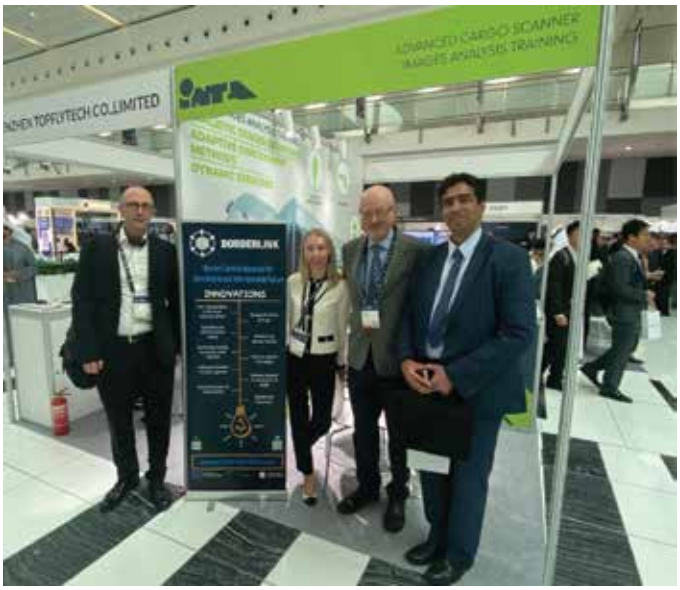
Join the Stakeholder Forum Area to engage with specific innovation communities, exchange expertise, and contribute to shaping the future of customs practices.

Where We've Been?

2026 WCO TECHNOLOGY CONFERENCE & EXHIBITION

BORDERLINK participated in the 2026 WCO Technology Conference & Exhibition in Abu Dhabi, together with consortium partners including INTA, the University of Nottingham, and Rapiscan Systems.

The event gathered over 1,500 participants from more than 100 countries, providing a valuable platform to showcase BORDERLINK's innovations.



At INTA's booth, discussions focused on X-ray image analysis, training, and the role of human expertise alongside emerging technologies such as AI. The event also enabled new connections with customs authorities and stakeholders, strengthening the project's visibility and outreach.

ODYSSEUS FINAL EVENT

BORDERLINK participated in the ODYSSEUS Final Demo and Event in Manchester (26–27 November 2025), represented by the project coordinator, Frank Janssens.

Demonstrations at Rapiscan Systems showcased advanced inspection technologies, while the event brought together Horizon Europe projects to exchange results and explore synergies.

Participation provided valuable insights into emerging detection technologies and strengthened opportunities for future collaboration within the EU customs and research community.

Explore our BLOG

Stay up to date with the latest insights, reflections, and project developments by visiting the BORDERLINK blog.

Our articles provide a closer look at key events, technological trends, and expert perspectives shaping the future of customs and border management.

https://www.borderlink.eu/blog

Our **PARTNERS**

The BORDERLINK project unites a diverse group of 18 expert organisations from across Europe, coordinated by CBRA Services (Belgium). These partners come together to drive innovation in customs interoperability, intelligence sharing, and cross-border enforcement.

Customs & Border Control Authorities

National Tax and Customs Administration (Hungary)
Revenue Commissioners / Irish Customs (Ireland)
UK Border Force (United Kingdom)
Norwegian Customs Administration (Norway)

Technology Providers & Industry Partners

Rapiscan Systems Limited (UK)
Satways (Greece)
INTA, JSC (Lithuania)
Rezero Limited (Ireland)
Analyze IQ Limited (Ireland)
Agilent Technologies Lda UK Limited (UK)

Research & Academic Institutions

Delft University of Technology (Netherlands)
University of Nottingham (UK)
University of Galway (Ireland)
University of Lausanne (Switzerland)

Supporting & Coordination Organisations

Cross-Border Research Association (Switzerland)
Vicesse Research GmbH (Austria)
RSOE (Radios Segélyhívó és Infokommunikációs Országos Egyesült, Hungary)
CBRA Services (Belgium, project coordinator)

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