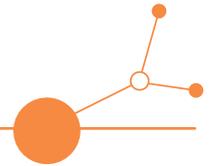
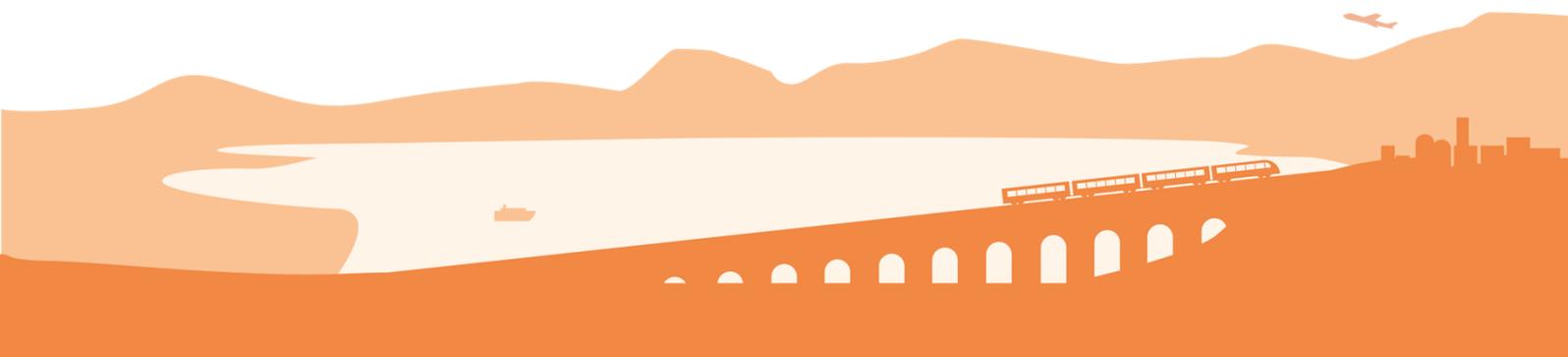


# D3.2.1 Action plan drafts in the six pilot regions

## Bologna metropolitan area



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## Authors of the document

Partner No.	Acronym	Name	Action	Version
2	Redmint	Gabriele Grea Anja Seyfert	Template	1
8	ATE	Florian Kressler	Template	1.1
1	SRM	Chiara Lepori Dario Marchini	Input from Bologna Pilot 1.1	1.2
8	ATE	Florian Kressler	Draft comments	1.3
1	SRM	Chiara Lepori Dario Marchini	Input from Bologna Pilot 1.1	1.4
4	Mobilissimus	Nikolett Csörgő Rita Petrovác Balázs Fejér	Draft revision 1	1.5
1	SRM	Chiara Lepori Dario Marchini	Feedback to the revision 1 and final version	Proposed final
8	ATE	Florian Kressler	Edited approved version for official release	Final



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## 1. Executive summary

The territory of central Europe is characterised by uneven transport connections and mobility opportunities, across and within regions, between urbanized contexts and rural and peripheral areas.

The project's common challenge is to improve accessibility and connectivity in CE peripheral and rural areas through better integration of public transport networks with Demand Responsive Transport (DRT) services, building on joint development and implementation of governance, planning, digital and operational innovations.

DREAM\_PACE will develop innovative DRT concepts complementing regional mobility networks.

The project will improve DRT planning and delivery capacities of public authorities and operators.

A new generation of DRT services will become functional and integral part of regional mobility networks, enhancing accessibility for citizens, territorial cohesion and social inclusion. Integration is the key to the DREAM\_PACE innovative approach, as DRT services are mostly developed as stand-alone solutions to specific needs, the potential of scalable strategies and solutions is widely underestimated.

Project Partners (thereafter PP) will jointly develop a strategy for DRT in Sustainable Urban Mobility Plans to be adopted at EU level, co-design, test and implement innovative DRT solutions enhancing mobility networks. Strategies and solutions will foster a better integration of DRT and public transport (Bologna, Pavia, Budapest areas), support a higher coordination among existing DRT initiatives (Osttirol, Baden-Württemberg) and experiment new integrated approaches for DRT "green fields" (Split-Dalmatia County).

DREAM\_PACE will exploit the potential of integrated planning and digital and operational innovations for a common strategy and develop innovative DRT modular solutions. The project implementation builds on transnational cooperation to guarantee an adequate responsiveness and adaptability of project results to specific characteristics of mobility ecosystems across CE rural and peripheral areas.

This document is the first of six draft Action plans for the DREAM\_PACE pilot regions that altogether constitute the deliverable D3.2.1, and focuses on the Bologna metropolitan area. As D3.2.1 will not be a public deliverable, it was decided to keep the six Action plan drafts separate, while their final versions that compose D3.2.3 will be consolidated in a single document. D.3.2.1 builds on the analysis and diagnosis of governance and planning (Activity 1.1) and of operational trends and approaches to DRT (Activity 2.1) and on the DRT strategy elaborated in D3.1.2 and for which the consultation process is being completed.

This document is organized as follows.

Chapter 2 provides an overview of the pilot region, outlining the purpose and scope of the Action plan.

Chapter 3 describes the starting point for the development of the Action plan, highlighting the needs and priorities identified, the challenges addressed, and the stakeholder involvement process. It also presents the baseline scenarios discussed with them and the next steps agreed upon.

Chapter 4 outlines the pilot action and its components that are being tested and specifies the measures that are consequently necessary to be implemented in order to achieve the objectives of the Action plan.

Chapter 5 details the monitoring and evaluation process for the Action plan, including the expected results of implementation, risks associated with planning and execution, and the estimated relevant impacts.

Chapter 6 serves as the concluding chapter, outlining how the Action plan will be officially approved or taken up, summarizing the overall approach, and presenting the next steps.

Finally, chapter 7 provides a comprehensive list of references, offering background information and sources supporting the document.



## 2. Introduction

The Metropolitan City of Bologna (comprising 55 municipalities and approximately 1 million inhabitants) is located in the Emilia-Romagna region, with Bologna as its capital (around 400.000 inhabitants). The area's mobility system is structured around: a bus public transport (PT) network (36,5 million km/year and 96,5 million passengers/year in 2021) - which includes DRT services, a metropolitan rail service (5,3 million km/year, 12,6 million passengers/year in 2021), free-floating bike- and car-sharing services.

Over the past decade, several key trends have contributed to shape mobility patterns: the motorization rate increased from 62,4 cars/100 inhabitants in 2012 to 68 cars/100 inhabitants in 2022, while the population grew by 2,1%. The proportion of students rose by 8% (2016-2022), and the population has progressively aged. The percentage of people living in Bologna compared to the entire metropolitan area has remained stable (38,4%), though the number of active enterprises has decreased by 2,4%, while employment increased by 18%<sup>1</sup>.

Main transport destinations include Bologna city centre, the main train and bus stations, the airport, and the Fair Centre, with secondary destinations such as hospitals and surrounding industries also significant.

Despite the availability of an extensive and diverse PT network and shared mobility options, several challenges persist, including:

- congestion peaks on some PT lines;
- need to guarantee night service in the outskirts;
- provide low demand area with an acceptable level of service;
- provide access to the industries in the surroundings of the main Bologna city;
- guarantee a proper number of shared transport means (especially the cars and the e-cars).

Given these socioeconomic, cultural, and territorial dynamics, the Bologna pilot action is framed within the context described above, aiming to address the specific mobility challenges and promote innovative solutions for a more integrated and sustainable transport system.

The Bologna action in DREAM\_PACE is the Pilot 1.1 "GOVERNANCE AND PLANNING of INTEGRATED DRT-public transport in a MaaS logic for peripheral and low demand areas" and focuses on the following components:

- 1 - Strategic planning approach (tested within a. SUMP);
- 2 - Recommendations on data governance and integration, tariff and funding;
- 3 - DRT dedicated tendering procedure (demonstrated on field).

As regards Regulation of DRT services, currently, the rules are defined by SRM, which is the metropolitan Public Transport Authority (PTA). After receiving the related fundings, SRM can award the DRT service through a tender or involving the current operator for the PT in the metropolitan area, case by case.

In such a context, the DREAM\_PACE Action plan has the purpose of setting a long-term vision for DRT integration by ensuring:

- Sustainability, through alignment with funding mechanisms and regulatory frameworks;
- Scalability, allowing the model to be expanded to other metropolitan and regional contexts;
- Operational viability, optimizing DRT services to complement traditional PT while addressing local mobility needs.

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<sup>1</sup> More statistics of the Bologna metropolitan area are available at <https://inumeridibolognametropolitana.it/dati-statistici>



### 3. Strategic background and scenarios developed in the area

Given the above picture of mobility and transport in the Bologna metropolitan area, several needs and challenges were identified at the governance and planning level. They are mainly related to the development of a planning approach and a tendering scheme for an effective integration of DRT elements in PT and in a MaaS.

The key objective of the pilot is to improve accessibility in underserved areas by integrating DRT services into the existing urban transport network.

The main needs and challenges identified in the governance and planning of DRT include<sup>2</sup>:

- aligning needs with planning to ensure that services meet the requirements of underserved areas;
- determining the most suitable operational model(s), to identify the optimal approach for delivering DRT services;
- developing effective methods to collect and integrate data, ensuring its use for ongoing monitoring and future planning;
- addressing tariff structure, to ensure sustainability and wide adoption of the service.

Through DREAM\_PACE, DRT in Bologna will become an essential component of both regional and local mobility networks, enhancing accessibility, territorial cohesion, and social inclusion. In a future (and desirable) scenario, following the implementation of the DREAM\_PACE pilot, DRT services will be fully integrated into public transport planning and procurement processes, with clear responsibilities and service requirements for both the main transport operator and the DRT operator.

To effectively design and implement this strategy, the Bologna Pilot established a Living Lab (LL) as a collaborative platform for analysis, planning, and co-design. The LL plays a crucial role in identifying local governance and operational challenges, engaging key stakeholders, and fostering public awareness and participation.

Stakeholder engagement in the Bologna LL was structured through a Stakeholder Mapping exercise, which identified key actors based on their institutional capacity and decision-making influence. This approach ensures that the LL includes representatives with the necessary expertise and authority to drive real policy and operational changes.

The Bologna LL stakeholder group will define a strategic evaluation and planning framework that is scalable at the regional level. This process involves identifying the key characteristics of an optimal DRT service model for the metropolitan area, ensuring seamless integration with existing public transport networks and alignment with regional mobility strategies. The definition of DRT planning and governance in the Bologna LL operates on a metropolitan scale, therefore the Emilia-Romagna Region (RER) has also been included among the LL stakeholders. This collaboration aims to assess practical actions in the territory and evaluate the scalability of the co-designed solutions.

The Bologna LL will deliver:

- a shared framework for integrating DRT into service contracts, ensuring flexibility and adaptability for different territories and service types;
- a contribution to a dedicated guideline for incorporating DRT into planning instruments, detailing key aspects such as appropriate service types and applicable areas.

<sup>2</sup> Ref. D.1.1.3 “Development scenarios for DRT innovative governance and planning approaches”



The outcome of the strategy adopted in the Bologna pilot will be the creation of an integrated and scalable governance model for DRT services, enhancing accessibility and efficiency within the metropolitan transport system.

So far, two meetings of the Bologna Living Lab (LL) took place, with the remaining meetings scheduled to be held by summer 2025. The four remaining meetings will be organized as follows, each of them producing specific outcomes.

- 3rd LL Meeting (phase B - State of the art<sup>3</sup>): this meeting will focus on discussing case studies and best practices to define data exchange protocols for integrating DRT services into the public transport offer and a MaaS system. Additionally, the governance structure and roles of key stakeholders will be outlined.
  - Outcomes: (1) refinement and validation of the study on measure "a" (see below chapter 4.2.1) and data exchange protocols for service information and booking, ensuring DRT integration into PT and MaaS; (2) definition and validation of governance models.
- 4th LL Meeting (phase B - State of the art + C - Scenario development): the draft territorial diagnosis (mobility demand assessment and identification of low-demand areas) will be presented and discussed for validation by stakeholders. The session will also introduce the concept of DRT-PT integration and collect feedback on different DRT models for specific territories.
  - Outcome: (1) refinement and validation of the territorial diagnosis; (2) increased awareness of DRT applicability (how, where, and why it can function).
- 5th LL Meeting (phase D - Co-Design of solutions): the study on DRT costs (see below measure "c" in chapter 4.2.3) will be presented, focusing on its integration within the reorganization of PT services. Additionally, discussions will explore the willingness of local authorities to contribute financially to DRT implementation.
  - Outcome: definition of funding models and financial sustainability strategies for DRT.
- 6th LL Meeting (phase D - Co-Design of solutions): final results of the territorial diagnosis and previous discussions will be presented for validation. The session will also gather stakeholder input on integrating DRT within urban and metropolitan planning tools (SUMP).
  - Outcome: definition of the framework for integrating DRT into planning tools (SUMP).

These meetings will ensure a structured approach to the co-design process, refining technical, governance, and financial aspects essential for the successful implementation and long-term sustainability of DRT services. The approach ensures not only the validation of the activities but also helps maintain a high level of interest and engagement among stakeholders throughout the process.

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<sup>3</sup> DREAM\_PACE methodology phases: A - Living Labs preparation/ stakeholder mapping; B - State of the art; C - Scenarios development; D - Co-design of solutions. See further details in D.3.1.1



## 4. Development of the Action plan

### 4.1. Activities developed on the territory and objective of the plan

Bologna pilot action is framed in the Pilot 1.1 “GOVERNANCE AND PLANNING of INTEGRATED DRT-public transport in a MaaS logic for peripheral and low demand areas”.

The components of the Bologna pilot define the Action plan that is being developed in the area, and structured as follows.

**Component 1:** Strategic planning approach for DRT in PT. This pilot component focuses on testing the strategic planning approach for integrating DRT services in the next SUMP of the Bologna metropolitan area that is expected in 2029. The component allows to identify opportunities and room for future implementation of DRT in terms of both integration with PT and coverage of weak-demand areas, and in the long-term perspective of the Action plan it ensures that services are effectively incorporated into long-term mobility strategies and contribute to a seamless and inclusive PT ecosystem.

**Component 2:** Recommendations on the integration of DRT services in MaaS. This pilot component addresses the analysis of the MaaS ecosystem that is under development at the Emilia-Romagna regional level, and the identification of the requirements for the seamless integration of DRT into the MaaS framework. In this respect, the target of the Action plan is to provide detailed recommendations for including DRT in a MaaS system that serves both urban and peripheral areas in the Metropolitan city of Bologna.

**Component 3:** DRT dedicated tendering procedure. This pilot component aims to integrate DRT into the PT offer and to simulate a PT tendering procedure that includes DRT services, as these are currently not part of the existing Contract of Service. The objective of the Action plan is to include DRT in the next tender for the PT that is planned to be hold in 2028.

As clarified in the pilot workplan contained in D1.3.1, for the development and testing of the Bologna pilot and its components, SRM has contracted the external technical support of GO-Mobility Srl. The pilot actions have been split down as follows:

- a) Study on the integration of DRT services into the public transport supply and into a MaaS system;
- b) Analysis of potential demand and definition of areas of weak demand at the metropolitan level (in terms of geographic, socio-economic, temporal, and inter-territorial characteristics);
- c) Study on DRT costs and the possibility of their inclusion in the Public Transport Contract of Service;
- d) Study on potential integrations between demand assessment methodologies and parameters and city and metropolitan planning tools (i.e., SUMP);
- e) Management of the Bologna LL stakeholder group;
- f) Exchange experiences with DREAM\_PACE project partners and international experts;
- g) Identification of potential weak demand areas by analysis and geographic visualization of the O/D matrix starting from telephone SIM data;
- h) Study on the city users (non-residents) mobility demand.

Those actions are synergistic with the MIND - Mobility-Data-INSight project (funded by the "PR FESR Emilia Romagna 2021-2027" and of which SRM is a beneficiary), particularly in reconstructing mobility demand through data from mobile phone operators. Given this alignment, the MIND project's activities were included in the informal market survey, and it will contribute to the financing of the related specific tasks (in particular, part of pilot action “g” and pilot action “h”).



As regards in specific DREAM\_PACE, the financial resources for the development of actions from “a” to part of “g” include the € 70.000 foreseen in the AF for contracting external technical expert support. Additionally, part of the WP1 staff resources from SRM is allocated to support the execution of these activities.

Based on the above, the Action plan aims to:

- incorporate DRT into long-term mobility strategies and contribute to a seamless and inclusive PT ecosystem;
- include DRT in a MaaS system that serves both urban and peripheral areas in the Metropolitan city of Bologna;
- integrate DRT in the next tender for the PT that is planned to be hold in 2028.

The achievement of those results through the Action plan would enable to reach some of the DREAM\_PACE objectives<sup>4</sup>. In particular, the ones relevant for the Bologna context are listed in the table below along with the proposed measures/actions.

Objective(s)	Measures/actions <sup>5</sup>
1) Generate cost savings by integrating DRT in the existing network (efficiency) and increase quality of services in terms of territorial coverage (effectiveness)	b) Analysis of potential demand and definition of areas of weak demand at the metropolitan level. c) Study on DRT costs and the possibility of their inclusion in the Public Transport Contract of Service. g) Identification of potential weak demand areas by analysis and geographic visualization of the O/D matrix starting from telephone SIM data.
2) Identify new models for the provision of the service	a) Study on the integration of DRT services into the public transport supply and into a MaaS system. d) Study on potential integrations between demand assessment methodologies and parameters and city and metropolitan planning tools (i.e., SUMP).
3) Integrate DRT in a MaaS perspective, improving the integration of mobility services	a) Study on the integration of DRT services into the public transport supply and into a MaaS system.
4) Identify revenue model(s)	c) Study on DRT costs and the possibility of their inclusion in the Public Transport Contract of Service.

## 4.2. Proposed measures for the Action plan (draft)

The Bologna metropolitan area Action plan proposes the implementation of the actions developed during the LL activities, as described in the pilot workplan in D1.3.1 and recalled in the above chapter 4.1.

In the following, the implementation of the actions “a” to “g” beyond DREAM\_PACE defines the measures for the Action plan.

<sup>4</sup> Ref. D.3.1.1 Annex IV

<sup>5</sup> Ref. D.1.3.1, chapter 2, which already contains also the coding of the measures.



#### 4.2.1. Measure “a”: Application of the “Study on the integration of DRT services into the public transport supply and into a MaaS system”

This measure includes the application of the identification of data exchange protocols to facilitate service information sharing and reservation functionalities, and the development of integration models for DRT services that can be replicated in other contexts within the MaaS4RER<sup>6</sup> project, along with the provision of practical implementation guidelines to support the planning and management of DRT services embedded in a MaaS effectively.

##### Main facts

**Timing for implementation:** this measure falls under medium-term measures, with implementation planned within three years after the end of the project. The output of the LL action, i.e. the study on the integration of DRT services into the public transport supply and into a MaaS system, will be used in the next Contract of Service, scheduled for the 2028-29 biennium.

**Stakeholders involved and responsibilities:** given the technical nature of this study, key stakeholders include:

- PT Operator / Authority: provides operational insights, ensures alignment with existing PT services, and contributes to defining integration models that enhance service efficiency and user experience;
- IT and MaaS provider/s: validates data exchange protocols, facilitating the integration of DRT services into the MaaS platform, and ensuring interoperability with existing digital mobility services.

##### Risk and/or vulnerability tackled:

- technical interoperability challenges: ensuring seamless integration between DRT services, public transport systems, and MaaS platforms may require overcoming technological incompatibilities and data standardization issues;
- data governance: managing the exchange of service information and reservation data;
- regulatory and contractual complexities: aligning DRT integration within existing PT Contracts of Service and regulatory frameworks may require adjustments in procurement procedures and service agreements;
- user adoption and digital accessibility: ensuring that the integration of DRT into MaaS is user-friendly and accessible to all.

**Financing plan and sources:** the next Contract of Service will be prepared by SRM with the winner of the public tender for PT.

#### 4.2.2. Measure “b”: Application of the “Analysis of potential demand and definition of areas of weak demand at the metropolitan level”

This measure implements in practice the replicable methodology to assess demand levels, define an optimal local PT network for metropolitan connections, and pinpoint DRT opportunities in low-demand areas. The

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<sup>6</sup> The MaaS4RER (Mobility as a Service for Emilia-Romagna Region) project is part of the national MaaS4Italy initiative. It aims to integrate various transportation services into a single digital platform, allowing users to organize, book, and pay for their journeys through a dedicated app.

MaaS4RER: <https://mobilita.regione.emilia-romagna.it/piani-programmi-progetti/maas>

MaaS4Italy: <https://innovazione.gov.it/progetti/mobility-as-a-service-for-italy/>



analysis considers geographic, socio-economic, temporal, and inter-territorial characteristics to develop a replicable methodology for assessing demand levels.

#### Main facts

**Timing for implementation:** this measure falls under medium-term measures, with implementation planned within three years after the end of the DREAM\_PACE project. It is part of the planning phase, laying the groundwork for integrating DRT into the PT network.

