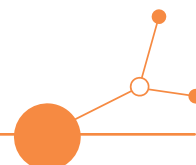


SUSTANCE

D.1.3.1. Roadmap n. 1 based on pilot action 1: IT-SI-HR Cross-Border Connectivity



Version 1
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Table of contents

1	Introduction	2
2	Existing public transport accessibility and key challenges	2
3	Impact of pilot action on public transport accessibility	3
4	Vision and goals for public transport accessibility improvement	3
5	Key measures and steps to achieve goals	5

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1 Introduction

This roadmap (D.1.3.1) is aimed at designing a realistic path for improving IT-SI-HR cross-border connectivity beyond the project closure. The roadmap is prepared by partner PP1 - CEI-ES in cooperation with project partners PP4 - Croatian Railways (HŽ) Passenger Transport Ltd, PP8 Slovenian Railways (SŽ) - Passenger Transport Ltd. and A08 (Trenitalia - Direzione Regionale Friuli Venezia Giulia) as associated partner.

The roadmap area encompasses the territories served by the Trieste/Villa Opicina-Rijeka pilot action train service, namely the Trieste FUA in Italy, the Slovenian regions of Coastal-Karst and Littoral-Inner Carniola, and the Primorje-Gorski Kotar region in Croatia. Through multimodal connections, it also links to further destinations, including Ljubljana and the Istrian Peninsula. Overall, the area combines major coastal urban centres with rural hinterlands in the Istrian Peninsula, and it is endowed with numerous natural and tourist attractions.

The roadmap is based on the findings and results from the following SUSTANCE deliverables:

- PT Accessibility report 1 - Trieste-Rijeka route: Assessment of Public Transport Accessibility on the Cross-Border Rail Line Trieste-Rijeka and Main Intermediate Stations (D.1.2.3),
- Transnational Public Transport Accessibility Report (D.1.2.3),
- Pilot Action 1 (PA1) Report “Cross-border train connection IT-SI-HR - Trieste V.O. - Divaca - Pivka - Rijeka” (D.2.3.1) and
- Long-term sustainability guidelines for solution n. 1 (PA1) Cross-border train connection IT-SI-HR - Trieste V.O. - Divača - Pivka - Rijeka (D.2.5.1).

The three consultation meetings with the local stakeholders (carried out on 21/02/2024, 10/11/2024 and 03/04/2025) provide additional insights into the findings in the deliverables listed above. The local meetings were organised by PP1- CEI-ES with the participation of Friuli Venezia Giulia Region, Trenitalia, EGTC GO, and the Municipality of Trieste. The first meeting was also attended by Trieste Trasporti / TPL FVG - Urban bus transport operator, and the second by a representative of the EGTC Euregio Without Borders. Additionally, three consultation meetings with local stakeholder (carried out on 15/02/2024, 12/09/2024 and 11/03/2025), which were organised by Slovenian Railways - Passenger Transport, Ltd. (SZPP-PP8) and Institute of Traffic and Transport Ljubljana l.l.c. (PIL-PP7) and participated by representatives of the Slovenian Ministry of the Environment, Climate and Energy, the Slovenian Ministry for Infrastructure, the Municipality of Divača and the Tourist Institute from the municipality of Pivka.

During the meetings, key aspects of the pilot were discussed, also proposing ideas for its implementation and potential follow-up.

2 Existing public transport accessibility and key challenges

The analysis of the current public transport accessibility along the Trieste-Rijeka route highlights significant disparities, and it is affected by state borders as well as by the urban characterisation. The assessment made, combining all public transport services (both commercial and non-commercial) before the pilot service implementation, shows overall fair but moderate accessibility, with higher values at the extremities (Villa Opicina and Rijeka). Villa Opicina, which acts as a railway border, records higher cross-border accessibility than the Trieste city centre itself due to the absence of a direct rail connection operating between the two.

Connectivity remains the main limiting factor, especially in terms of frequency, speed, and the directness of services, while infomobility values are generally satisfactory. However, travellers tend to weigh connectivity more heavily. Critical weaknesses include the slow rail connection, also due to orographic



reasons and the layout of the railway line, the limited direct services between Divača, Sežana, and Trieste, as well as the limited interconnectivity of the section between Pivka and Rijeka via Šapjane. On the other hand, the integration of information types reaches acceptable levels across the area, though the integration of infomobility should also be improved.

Therefore, the most impactful efforts should focus on increasing the frequency and directness of cross-border connections, improving infomobility (esp. on the Croatian side) and establishing a direct Trieste-Villa Opicina link.

3 Impact of pilot action on public transport accessibility

The pilot train service between Trieste/Villa Opicina and Rijeka has significantly improved public transport accessibility along this key cross-border corridor linking Italy, Slovenia, and Croatia. Overall, 8,273 passengers were transported during the testing period (between April and September 2024), of which 425 were passengers with bicycles. The strongest impact is seen in increased connection frequency, with notable improvements in the directness of services at stations like Sežana and Divača, as well as better availability of travel information.

