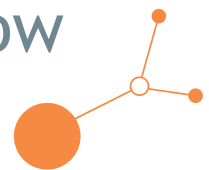


DREAM_PACE

Strategic planning framework for low demand and rural areas



Final Version
09 2025





Authors and change log of the document

Partner No.	Partner Acronym	Name of the author	Action	Version
9	RMO	Jakob Britz	Drafting of East Tyrol blueprint	1
2	Redmint	Gabriele Grea, Anja Seyfert	Finalisation of the document	2



Contents

1. Executive summary	3
2. Analysing regional characteristics	4
3. Existing offers in public transport	5
4. Stakeholder mapping and Governance	7
5. Engagement of municipalities, general public and stakeholders	8
6. Technical Analyses and Tools	9
7. Define Service Options	12
8. Integrated Network	13
9. Funding and procurement	14
10. Conclusions	15

List of tables

Table 1: Dates and topics of Living Labs	8
Table 2: percentage of population served by PT-quality grades	10
Table 3: Example of municipality profile	11

List of figures

Figure 1: Impression of East Tyrol ©TVB Osttirol/Peter Maier	4
Figure 2: Route map East Tyrol ©VVT	5
Figure 3: bubble chart of overnight stays in East Tyrol per municipality	6
Figure 4: simplified governance scheme in East Tyrol	7
Figure 5: GIS Analysis of population and PT-quality grade cross-cut	9
Figure 6: line based DRT in East Tyrol (RegioAST) ©TVB Osttirol/VVT/Johannes Plattner	12
Figure 7: Funding key in East Tyrol	14



1. Executive summary

Rural and peripheral areas across Europe, such as East Tyrol, Austria, face mobility challenges that differ fundamentally from those encountered in urban areas. The characteristics that shape rural regions - dispersed settlements, low population density, and seasonal fluctuations caused by tourism - create structural barriers to maintaining conventional forms of public transport. Buses and trains, designed for urban contexts where demand is consistently high, are often unable to provide the frequency or coverage required to meet the needs of residents in mountain villages, students commuting to school, elderly people seeking access to healthcare, or visitors arriving during tourist seasons.

Demand Responsive Transport (DRT) can be a promising tool to complement traditional public transport (PT). Unlike rigid bus or train timetables, DRT services can adapt to fluctuations in demand, offering flexibility and efficiency in areas where conventional systems struggle. This blueprint sets out a strategic planning framework for introducing and sustaining DRT services in rural contexts. It draws on the experiences and lessons learned in East Tyrol, while providing guidance that can be transferred to similar rural regions.

The work concentrates on three key challenges:

- the difficulties posed by mountainous geography and widely dispersed settlements
- the financial and logistical constraints resulting from low population density
- and the pronounced peaks and troughs in demand caused by seasonal tourism.

To address these, the document highlights a series of strategic solutions: strengthening backbone services in valley corridors, introducing flexible DRT in underserved areas, and connecting governance structures through the role of a regional mobility coordinator. Together, these solutions form a pathway towards more inclusive, resilient, and efficient rural mobility.

The following sections present the strategic planning steps in a structured way. Each step is illustrated with insights from East Tyrol, which serve as inspiration and example for other rural regions.



2. Analysing regional characteristics

The first stage of planning a Demand Responsive Transport system is to develop a comprehensive understanding of the regional characteristics. Without such a foundation, subsequent measures risk being ill-suited to local realities. Strategic planning must therefore begin with a detailed analysis of geography, settlement structures, demographic trends, and patterns of mobility demand.

In East Tyrol, this meant looking at a region composed of 33 municipalities spread across three major valleys. The city of Lienz serves as the administrative and economic hub, but many smaller settlements are situated far from the main transport corridors. Tools such as Geographic Information System (GIS) mapping allowed planners to visualise these dispersions and identify which areas were underserved. Municipalities like Heinfels and Stronach, for instance, were revealed as blind spots in the existing transport network.



Figure 1: Impression of East Tyrol ©TVB Osttirol/Peter Maier

The lesson here is straightforward: peripheral settlements, often located at the ends of valleys or at higher altitudes, can easily be overlooked when planning is driven only by aggregate statistics. Detailed visual mapping provides an evidence base that ensures no community is left out. At the same time, planners must remain aware of the risks of overgeneralisation. Every rural settlement has its own specific needs, and these should not be glossed over in the pursuit of a uniform regional solution.

Once the physical and demographic characteristics of the region are well understood, the next logical step is to assess what forms of mobility already exist. Mapping demand without simultaneously evaluating supply would provide only a partial picture. The next step therefore focuses on analysing the existing public transport system and identifying the gaps that a DRT scheme could fill.



3. Existing offers in public transport

After mapping the settlement structure and other relevant characteristics of the region, the second step is to assess the existing transport infrastructure. This involves evaluating backbone services such as railways and main bus lines, but also extends to school buses, company shuttles, and tourism-related services. The goal is to create a complete picture of what is already available, where redundancies exist, and where integration is lacking.