**Stakeholders involved and responsibilities:** given the territorial nature of this mobility analysis, key stakeholders include:

- Public Authorities (local and regional): responsible for governance, urban and regional mobility planning, and ensuring alignment with policy frameworks (e.g., SUMP);
- PT Operator / Authority: provide operational insights, data on existing services, and contribute to the evaluation of DRT integration feasibility;
- Technical experts and data analysts: to support in demand assessment, data integration, and methodology development).

#### Risk and/or vulnerability tackled:

- data limitations: overcoming fragmented or incomplete mobility data;
- low predictability of demand: addressing uncertainties in mobility patterns by refining demand estimation methodologies;
- coordination challenges: ensuring effective collaboration between multiple stakeholders to align strategies and policies.

**Financing plan and sources:** SRM will apply the results of the Analysis when preparing the next public tender for the PT service in the Bologna metropolitan area, in particular targeting the inclusion of DRT in the next PT Contract of Service.

### 4.2.3. Measure “c”: Application of the “Analysis on DRT costs and the possibility of their inclusion in the PT Contract of Service, ensuring cost efficiency and optimized resource allocation”

This measure applies the defined cost structure of DRT services for their potential inclusion in the PT Contract of Service, ensuring cost efficiency and optimized resource allocation. The Analysis considers key DRT features such as flexibility, dynamic routing, and demand-based service adjustments, assessing their financial sustainability within the existing PT framework. It involves developing models for equivalent kilometres to ensure fair compensation and cost allocation, simulating economic feasibility through parametric frameworks to evaluate different operational and funding scenarios, and establishing regulatory guidance with KPI tailored to DRT services. This approach provides a structured basis for integrating DRT into long-term PT funding and contractual mechanisms, ensuring sustainable operation and financial viability.

#### Main facts

**Timing for implementation:** this measure falls under medium-term measures, with implementation planned within three years after the end of the project. The measure will use the output of the pilot action “c” in the next PT Contract of Service, scheduled for the 2028-29 biennium.

**Stakeholders involved and responsibilities:** given the territorial nature of this analysis, key stakeholders include:



- Public Authorities (local and regional): responsible for governance, funding mechanisms, and contractual frameworks for PT services;
- PT Operator / Authority: providing operational insights, cost data, and contributing to the evaluation of financial sustainability;
- technical experts and data analysts: supporting the development of economic models, feasibility studies, and regulatory guidelines.

**Risk and/ or vulnerability tackled:**

- uncertainty in cost estimation: variability in DRT operational costs, influenced by demand fluctuations, service configurations, and geographic factors, may challenge accurate financial forecasting;
- regulatory and contractual complexities: aligning DRT integration within existing PT Contracts of Service and regulatory frameworks may require adjustments in procurement procedure, funding structures, and contractual obligations;
- financial sustainability risks: ensuring funding for DRT services is crucial. If the cost structure is not well-defined or aligned with available resources, the economic feasibility of DRT could be compromised;

**Financing plan and sources:** SRM will apply the results of the Analysis when preparing the next public tender for the PT service in the Bologna metropolitan area, in particular targeting the inclusion of DRT in the next PT Contract of Service.

#### 4.2.4. Measure “d”: Application of the “Study on potential integrations between demand assessment methodologies and parameters and city and metropolitan planning tools (i.e., SUMP)”

This measure implements the results that inform and enhance the PT strategic planning process; those results will include the development of guidelines for evolving the suburban local PT network and defining the role and characteristics of mobility hubs. For example, within the framework of the future SUMP (or the update of the current one), it will be possible to identify primary interchange points and precisely define their features and required infrastructure based on the types of lines and users utilizing them.

**Main facts**

**Timing for implementation:** this measure falls under short-term measure, with implementation planned within the end of the project. The output of the pilot action “d” will be used by the end of 2025, as the SUMP update is scheduled for 2026, allowing for its integration into the revised document.

**Stakeholders involved and responsibilities:** given that this study covers the entire metropolitan territory, it is essential to involve all relevant territorial stakeholders:

- Public Authorities (local and regional): responsible for integrating demand assessment methodologies into urban and regional planning tools, ensuring alignment with mobility policies (e.g., SUMP and Metropolitan Basin Plan).
- PT Operator / Authority: provides operational data, insights on existing services, and contributes to defining the role of DRT within the broader PT network;
- University: supports the validation of the study by offering research-based insights to enhance the governance and planning of DRT services;
- general public: ensure planning solutions reflect actual mobility needs.

**Risk and/or vulnerability tackled:**



- misalignment between planning tools: integrating demand assessment methodologies with different territorial planning instruments may require adjustments to existing frameworks;
- stakeholder coordination challenges: aligning the perspectives and priorities of multiple actors may slow down decision-making processes;
- uncertainty in future mobility patterns: evolving mobility trends could affect the accuracy of demand models.

**Financing plan and sources:** SRM will apply the results of the Study when supporting the SUMP update, for which SRM is usually subcontracted by the Metropolitan city of Bologna to provide support.

#### 4.2.5. Measure “g”: Application of the “Identification of potential weak demand areas by analysis and geographic visualization of the O/D matrix starting from telephone SIM data”

This action defines the quantitative structure of demand with as much detail as possible considering spatial, temporal and user category (resident, non-resident, foreign, etc.) features.

The O/D matrix will be generated using mobile phone data acquired from Vodafone Business. The reference periods for the analysis will be May, July, and November 2024, while the geographical references will include approximately 140 areas within the Metropolitan city of Bologna and around 60 areas outside the Metropolitan city of Bologna. The data will undergo processing, cleaning, and classification. To manage complexity and enhance usability, the geographic representation of the data will be implemented through an interactive Tableau dashboard, enabling detailed visualization and analysis of weak demand areas.

The O/D matrices produced by Vodafone Business are based on data representing approximately 27% of the mobile network market share. The stratification of the sample is a key element in the data expansion processes used to extrapolate results to the full population dataset delivered to the final client. Additionally, Vodafone Business collaborates with ISTAT to improve statistical methodologies and data expansion techniques, ensuring greater accuracy and representativeness.

##### Main facts

**Dependencies (if any) on other proposed measures/actions:** the methodology for identifying potential weak demand areas is described in the section **Errore. L'origine riferimento non è stata trovata.** related to Action b).

**Timing for implementation:** this measure falls under short-term measures, with implementation planned within the end of the project. The output of the pilot action “g”, an interactive dashboard which visualizes the O/D matrix, can be used immediately to support decision-making in public transport planning, particularly in the design of new mobility services.

**Stakeholders involved and responsibilities:** the functionalities of the interactive dashboard, including filtering capabilities and its effectiveness in identifying weak demand areas and associated mobility patterns, are internally tested and validated by SRM. The Metropolitan city of Bologna (CMBO) is the only stakeholder/associated partner involved in this phase, specifically for the validation of the zoning used in the dashboard.

##### Risk and/or vulnerability tackled:

- data accuracy and representativeness: the use of telephone SIM data for mobility analysis depends on data quality, potential biases, and coverage limitations;
- methodological consistency: ensuring alignment between this action and the broader demand assessment methodology (action “b”) is crucial for reliable and replicable results;



- usability of the dashboard: the effectiveness of the dashboard depends on the clarity of the visualization tools and the ability of stakeholders to interpret and apply the insights effectively.

**Financing plan and sources:** SRM will the O/D matrix when to support decision-making in public transport planning, particularly in the design of new mobility services; no more funds are needed.



## 5. Monitoring and evaluation

### Expected results of the implementation:

- 1) optimization of public transport resources by enhancing service adaptability in low-demand areas, improving territorial coverage while maintaining cost efficiency. This will lead to better accessibility for underserved areas, a more balanced allocation of financial and operational resources, and an overall increase in service effectiveness;
- 2) comprehensive evaluation of innovative DRT service provision models, assessing their feasibility within the existing public transport network and MaaS framework. The action will support the definition of optimal operational models tailored to the Bologna metropolitan area;
- 3) definition of data exchange protocols and integration models to enable the seamless incorporation of DRT services within the regional MaaS ecosystem. The development of guidelines will provide an approach for integrating DRT into MaaS platforms and the active engagement with stakeholders and IT service providers will facilitate the creation of effective digital solutions;
- 4) identification of sustainable revenue models for DRT services through the evaluation of funding opportunities and financial sustainability. Defining key financial and regulatory aspects in the simulated tendering process will support the long-term viability of DRT.

Despite the promising potential of the proposed actions, there are several risks that may arise during the planning and implementation phases. These risks need to be carefully managed to ensure the successful delivery of the project and its long-term sustainability.

The risk associated to planning and implementation are listed as follows.

#### Planning and demand-related risks:

- uncertainty in demand estimation: the success of integrating DRT into the existing network depends on accurately assessing mobility demand;
- mismatch between service design and user needs: if DRT services do not align with actual mobility demand, it may fail to attract sufficient users;
- challenges in defining service parameters: establishing frequency, operating areas, and service hours for DRT while ensuring cost efficiency and reliability can be complex.

#### Regulatory risks:

- regulatory and contractual barriers: the inclusion of DRT within the PT system requires adjustments in procurement procedures and service contracts;
- inconsistent policy frameworks: misalignment policies regarding DRT governance, funding, and service contracts could create obstacles;
- legal uncertainties in data sharing: integrating DRT into MaaS requires data exchange across different platforms.

#### Financial and economic risks:

- financial sustainability: if financial support mechanisms are not clearly defined, the viability of the service may be at risk.

#### Stakeholders and users' risks:

- stakeholder coordination challenges: effective integration of DRT requires close collaboration between public authorities, TPO, and MaaS providers;



- limited local authority capacity: Public Authorities may lack the expertise or resources to manage DRT planning and governance effectively;
- perceived complexity of the service: if DRT booking, ticketing, or service use is not intuitive, potential users may be discouraged;
- equity and accessibility concerns: if not properly designed, DRT services may exclude certain user groups.

#### Technological and operations risks:

- technological and operational integration: ensuring interoperability between DRT and the existing PT network, presents technical challenges that may require additional investments and adjustments;
- scalability challenges: the initial pilot may function well in a controlled environment, but expanding the service to a regional scale may introduce operational complexities.

#### **Estimated relevant impact:**

- **Connectivity and Accessibility:** the integration of DRT services into the PT network will enhance overall connectivity, especially in underserved or low-demand areas. By providing flexible, on-demand transport options, DRT will increase mobility for individuals who currently face difficulties accessing PT, such as elderly people and residents of remote areas. This will contribute to a more inclusive transportation system, ensuring that all members of society have equal access to mobility services.
- **Environmental Benefits:** the shift toward DRT services can contribute to the reduction of traffic congestion and pollution by optimizing resource use and reducing the number of private cars on the road. By providing efficient DRT options that reduce the need for personal vehicle ownership, the initiative will support greener, more sustainable transport systems. It is noted that, to maximize the impact of integrating DRT with PT and potentially MaaS, raising awareness and education as a planned soft measure is crucial for encouraging private car users to shift to DRT services.
- **Energy Savings:** DRT services can lead to energy savings by optimizing routes and service frequencies based on real-time demand. This efficient operation can reduce unnecessary travel, helping to lower energy consumption compared to traditional fixed-route services.
- **CO<sub>2</sub> Emission Reduction:** by encouraging shared rides and reducing the need for private car usage, DRT services have the potential to significantly lower CO<sub>2</sub> emissions. Through careful planning, the integration of DRT into the public transport network can be a key step in achieving substantial emissions reductions in the PT sector.

#### **Possible KPIs are the followings<sup>7</sup>:**

- level of data sharing;
- level of service integration;
- cost of the service;
- DRT territorial coverage, passengers on peripheral lines;
- length of DRT network/number of bus stops;
- n° of passengers;
- n° of km driven;
- hours of availability of the service.

The final identification of the KPIs could be done later, once the outcomes of the actions above are finalized, with particular reference to the study of potential demand and pinpointing DRT opportunities in low-demand areas.

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<sup>7</sup> Those KPIs are derived from the possible indicators listed in D.3.1.1 Annex IV. They are a preliminary proposal and will be further refined in the final Action plan in D3.2.3.



## 6. Conclusions and next steps

The contents of the Action plan for the Bologna pilot will be officially approved during the LL meetings with the stakeholders, as detailed in chapter 0.

This process ensures the validation of all actions while also maintaining a high level of engagement and interest among stakeholders throughout the process.

The goal of this draft Action plan is to establish a scalable and sustainable framework to enhance accessibility in peripheral and low-demand areas by integrating DRT services with traditional PT and with a MaaS logic.

Building on the insights gained from the Bologna pilot, the Action plan provides strategic guidelines for:

- optimizing service provision by identifying the most suitable areas and operational models for DRT deployment;
- strengthening governance and planning to ensure DRT services are effectively coordinated within the broader transport system;
- fostering collaboration among stakeholders, ensuring continuous dialogue and co-design between public authorities, operators, and end-users.

Besides the involvement of stakeholders, attention is given to potential barriers to the deployment of the Action Plan measures.

By integrating DRT into a broader transport vision, this Action plan sets the foundation for a more inclusive, efficient, and adaptable mobility system in the Bologna metropolitan area, with the potential for replication and expansion at the regional level.

From now on, the next steps in Bologna LL foresee four remaining meetings that will guide the co-design process and ensure the successful implementation of DRT services. Through these meetings, the Bologna LL will deliver a shared framework for integrating DRT into service contracts, ensuring flexibility and adaptability for different territories and service types. Additionally, the LL will provide a contribution to a dedicated guideline for incorporating DRT into planning instruments, focusing on key elements such as appropriate service types and areas where DRT is most effective.

The collaboration with stakeholders will not end with the conclusion of the DREAM\_PACE project, as the long-term objective is to fully integrate DRT into the regional mobility system. To achieve this goal, it will be essential to maintain continuous dialogue with key actors, particularly Local and Regional Public Authorities, the future Public Transport Operator, and other relevant stakeholders.

SRM will continue working closely with the Metropolitan city of Bologna (CMBO) and the Municipality of Bologna (COBO) to ensure that DRT governance and planning align with the SUMP and the broader mobility strategies of the Bologna metropolitan area. This collaboration will be crucial for implementing the measures and actions developed within the project, facilitating the effective integration of DRT into the PT network and its incorporation within a MaaS framework. In particular, coordination with the Emilia-Romagna Region (RER) will be essential as they move forward with the deployment of a regional MaaS system, where DRT services are expected to be fully integrated.

Additionally, engagement with the current and the future PTO - selected through the upcoming tender procedure - will be crucial to ensuring that DRT services are effectively included in the new Contract of Service, building on the outcome of the aforementioned measures.

At the same time, maintaining collaboration with IT and MaaS providers will be essential, given the continuous evolution of digital mobility solutions. In particular, ongoing work on data exchange protocols between the DRT operator and the MaaS system will be a priority to ensure the effective integration and interoperability.

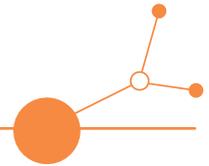


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- 2) DREAM\_PACE D1.1.1 “Report on governance and planning for public transport, mobility innovations and DRT in CE Regions”. 2023.
- 3) DREAM\_PACE D1.1.2 “State of the art report on governance structures and planning processes for DRT in the pilot areas”. 2024.
- 4) DREAM\_PACE D1.1.3 “Development scenarios for DRT innovative governance and planning approaches”. 2024.
- 5) DREAM\_PACE D1.2.1 “Living labs preparation: stakeholder mapping, raising awareness and local engagement”.2023.
- 6) DREAM\_PACE D2.1.1 “Analysis report on DRT digital and operational innovations in CE Regions and engaged areas”. 2023.
- 7) DREAM\_PACE D2.1.2 “State of the art report on digital and operational approaches for DRT in the pilot areas”. 2024.
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- 11) DREAM\_PACE D3.1.2 “DRT strategy draft and setup of the consultation process”. 2024.

# D3.2.1 Action plan drafts in the six pilot regions

## Budapest



Final Version

02 2025





## Authors of the document

Partner No.	Acronym	Name	Action	Version
2	Redmint	Gabriele Grea Anja Seyfert	Template	1
8	ATE	Florian Kressler	Template	1.1
5	BKK	Viktoria Hideg Aron Hegedus	Input from Budapest ref. DREAM_PACE pilots 1.1 and 2.1	1.2
8	ATE	Florian Kressler	Draft comments	1.3
5	BKK	Viktoria Hideg Aron Hegedus	Input from Budapest ref. DREAM_PACE pilots 1.1 and 2.1	1.4
4	Mobilissimus	Nikolett Csörgő Rita Petrovác Balázs Fejér	Draft revision 1	1.5
5	BKK	Viktoria Hideg Aron Hegedus	Feedback to the revision 1 and proposed final version	Proposed final
8	ATE	Florian Kressler	Edited approved version for official release	Final



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## 1. Executive summary

The territory of central Europe is characterised by uneven transport connections and mobility opportunities, across and within regions, between urbanized contexts and rural and peripheral areas.

The project's common challenge is to improve accessibility and connectivity in CE peripheral and rural areas through better integration of public transport networks with Demand Responsive Transport (DRT) services, building on joint development and implementation of governance, planning, digital and operational innovations.

DREAM\_PACE will develop innovative DRT concepts complementing regional mobility networks.

The project will improve DRT planning and delivery capacities of public authorities and operators.

A new generation of DRT services will become functional and integral part of regional mobility networks, enhancing accessibility for citizens, territorial cohesion and social inclusion. Integration is the key to the DREAM\_PACE innovative approach, as DRT services are mostly developed as stand-alone solutions to specific needs, the potential of scalable strategies and solutions is widely underestimated.

Project Partners (thereafter PP) will jointly develop a strategy for DRT in Sustainable Urban Mobility Plans to be adopted at EU level, co-design, test and implement innovative DRT solutions enhancing mobility networks. Strategies and solutions will foster a better integration of DRT and public transport (Bologna, Pavia, Budapest areas), support a higher coordination among existing DRT initiatives (Osttirol, Baden-Württemberg) and experiment new integrated approaches for DRT "green fields" (Split-Dalmatia County).

DREAM\_PACE will exploit the potential of integrated planning and digital and operational innovations for a common strategy and develop innovative DRT modular solutions. The project implementation builds on transnational cooperation to guarantee an adequate responsiveness and adaptability of project results to specific characteristics of mobility ecosystems across CE rural and peripheral areas.

This document is the second of six draft Action plans for the DREAM\_PACE pilot regions that altogether constitute the deliverable D3.2.1, and focuses on the Budapest area. As D3.2.1 will not be a public deliverable, it was decided to keep the six Action plan drafts separate, while their final versions that compose D3.2.3 will be consolidated in a single document. D.3.2.1 builds on the analysis and diagnosis of governance and planning (Activity 1.1) and of operational trends and approaches to DRT (Activity 2.1) and on the DRT strategy elaborated in D3.1.2 and for which the consultation process is being completed.

This document is organized as follows.

Chapter 2 provides an overview of the pilot region, outlining the purpose and scope of the Action plan.

Chapter 3 describes the starting point for the development of the Action plan, highlighting the needs and priorities identified, the challenges addressed, and the stakeholder involvement process. It also presents the baseline scenarios discussed with them and the next steps agreed upon.

Chapter 4 outlines the pilot action and its components that are being tested and specifies the measures that are consequently necessities to be implemented in order to achieve the objectives of the Action plan.

Chapter 5 details the monitoring and evaluation process for the Action plan, including the expected results of implementation, risks associated with planning and execution, and the estimated relevant impacts.

Chapter 6 serves as the concluding chapter, outlining how the Action plan will be officially approved or taken up, summarizing the overall approach, and presenting the next steps.

Finally, chapter 7 provides a comprehensive list of references, offering background information and sources supporting the document.



## 2. Introduction

BKK Centre for Budapest Transport, the main transport organiser company of Budapest, has been operating Demand Responsive Transport (DRT) services since 2006 with the introduction of a night service that only operated if journey requests were indicated via phone. Then in 2013, the system was extended to new, daytime services as well and in December 2020 - as a part of the Interreg SMACKER project<sup>1</sup>, a dedicated website was established, where requests could be indicated online as well. In the DREAM\_PACE project, BKK aims to introduce and test a brand new, flexible DRT system for the first time in Budapest in order to serve a mixed-use residential area, located in the eastern part of the 16th district in the capital city of Hungary, which is currently underserved by public transport (PT) services. The pilot area is mainly residential, as it does not feature any specific trip-attracting facilities; however, a supermarket is about to be opened in the near future that could attract more citizens. The neighbourhood is surrounded by a main road, where regular bus services are currently operating and by a suburban railway line, which leads to a nearby suburban town, Csömör. Nevertheless, despite the existing PT connections, the large distances that are required to get to the locations of the stops make these transport links uncompetitive and uncomfortable for many residents in the area, such as the elderly population. As a result, car dependency within the area is very high and cars serve as the dominant transport mode.

The new service will be operated without a pre-fixed designated route with the support of a cutting-edge software which will be acquired through a procurement from an experienced company that handles state-of-the-art transport solutions. The testing would help to gain experience and thus identify potential opportunities to extend demand-responsive transport solutions in Budapest.