The improvements are most pronounced for tourists, whose travel needs differ from commuters, as holiday service levels have historically been lower. Crucially, the pilot enhances direct rail links between major urban areas at opposite ends of the route, Trieste and Rijeka. Furthermore, accessibility gains among tourists in Slovenian areas range from +5.2% to +12.2%, primarily driven by improved connectivity, while also recording benefits for commuters, especially in the Sežana and Divača areas.

These findings demonstrate that targeted cross-border rail services can effectively reduce travel times and close connectivity gaps, especially between Trieste and Divača and between Pivka and Rijeka. The pilot underscores the potential for further developing this corridor through measures such as increasing service frequency, improving speed and directness of connections (also by addressing cross-border interoperability), and enhancing information integration. In this regard, a relevant option, to be further explored, could be also related to the capitalisation of the pilot train service previously operated between Trieste and Ljubljana within the CROSSMOBY project (Italy-Slovenia Programme 2014-2020).

4 Vision and goals for public transport accessibility improvement

Based on a thorough SWOT analysis elaborating on the outcomes of the carried out pilot Action (see Long-term sustainability guidelines (D.2.5.1) - Section 2), the following three long-term sustainability goals have been identified for the continuation of the new cross-border railway line (Trieste) V. Opicina-Rijeka (PA1):

- Goal G1: Enhancing attractiveness and usability of a direct cross-border railway train connection from (Trieste) V. Opicina to Rijeka (PA1),
- Goal G2: Securing the long-term financial viability of the direct train connection and
- Goal G3: Building institutional and political support between involved PT authorities and key stakeholders.

Goal G3 is the first to be addressed (though to be maintained also in the long term), as it is a crucial prerequisite for proper further implementation of the services, according to a well-coordinated approach. G2 is mainly to be addressed as a second step, in a mid-term perspective, though it can also be further developed and upgraded in subsequent stages. G1 represents the final achievement, thus being more pertinent to the long-term perspective, although preliminary activities should be initiated earlier.



These goals are synergically contributing to a broader vision aimed at enhancing cross-border accessibility and connections. This leverages the analysed railway link while framing it within a wider, comprehensive multimodal approach. This approach is intended to be developed through an enhanced cross-border dialogue involving key stakeholders from Italy (esp. Friuli Venezia Giulia region), Slovenia, and Croatia. Accordingly, important synergies with other initiatives and strategic developments at both regional/local levels (e.g., regional MaaS) and along key long-distance corridors within the TEN-T network can be effectively exploited.

Within this overall framework, priorities for future action include speeding up connections, enhancing directness and interconnectivity in key corridor sections as well as to further relevant touristic destinations, and improving infomobility. These efforts, combined with infrastructure upgrades, will strengthen public transport accessibility and attractiveness, supporting sustainable mobility goals.

In relation to the Connectivity Dimension the vision of the Roadmap is further reinforced by the **Transnational action plan for better Cross border Public Transport connectivity (D 1.4.2)**, which confirms that improving accessibility along the Trieste-Rijeka corridor requires an integrated combination of operational, technical and multimodal measures rather than an isolated continuation of the tested service. In line with Goals G1 and G2, priority should therefore be given to increasing service frequency and directness, harmonising timetables at key interchange nodes, improving cross-border interoperability and integrating the railway connection with other public transport and first/last-mile mobility options.

These measures should be complemented by improved passenger information, ticketing and bicycle reservation solutions and, in the longer term, by targeted infrastructure and rolling-stock improvements. This approach responds directly to the structural weaknesses identified at transnational level—particularly insufficient connectivity performance, weak cross-border coordination and limited multimodal integration—and supports the evolution of the corridor towards a more competitive, reliable and integrated alternative to private car travel.

The approach is fully consistent with the Roadmap measures on frequency, timetable harmonisation, multimodal connections, PSO financing, digital ticketing and passenger information.

In relation to the Governance dimension, achieving this connectivity vision requires a stable and coordinated governance framework capable of bringing together the competent authorities and transport operators of Italy, Slovenia and Croatia.

In line with Goal G3 and the **SUSTANCE Governance Strategy (D 3.4.1)**, the Roadmap therefore envisages the establishment of a cross-border coordination structure, such as a trilateral working/advisory group, to support joint planning and progressively address service frequency, timetables, interoperability, tariffs and financing.

This structure should provide the institutional basis for developing ad-hoc cross-border agreements and coordinated PSO arrangements, including a shared approach to costs and responsibilities, while ensuring continuous dialogue among regional and national authorities, railway operators and other relevant stakeholders.

Such an approach reflects the wider SUSTANCE governance vision, which calls for connecting public and private actors, combining short-term initiatives with long-term strategies, addressing bilateral administrative barriers through dedicated agreements and identifying sustainable financing mechanisms for cross-border services.

In this perspective, governance is not an accompanying element but a prerequisite for implementing the Roadmap and for transforming the experience gained through PA1 into a stable and progressively integrated cross-border rail connection.