In East Tyrol, the Drautalbahn railway and the bus system along the valley floors form the backbone of the regional network. These services are robust in terms of spatial coverage, but frequency and reliability remain limited. Moreover, seasonal variations caused by tourism heavily affect demand and ask for adjustments in the offered number of busses. These fluctuations undermine the economic viability of conventional services and highlight the need for flexible solutions. In East Tyrol there are specific bus lines only operated in winter and summer respectively.

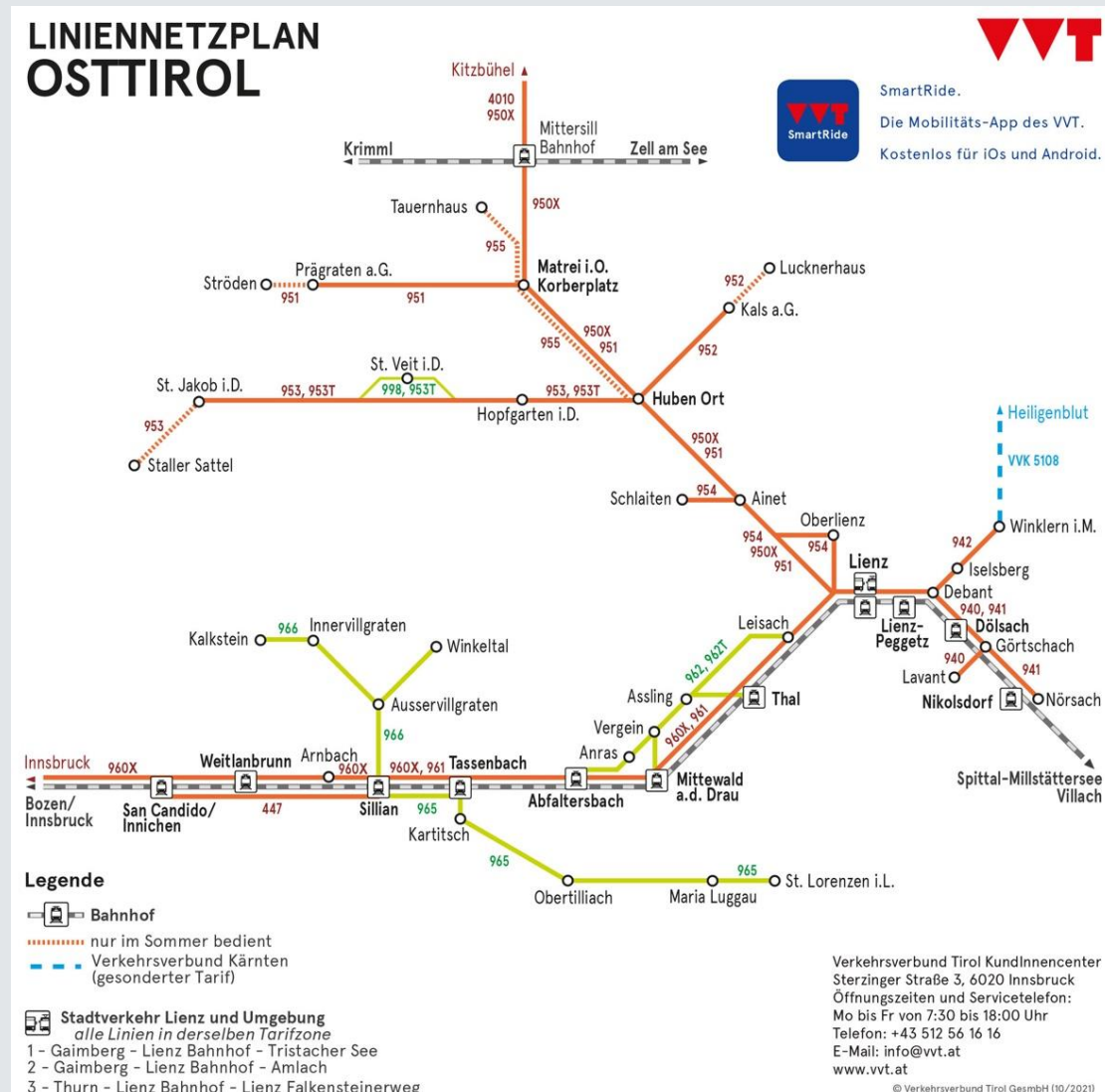


Figure 2: Route map East Tyrol ©VVT



What we can take away from this, is that tourism must be explicitly factored into planning. Ignoring the pronounced peaks in demand associated with tourism can lead to mismatches between capacity and real needs. On the other hand, overbuilding capacity to cater to tourism risks creating unsustainable systems during off-peak months. The risk is thus one of imbalance: without careful analysis, either local residents are underserved, or public funds are spent inefficiently.