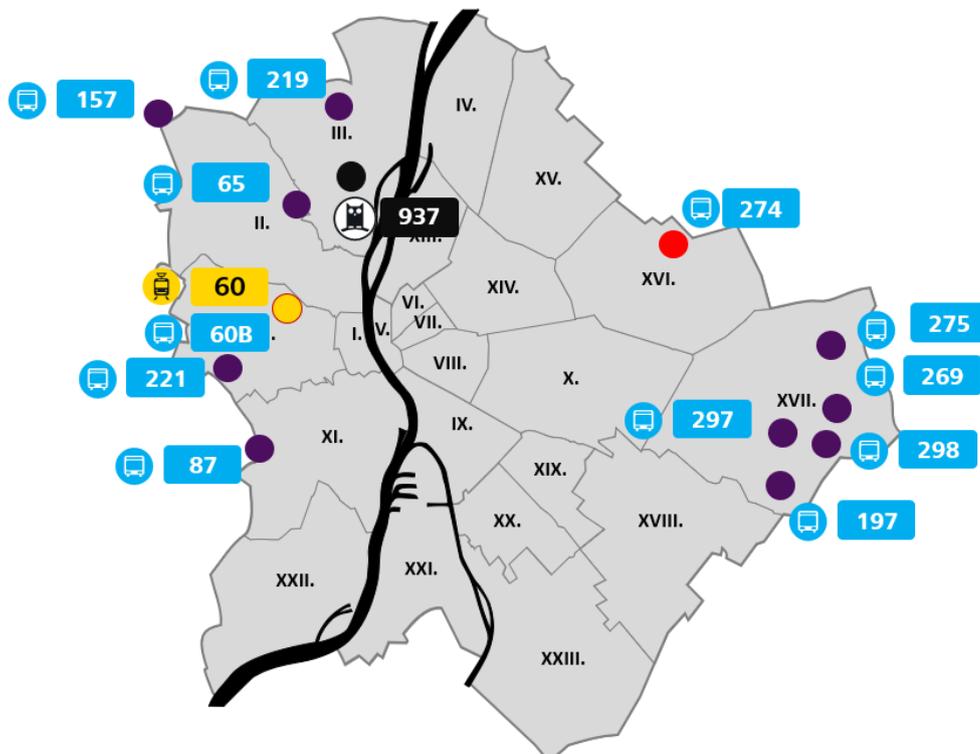


Figure 1. The existing DRT services in Budapest and the planned 274 service.

<sup>1</sup> SMACKER (Soft Measures & Actions for behavioural Change and Knowledge to Embrace peripheral and Rural areas) was an Interreg Central Europe 2014-2020 project active from 01/04/2019 to 31/03/2022. The project aimed at addressing disparities in mobility in peripheral and rural areas, designing and promoting efficient and sustainable public transport services.

<https://programme2014-20.interreg-central.eu/Content.Node/SMACKER.html>



### 3. Strategic background and scenarios developed in the area

For the first and second LL meetings, BKK invited the relevant stakeholders to discuss the technical issues of DRT development.

The third LL meeting was a site visit where BKK tested the services in the pilot area with a Mercedes Sprinter 515 minibus vehicle. In addition to the professional actors, the deputy mayor and other municipal actors of the pilot area were invited to this site visit.

The fourth LL meeting was a public consultation where BKK presented the planned new service to the inhabitants of the pilot area and where they could ask questions about it.

The main outcomes of the LL meetings were as follows:

- BKK decided on the pilot area: BKK's technical team examined the possible locations in detail, 4 DRT locations were identified in 2024, the aim was to have an area where public transport is not available within 500 m walking distance and where there is a rail or HÉV (suburban railway) connection. Among the sites considered were Pálvölgy, Madárhegy, Csillebérc and Csobaj-bánya, of which the latter was chosen.

It is important to note that current DRT services have been based on fixed routes and fixed departure times, in the DREAM\_PACE pilot this would be further developed, as a flexible route would be developed;

- BKK defined the possible boarding points - its location, density, placement;
- BKK identified the relevant stakeholders on the first LL meeting: according to the participants, all relevant stakeholders have been involved, and there is no need to involve other stakeholders at the moment, apart from the partners present;
- For the planned Budapest service, there would be one fixed departure/arrival stop, Cinkota suburban railway station (HÉV), where passengers would be transported within the designated area, connecting to the arrival/departure of the suburban railway station (HÉV);
- During the LL meetings and from the public forum with the inhabitants, BKK received requests for the extension of the service area and better connection opportunity to the suburban railways (HÉV) and other BKK bus lines;
- BKK discussed the methodology for public involvement. It was carried out in two ways: a face-to-face public forum and an online questionnaire (in which residents could indicate their current travel habits and whether and how they would use the planned DRT service - in terms of time, route, potential stopping point).

#### Main challenges:

- The main challenge in the DREAM\_PACE project is that contrary to the current DRTs in Budapest having a fixed line, there will be an opportunity to test a demand responsive system with a flexible route on a certain part of the line. Since such a service is new in Budapest, it is a challenge both in terms of operation and IT;
- The IT system will be developed by an external contractor, the challenge is to receive at least 3 valid bids for the procurement. The procurement process was unsuccessful in the first round and will be reopened;



- To find the suitable bus: The type of bus tested during the site visit is not suitable as there are many traffic calming barriers in the area, some built too high and the bottom of the bus too low, so some of these traffic calming barriers "caught" the bus.

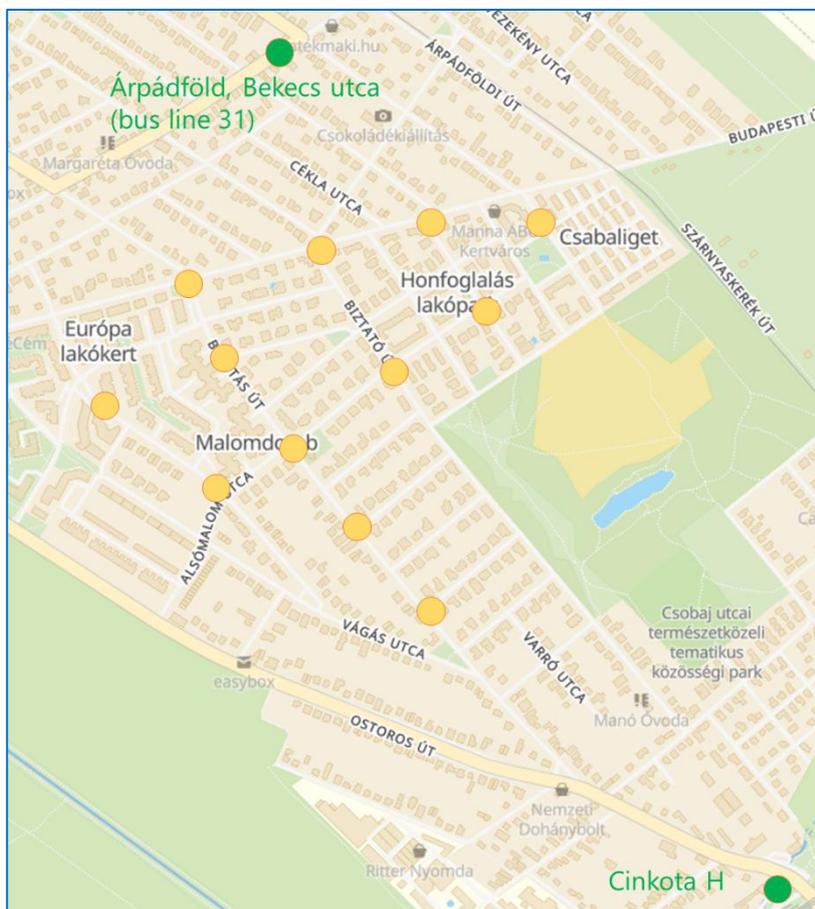


Figure 2. The planned boarding/disembarking points in the pilot area.



## 4. Development of the Action plan

### 4.1. Activities developed on the territory and objective of the plan

In Budapest, two pilots are elaborated throughout the project. Each consists of several components.

**Activity 1 of the Budapest pilot (Pilot 1.1: Governance and planning of integrated DRT-public transport in a MaaS logic for peripheral and low demand areas)** consists of the following components:

- **Component 1:** Strategic approach for DRT in PT, transforming traditional lines in DRT and designing new DRT in developing areas.

The component focuses on testing new regulations related to DRT systems. In Hungary, transport infrastructural elements, such as stops, need to meet various infrastructural requirements in order to be approved by certain authorities. Although BKK Budapesti Közlekedési Központ (BKK Centre for Budapest Transport) has introduced so-called “simplified boarding points” in existing DRT services, the company aims to elaborate and test new solutions to make DRT systems more flexible. As part of the project, BKK aims to test more simplified boarding points where - due to the flexibility of the new DRT service - vehicles would be able to approach from different directions (at crossings) and thus, no designated stopping areas would be established. The area of the stop would be marked with a single sign showing all necessary information about its operation.

- **Component 2:** Model for flexible management of DRT-PT, to be provided by AG/Redmint (Pavia Oltrepò).

The business planning tool should help in planning the opportunity costs for the DRT service in low demand areas. A test with abstract data should allow the validation of the model. The pilot will choose the test service, but it should work in different contexts. The evaluation model needs to be validated with an existing service or a new one. This evaluation model will be shared by Redmint, which should be validated by BKK, highlighting the importance of this validation process. BKK will test the model on an existing or new DRT/PT service in Budapest and share the results with AG/Redmint to finalise the model.

**Activity 2 (Pilot 2.1: Enhancing existing DRT networks responsiveness in rural and peripheral areas through digital/operational innovations)** of the Budapest pilot consist of the following components:

- **Component 1:** DRT in MaaS App.

The new DRT service is aimed to be displayed in the BudapestGo journey planner application (<https://go.bkk.hu/>), which is used in Budapest and in its suburban area. The location of the vehicles could be tracked on a live basis and real-time departure times will be shown to its users. Users will have the opportunity to plan journeys with the new service, as it will be integrated to the trip planning system. The ticketing system for the new service will be the same, which is used in BKK’s existing public transport network. Although, journey requests will need to be indicated in a dedicated website, which will be carried out exclusively for the project, but it will be stand-alone integrated in the BudapestGO app.

- **Component 2:** Display of DRT and traditional services in the same interface, fostering integration.

The new service will be stand-alone and integrated into the BudapestGO application, in a similar way, like the operating DRT demand-responsive transport systems (Telebusz). The location of the vehicles could be tracked real-time in the BudapestGO application along with other existing BKK and MÁV-HÉV services.



- **Component 3: New DRT services without fixed itineraries.**

The solution will enable to operate a flexible DRT service without a pre-fixed designated route in a suburban area of the capital city of Hungary with the support of a cutting-edge software which is aimed to be acquired through a procurement from an experienced company that handles state-of-the-art transport solutions. The testing would help to gain experience and thus identify potential opportunities to extend demand-responsive transport solutions in Budapest. The new flexible DRT system is planned to serve a mixed-use residential area, located in the eastern part of the 16<sup>th</sup> district in Budapest, which is currently underserved by public transport (PT) services.

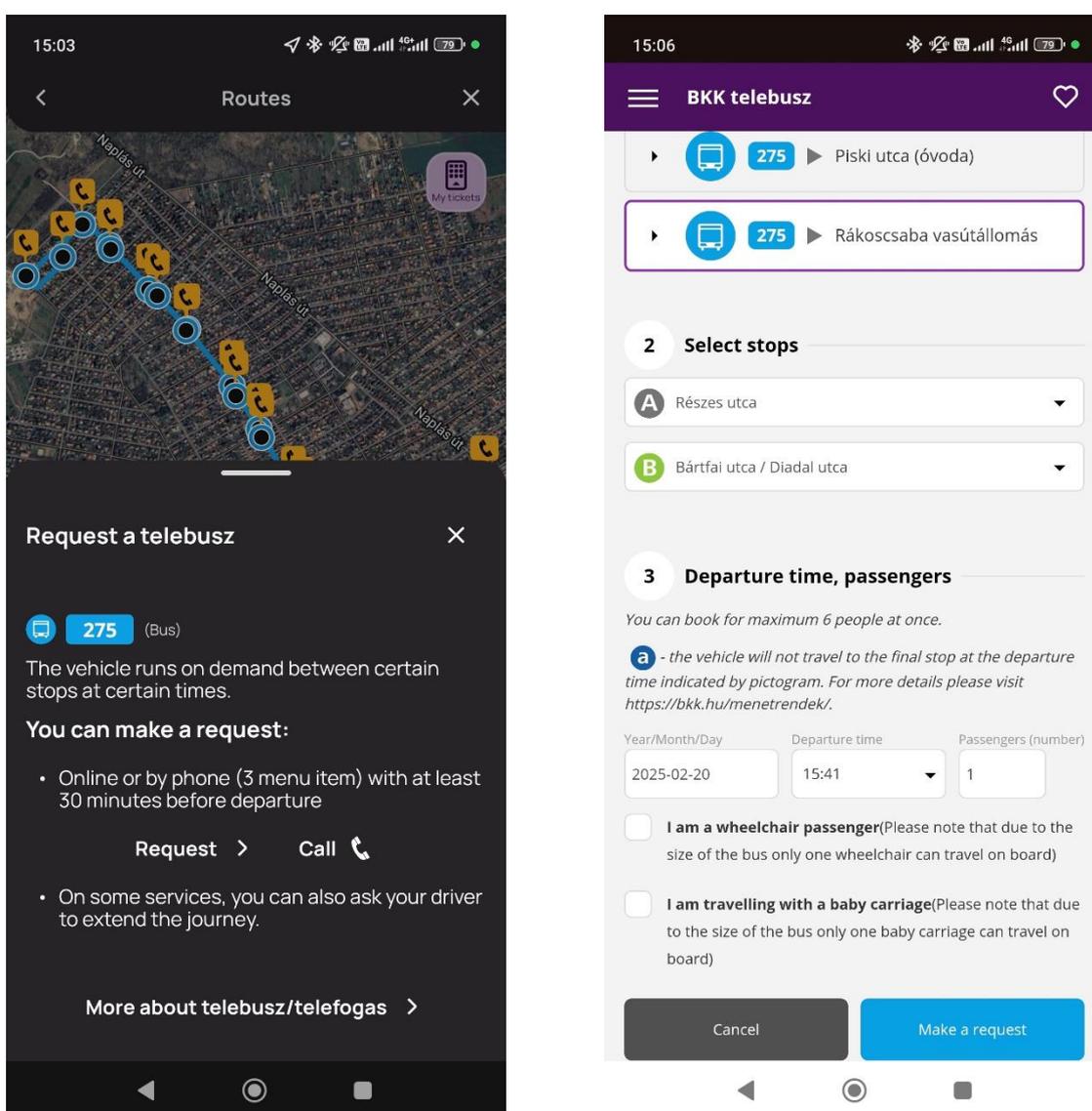


Figure 3. The DRT services in the BudapestGO app (left) and the Telebusz website (right).

Objectives of the Action plan are the following:

- Refine and expand the design of simplified boarding points, taking into account pilot experiences.
- Adaptation and long-term application of the DRT/PT model (provided by AG/Redmint).



- Integration of the new DRT service to the [Telebusz](#) online request system.
- Fine-tuning and expansion of the flexible DRT system to other areas in Budapest.

## 4.2. Proposed measures for the Action plan (draft)

### 4.2.1. Action 1: Refine and expand the design of simplified boarding points, taking into account pilot experiences

Refine the design of the simplified boarding points based on the experience of the pilot and use it for the design of other flexible DRT systems. The simplified boarding points used in the pilot will allow vehicles to approach intersections from different directions without designated stopping areas. These stops will be marked by a single sign with basic operational information.

#### Main facts:

- Timing for implementation: the simplified DRT boarding points can be tested during the test period of the new flexible DRT service (around from June 2025 to January 2026).
- Institution(s) / department(s) responsible for implementation: BKK.
- Stakeholders involved and responsibilities:
  - Bus Market Surveillance and Passenger Rights Authority of Hungary - Advisor in legal issues;
  - Municipality of the 16<sup>th</sup> district of Budapest - pilot area responsibility, local authority;
  - KTI Hungarian Institute of Transport Sciences and Logistics - Good practices and knowledge among designing transport systems;
  - Budapest University of Technology and Economics, Faculty of Transport Engineering and Vehicle Engineering - Academic knowledge and practices among designing transport systems;
  - Mobilissimus (PP) - co-design process, design and analysis research to gather more information about the potential demands for the planned DRT service;
  - General public - the users of the new DRT system.
- Risk and / or vulnerability tackled: the new and simplified boarding points will not be familiar to passengers and/or will not be sufficiently safe. At some points, buses can arrive from all directions of the crossing (due to the flexible route), but only one sign will mark the boarding point per crossing. This means that passengers will not necessarily have to wait for the bus where the sign is.
- Financing plan and sources: the design and installation of the signs will be financed by BKK.
- Dependencies on other proposed measures: the implementation of this action can be started when the new DRT service started the test operation (Action 4).
- Will this measure continue after the project? Yes, the simplified boarding points can be used in other areas of Budapest if a flexible DRT system is developed.

### 4.2.2. Action 2: Adaptation and long-term application of the DRT/PT model (provided by AG/Redmint)

Investigation of the adaptation and long-term application of the DRT/PT model (provided by AG/Redmint) in the transport planning of BKK.



**Main facts:**

- **Timing for implementation:** the testing of the business planning tool lasts around from 15 May 2025 to 31 June 2025.
- **Institution(s)/ department(s) responsible for implementation:** Redmint/AG for development, BKK for testing and validation of the model.
- **Will this measure continue after the project?** Yes, BKK would like to investigate the applicability of the final model for Budapest transport planning after the project.

#### 4.2.3. Action 3: Integration of the new DRT service in the Telebusz online request system

All the DRT services are (partially) integrated in the BudapestGO app: it is possible to see the live positions of the vehicles, the live departure time, the stops, but it is necessary to indicate the request for a journey on another website Telebusz (<https://telebusz.bkk.hu/>), which is redirected from BudapestGO via a hyperlink. The new DRT service will also have to be requested on a separate website, but it will be also integrated into the BudapestGO. The aim is that the new DRT system will be integrated in the Telebusz online request system after the project.

DRT services can be used with the same ticket and pass as all PT services. Tickets can be purchased via the BudapestGO app, at ticket machines or at customer centres.

**Main facts:**

- **Timing for implementation:** the test operation of the new DRT system will last from June 2025 to January 2026.
- **Institution(s)/ department(s) responsible for implementation:** BKK, external provider.
- **Stakeholders involved and responsibilities:**
  - General public - the users of the new DRT system;
  - External provider - development of the IT system.
- **Dependencies on other proposed measures:** it is related to the Action 4.
- **Will this measure continue after the project?** Yes.

#### 4.2.4. Action 4: Fine-tuning and expansion of the flexible DRT system to other areas in Budapest

Fine-tuning and extending the flexible route DRT system tested during the pilot to other areas of Budapest and converting existing DRT systems into a flexible route system.

**Main facts:**

- **Timing for implementation:** test period from June 2025 to January 2026.
- **Institution(s)/ department(s) responsible for implementation:** BKK.
- **Stakeholders involved and responsibilities:**
  - Municipality of the 16th district of Budapest - pilot area responsibility, local authority;



- KTI Hungarian Institute of Transport Sciences and Logistics - Good practices and knowledge among designing transport systems;
  - Budapest University of Technology and Economics, Faculty of Transport Engineering and Vehicle Engineering - Academic knowledge and practices among designing transport systems;
  - Mobilissimus (PP) - co-design process, design and analysis research to gather more information about the potential demands for the planned DRT service;
  - General public - the users of the new DRT system;
  - External provider - development of the IT system.
- **Dependencies on other proposed measures:** it is related to Action 1.
  - **Will this measure continue after the project?** Yes, hopefully the new DRT system will be successful and will operate after the project in the pilot area and be extended to other areas of Budapest.



## 5. Monitoring and evaluation

Action	Expected impacts	KPI
Action 1: Refine and expand the design of simplified boarding points, taking into account pilot experiences.	-	Clear policy for design DRT boarding points; guidance/manual for designing DRT boarding points.
Action 2: Adaptation and long-term application of the DRT/PT model (provided by AG/Redmint).	More efficient business planning for DRT services.	Validated model for DRT/PT management.
Action 3: Integration of the new DRT service to the Telebusz online request system.	All DRT service can be requested in the same applications.	The new DRT system in the Telebusz application.
Action 4: Fine-tuning and expansion of the flexible DRT system to other areas in Budapest.	More effective and flexible DRT systems in Budapest.	Flexible DRT systems in other areas in Budapest.



## 6. Conclusions and next steps

The Action Plan will be approved by BKK. BKK Centre for Budapest Transport is the transport manager of Budapest, and also the local authority, then it does not need any external approval. Several professional areas of BKK are involved in the development of the project tasks: the Public Transport Network Planning Unit and the IT Department are responsible for the development of the technical tasks, while the Strategic Knowledge Centre and the R&D Department are responsible for the project management.