5 Key measures and steps to achieve goals

In order to achieve the goals described previously, the following key measures are proposed as recommendations for a proper development process, representing a follow-up of the pilot cross-border train connection IT-SI-HR - Trieste V.O.- Divaca - Pivka - Rijeka tested within the SUSTANCE project.

MEASURES		STEPS		
No.	Description	Description	Timeline	Involved stakeholders
M1	Establish a cross-border stakeholder structure (e.g. trilateral working group) for the development of the new railway line service and for promoting inclusion of the cross-border line in national and EU development strategies	M1.S1: Cooperation Agreement on the CB trilateral working group set up	short	FVG Region, Slovenian and Croatian Ministries, PT operators
		M1.S2: Kick off the actual activities (regular meetings), also addressing interoperability issues and the elimination of technical obstacles	short	FVG Region, Slovenian and Croatian Ministries, PT operators
M2	Increase the daily frequency of trains during the summer season and, additionally, the weekend daily frequency outside the summer season	M2.S1: Identification and analysis of possible options	Short/medium	FVG Region, Slovenian and Croatian Ministries, PT operators
		M2.S2: (In case) Agreement between PTAs	medium	FVG Region, Slovenian and Croatian Ministries
		M2.S3: (In case) specific provisions to be included in the PSOs	medium	FVG Region, Slovenian and Croatian Ministries
M3	Harmonise the timetable of a new cross-border train at key hubs (Pivka, Divača) in order to smooth transfers to other trains linking other destinations (e.g. Pula, Koper, Ljubljana)	M3.S1: Identification and analysis of possible options	Short/medium	FVG Region, Slovenian and Croatian Ministries, PT operators
		M3.S2: (In case) Agreement between PTAs	medium	FVG Region, Slovenian and Croatian Ministries
		M3.S3: (In case) Outline the specific provisions to be included in the PSO	medium	FVG Region, Slovenian and Croatian Ministries
M4	Link the new train service with the international airport in Ronchi, either by train, shuttle or bus	M4.S1: Identification and analysis of possible options	Short /medium	FVG Region, PT operators
		M4.S2: (In case) Inclusion of the related provisions in the PSO	medium	FVG Region
M5	Connect the train to micromobility and other PT services (cycling, walking links, shuttle) at the stations close to tourist hotspots (e.g. Divača - Lipica - Škocjan) to improve first and last mile connectivity	M5.S1: Identification and analysis of possible options	Short /medium	Slovenian Ministry, PT operators, local touristic institutions, PT operators
		M5.S2: (In case) agreement between operators and micromobility providers and local touristic institutions	medium	Slovenian Ministry, local touristic institutions, PT operators
M6	Considering the introduction of cross-border lines through PSO financing by all involved bordering countries	M6.S1: Agreement on the subdivision of costs or tasks	Medium	FVG Region, Slovenian and Croatian Ministries
		M6.S2: carrying out coordinated PSO procedures	medium	FVG Region, Slovenian and Croatian Ministries
		M6.S3: (In case) activation of new services	long	PT Operators
M7	Implement an online/mobile app for ticket purchase and reservation of bicycle stands	M7.S1: Agreement between stakeholders, possibility for implementation within European project	medium	FVG Region, SI Ministry, PT operators
		M7.S2: Development and Testing	medium	PT operator



		<i>M7.S3: Deployment, (continuous) fine-tuning</i>	<i>long</i>	<i>PT operator</i>
M8	Integrate a new cross-border train timetable into international and national timetable platforms to improve visibility of the train	<i>M8.S1: Contacting and Agreement</i>	<i>medium</i>	<i>PT operators</i>
		<i>M8.S2: Implementation and continuous update</i>	<i>long</i>	<i>PT operators</i>
M9	Strengthen promotion (e.g. brand the service with a clear identity - visual style, storytelling, naming...) to raise awareness and usage	<i>M9.S1: Design</i>	<i>medium</i>	<i>PT operators</i>
		<i>M9.S2: Implementation</i>	<i>long</i>	<i>PT operators</i>
M10	Implement targeted promotional campaigns to raise awareness of Zero or low-carbon trains compared to other modes	<i>M10.S1: Design</i>	<i>medium</i>	<i>PT operators</i>
		<i>M10.S2: Implementation</i>	<i>long</i>	<i>PT operators</i>
M11	Implement KPIs (passenger numbers, ticket sales, transfers, user satisfaction) to evaluate the operation of the service	<i>M11.S1: Identification of suitable KPIs for evaluation of the service</i>	<i>medium</i>	<i>FVG Region, Slovenian and Croatian Ministries, PT operators</i>
		<i>M11.S2: Implementation and Assessment</i>	<i>long</i>	<i>FVG Region, Slovenian and Croatian Ministries, PT operators</i>

In order to cater for the financial sustainability of the concerned PT services, a relevant option can be represented by the extension of the PSO co-financing to all partners of the cross-border route, to be based on a comprehensive cooperation framework developed through the measures and steps described in the table above.