Developing and testing DRT with a flexible route in Budapest is a great and exciting challenge. BKK expects that, as a result of this project, to be able to successfully implement this new and innovative system, continue its operation in the area after the project is finished and expand it to other areas.

Next steps agreed upon in the stakeholder group are:

- It is agreed that the next public forum will be in the mid of the pilot project, where BKK can get the public's feedback on the new DRT service;
- Throughout and after the project, BKK has kept in contact with other stakeholders and involve them individually in the necessary parts of the project.

Additional input needed to develop the Action plan is:

- Business planning tool from the AG/Redmint.

Follow up with the stakeholders in the development of the Action plan will be done as follows:

- BKK will inform the stakeholders about the main milestones and the progress of the project.

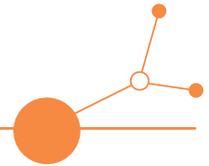


## 7. References

- 1) DREAM\_PACE Application Form, Version 2.0. 2023.
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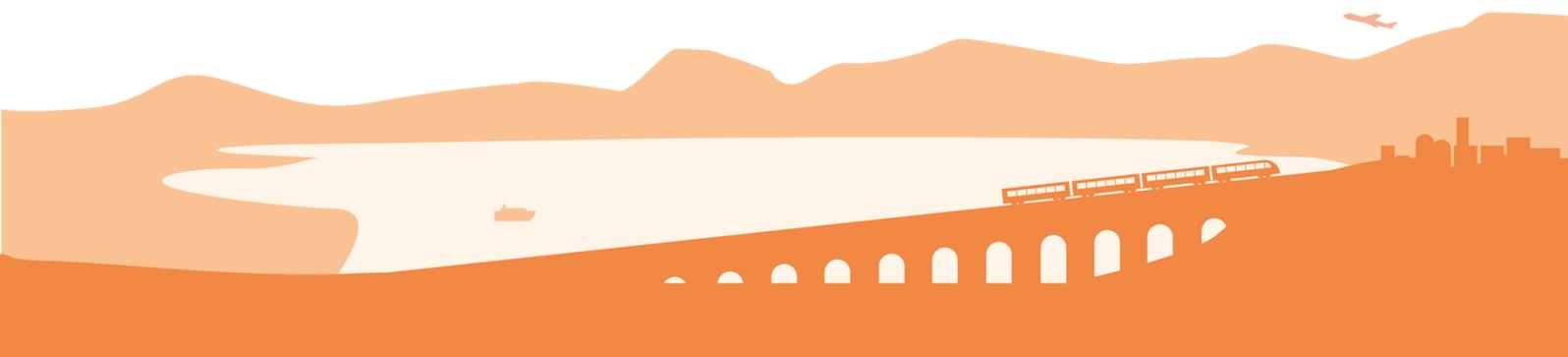
# D3.2.1 Action plan drafts in the six pilot regions

## Osttirol



Final Version

02 2025





## Authors of the document

Partner No.	Acronym	Name	Action	Version
2	Redmint	Gabriele Grea Anja Seyfert	Template	1
8	ATE	Florian Kressler	Template	1.1
9	RMO	Jakob Britz	Input from Osttirol Pilot 1.2	1.2
8	ATE	Florian Kressler	Draft comments	1.3
9	RMO	Jakob Britz	Input from Osttirol Pilot 1.2	1.4
4	Mobilissimus	Nikolett Csörgő Rita Petrovác Balázs Fejér	Draft revision 1	1.5
9	RMO	Jakob Britz	Feedback to the revision 1 and final version	Proposed final
8	ATE	Florian Kressler	Edited approved version for official release	Final



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## 1. Executive summary

The territory of central Europe is characterised by uneven transport connections and mobility opportunities, across and within regions, between urbanized contexts and rural and peripheral areas.

The project's common challenge is to improve accessibility and connectivity in CE peripheral and rural areas through better integration of public transport networks with Demand Responsive Transport (DRT) services, building on joint development and implementation of governance, planning, digital and operational innovations.

DREAM\_PACE will develop innovative DRT concepts complementing regional mobility networks.

The project will improve DRT planning and delivery capacities of public authorities and operators.

A new generation of DRT services will become functional and integral part of regional mobility networks, enhancing accessibility for citizens, territorial cohesion and social inclusion. Integration is the key to the DREAM\_PACE innovative approach, as DRT services are mostly developed as stand-alone solutions to specific needs, the potential of scalable strategies and solutions is widely underestimated.

Project Partners (thereafter PP) will jointly develop a strategy for DRT in Sustainable Urban Mobility Plans to be adopted at EU level, co-design, test and implement innovative DRT solutions enhancing mobility networks. Strategies and solutions will foster a better integration of DRT and public transport (Bologna, Pavia, Budapest areas), support a higher coordination among existing DRT initiatives (Osttirol, Baden-Württemberg) and experiment new integrated approaches for DRT "green fields" (Split-Dalmatia County).

DREAM\_PACE will exploit the potential of integrated planning and digital and operational innovations for a common strategy and develop innovative DRT modular solutions. The project implementation builds on transnational cooperation to guarantee an adequate responsiveness and adaptability of project results to specific characteristics of mobility ecosystems across CE rural and peripheral areas.

This document is the fourth of six draft Action plans for the DREAM\_PACE pilot regions that altogether constitute the deliverable D3.2.1, and focuses on the Osttirol area. As D3.2.1 will not be a public deliverable, it was decided to keep the six Action plan drafts separate, while their final versions that compose D3.2.3 will be consolidated in a single document. D.3.2.1 builds on the analysis and diagnosis of governance and planning (Activity 1.1) and of operational trends and approaches to DRT (Activity 2.1) and on the DRT strategy elaborated in D3.1.2 and for which the consultation process is being completed.

This document is organized as follows.

Chapter 2 provides an overview of the pilot region, outlining the purpose and scope of the Action plan.

Chapter 3 describes the starting point for the development of the Action plan, highlighting the needs and priorities identified, the challenges addressed, and the stakeholder involvement process. It also presents the baseline scenarios discussed with them and the next steps agreed upon.

Chapter 4 outlines the pilot action and its components that are being tested and specifies the measures that are consequently necessary to be implemented in order to achieve the objectives of the Action plan.

Chapter 5 details the monitoring and evaluation process for the Action plan, including the expected results of implementation, risks associated with planning and execution, and the estimated relevant impacts.

Chapter 6 serves as the concluding chapter, outlining how the Action plan will be officially approved or taken up, summarizing the overall approach, and presenting the next steps.

Chapter 7 provides a comprehensive list of references, offering background information and sources supporting the document. Finally, the Annex presents some pictures describing the current PT situation in Osttirol.



## 2. Introduction

Osttirol is located in the southern part of Austria, directly south from the main alpine ridge. With an area of 2.020km<sup>2</sup> and 48.841 inhabitants, Osttirol is very sparsely populated (24 inhabitants/km<sup>2</sup>). Due to its large share of natural space and its scenic beauty, Osttirol attracts lots of tourists both in summer and in winter with about 2.1 million overnight stays per year. The landscape is characterized by mountains and valleys, subsequently the settlement area is only 9% of the region's total area.

Settlements consist, on the one hand, of Lienz, the capital city of Osttirol, and on the other hand, of 32 communities which, in most cases, have a core settlement area but also many remotely placed farms and houses which are hard to access since most of them are placed further up the mountain.

These characteristics account for the fact that most people choose the car over public transport for daily and occasional mobility. Particularly in Lienz, in combination with the through traffic and tourist traffic, this leads to a large number of vehicles on the road with all their negative effects, such as air and noise pollution, loss of space, risks of accidents, etc. To reduce these social costs, and in favour of vulnerable groups like older people, children and people with special needs, this action plan points out the potential for improvement and several objectives of improving accessibility and useability of public transport in the region of Osttirol. Finally, the following actions aim to improve public mobility in the region and enhance the residents' quality of life.

Public transport in Osttirol is organized by Verkehrsverbund Tirol (VVT), the county's collective traffic planning authority. Currently, public transport in Osttirol is operated by Postbus, an operator who is active all over Austria, but the service will be tendered again by the end of 2025.

There is one rail line crossing the region via two valleys and trains pass on an hourly basis in each direction. Additionally, there are 18 bus lines, two night bus lines and two Dial-a-Bus lines in the Puster valley and the Deferegggen valley, the two operating DRT-Systems in Osttirol. When PT is mentioned in this document, it also includes these two DRTs. In the figure below, these lines are indicated in the form of a network plan.





### 3. Strategic background and scenarios developed in the area

In Osttirol, demand responsive transport (DRT) services are only available in two regions: Puster Valley and Deferegggen Valley, operating as dial-a-taxi services from 5 am to 7 pm, 7 days a week. These services work on a reservation basis, requiring bookings at least 60 minutes in advance. In addition, various mobile apps cater to different mobility services in the region, leading to fragmentation of the digital usability. Several living lab meetings were held in the framework of the DREAM\_PACE Project (11 and 14 December 2023, 17. June 2024), to develop scenarios for optimizing existing DRT services in Osttirol and integrating them into a unified mobility app for the region.

Complementary to this, 9 of the 33 municipalities provide a so called “Gemeindemobil”<sup>1</sup>, a very simple kind of DRT, where the municipality provides an electric car and about 20-30 voluntary drivers per community operate the service from Monday to Friday between 8 am and 12 am and between 1 pm and 6 pm. People can call and order the car for a drive inside the area of the municipality. One-way costs between 1 € and 2 €. According to the mayors, this system works very well for them, it is very cost effective and a good addition to the public transport (PT) offers. Restrictions are that it can only be used by local residents (not tourists) and that it can only offer the service inside the borders of the municipality, in some exceptional cases also into the neighboring municipality (e.g. to go to a doctor if one is not available within the municipality)

During the living lab meetings in the DREAM\_PACE project, stakeholders, including representatives from local authorities, transportation authorities, and technology providers, discussed strategies to improve DRT services in Osttirol and streamline mobility solutions.

The following topics were addressed:

- **Optimization of existing DRT Services:** Participants discussed strategies to enhance the efficiency and effectiveness of the current Demand-Responsive Transport (DRT) services in the region. This included evaluating route configurations, adjusting schedules, and improving service coverage to better meet the mobility needs of residents and visitors.
- **Availability of Public Transport (PT):** Discussions concentrated on the lack of public transport options available in the region after 7 pm. Participants explored potential solutions to extend the operating hours of public transportation services, ensuring accessibility for commuters and enhancing mobility during evening hours by extending the lines to later times and better fit bus lines to the schedules of the trains.
- **Unified app for all Mobility Services:** Discussion revolved around the development of a unified mobile application that integrates various mobility services available in the region. Participants highlighted the importance of consolidating information on DRT, public transport, ride-sharing, and other transportation options into a single platform to ease access and enhance user experience.

The main challenge in the DREAM\_PACE project in Osttirol is optimizing the existing Demand-Responsive Transport (DRT) services. Additionally, the project aims to extend DRT coverage to more parts of the region, addressing the current limited availability of public transport options. Moreover, ensuring the availability of public transport after 7 pm poses a significant challenge in Osttirol. Furthermore, the existence of different apps for various mobility services complicates accessibility and user experience. To tackle these challenges, the vision is to have a unified mobility app that integrates all mobility service options in Osttirol.

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<sup>1</sup> Communities with „Gemeindemobil“: [Assling](#), [Hopfgarten i.D.](#), [Kals a.G.](#), [Matrei i.O.](#), [Nußdorf-Debant](#), [Prägraten a.G.](#), [St. Jakob i.D.](#), [St. Veit i.D.](#), [Virgen](#).



Two crucial areas were also highlighted for improving mobility in the region. Firstly, it emphasized the need to address the limited accessibility of public transport, especially for those living outside main routes. Figure 1 shows the intersection of quality of PT-service coverage (red/green/grey area with red having the highest service quality) and permanent settlement areas (blue squares). This helps to illustrate the lack of PT coverage in certain areas. This Analysis was done for all 33 municipalities in Osttirol for both workdays and holidays.

Participants of the Living Labs also addressed the **scarcity of local taxis**. However, proposed solutions like tailored taxi services and expanding DRT could be promising ways to enhance accessibility. Secondly, the fragmentation of mobility services caused by multiple apps was discussed, making it challenging for users to find efficient transportation options. The proposal for a unified app encompassing all mobility services could significantly streamline mobility solutions and provide users with better recommendations.

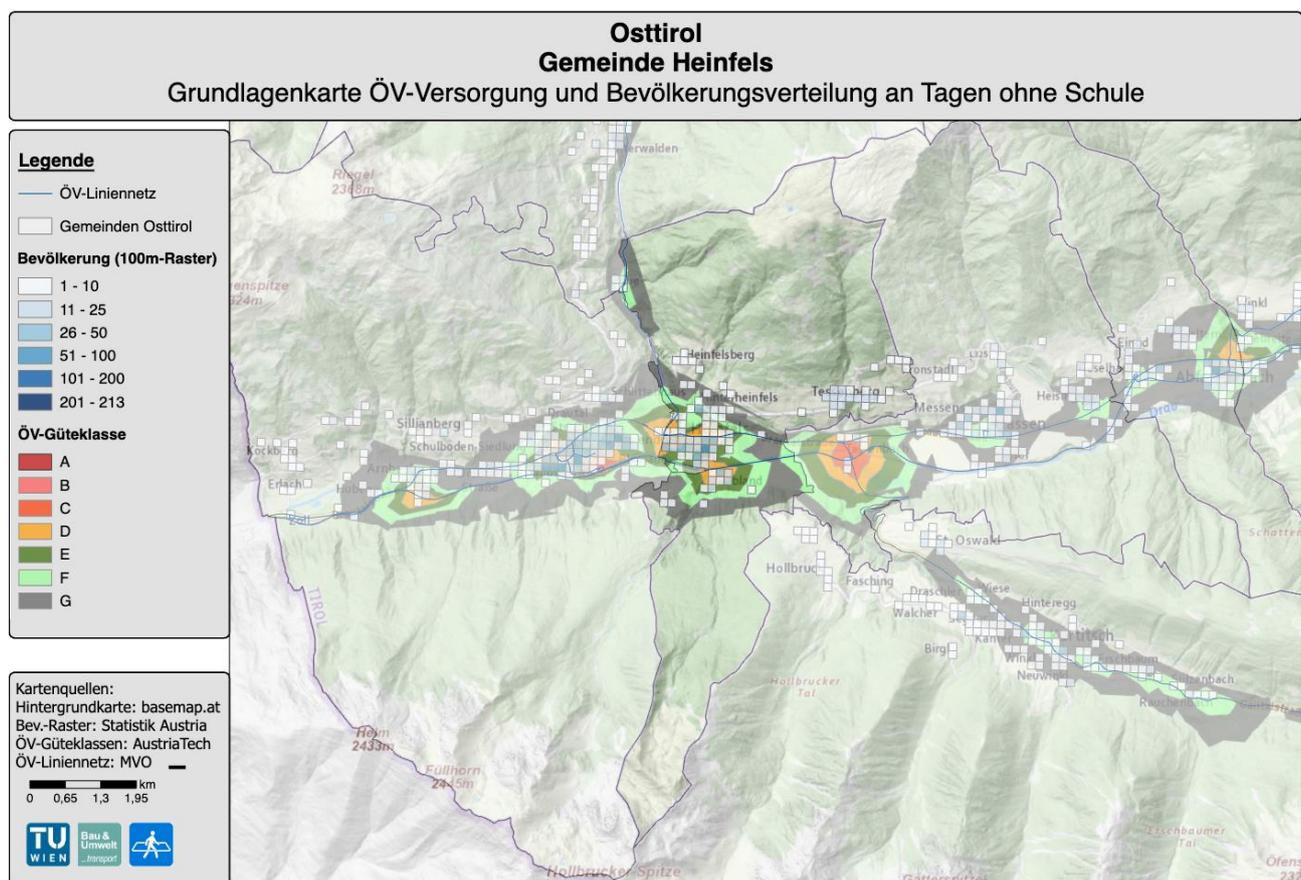


Figure 2. PT offer and settlement, example Heinfels (Tessenberg)

To build on these discussions, it is essential to conduct feasibility studies to assess the practicality and effectiveness of proposed solutions like extended offers in the evenings and a better tuning between train and bus lines. Engaging with stakeholders, including transportation authorities and technology firms, will be crucial in collaborating on solution development and implementation. Monitoring and evaluation mechanisms need to be established to track implementation progress and make necessary adjustments based on feedback and evolving mobility trends. These follow-up actions aim to enhance accessibility and streamline mobility services, improving the overall mobility experience in the region.



## 4. Development of the Action plan

### 4.1. Activities developed on the territory and objective of the plan

#### **Development of a Blueprint for Sustainable Mobility in Osttirol: Closing Gaps with Demand-Responsive Transport (DRT) Services.**

In response to increasing mobility demands and the need for more efficient public transport (PT) solutions, RMO is developing a comprehensive mobility blueprint for Osttirol. This initiative is undertaken in collaboration with an external expert team and involves a detailed assessment of the region's existing transport infrastructure. The primary objective is to identify service gaps in the current PT system and explore how Demand-Responsive Transport (DRT) solutions can complement and enhance mobility offerings.

To ensure a data-driven and community-oriented approach, RMO will conduct a multi-phase analysis that integrates both qualitative stakeholder insights and quantitative technical assessments. By engaging with all relevant stakeholders, including municipalities, transport authorities, and local residents, RMO aims to develop a robust and actionable strategy that can serve as a foundation for implementing efficient, cost-effective, and user-friendly transport solutions in the region.

#### **Methodology and Approach.**

The project is structured into three key phases, each contributing to a deeper understanding of the region's mobility needs and potential improvements:

##### **1. Community Engagement & Stakeholder Consultations.**

To capture the diverse mobility needs across Osttirol's 33 municipalities, RMO will conduct individual interviews with representatives from each community. These discussions will focus on:

- Current public transport availability and its alignment with local needs;
- Key mobility challenges, including accessibility gaps, service frequency issues, and insufficient connections to major transport hubs;
- Local expectations and priorities, helping us to understand what solutions are most desirable and feasible;

In addition, RMO will engage with:

- Local businesses and institutions to assess transport needs for commuters and employees;
- Tourism operators to evaluate seasonal demand fluctuations and potential synergies with public transport;
- Residents and mobility user groups to gather first-hand experiences and identify pain points.

##### **2. Technical & Data-Driven Mobility Assessment.**

Alongside qualitative insights, RMO will conduct a technical analysis to map existing transport infrastructure and assess potential for optimization. This includes:

- Population distribution and settlement structures to identify underserved areas.
- Analysis of existing public transport routes, stops, and service frequencies, highlighting inefficiencies or gaps.
- Traffic flow and private car usage data, including traffic counts, to estimate potential modal shifts from private vehicles to public transport.



- Geospatial analysis to pinpoint areas where new or improved PT services, such as DRT, could be most impactful.

By integrating mobility patterns with demographic and spatial data, RMO can generate detailed community-specific transport profiles, outlining:

- Current mobility patterns and key weaknesses in PT services.
- Potential user groups who could transition from private car use to PT.
- Strategic recommendations for improving accessibility and sustainability.

### 3. Regional Mobility Strategy & Stakeholder Collaboration

The insights gained from community consultations and technical analysis will be consolidated into a comprehensive regional mobility profile. These findings will be presented in a large intermediate workshop, bringing together:

- Representatives from all 33 communities.
- Local and regional transport authorities (VVT, municipal governments).
- Mobility experts and urban planners.
- Business and tourism stakeholders.

This workshop will serve as a platform for discussion, enabling municipalities to align their mobility goals, explore collaborative solutions, and identify synergies in service integration. The aim is to develop a coordinated public transport concept that is financially viable, operationally efficient, and adaptable to future mobility needs.

The results of this process will directly be fed into 2025 public transport program revision, ensuring that the blueprint contributes to a more sustainable and user-centred mobility system in Osttirol.

#### Challenges & Financial Considerations.

One of the main challenges in expanding public transport services is financial feasibility. Many municipalities, along with the regional Public Transport Authority (VVT), remain hesitant to commit additional funding beyond the baseline PT services.

Key financial challenges include:

- Rising costs of PT services: The upcoming re-tendered PT program is projected to cost 20% more than the existing one, leaving little room for additional expenditures.
- High costs of DRT solutions under the VVT framework: Implementing a Dial-a-Bus (DRT service) through the VVT program would require an estimated €250,000 per community, making it an impractical solution for many municipalities.

Given these financial constraints, alternative solutions are being considered:

- Community-based e-car sharing programs with voluntary drivers, which provide a low-cost, flexible mobility option while fostering community engagement.
- Optimizing existing PT routes and schedules to reduce inefficiencies and improve coverage without significant additional investment.
- Exploring funding opportunities and partnerships, including potential EU grants or regional mobility subsidies, to support innovative transport models.

Despite these constraints, the timing is optimal to influence the upcoming PT tender for Osttirol. Through this project, RMO aims to provide VVT and local authorities with comprehensive data and insights that will



support the design of a more adaptive and inclusive transport system, maximizing the opportunities available within the restructured PT framework.

### Conclusion & Expected Impact.

The Blueprint for Sustainable Mobility in Osttirol is an ambitious yet necessary initiative aimed at modernizing the region's transport infrastructure while addressing the challenges of cost, accessibility, and environmental sustainability. By leveraging stakeholder collaboration, technical analysis, and innovative DRT models, RMO aims to:

- Bridge the gaps in existing PT services by introducing targeted DRT solutions.
- Reduce dependency on private cars and promote more sustainable mobility habits.
- Ensure cost-effective and community-driven solutions, making public transport a viable option for a larger population.
- Maximize synergies between different municipalities, creating a more integrated regional transport system.

By aligning with the 2025 public transport program revision, this blueprint has the potential to significantly enhance mobility in Osttirol, offering more efficient, flexible, and sustainable transport solutions for both residents and visitors.

The main objective of the action plan and the listed measures is to improve the public transport offer for the residents but also the tourists by optimizing the coordination between lines, extending the offer during specific daytimes and filling gaps in the existing PT plan by DRT-offers.

During the elaboration of the mobility blueprint of Osttirol RMO will identify points in the region, which would be most suitable for a future implementation of DRT-Systems, where it would be interesting to adapt general PT offer, design new routes for PT or where capacities must be increased. In the blueprint, there will be recommendations to adapt the offer of these points which is an objective for the following time after the project lifetime.

By doing so, the accessibility and useability of PT will be enhanced and therefore the base for heavier use of PT will be made. Finally, this will improve quality of life and enhance decarbonization in Osttirol.

## 4.2. Proposed measures for the Action plan (draft)

### 4.2.1. Measure 1: Establish DRT offers for several municipalities with potential need/demand

Several settlements in Osttirol, like for example Tessenberg<sup>2</sup>, part of the municipality of Heinfels in the Puster valley, which is a settlement with about 200 inhabitants, are not connected to any public transport service or bus line. Tessenberg is located at an elevated position above the valley and is about 3km away from the next bus stop. This makes it almost impossible for some groups of people who don't have a car to do their daily routines, parents must bring their kids to school and older people are either dependent on their families or have to own a car.

Since there is a road coming from two sides into the settlement, it is possible to connect the two neighbouring communities via this route and try to offer a DRT-system like a dial-a-bus or a community e-car service. For that, first the municipality must commit to implementing an offer. Then, it can be

<sup>2</sup> Other Settlements without functional Connection to PT: [Stronach](#), [Hollbruck](#), [St. Oswald](#), [Wacht](#), [Alkus](#), [Gwabl](#), [Oberleibnig](#), [Bichl](#), [Zedlach](#), [Proßegg](#), [Gruben](#), [Berg](#), [Hintenburg](#)



determined, what kind of offer RMO wants to implement also depending on the financial power of the municipality and in dialogue with the inhabitants what the DRT-System should look like (operating times, size of vehicle, legal requirements, financing, volunteers etc.).

**Main facts:**

**Timing for implementation:** 6 months pilot, specific timing can vary, depending on what is already available in the municipality.

**Institution(s)/ department(s) responsible for implementation:** Municipalities, RMO, DRT-operator or VVT or Taxi company, ÖPNV Verband Osttirol.

**Stakeholders involved and responsibilities:**

- Municipalities: implementation;
- RMO: coordination;
- ÖPNV Verband Osttirol: collecting interests/needs from all communities;
- Taxi Companies: potential operators but they might also be against a DRT-Systems, as it could substitute their services.;
- General Public.

**Risk and/ or vulnerability tackled:** potential low acceptance by general public - early involvement in process.

#### 4.2.2. Measure 2: Improve coordination between trains and bus lines in Lienz

During the interviews with the municipalities, it was often mentioned, that specific bus lines starting from Lienz train station do not well coordination with the incoming trains, with buses leaving just before trains arrive. This is due to the large number of pupils using these busses who are an important group of users rather than the small number of tourists who complain about missing a bus and having to wait an hour for the next bus.

This problem has to be addressed in the new tender for PT and if it cannot be solved by a better coordination between bus and train, DRT Systems with a specific target group could be a solution.

**Main facts:**

**Timing for implementation:** immediately with new PT-program, open end.

**Institution(s)/ department(s) responsible for implementation:** Municipalities, RMO, ÖPNV Verband Osttirol, VVT.

**Stakeholders involved and responsibilities:** Communities are responsible for implementation, since earlier plans on a regional basis were put to rest due to lack of feasibility. Thereby, useful solutions at this time, can only take place in a small scale, organized by the municipalities in form of the before mentioned community-based DRT-Services (“Gemeindemobile”), RMO responsible for coordination, general public.

**Risk and / or vulnerability tackled:** enhanced connection between bus and train, better useability of train for residents and tourists.

**Estimated deployment costs:** costs should be low, only adaption to the bus lines necessary.

**Dependencies on other proposed measures:** when adapting bus lines always check with other municipalities to identify dependencies and conflicts of time tables.



**Will this measure continue after the project?** If pilot is successful, and adaption sustainably effective: yes.

#### 4.2.3. Measure 3: Optimize bus lines in the region and react to input from municipalities

By directly interviewing municipalities on their expectations and objectives for public transport, RMO identified existing gaps in the PT offer in Osttirol. RMO will use this information to provide input to the tender of the new PT program, which includes the two existing DRT-Systems in Puster Valley and Deferegggen Valley. These could also be optimized by implementing virtual stops or extend their operating hours for example. At the moment, these DRTs have a classic timetable and route with fixed stops but only operate with a prior call for ordering them. By operating this way, they are not very flexible and are only suitable to complement the classis bus line operating in parallel.

**Main facts:**

**Timing for implementation:** immediately with new PT-program, open end.

**Institution(s)/ department(s) responsible for implementation:** municipalities, RMO, local PT Authority (ÖPNV Verband Osttirol), VVT.

**Stakeholders involved and responsibilities:** VVT: implementation, RMO: coordination, general public, municipalities as principals.

**Risk and / or vulnerability tackled:** optimized bus timetable, better useability of local PT for residents and tourists.

**Estimated deployment costs:** adaption of timetable of bus lines necessary.

**Dependencies on other proposed measures:** adapted bus lines always have to be check with other municipalities and dependencies of bus timetable in relation to the general timetables.

**Will this measure continue after the project?** If pilot is successful, and adaption sustainably effective, yes.



## 5. Monitoring and evaluation

The following results are expected from the implementation: better connection to existing PT system, lower dependence of residents on cars, greater resilience to weather issues, smaller CO<sub>2</sub> footprint of the region in general and positive effects on tourist mobility.

Risks associated with planning and implementation are: financing of VVT- DRT, finding an operator, adaption of bus line 941 or 942 (Dölsach) may not be feasible or possible, VVT may not be willing to cooperate.

The following KPIs can be defined:

- Dialogue with municipalities - number of events/meetings, stakeholders involved.
- Dialogue with residents - number of events/meetings, stakeholders involved.
- Number of people transported.
- Km driven by DRTs.
- Number of trips made.
- People affected positively: survey on user satisfaction.
- Number of cars in Municipality (new registrations).
- Traffic count before and after implementation of measure.
- Number of km per car: based on survey.



## 6. Conclusions and next steps

The Action plan will be given to VVT and the goal is to get their confirmation that they will consider it when setting up the new PT-program which will be tendered at the end of 2025, contracted in August 2026 and implemented by the end of 2027. Furthermore, the Action plan will be approved by the ÖPNV community association and also included for further planning and implementations since it brings a holistic picture of the mobility situation in Osttirol.

Although RMO is not bringing an actual pilot to practice, the blueprint of the region RMO is working on will be a detailed plan to setup the right mix of traditional PT and DRT Systems in the region of Osttirol. Furthermore, the momentum of sneaking into the new setup of the PT program is the best time possible to deliver inputs which will be brought to practice very soon.

The elaborated data will be up to date, so RMO doesn't rely on old characteristics of the region. Also results from predecessor projects like "last mile" or a regional study of the factory traffic will be used to cover these types of transport.

Next steps will be detailed dialogues with the partnering municipalities, where RMO identified potential changes of PT-lines and useful DRT potential and collect these inputs to integrate them into the new tender for PT in Osttirol. With the same objective, RMO will organize a big workshop with all stakeholders to discuss the changes and adaptations in the big group and finalize our input to the tender.

Subsequently, RMO will then continue to concentrate on the digitalization (unified app for intermodal transport and PT offer) and accompanying this with the simplification of access and use of the PT offers and also intermodality in Osttirol.



## 7. References

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- 8) DREAM\_PACE D2.1.3 “Development scenarios for DRT innovative digital and operational approaches”. 2024.
- 9) DREAM\_PACE D2.2.1 “Living labs preparation: stakeholder mapping, raising awareness and local engagement”. 2023.
- 10) DREAM\_PACE D3.1.1 “Methodological background for the design of DRT integrated solutions”. 2023.
- 11) DREAM\_PACE D3.1.2 “DRT strategy draft and setup of the consultation process”. 2024.



## 8. Annex - Pictures from current PT offer in Osttirol



Skibus St. Jakob in Deferegggen.



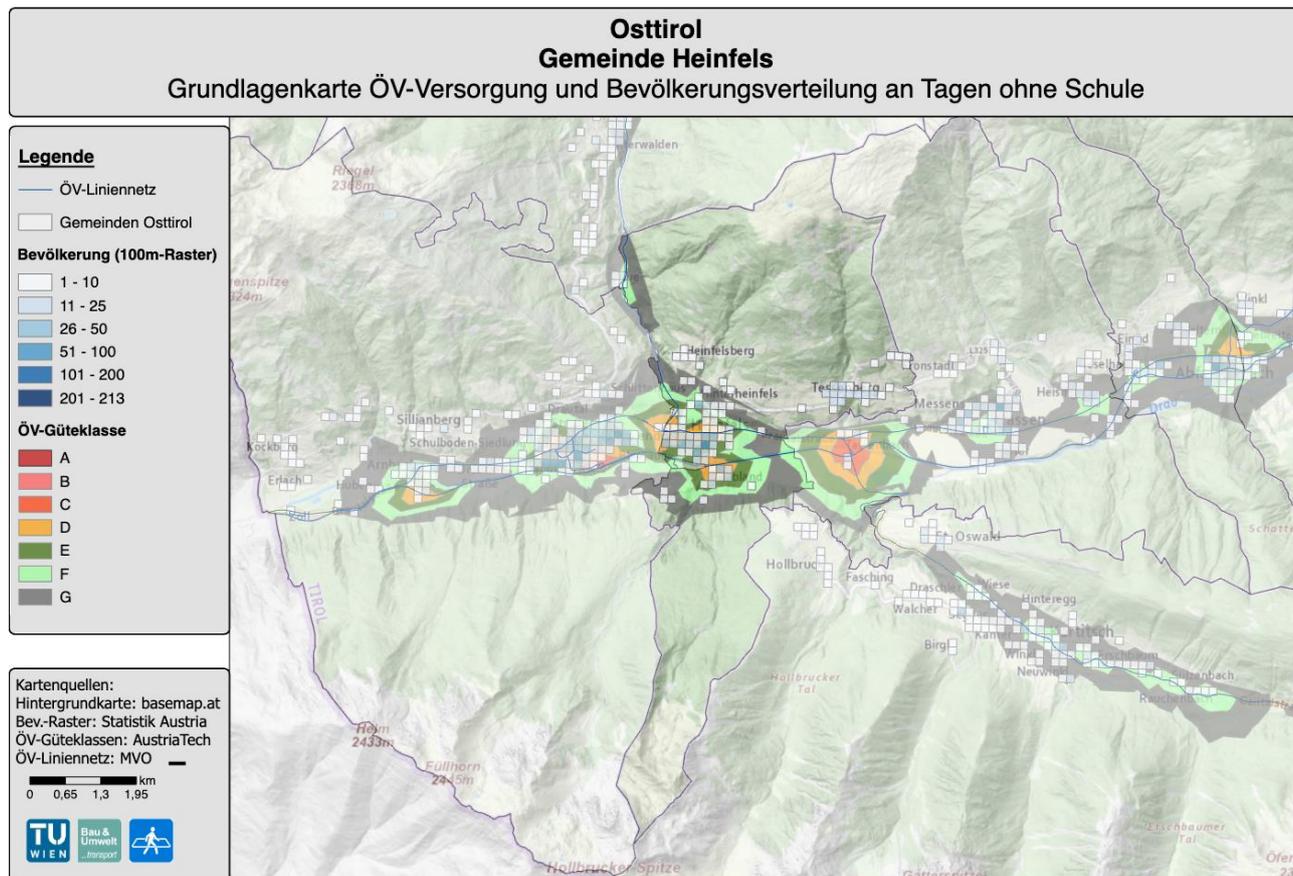
*PT on its limit during rush hour.*



*Bus in reserve, must be available at all times, cannot be used to balance demand.*



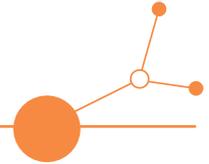
*Checking the PT and DRT-Routes in live action.*



Example of mapping of PT offer and Settlement/Inhabitants, done for all 33 municipalities in Osttirol.

# D3.2.1 Action plan drafts in the six pilot regions

## Pavia-Oltrepò



Final Version

02 2025





## Authors of the document

Partner No.	Acronym	Name	Action	Version
2	Redmint	Gabriele Grea Anja Seyfert	Template	1
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3	AG	Monica Marconi Marco Cirtoli	Input from Pavia pilot 1.1	1.4
4	Mobilissimus	Nikolett Csörgő Rita Petrovác	Draft revision 1	1.5
3	AG	Monica Marconi Marco Cirtoli	Feedback to the revision 1 and final version	Proposed final
8	ATE	Florian Kressler	Edited approved version for official release	Final



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## 1. Executive summary

The territory of central Europe is characterised by uneven transport connections and mobility opportunities, across and within regions, between urbanized contexts and rural and peripheral areas.

The project's common challenge is to improve accessibility and connectivity in CE peripheral and rural areas through better integration of public transport networks with Demand Responsive Transport (DRT) services, building on joint development and implementation of governance, planning, digital and operational innovations.

DREAM\_PACE will develop innovative DRT concepts complementing regional mobility networks.

The project will improve DRT planning and delivery capacities of public authorities and operators.

A new generation of DRT services will become functional and integral part of regional mobility networks, enhancing accessibility for citizens, territorial cohesion and social inclusion. Integration is the key to the DREAM\_PACE innovative approach, as DRT services are mostly developed as stand-alone solutions to specific needs, the potential of scalable strategies and solutions is widely underestimated.

Project Partners (thereafter PP) will jointly develop a strategy for DRT in Sustainable Urban Mobility Plans to be adopted at EU level, co-design, test and implement innovative DRT solutions enhancing mobility networks. Strategies and solutions will foster a better integration of DRT and public transport (Bologna, Pavia, Budapest areas), support a higher coordination among existing DRT initiatives (Osttirol, Baden-Württemberg) and experiment new integrated approaches for DRT "green fields" (Split-Dalmatia County).

DREAM\_PACE will exploit the potential of integrated planning and digital and operational innovations for a common strategy and develop innovative DRT modular solutions. The project implementation builds on transnational cooperation to guarantee an adequate responsiveness and adaptability of project results to specific characteristics of mobility ecosystems across CE rural and peripheral areas.

This document is the third of six draft Action plans for the DREAM\_PACE pilot regions that altogether constitute the deliverable D3.2.1, and focuses on the Pavia - Oltrepò area. As D3.2.1 will not be a public deliverable, it was decided to keep the six Action plan drafts separate, while their final versions that compose D3.2.3 will be consolidated in a single document. D.3.2.1 builds on the analysis and diagnosis of governance and planning (Activity 1.1) and of operational trends and approaches to DRT (Activity 2.1) and on the DRT strategy elaborated in D3.1.2 and for which the consultation process is being completed.

This document is organized as follows.

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Chapter 3 describes the starting point for the development of the Action plan, highlighting the needs and priorities identified, the challenges addressed, and the stakeholder involvement process. It also presents the baseline scenarios discussed with them and the next steps agreed upon.

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Chapter 5 details the monitoring and evaluation process for the Action plan, including the expected results of implementation, risks associated with planning and execution, and the estimated relevant impacts.

Chapter 6 serves as the concluding chapter, outlining how the Action plan will be officially approved or taken up, summarizing the overall approach, and presenting the next steps.

Finally, chapter 7 provides a comprehensive list of references, offering background information and sources supporting the document.



## 2. Introduction

The **Oltrepò Pavese** is a mainly hilly rural area, composed of about 30 small municipalities; Stradella (main urban municipality of the area) is the main destination of travel from other municipalities, for work reasons, thanks to the considerable development of all production sectors (especially logistics), for study reasons, thanks to the presence of secondary schools and for leisure and shopping reasons, thanks to the presence of some commercial activities and an important market on a bi-weekly basis.

**Miobus** is a DRT service with free itineraries between a predefined set of stops, available in the following service hours: in the school period, from Monday to Friday 9.30-11.30 / 16.30-18.30; Saturday 6.00-10.00 / 12.00-14.00 / 17.00-19.00; in the non-school/summer period, Monday to Saturday 6.00-10.00 / 12.00-14.00 / 17.00-19.00. During the booking phase, the passenger can choose the departure stop, the arrival stop and the desired departure or arrival time; the management system accepts the request and organises the trip according to the availability of the buses for the requested stops and departure/arrival time. In the same area, in addition to the DRT service, there are some fixed lines to reach other destinations outside the area (e.g. line 132 Stradella-Voghera; line 95 Castel S. Giovanni-Stradella-Pavia-Milano Famagosta), where interchange with the DRT service is possible; there are two railway lines as well (Piacenza-Voghera and Piacenza-Pavia-Milano via Stradella and Broni).

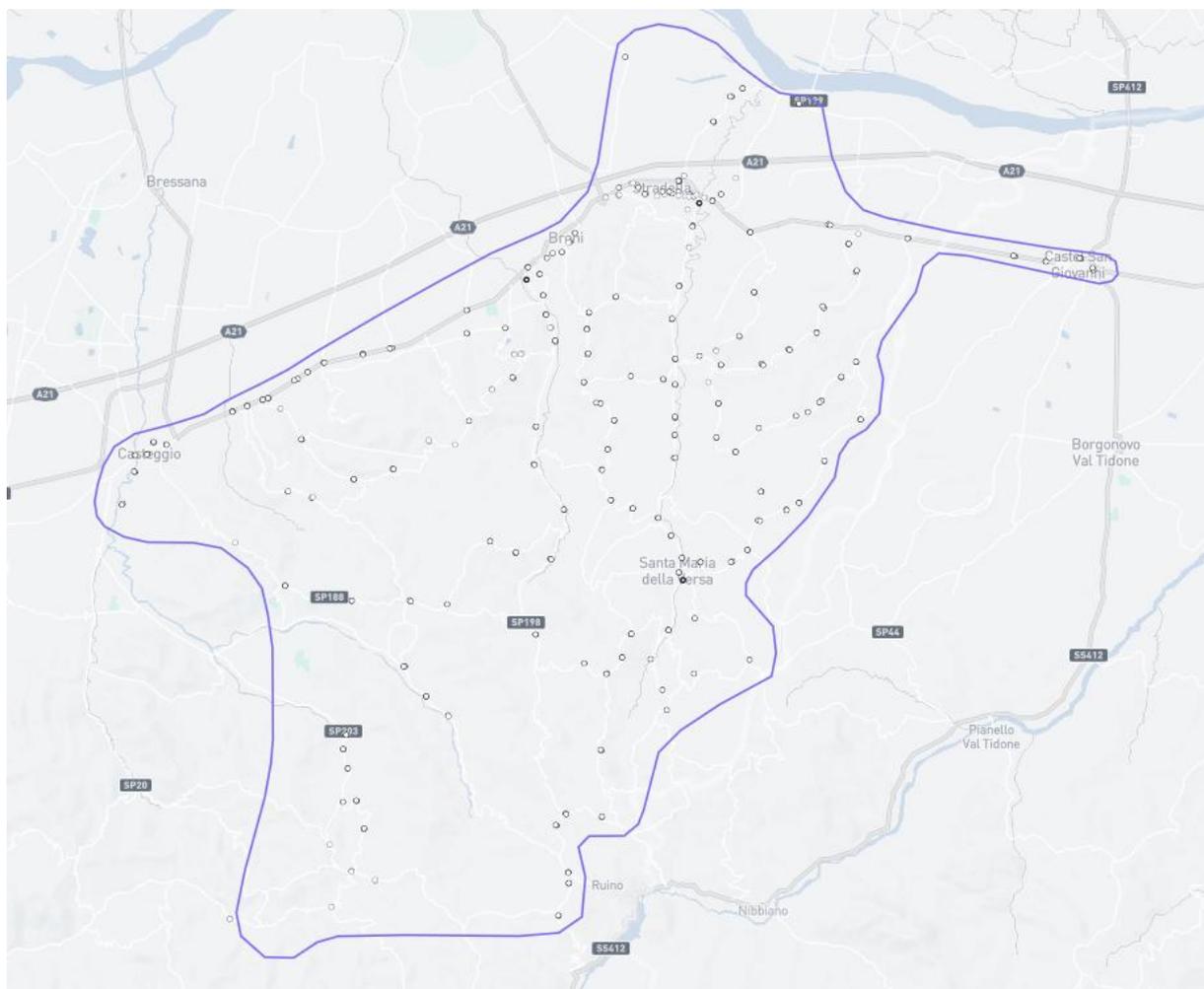


Figure 1. Pilot area Oltrepò Pavese



The **main recognised advantages** of the current Miobus service are the following:

- Completely digital experience for the customer: booking, change (up to 30 minutes before departure time), confirmation, real-time notifications, check-in and travel;
- Fully digital service experience for the driver: list of journeys to be completed, passengers to be accompanied, and check-in via a special device installed on board the bus;
- Optimisation of routes between booked stops according to actual travel requirements to ensure environmental sustainability;
- Integration with traditional scheduled services within the customer app.

The **main challenge** is to address the weaknesses in the system: the service should be able to integrate flexibility and reliability and help address mobility needs of the different target groups, even the elderly, of the population. Filling these gaps requires a more composite approach to the service planning and the digital and operational innovations.

The **main purpose** of the Action plan is to increase the potential of DRT solutions in the Pavia - Oltrepò area through a mix of planning, technological and soft measures putting citizens and local communities at the centre of the network. The measures proposed in the Action plan can also be considered as a targeted strategy for the extension and implementation of integrated DRT solutions in new areas, aligned with the broader business strategy of the company.



### 3. Strategic background and scenarios developed in the area

Starting point of the activities were Living Lab workshops, held on 21 and 29 November 2023, 13 March and 28 August 2024. They were carried out with the involvement of several Municipalities, a regional public Authority and some Miobus users. The meetings focused on showing the service in practice, sharing with the stakeholders the main digital functionalities of the new system to be tested, discuss the next innovations and prepare for the testing phases.

They highlighted the main challenges of the territory and validated the strategy and the scenario perimeter. The main elements that emerged are:

- Accessibility;
- Improvement of reliability and flexibility;
- Better communication of the services in the territory.

The activities have been enriched with the involvement of local stakeholders to become “ambassadors”<sup>1</sup> and supporters of the service, in particular where there is a lack of information and knowledge on how to use it.

The stakeholders involved can be clustered into three main groups:

- Stakeholders with competences in public transport governance and planning, selected on a territorial scope basis (responsible for the testing area or other pilot areas);
- Stakeholders with competences in public transport operations, selected on a type of operational territory basis (responsible for services in low demand areas, with similar characteristics);
- Stakeholders with competences in digitalization and DRT, selected considering experiences and market scope (one is a SME with strong focus on mobile market, one has experience at EU level, and the third is a global company).

Their contribution will be useful to validate the approach from three different perspectives and identify potential for improvement to be consolidated in the validated solutions.

The scenario development and discussion process led to the identification of the following elements for the enhancement of the DRT service through operational and digital innovations:

- The integration between the Miobus (DRT) and the Autoguidovie (PT) Apps, in order to support a multimodal and efficient use of the services;
- The testing and implementation of measures to increase the user-friendliness and inclusiveness of the DRT solutions for the engaged territories;
- A targeted communication approach increasing knowledge and acceptance of the DRT network and its potential among the citizens.

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<sup>1</sup> These ambassadors are small local activities (e.g. newsagents, tobacconists, meeting points such as bars or centres for elderly people)



## 4. Development of the Action plan

### 4.1. Activities developed on the territory and objective of the plan

The Pavia Oltrepò area is interested in the activities of Pilot: 1.1 “**GOVERNANCE AND PLANNING of INTEGRATED DRT public transport in a MaaS logic for peripheral and low demand areas**”. Within this framework, a **new model for the identification of DRT services in the network, and for the analysis of economic performance and compensations**, is being tested. The business planning tool for flexible management of DRT-PT (tested of running services) is designed to support the planning of DRT services in low demand areas according to relevant territorial, socioeconomic and mobility data. The tool will be tested on existing services, to identify: a) the parameters to be taken in consideration for the identification of DRT suitable areas, b) the applicable DRT operational models, c) the optimal layout of flexible and scheduled options. The tool will be tested internally on defined areas and routes within the network, then validated by relevant stakeholders. A second round of testing will be conducted by the other partners involved in the pilot action (SRM, BKK) for a comprehensive validation.

Within the framework of co-design solutions components to be tested in Pilot 2.1 “**enhancing existing DRT networks responsiveness in rural and peripheral areas through DIGITAL/OPERATIONAL INNOVATIONS**”, the activities in the Pavia - Oltrepò area are focusing on:

1. **Digital integration between DRT and PT;**
2. **New approaches to inclusiveness.**

In particular, concerning the first point, the digital/operational innovation is represented by the **display of information on traditional public transport services as well as DRT services on the same interfaces**, namely the Miobus (DRT) app, the Autoguidovie (PT) app and website, and the web app designed to be integrated in the interactive screens (totems) to be installed at bus stops. The aforementioned digital systems will provide the following information/functionalities:

- Timetables of bus lines with interchange at the DRT stops (routing POI);
- Possibility of booking DRT service in connection with bus line service;
- Points of interest near the DRT stops (public services, touristic attractions, cycling routes, etc.).

Regarding the new approaches to inclusiveness, as mentioned, **interactive screens (totems) will be installed at three selected bus stops**, facilitating the access to information (e.g. real time position of the vehicles) and booking of services. Screens will be installed, and dedicated testing and demonstration of the digital functionalities to the citizens will be organised on the territory.

The reference area is represented by about 30 small municipalities in the area, where Stradella (main urban municipality in the area) represents the main travel destination for commuters (workers and students) as well as for leisure purposes. In this area, the DRT service operates with free itineraries between a predefined set of stops, in the following service hours:

- In the school period:
  - Monday to Friday h.9.30-11.30 / 16.30-18.30;
  - Saturday h.6.00-10.00 / 12.00-14.00 / 17.00-19.00.
- In the non-school/summer period:
  - Monday to Saturday h.6.00-10.00 / 12.00-14.00 / 17.00-19.00.

It is worth adding here that, as emerged during the Living Lab co-design process, one of the major challenges for the success of DRT in the Oltrepò area is represented by the difficulties of communicating the existence



as well as the user friendliness of the service. Testing activities will be accompanied by tailored communication and engagement activities on the territory, with the triple objective of raising awareness on the service and its potential, training current and potential users in using digital features, and monitoring the impact of tests through surveys and interviews.

In summary, the work carried out within the project has identified **three interlinked objectives** (or strategic streams) that will guide the definition and future implementation of measures to enhance DRT planning and operations in the Pavia - Oltrepò area and beyond:

- I. Proceed towards a deep **integration between traditional and DRT services based on intermodality and enhanced accessibility**, starting from the network planning to the digital integration and optimisation of operations;
- II. **Guarantee inclusiveness and easy access**, by designing services and digital tools around local communities and participation;
- III. Establish an **effective communication approach** with local communities on the territory, in order to increase the knowledge and the use of the service.

## 4.2. Proposed measures for the Action plan (draft)

Connected to the three objectives summarised above, the following set of measures has been drafted, to be validated with stakeholder and adopted by Autoguidovie within its strategic planning approach for low demand territories.

### 4.2.1. Measure 1: Apply the planning model/tool to new areas to define low demand and design effective and efficient services

The measure refers to the objective (I), and consists in the application of the solution component “**New model for the identification of DRT services in the network, and for the analysis of economic performance and compensations**” (tested in Pilot 1.1), to different peripheral and remote territories, in order to better understand the potential of DRT solutions, and the conditions under which their development can be provided. The ambition is to make this model a tool for the assessment of business and network development opportunities, and to use the outcomes of the analysis to promote new DRT applications.

#### Main facts

The measure will be implemented according to the opportunities of market and network development (tendering procedures), to design and propose innovative solutions to the authorities awarding the service contracts. Further tests in selected areas will be promoted in the first year.

As the tool will be publicly available after the conclusion of the project, the costs of implementation of the measure are related to the data collection, estimation of inputs and processing. Furthermore, the model can be continuously improved and adapted to different purposes and scopes by refining parameters according to experience and specific studies.

### 4.2.2. Measure 2: Apply Integration principles and IT approaches to different contexts and areas

The measure refers to the objective (I), and consists in the application of the solution component “**Display of information on traditional public transport services as well as DRT services on the same interfaces**”



(tested in Pilot 2.1), to DRT services in different areas. The ambition is to scale up the tested solution components to support a consolidated DRT digital model for low demand areas.

**Main facts:**

The measure will be implemented in other territories where the company is providing DRT services. Costs of implementation will be integrated in the digital mapping, set up and licencing of the DRT software for new areas. However, the solution provided is expected to be scalable, depending in some cases on other apps and IT systems with which it will be integrated in a MaaS logic (e.g. when a local/regional MaaS architecture is established).

#### 4.2.3. Measure 3: Reuse the concept of totems

The measure refers to the objective (II), and consists in the replication of the solution component “**New displays facilitating information and booking, proximity info points and digital gyms**” (tested in Pilot 2.1), in selected bus stops. The ambition is to scale up the tested solution in other stops and low demand areas.

**Main facts:**

The measure will be implemented at other stops in the area, and in other territories where the company is providing DRT services. Technologies might differ according to the scope and functionalities to be activated: the most important element is non technological, and refers to the engagement actions in the territory to reduce the digital divide and increase participation. The costs of equipment might represent a barrier, so simpler solutions might be considered.

#### 4.2.4. Measure 4: Develop a communication strategy for DRT in low demand areas

A communication strategy focused on the promotion of digital and DRT services in low demand areas will be developed to support the launch of future services and the extension of DRT, building on the experiences of DREAM\_PACE and other projects.

**Main facts:**

The measure will be implemented beyond the scope of the project, in synergy with other initiatives. A joint communication strategy will be used as blueprint for targeted campaigns in different territories with similar characteristics and challenges.



## 5. Monitoring and evaluation

The monitoring and evaluation plan for the measures will be designed according to the following approach.

### **Measure 1 - Apply the planning model/tool to new areas to define low demand and design effective and efficient services.**

Expected results of the implementation: assessment of DRT potential in new areas (e.g. >3 new territories).

Risks associated to planning and implementation: the number of areas for the analysis depends on the business development opportunities (new DRT services, tenders, etc.).

Estimated relevant impacts: improved planning of “natively integrated” DRT services; increased accessibility of low demand areas (increase of territorial coverage, measured in number of stops or sq/kms of territory covered).

### **Measure 2 - Apply Integration principles and IT approaches to different contexts and areas.**

Expected results of the implementation: new services digitalised and integrated (e.g. >3 new services).

Risks associated to planning and implementation: the number of digitalised/ integrated services depends on the business development opportunities (new DRT services, tenders, etc.).

Estimated relevant impacts: increased intermodality (increase of integration, measured in number of traditional and DRT services matched, increased number of users, increased number of users utilising both services).

### **Measure 3 - Increase inclusiveness, reuse of the concept of totems.**

Expected results of the implementation: new stops/territories equipped (e.g. >5 new totems).

Risks associated to planning and implementation: cost and permissions for installation; however, other technological simplified solutions might be considered.

Estimated relevant impact(s): better knowledge of services, user friendly access, measured in number of stops covered, and also increase of users and number of bookings via totems.

### **Measure 4 - Develop a communication strategy for DRT in low demand areas.**

Expected results of the implementation: a communication blueprint to promote DRT to be adopted in different areas.

Risks associated to planning and implementation: timing for the adoption of the strategy depend on several factors at local level.

Estimated relevant impacts: better knowledge of services, higher acceptance.



## 6. Conclusions and next steps

The measures proposed will be shared at two different levels, in order to be validated:

- Internally, different companies and departments within the Autoguidovie Group will be engaged in order to discuss the measures, their strategic relevance, applicability, scope and time for implementation;
- Externally, engaging the stakeholders of the Pavia Oltrepò area, and especially the PTA, to validate the framework of measures and discuss their relevance and the possibility of integrating them in the mobility planning process.

The uptake of the Action plan will happen with a formal decision of the company board on the final set of measures validated and agreed upon. The Action plan will also be mentioned as relevant project output in the company's Sustainability Report.

The adoption of the Action plan, following the two validation steps described above, will be finalized within the project framework and therefore before February 2026.

In April/May 2025 both the validation processes (internal and external) will start, with the objective of consolidating the final version by September/October.

Internal peer reviews, focus groups and meetings will be organised to discuss the objectives and measures.

External Living Lab and bilateral meetings with stakeholders will take place in order to assess the acceptance of the measures proposed, and collect feedback and recommendations.

The measures envisaged will support the evolution of DRT services as strategic option in the mobility network development with specific focus on peripheral and remote areas, while guaranteeing their sustainable and durable implementation by enabling integration and inclusion.

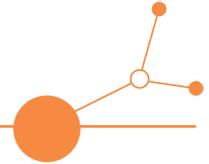


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- 1) DREAM\_PACE Application Form, Version 2.0. 2023.
- 2) DREAM\_PACE D1.1.1 “Report on governance and planning for public transport, mobility innovations and DRT in CE Regions”. 2023.
- 3) DREAM\_PACE D1.1.2 “State of the art report on governance structures and planning processes for DRT in the pilot areas”. 2024.
- 4) DREAM\_PACE D1.1.3 “Development scenarios for DRT innovative governance and planning approaches”. 2024.
- 5) DREAM\_PACE D1.2.1 “Living labs preparation: stakeholder mapping, raising awareness and local engagement”. 2023.
- 6) DREAM\_PACE D2.1.1 “Analysis report on DRT digital and operational innovations in CE Regions and engaged areas”. 2023.
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- 9) DREAM\_PACE D2.2.1 “Living labs preparation: stakeholder mapping, raising awareness and local engagement”. 2023.
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- 11) DREAM\_PACE D3.1.2 “DRT strategy draft and setup of the consultation process”. 2024.

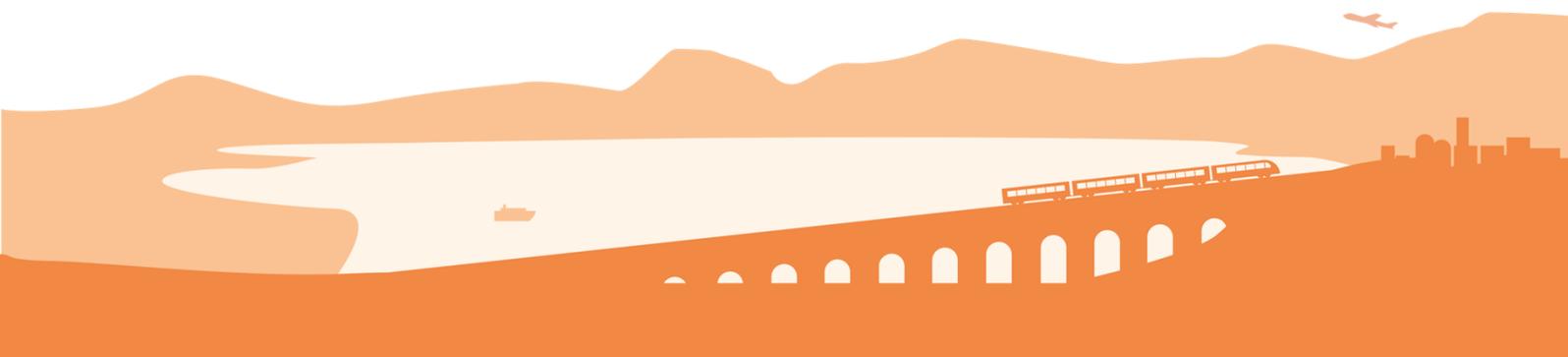
# D.3.2.1 Action plan drafts in the six pilot regions

## Split-Dalmatia County (SDC)



Final Version

02 2025





## Authors of the document

Partner No.	Acronym	Name	Action	Version
2	Redmint	Gabriele Grea Anja Seyfert	Template	1
8	ATE	Florian Kressler	Template	1.1
6	Dyvolve	Saša Bart Dijana Mišerić Beganović	Input from SDC Pilot 1.1 and 2.2	1.2
8	ATE	Florian Kressler	Draft comments	1.3
6	Dyvolve	Saša Bart Dijana Mišerić Beganović	Input from SDC Pilot 1.1 and 2.2	1.4
4	Mobilissimus	Nikolett Csörgő Rita Petrovác Balázs Fejér	Draft revision 1	1.5
6	Dyvolve	Saša Bart Dijana Mišerić Beganović	Feedback to the revision 1 and final version	Proposed final
8	ATE	Florian Kressler	Edited approved version for official release	Final



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## 1. Executive summary

The territory of central Europe is characterised by uneven transport connections and mobility opportunities, across and within regions, between urbanized contexts and rural and peripheral areas.

The project's common challenge is to improve accessibility and connectivity in CE peripheral and rural areas through better integration of public transport networks with Demand Responsive Transport (DRT) services, building on joint development and implementation of governance, planning, digital and operational innovations.

DREAM\_PACE will develop innovative DRT concepts complementing regional mobility networks.

The project will improve DRT planning and delivery capacities of public authorities and operators.

A new generation of DRT services will become functional and integral part of regional mobility networks, enhancing accessibility for citizens, territorial cohesion and social inclusion. Integration is the key to the DREAM\_PACE innovative approach, as DRT services are mostly developed as stand-alone solutions to specific needs, the potential of scalable strategies and solutions is widely underestimated.

Project Partners (thereafter PP) will jointly develop a strategy for DRT in Sustainable Urban Mobility Plans to be adopted at EU level, co-design, test and implement innovative DRT solutions enhancing mobility networks. Strategies and solutions will foster a better integration of DRT and public transport (Bologna, Pavia, Budapest areas), support a higher coordination among existing DRT initiatives (Osttirol, Baden-Württemberg) and experiment new integrated approaches for DRT "green fields" (Split-Dalmatia County).

DREAM\_PACE will exploit the potential of integrated planning and digital and operational innovations for a common strategy and develop innovative DRT modular solutions. The project implementation builds on transnational cooperation to guarantee an adequate responsiveness and adaptability of project results to specific characteristics of mobility ecosystems across CE rural and peripheral areas.

This document is the fifth of six draft Action plans for the DREAM\_PACE pilot regions that altogether constitute the deliverable D3.2.1, and focuses on the Split-Dalmatia County (SDC). As D3.2.1 will not be a public deliverable, it was decided to keep the six Action plan drafts separate, while their final versions that compose D3.2.3 will be consolidated in a single document. D.3.2.1 builds on the analysis and diagnosis of governance and planning (Activity 1.1) and of operational trends and approaches to DRT (Activity 2.1) and on the DRT strategy elaborated in D3.1.2 and for which the consultation process is being completed.

This document is organized as follows.

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Finally, chapter 7 provides a comprehensive list of references, offering background information and sources supporting the document.



## 2. Introduction

Split-Dalmatia County (SDC) is the largest county in the Republic of Croatia by area. It includes the coastal region, islands (Brač, Hvar, Vis and Šolta), and the hinterland (Dalmatian Zagora). The largest city and administrative centre is Split. According to the latest census, around 420,000 inhabitants live in the county. The highest population concentration is in the coastal cities, while Dalmatian Zagora is less populated. The main economic activities are tourism, shipbuilding, trade, fishing, and agriculture.

The region faces challenges in transport connectivity, especially in rural and peripheral areas, where public transport is limited or inefficient. Traffic congestion is prevalent in urban areas like Split. The main need of SDC is to improve connectivity in rural and peripheral areas and to national and European transport networks by enhancing transport links between its rural and peripheral areas, transport hubs, and regional economic centres (mainly Split). Currently, the public transport system is sub-optimally organized. This results in significant traffic congestion and delays in regional centres, especially in Split. Therefore, the primary expectation from the pilot project is to enhance sustainable mobility by introducing the DRT service.

To address these issues, the county plans to implement a pilot project introducing Demand Responsive Transport (DRT) services. The goal is to improve mobility, enhance connectivity between rural and urban areas, and integrate DRT with the existing public transport system. This pilot project aims to benefit various groups, including socially vulnerable individuals, students, pensioners, and people with reduced mobility.

The pilot will be conducted in the municipalities of Dugopolje, Dicmo and City of Trilj, with activities including research, service design, procurement, testing, and implementation. Stakeholders include local authorities, future service providers, digital platform providers, and the general public.

According to the latest population census (2021), the area of Dugopolje has 3.742 inhabitants, while the area of Dicmo has 2.805 and Trilj has 8.182 inhabitants. In Dugopolje there is the Podi Dugopolje business zone, where employees from the surrounding areas of Dugopolje and Dicmo work. The business zone includes supermarkets, restaurants, gas stations, ATMs, clothing stores, furniture showrooms, business premises (office and warehouse spaces), a hotel (currently closed), a polyclinic, a sports centre with a football stadium, a visitor centre, and educational (conference) halls. Additionally, there are plans to build a market for local products.

It is expected that the new model for integrating DRT into public transport and the DRT service implemented during the project will encourage investment from other financing instruments and reduce barriers to major hubs and economic centres. The implementation of the DRT service will demonstrate the feasibility of new approaches.

Key components of the Action plan include organizing a tender for selecting the DRT service provider, testing the service, and conducting public presentations. Challenges during the process could involve delays in procurement, attracting bidders, and generating user interest.

Expected outcomes include improved connectivity, reduced emissions, energy savings, and greater mobility in areas with low public transport availability. Success will be measured through data collection on service usage, user satisfaction, and operational efficiency.

The Action plan also includes monitoring and evaluation, with defined key performance indicators (KPIs) to assess the effectiveness of the DRT service and its integration into the public transport system.



### 3. Strategic background and scenarios developed in the area

SDC is the largest county in the Republic of Croatia by area. It includes the coastal region, islands (Brač, Hvar, Vis and Šolta), and the hinterland (Dalmatian Zagora). The largest city and administrative centre is Split. According to the latest census, around 420.000 inhabitants live in the county. The highest population concentration is in the coastal cities, while Dalmatian Zagora is less populated. The main economic activities include tourism, shipbuilding, trade, fishing, and agriculture. The area is shown below in the image.



Figure 1. The area covered by Split-Dalmatia County, website Croatian Chamber of Economy

The SDC area is characterized by a large territory with varying transport demand (high in coastal cities and low in the hinterland). The starting point for developing the Action Plan was identifying the need to **improve mobility in areas of SDC where traditional public transport services do not exist or where demand is highly variable or low.**

Public transport is traditionally organized. In the county, transport services still operate based on issued permits. Ongoing projects aim to organize public transport in the county as a public service in accordance with EU Directive 1370/2007.

There is a **recognized need for introducing models such as DRT, which currently does not exist in SDC or anywhere in the Republic of Croatia.** During Living Lab (LL) meetings, a specific area for implementing the pilot project was defined in the municipalities of Dugopolje, Dicmo and the City of Trilj. **The goal is to connect surrounding settlements with business zones and complement the existing public transportation network.**



The biggest **challenges** were identified in the field of tenders. During the tender process, the following risks are possible:

- Delays in the public procurement process due to complaints;
- The possibility that no bidders will respond;
- Delays in contract negotiations.

Other possible risks include:

- Low user turnout;
- Application performance issues (delays due to internet connectivity).

Besides the tender, further challenges may occur in **generating user interest** in the new public transport service. After defining the area of the pilot project (the area of Dugopolje, Dicmo and City of Trilj), a list of stakeholders was established, consisting of:

- Local authorities (municipality of Dugopolje and City of Trilj);
- Future public transport operator (PTO);
- Future digital service provider;
- Regional authority (SDC);
- General public (business zone Podi, Dugopolje).

(1) **Local authorities (municipality of Dugopolje and Dicmo)** are a local administrative unit situated in the Split-Dalmatia County, Croatia. It is known for its strategic location between the city of Split and the inland regions, making it an important hub for both urban and rural connectivity.

**Competences:** Direct insight into the needs of the population, infrastructural capabilities and information gathering (identifying the needs of the population).

**Role:** stakeholder collaboration and DRT service promotion.

**Contribution to the pilot:** evaluation of the service and its impact. It is expected to collect basic information on areas requiring DRT services and identify potential new locations for future expansion.

(2) **Future PTO** is the future DRT service provider in the Trilj, Dugopolje and Dicmo area. He will be selected through a public procurement tender. He is essential for the successful operation of the service as he provides transport infrastructure, vehicles, and drivers, ensuring the service is adapted to users.

**Competences:** ensuring vehicles and drivers, using digital platforms

**Role:** providing the service to users, adapting the service to users.

**Contribution to the pilot:** increasing transport availability in low-demand areas. The PTO is required to maintain a high level of professionalism in delivering the service and maintain continuous communication with the SDC on a monthly basis.

(3) **Future digital service provider** is the future provider of the technical solution in the DRT field. He is essential for the successful operation of the service as he provides the technical solution (receiving user requests, generating routes). He ensures the technical infrastructure for the transport operator and enables a successful service for users.

**Competences:** providing technical solutions and services.



**Role:** providing or developing and integrating route planning, booking, and payment of different services into one app.

**Contribution to the pilot:** improving usability for residents and tourists. The provider is required to maintain a high level of professionalism in delivering the service and maintain continuous communication with the SDC on a monthly basis.

(4) **Regional authority (SDC)** is a regional administrative unit in the Republic of Croatia. The region is known for its coastal cities and tourism, as well as the rural area (Dalmatian hinterland), which is not connected by traditional transport methods.

**Competences:** representing the interests of citizens, bringing information of hotspots for activities and during tourist season.

**Role:** providing information about hotspots for activities and tourist seasons.

**Contribution to the pilot:** coordinating co-design/implementation, contributor to co-design/implementation, and implementing the service while enhancing its relevance based on the needs of citizens and tourists.

(5) **General public (business zone Podi, Dugopolje)** is one of the largest business zones in the SDC area. The zone is home to companies offering manufacturing and service activities.

**Competences:** understanding of the working environment in the business zone, knowledge of employee commuting patterns and working hours, familiarity with the needs of workers and potential users of new public transport services.

**Role:** representing the interests of workers and potential users of new public transport services in the business zone, gathering input from the companies operating in the zone to support the design and implementation of the pilot.

**Contribution to the pilot:** engaging at least five people from major companies in the business zone to provide key information, ensuring that the new public transport services are tailored to meet the specific needs of the employees in the zone. The zone has a large parking area where DRT vehicles can be parked when not in service.

As part of the pilot project, two Living Lab workshops were held. The first workshop took place on 7 December 2023, in Dugopolje. It was attended by stakeholders from service providers, infrastructure maintenance, representatives of cities and municipalities, and associations interested in implementing DRT solutions. Participants had the opportunity to gain an overview of the main project objectives and receive general information about DRT. Stakeholders were able to connect the surrounding settlements of Trilj, Dugopolje and Dicmo in the selected area, define stops, and propose DRT travel routes.

The second workshop was held on 8 February 2024, Dugopolje, where stakeholders had the opportunity to analyze the vision of DRT in the area of Trilj, Dugopolje and Dicmo. Challenges and needs were identified, including the target user groups for the service, strategic goals, indicators, expected impacts, and limitations. Following this, stakeholders conducted a SWOT analysis of the proposed scenarios. The group analyzed four scenarios: commuting to work, traveling for shopping, visiting the doctor, and traveling for leisure activities. For each scenario, the user group and their mobility needs were defined, along with a functional description of the DRT service, user stories, areas of application, operational parameters, and success factors aimed at increasing usage and attractiveness.

After the second Living Lab (LL) workshops, a more focused testing area for the DRT service was determined (the area of Trilj, Dugopolje and Dicmo). Accordingly, corrections were made to the list of stakeholders, that is represented in the previous chapter.

From the General Public, the most significant areas to be covered with the DRT in the pilot are the business zones Podi and Dugopolje, where potential DRT service users are located. It is expected that at least five



people from the business zone will be involved (at least one from each major company operating in the zone), providing inputs such as working hours, the number of employees per shift, and the locations from which employees commute. These data would be used to improve the DRT service.

**Actions within the pilot will include research, new DRT service design, procurement and testing, and implementation:**

1. **Research** - includes mobility demand and offer analysis in the potential area of service deployment, together with gathering inputs from different stakeholders (NGOs, public transport operators, local authorities, etc.) through various living labs. Analysis and cooperation with stakeholders will lead to identification of existing challenges, as well as needs and expectations of potential new users and stakeholders.
2. **DRT service design** - based on the gathered knowledge and co-creation living labs that involve stakeholders, DRT service design will be conducted to define the operational and business model of DRT pilot, scaled for users' needs.
3. **Procurement and testing** - after confirmation from local government bodies/associations included, based on technical characteristics identified through designing activity, SDC will conduct public procurement and installation of DRT systems, IT solutions/platform and equipment, followed by testing of innovative DRT service elaborated at living lab level, to minimise implementation risks.
4. **Implementation** - In cooperation with local government bodies/associations included, SDC will monitor and integrate DRT service into existing public transport services, both from the perspective of public transport operators and users.



## 4. Development of the Action plan

### 4.1. Activities developed on the territory and objective of the plan

#### **Pilot: 1.1. Governance and planning of integrated DRT public transport in a MaaS logic for peripheral and low demand areas.**

SDC is the largest county in the Republic of Croatia by 17 area. It includes the coastal region, islands (Brač, Hvar, Vis, and Šolta), and the hinterland (Dalmatian Zagora). Public transport in the SDC area, which includes 16 cities and 39 municipalities, is traditionally organized and permit-based, but ongoing projects aim to establish it as a public service under Directive 1370/2007, with plans to introduce a DRT model to support residents with limited mobility, including socially vulnerable individuals, students, pensioners, and persons with disabilities.

The DRT will be tested in the City of Trilj and the municipalities of Dicmo and Dugopolje. The key objectives include improving mobility accessibility in areas where traditional public transport services do not exist due to low or occasional demand. In the regulatory area, guidelines will be provided for future public procurement processes for the implementation of DRT solutions.

#### **Component 1: Defining guidelines for the Public Procurement Process for the Introduction of DRT Service.**

Description: The goal of this activity is to define guidelines for future public procurement procedures to simplify the entire process of selecting a DRT service provider across the Republic of Croatia. The focus of the activity should be on efficiency, sustainability, and adaptability. The activities should include defining criteria at the national level for selecting service providers. With a unified approach to service provider criteria, it would be easier for regional and local authorities to ensure minimum quality standards in service implementation.

#### **Pilot: 2.2. Experimental DRT service in a new regulatory framework.**

In the future, it is necessary to regulate the existing regulatory framework for DRT services in a way that encompasses all specific areas within the Republic of Croatia. One such area includes inhabited islands. On inhabited islands where there is no form of public transport outside the tourist season and no registered transport operators who could offer the service, it is essential to define guidelines for promoting DRT in these areas. This could be achieved through additional incentives for transport operators willing to serve areas with exceptionally low and occasional demand and establish one of their headquarters on an island.

#### **Component 1: Defining the Public Procurement Process for the Introduction of DRT Service.**

Description: The goal of this activity is to develop unified guidelines for conducting public procurement procedures for the introduction of DRT services across the entire Republic of Croatia in the future. The focus should be on the local needs of each area while maintaining unified guidelines at the national level to ensure a minimum quality standard of service for users.

#### **Component 2: Expanding the DRT Service to Other Areas.**

Description: The goal of this activity is to expand the DRT service to other areas in the Republic of Croatia in the future. The emphasis should be on researching user needs in areas with low or occasional demand, such as smaller villages in the east and north of Croatia (Slavonia and Međimurje), towns and municipalities in the Gorski Kotar and Lika regions that are not well connected, and islands where transport services are limited outside the tourist season.



## 4.2. Proposed measures for the Action plan (draft)

### 4.2.1. Measure 1: Defining guidelines for the public procurement process for the introduction of DRT Service

The measure includes activities that define the minimum service standards to be incorporated into the legislative framework (technical standards for the vehicle fleet, digital services). Additionally, it includes guidelines to assist contracting authorities in creating tender documentation.

The measure also involves activities related to workshops with stakeholders who would participate in the process of defining the DRT service in specific areas, including the future public transport operator (PTO) and the future digital service provider.

The tender documentation process is currently being tested. At this moment, the tender documentation for SDC (Split-Dalmatia County) has been published. The tender was announced on 17 February 2025, and will last until 7 March 2025. The selection of the most favourable offer is expected to be completed by 20 April 2025, while the contract signing is anticipated by 30 April 2025. The implementation of this measure affects the timeline of all other measures. The tender documentation for the DRT service in SDC consists of the project task, selection criteria for bidders, and forms. The project task contains information for bidders, including the area where the DRT service should be provided, the frequency of service, and the required features of the software supporting the DRT service.

During the public procurement process, emphasis is placed on:

- Conditions for economic entities;
- Conditions for technical capability.

Regarding the conditions for economic entities, the bidder must minimally meet the basic criteria required by law to provide DRT services (a license to operate public transport services in the Republic of Croatia, the necessary number of technical and human resources, and experience at an appropriate quality level).

In the area of technical capability, the bidder is required to provide specific transport means and characteristics of the information system for managing the DRT service. This includes software for organizing and managing the DRT service, applications for drivers and users of the DRT service, as well as vehicle equipment.

The contract is expected to last a total of 6 months according to the 1+5 model, with the first month dedicated to establishing and testing the service itself. Following this, the operational phase of providing the DRT service will begin and last for a total of five months. The selection criteria are the offer with the lowest price and the average age of the vehicle fleet.

The tender documentation covers two routes: Fixed route in the area of Dugopolje and part of Dicmo - The total length of the fixed route in the area of Dugopolje and part of Dicmo, from the starting to the final stop, will be approximately 31.3 km, with an expected travel time of about 1 hour and 16 minutes (01:16h). The total number of kilometers that could be covered on the proposed route throughout the entire day will be around 375 km, with an estimated fuel consumption of about 56 liters per day. The total maximum travel duration throughout the entire day (two shifts) will be about 15 hours and 12 minutes (15:12h).

### 4.2.2. Measure 2: Expanding the DRT Service to the other areas

The goal of this measure is to expand the DRT service to other areas in the Republic of Croatia in the future. The focus should be on researching user needs in areas where demand is low or occasional, such as smaller villages in eastern and northern Croatia (Slavonia and Međimurje), towns and municipalities in the Gorski



Kotar and Lika regions that are not well connected, and islands where transport services are limited outside the tourist season. This measure includes familiarizing cities, municipalities, transport providers, and end users with this model, which can better connect their area.

In the future, this measure may include activities such as:

- Educational campaigns and workshops - informative campaigns in educational institutions, workplaces, and local communities to raise awareness of sustainable transportation options;
- Promotion and subsidization of public transport - a subsidy model for a specific period to increase usage rates;
- Introduction of a rewards program - developing a model of free rides and discounts for users who frequently use sustainable travel options;
- Collaboration with local businesses and authorities - encouraging employers and institutions to implement sustainable transport strategies for their employees;
- Promotion of digital platforms and applications - investing in the development of app solutions for the most sustainable routes.

In this pilot project, the approach with Living Lab workshops was tested, where stakeholders actively participated, and based on their input, routes were created in the SDC area.



## 5. Monitoring and evaluation

The expected results of the implementation include activities that will be carried out in the future. These are primarily related to activities concerning the future expansion of the DRT service to other areas of the Republic of Croatia and providing guidelines for the tender documentation and defining minimum service quality criteria.

Given the current situation, the main challenges and risks can be summarized as:

- Delays in the public procurement process due to complaints;
- The possibility that no bidders will respond;
- Delays in contract negotiations;
- Low user turnout;
- Application performance issues (delays due to internet connectivity);
- The technical condition of vehicles;
- Emergency roadworks (detours that prolong the journey).

#	Measure/Activity	Description/methodology	KPI
1	Defining guidelines for the public procurement process for the introduction of DRT Service.	Defining minimum quality standards for the DRT service and guidelines for preparing tender documentation.	At least one new area with a DRT service.
1.1	Workshop with stakeholders.	Workshop with stakeholders from interested areas for the implementation of the DRT service from all over Croatia. Defining at least two areas where the DRT service can be implemented.	Min one Living Lab.
1.2	Promotion of the DRT service at the national, regional, and local levels.	Promotional activities, public forums on the topic of DRT, news on portals.	Number of media announcements / publications (at least 3).
2	Expanding the DRT Service to the other areas.	Issuance of new tenders across the entire Republic of Croatia.	Implementation of the DRT service in at least two areas across the entire Republic of Croatia.
2.1	Workshop with stakeholders.	Analysis of the activities carried out in the field of DRT and defining the next steps.	Min one Living Lab.



## 6. Conclusions and next steps

The Action plan will be officially approved through an agreement between SDC, the future PTO, and the future digital service provider. DRT, as a form of sustainable mobility, is integrated into strategic documents at the national, regional, and local levels.

In addition to the stakeholders who are signatories to the agreement (contracting parties) for the provision of DRT services, the municipalities of Dugopolje, Dicmo and City of Trilj, as well as the Podi business zone in Dugopolje, will also participate as stakeholders. These stakeholders will contribute with the information they have about future DRT service users, thereby helping to improve the quality of the service.

The overall approach to the pilot project, based on the active involvement of the local community and stakeholders through workshops, provides valuable input for their local connectivity and for shaping the DRT service itself. The local community, which has knowledge of the needs of the local population, along with transport operators who provide daily line transport services, offers high-quality input for the introduction and development of the DRT service.

Through continuous communication, knowledge exchange, experience sharing, and data analysis, positive results are expected in the future, including:

- The first experience of DRT service in the Republic of Croatia;
- Preparation of tender documentation and introduction of sustainable mobility;
- Utilization of digital innovations in DRT services;
- Improved connectivity of rural areas;
- Better interaction and communication between local stakeholders;
- Environmental and energy benefits.

After completing the public procurement process and signing the contract, it is crucial that all involved stakeholders participate in presenting the DRT service to end users. Engaging local authorities and communities is essential to ensure that all necessary information about service usage is clearly communicated to interested users.

Upon completion of the pilot project, it is important to analyse the results and define the next steps, including whether the service will continue, identifying new areas where it could be implemented, and other relevant considerations.

Implementation will be monitored through monthly reports during the duration of the pilot project in the Dugopolje and Dicmo areas and the City of Trilj. The monthly reports will provide insights into the level of service activity, the number of requests, whether service visibility needs improvement, and whether further involvement of the local community is necessary. The monthly report summaries will be shared with stakeholders, to align expectations for future service retainment and possible extensions / DRT introductions in new areas.

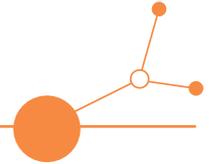


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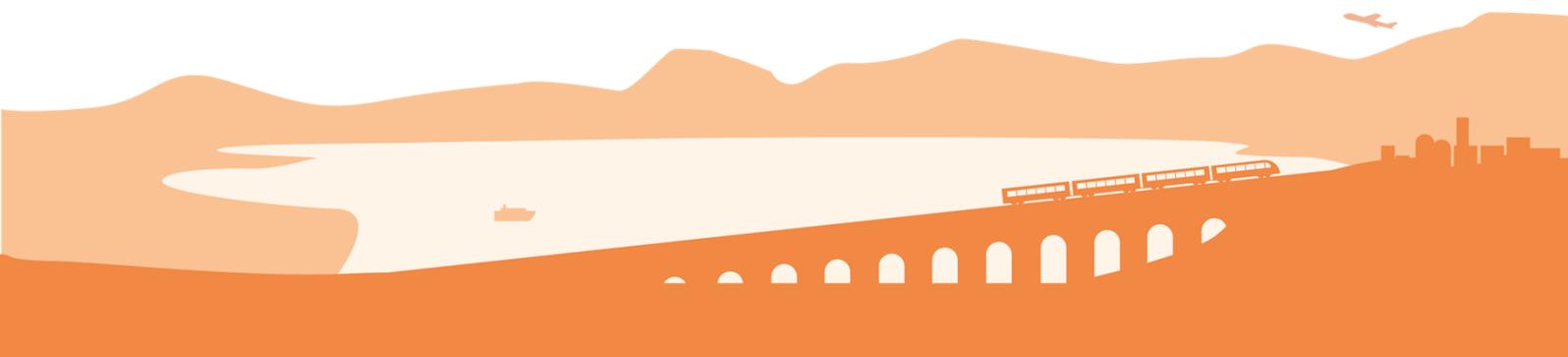
# D.3.2.1 Action plan drafts in the six pilot regions

## Stuttgart (Baden-Württemberg)



Final Version

02 2025





## Authors of the document

Partner No.	Acronym	Name	Action	Version
2	Redmint	Gabriele Grea Anja Seyfert	Template	1
8	ATE	Florian Kressler	Template	1.1
11	nexus	Martin Schlecht Wiebke Blum Ayla Tiefenbach Paul Schlichting	Input from Baden-Württemberg pilot 1.2	1.2
8	ATE	Florian Kressler	Draft comments	1.3
4	Mobilissimus	Nikolett Csörgő Rita Petrovác	Draft revision 1	1.5
11	nexus	Martin Schlecht Wiebke Blum Ayla Tiefenbach Paul Schlichting	Feedback to the revision 1 and final version	Proposed final
8	ATE	Florian Kressler	Edited approved version for official release	Final



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## 1. Executive summary

The territory of central Europe is characterised by uneven transport connections and mobility opportunities, across and within regions, between urbanized contexts and rural and peripheral areas.

The project's common challenge is to improve accessibility and connectivity in CE peripheral and rural areas through better integration of public transport networks with Demand Responsive Transport (DRT) services, building on joint development and implementation of governance, planning, digital and operational innovations.

DREAM\_PACE will develop innovative DRT concepts complementing regional mobility networks.

The project will improve DRT planning and delivery capacities of public authorities and operators.

A new generation of DRT services will become functional and integral part of regional mobility networks, enhancing accessibility for citizens, territorial cohesion and social inclusion. Integration is the key to the DREAM\_PACE innovative approach, as DRT services are mostly developed as stand-alone solutions to specific needs, the potential of scalable strategies and solutions is widely underestimated.

Project Partners (thereafter PP) will jointly develop a strategy for DRT in Sustainable Urban Mobility Plans to be adopted at EU level, co-design, test and implement innovative DRT solutions enhancing mobility networks. Strategies and solutions will foster a better integration of DRT and public transport (Bologna, Pavia, Budapest areas), support a higher coordination among existing DRT initiatives (Osttirol, Baden-Württemberg) and experiment new integrated approaches for DRT "green fields" (Split-Dalmatia County).

DREAM\_PACE will exploit the potential of integrated planning and digital and operational innovations for a common strategy and develop innovative DRT modular solutions. The project implementation builds on transnational cooperation to guarantee an adequate responsiveness and adaptability of project results to specific characteristics of mobility ecosystems across CE rural and peripheral areas.

This document is the sixth of six draft Action plans for the DREAM\_PACE pilot regions that altogether constitute the deliverable D3.2.1, and focuses on the Baden-Württemberg region. As D3.2.1 will not be a public deliverable, it was decided to keep the six Action plan drafts separate, while their final versions that compose D3.2.3 will be consolidated in a single document. D.3.2.1 builds on the analysis and diagnosis of governance and planning (Activity 1.1) and of operational trends and approaches to DRT (Activity 2.1) and on the DRT strategy elaborated in D3.1.2 and for which the consultation process is being completed.

This document is organized as follows.

Chapter 2 provides an overview of the pilot region, outlining the purpose and scope of the Action plan.

Chapter 3 describes the starting point for the development of the Action plan, highlighting the needs and priorities identified, the challenges addressed, and the stakeholder involvement process. It also presents the baseline scenarios discussed with them and the next steps agreed upon.

Chapter 4 outlines the pilot action and its components that are being tested and specifies the measures that are consequently necessary to be implemented in order to achieve the objectives of the Action plan.

Chapter 5 details the monitoring and evaluation process for the Action plan, including the expected results of implementation, risks associated with planning and execution, and the estimated relevant impacts.

Chapter 6 serves as the concluding chapter, outlining how the Action plan will be officially approved or taken up, summarizing the overall approach, and presenting the next steps.

Finally, chapter 7 provides a comprehensive list of references, offering background information and sources supporting the document.



## 2. Introduction

Baden-Württemberg, located in Southwest Germany, is the country's third most populous federal state, with approximately 11.28 million inhabitants as of 31 December 2022 (Federal State of Baden-Württemberg). Since its foundation in 1952, the state's population has grown by over four million people, representing an increase of 64%.



Figure 1. The Region of Baden-Württemberg in South-West Germany  
(source: Land Baden-Württemberg, 2023)

Economically, Baden-Württemberg is one of Germany's most prosperous regions. In 2023, the state's nominal gross domestic product (GDP) amounted to 615 billion euros, equating to approximately 54,339 euros per capita. This places its per capita economic output 27% above the European Union average (Baden-Württemberg Statistics Portal). A distinctive feature of the region is its high density of 'hidden champions'—medium-sized companies that are global leaders in niche markets. These businesses significantly contribute to the state's economic stability and innovative strength.

### Public Transport and DRT Governance

Since its establishment in 1996, NVBW has served as the central service company of the Baden-Württemberg Ministry of Transport, responsible for the planning and coordination of local rail passenger transport (SPNV) in the state. As a wholly state-owned company, NVBW advises and supports the ministry on regional rail transport matters. One of its key tasks is organizing Europe-wide tenders for regional rail transport services. NVBW collaborates with infrastructure operators, districts, municipalities, and regional associations to ensure an efficient and customer-oriented public transport system.

Under the bwegt mobility brand, NVBW promotes modern and sustainable local transport in Baden-Württemberg, in partnership with transport associations. As the primary superregional partner, NVBW played a crucial role in the pilot project, which was implemented in Calw, a small city in the Northern Black Forest region, in collaboration with local authorities and DRT providers.



### Testing region: Calw

The district of Calw has a population of approximately 158.000 people (as of 2019) and covers an area of 797 km<sup>2</sup>. It consists of numerous small, remote valleys and villages, making public transport accessibility a key challenge. Additionally, Southern Germany's long-standing automotive industry presence has resulted in private combustion vehicles remaining the dominant mode of transport. As of 2023, there were 123.000 registered vehicles in the district (112.000 cars and 9.000 motorbikes) for approximately 69.800 households, with a rising trend in ownership.

Despite these mobility patterns, efforts have been made to expand public transport in recent years. Among these initiatives is 'Rufbus Calw', an on-demand bus service coordinated and financed by the municipality through the transport company Verkehrsgesellschaft Calw (VGC). The Rufbus operates on regular bus routes but can be ordered via phone call, providing additional flexibility to public transport users.

While many municipalities in Baden-Württemberg face similar mobility challenges as Calw, it is important to note that DRT governance and implementation in the state function under highly federalized principles. This results in significant regional differences in how DRT is planned, funded, and integrated into local transport networks.

Baden-Württemberg is characterized by dynamic population growth, strong economic performance, and a focus on innovation-driven SMEs. Its mobility structure integrates both traditional and sustainable transport solutions, though private vehicle use remains prevalent in rural regions. The governance and financing of DRT services in Calw reflect the complex decision-making structures within the federal transport system, which must be considered when evaluating insights gained from the pilot project.

### Purpose of the Action plan

By combining user insights with interregional collaboration, this Action plan lays the foundation for more efficient and accessible DRT services in Baden-Württemberg.

This Action plan outlines the planned and future measures aimed at improving Demand-Responsive Transport (DRT) services in Baden-Württemberg. The plan builds on insights from pilot activities conducted in Calw, where tests and research were carried out to assess DRT service provision and identify key characteristics. The proposed actions focus on the governance and planning of a coordinated DRT network to enhance accessibility in peripheral and rural regions.

DRT services in Baden-Württemberg are highly diverse and heavily reliant on regional public funding. The Nahverkehrsgesellschaft Baden-Württemberg mbH (NVBW), public transport company of Baden-Württemberg) plays a central role as the main funding provider. Given that DRT services in Calw operate within a federal system of decision-making and financing, the implementation of most proposed measures requires an interregional approach rather than being limited to the pilot region alone. Strengthening collaboration across different regions is therefore essential to ensuring the long-term success and sustainability of DRT services.

The Action plan serves as a strategic guide for implementing the pilot components related to the governance and planning of a coordinated Demand-Responsive Transport (DRT) network, with the goal of enhancing accessibility in peripheral and rural regions.

In this specific use case, the Action plan aims to:

- Assess passenger experiences with the existing on-demand services to identify areas for improvement and optimize service delivery;
- Strengthen the network of stakeholders in the transport sector by exploring collaborative solutions to address shared challenges and improve overall DRT governance.



### 3. Strategic background and scenarios developed in the area

#### Identifying challenges and user needs

During the living labs with the stakeholders in Calw and NVBW, the persona method was used to better understand the challenges people face when using the current Demand-Responsive Transport (DRT) system. Stakeholders from municipalities and transport operators discussed the needs of different passenger groups and explored ways to make DRT services easier to access and use.

#### Future Scenarios for DRT Development

Based on these discussions, plans were developed to improve the booking system and the way routes are planned for DRT services in Baden-Württemberg.

The booking system should be managed by a regional operator, making it easier to handle reservations in a coordinated way. People should be able to book a ride by phone, website, or mobile app. The existing app should be improved so that it is easy to use and well-known, ideally linking with popular navigation apps like Google Maps, the NVBW App, or the DB App. Over time, the app is expected to become the preferred booking method instead of phone calls. It should also offer real-time updates on waiting times and routes, be available 24/7 for both advance and last-minute bookings, and allow users to cancel trips directly through the app to avoid unnecessary journeys.

The way DRT routes are planned should also become more flexible. Instead of following fixed routes, the system should adjust to passenger requests in real time, picking them up from their requested location or a nearby stop. This approach would be especially helpful for older people, passengers with limited mobility, women traveling at night, and children or young people who need a safe and reliable transport option.

One key finding from the living labs was that making these improvements possible will require close cooperation between many different groups, including municipalities, transport providers, and planners. Working together will be essential to ensure that these changes fit well within the existing DRT system and improve services for all users.



Figure 2. The NVBW-App logo  
(source: Google Play store,  
2025)



## 4. Development of the Action plan

### 4.1. Activities developed on the territory and objective of the plan

Pilot activities with NVBW were carried out in Calw, approximately 40 kilometers west of Stuttgart. The pilot focused on the existing dial-a-bus service ("Rufbus") and contributes to Pilot Action 1.2, which aims to enhance the governance and planning of a coordinated DRT network to improve accessibility in peripheral and rural regions.

Through stakeholder engagement and citizen surveys, the project examined the functions, benefits, and challenges of the DRT service in Calw. The goal was to establish an evaluation format for understanding passenger needs and to bring stakeholders together to improve the existing service.

To address the identified challenges and explore potential improvements, several actions are being undertaken:

- **Supermarket Survey:** A survey conducted outside a major supermarket gathers insights into why non-users do not use the DRT service. Key issues identified include a limited bus network and a lack of awareness about the existing service, highlighting the need for improved marketing;
- **Onboard Interviews:** Short interviews conducted with passengers during DRT rides capture user experiences, including both benefits and areas for improvement. While many users appreciate the service, areas for enhancement include increasing service frequency, improving punctuality and reliability, and addressing concerns from both drivers and passengers;
- **Service Needs:** Existing users primarily rely on DRT for daily commuting, often as a substitute for regular public transport. As a result, flexibility is a greater concern for non-users than for current passengers. Needs such as extended service hours beyond regular public transport operation and effective communication with drivers are generally well met;
- **Stakeholder Workshop:** A workshop with local transport authorities and DRT operators aims to strengthen collaboration and reinforce the shared objective of providing an efficient and well-functioning DRT system.

By implementing these actions, the project seeks to develop a more user-centred and effective DRT service tailored to the needs of both users and non-users in the region.

### 4.2. Proposed measures for the Action plan (draft)

#### 4.2.1. Measure 1: Improve booking system

Currently, there is no common booking system in the region of Baden-Württemberg. To improve the booking system for Demand-Responsive Transport (DRT), the bwrider platform, developed by Südwestdeutsche Landesverkehrs-GmbH (SWEG, Southwest German Transport Authority), is set to become the standard system across Baden-Württemberg. The goal is to create a consistent and user-friendly booking experience that makes it easier for people to access DRT services, no matter where they are.

By introducing bwrider as the main booking platform, the system will improve compatibility between different transport providers, make operations more efficient, and simplify access for passengers. The platform aims to provide three key functions:

1. Searching for available rides;
2. Selecting the most suitable option;



### 3. Booking the ride.

However, technical challenges remain, particularly in integrating the systems of different providers. At the same time, using a single platform helps avoid inefficiencies, such as municipalities developing their own booking systems at a high cost. Ongoing technical improvements and collaboration with local DRT projects will ensure that bwrider meets the needs of different regions while aligning with the broader public transport network.

#### **Main Facts:**

The NVBW and SWEG are responsible for developing and implementing the bwrider platform as a unified booking system across Baden-Württemberg. Local transport providers will play a key role in integrating the system into their services and adapting it to their branding.

By standardizing the booking process, this measure aims to lower barriers for users, making DRT more accessible and easier to use. While the deployment costs are not yet defined, the project will be publicly funded by NVBW.

Designed for long-term impact, the measure will continue beyond the initial project phase, ensuring ongoing improvements in DRT accessibility and integration.

### 4.2.2. Measure 2: Involving local stakeholders as multipliers

Various local stakeholders are involved in the regional funding scheme, receiving financial support to test different Demand-Responsive Transport (DRT) models based on local mobility needs. These pilot projects explore different approaches to optimize DRT services, but challenges remain.

One major issue is the comparatively high self-financing portion, which makes it difficult for municipalities to secure the necessary funding. As a result, services often struggle with financial sustainability and efficiency. Additionally, funding beyond the regional elections is uncertain, creating instability for DRT operations. Since these services rely on temporary funding and are not adequately integrated into municipal budgets, they often disappear once funding ends.

Municipalities face a delicate balancing act: they must ensure adequate DRT service provision without undermining their existing public transport systems. The lack of long-term financial security makes it difficult to plan and sustain these services effectively. To address these challenges, more efficient funding structures and long-term integration into municipal budgets are essential.

#### **Main Facts:**

- NVBW is conducting accompanying research (Begleitforschung) until 2028 to analyse and, if possible, harmonize the activities, best practices, and challenges across different regions;
- Key challenge: High self-financing costs and lack of long-term funding security;
- Funding concerns: Many DRT services are temporary and risk being discontinued once funding expires.

### 4.2.3. Measure 3: Marketing - develop a marketing and branding strategy

A unified marketing strategy is being developed to improve transparency, visibility, and communication for Demand-Responsive Transport (DRT) in Baden-Württemberg. A key component of this strategy is the publication and establishment of the "bwshuttle" brand, which will be integrated into bwegt, the region's existing mobility brand that already unifies public transport services.



Designed specifically for DRT projects, the strategy ensures consistent messaging and effective user engagement. To support local implementation, a marketing toolbox will be provided, offering customizable materials and guidelines tailored to the diverse needs of different DRT initiatives.

Additionally, plans are in place to expand the variety of available vehicles based on regional needs, including trains, cars, buses, and shuttles. While all DRT providers in Baden-Württemberg will have access to the joint marketing materials, their use will remain optional.

#### Main Facts:

- The marketing strategy development began in 2025;
- NVBW is responsible for its development, while local DRT providers and operators will handle execution;
- The strategy aims to increase the visibility of DRT services and establish a recognizable brand to help users easily identify and access mobility options;
- The initiative is publicly funded by NVBW, though the exact deployment costs are yet to be determined;
- The measure is designed for long-term impact, continuing beyond the initial project to support the ongoing promotion and integration of DRT services;
- The joint marketing toolbox will be available in Q2 of 2025.

#### 4.2.4. Measure 4: Financing programme

The "Förderprogramm ODV" is established in accordance with §15 ÖPNV-G, the local public transport law, to support the development and expansion of Demand-Responsive Transport (DRT) services in Baden-Württemberg. A key aspect of this initiative is the integration of a surcharge-based DRT model into the existing financing framework under §15 ÖPNV-G, planned for the third quarter of 2025. This will allow participating providers to apply fare-based surcharges for DRT services, which could potentially be incorporated into the public transport funding model, increasing revenue for operators.

Currently, 16 projects are being implemented across 15 municipalities, ensuring financial support for local DRT solutions. With a total budget of 20 million euros, the programme aims to enhance accessibility and efficiency, strengthen the role of DRT within the public transport system, and improve its financial sustainability.

#### Main Facts:

- Implementation Timeline: The programme is set to launch in 2025;
- Responsible Entities: NVBW will oversee the programme, while regional municipalities and DRT providers will manage local implementation;
- Funding & Budget: the initiative is publicly funded, with a budget of 20 million euros, ensuring stable financial support for continuous DRT operations;



Figure 3. bw branded DRT service (source NVBW, 2024)



Figure 4. bwshuttle branding logo (source: NVBW, 2024)



- Long-Term Outlook: the funding is secured for the current legislative period, but financial support beyond 2027 is not yet guaranteed;
- Strategic Goal: the programme is designed to integrate DRT more effectively into the public transport system, reinforcing its role as a flexible and accessible mobility solution.

#### 4.2.5. Measure 5: Strengthening the interregional network

A key finding from the pilot governance workshop, which brought together stakeholders from multiple bordering regions in Baden-Württemberg, was that interregional exchange significantly benefits DRT governance. It fosters mutual learning, strengthens collaboration, and helps identify shared challenges and solutions. Given the highly federalized and diverse mobility governance structures in Baden-Württemberg, interregional cooperation is particularly valuable. Therefore, fostering stronger interregional networks must be a key priority.

To facilitate this, the interregional network "Zukunftsnetzwerk ÖPNV", established by NVBW, will serve as a platform for continuous exchange and collaboration among stakeholders in the public transport sector. Through regular networking events and information exchanges, the network aims to:

- Promote dialogue between municipalities, transport authorities, service providers, and researchers.
- Share best practices and facilitate knowledge transfer on key topics such as DRT digitalization and sustainable mobility.
- Support coordinated development of public transport in Baden-Württemberg and beyond.

Additionally, the network will organize workshops, expert discussions, and working groups to deepen cooperation and develop actionable strategies for improving interregional mobility.

#### Main Facts:

- Start Date: the initiative will begin in 2025;
- Leadership: NVBW will lead the implementation, with active participation from local DRT providers, operators, and municipalities;
- Goals: strengthen collaboration, improve DRT services, and address common challenges through regular exchanges;
- Impact: stakeholders will develop shared solutions and best practices, enhancing the efficiency and accessibility of DRT across the region;
- Funding & Continuity: while deployment costs and financing sources are yet to be determined, the initiative is designed for long-term cooperation and continuous improvement beyond the initial project phase.

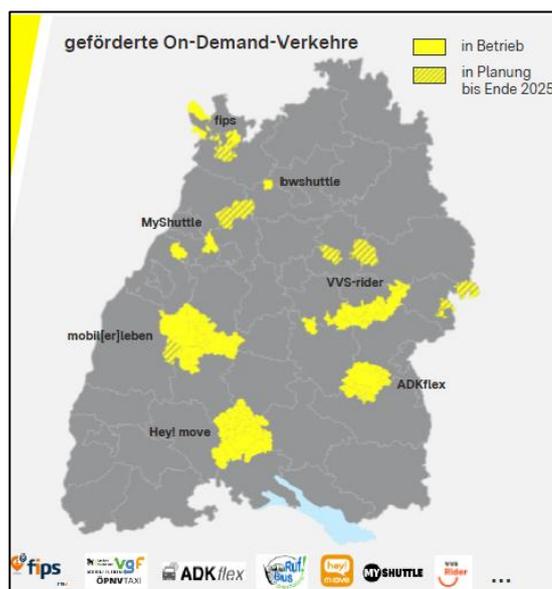


Figure 5. Currently funded DRT initiatives in the region of Baden-Württemberg (source: NVBW, 2025)



#### 4.2.6. Measure 6: Defining common KPIs for comparative analysis

Currently, Demand-Responsive Transport (DRT) services in Baden-Württemberg vary significantly across different categories, including service provision, marketing, operational setup, and booking systems. This high degree of individuality makes it difficult to systematically compare services and evaluate their performance in a meaningful way. Establishing a standardized framework for analysis is essential to improve transparency and enable data-driven decision-making.

##### **Main Facts:**

A key objective of this initiative is to define common Key Performance Indicators (KPIs) to allow for consistent and comparative analysis of DRT services.

These standardized KPIs will help create a uniform evaluation framework, making it possible to assess performance, identify best practices, and optimize services across different regions.

Establishing common DRT standards will ensure comparable data, providing valuable insights for future service improvements and policy decisions.



## 5. Monitoring and evaluation

The outlined actions will be closely monitored by NVBW and its respective partners to ensure effective implementation and continuous improvement. A key component of this process is the Begleitforschung, which will systematically assess the impact of the measures, identify best practices, and provide data-driven recommendations for further development.

Building on the strong collaboration and exchange established in the project, Nexus will maintain regular contact with NVBW through ongoing evaluation meetings. These exchanges will also involve the local partner municipality of Calw, ensuring that insights from the pilot study are integrated into existing DRT plans and governance structures.

A particular focus will be on evaluating the benefits of interregional exchange. The findings will be used to encourage stakeholder engagement, strengthen collaborative networks, and highlight the advantages of knowledge-sharing for improving DRT services. By fostering a data-driven approach, the monitoring and evaluation efforts will support the long-term sustainability and efficiency of DRT in Baden-Württemberg.



## 6. Conclusion and next steps

The measures outlined in this Action plan are primarily aimed at strengthening interregional collaboration in the organization and synchronization of Demand-Responsive Transport (DRT) services in Baden-Württemberg. These actions will not only enhance accessibility and improve the service's ability to meet user needs, but they will also ensure that DRT services are adapted to the federal governance structure in which they operate. This alignment is essential for effective governance and planning, particularly in peripheral and rural regions, as highlighted throughout this Action plan.

To define concrete steps for implementation, insights from the pilot project will be gathered and shared with the involved partners. Following the planned stakeholder workshop, which will bring together representatives from different regions in Baden-Württemberg, findings from interviews with users and non-users can be further refined, and additional experiences can be exchanged.

To successfully implement the proposed actions, ongoing interregional exchange will be essential. Ensuring the continuation of this collaborative approach is a key next step in the process



## 7. References

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- 11) DREAM\_PACE D3.1.2 “DRT strategy draft and setup of the consultation process”. 2024.