Having understood the strengths and weaknesses of the existing network, planners must next turn their attention to the institutional and organisational framework. Transport is never just a technical matter; it is also about governance, responsibilities, and the alignment of diverse stakeholders. Step 3 therefore addresses the question of governance and stakeholder involvement.

For regions for which tourism is a relevant economic and social factor, making capacity and demand visible for mobility planning purposes isn't a hard task. In the case of East Tyrol, a bubble chart for both bed capacity and demand of overnight stays was designed and clearly highlights the relevant points and lines where touristic demand of mobility offers has to be taken into account. As the below map of East Tyrol with overnight stays per summer shows.

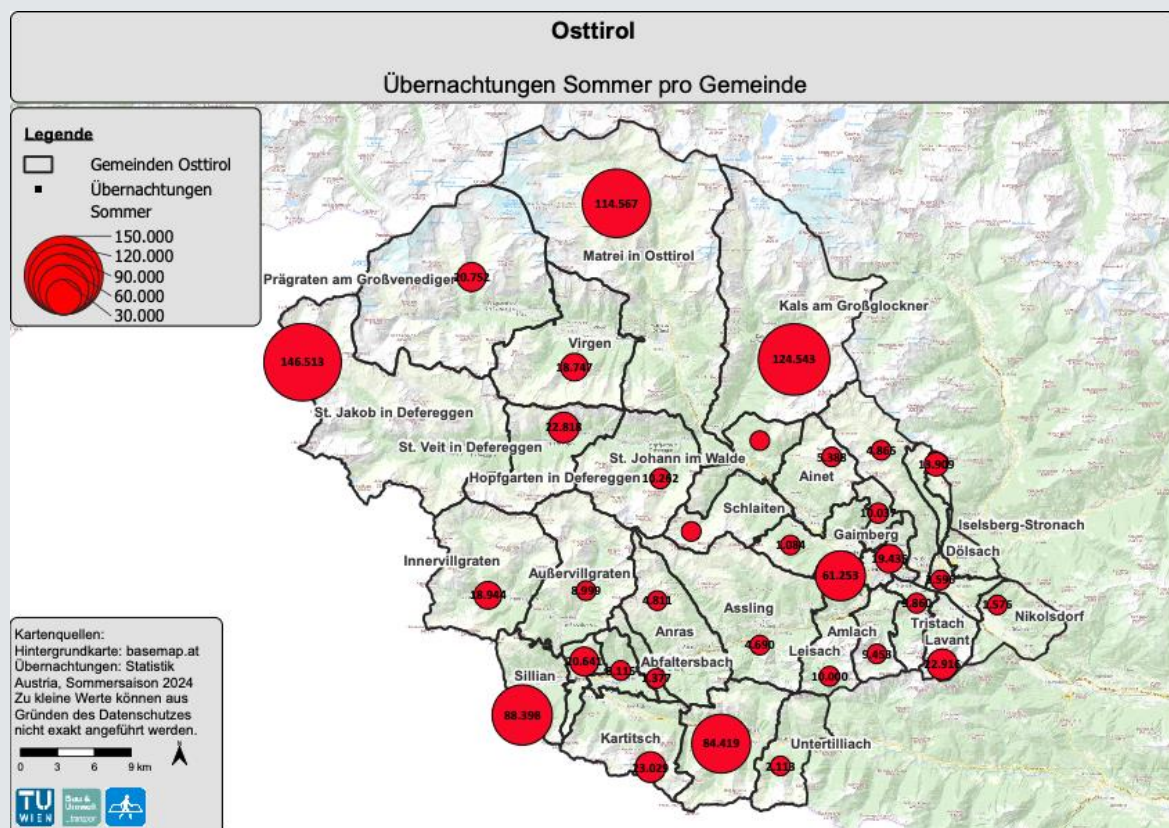


Figure 3: bubble chart of overnight stays in East Tyrol per municipality



4. Stakeholder mapping and Governance

The successful implementation of DRT hinges on cooperation among a wide range of stakeholders. Public transport authorities, municipalities, private operators, employers, schools, tourism boards, and social service providers all play roles in shaping mobility demand and supply. Clearly defined responsibilities and transparent communication channels are essential to prevent duplication, conflict, or neglect.

In East Tyrol, the Verkehrsverbund Tirol (VVT) acts as the regional public transport authority, setting the framework for services and coordinating with municipalities. Local initiatives such as the so-called 'Gemeindemobile'—community-based vehicles—illustrate how municipalities can directly engage in mobility provision. Yet without a higher-level coordinator, these efforts risk fragmentation. The appointment of a regional mobility coordinator has therefore proven vital, ensuring alignment across partners and continuity over time. A simplified figure of the governance scheme in East Tyrol illustrates the before mentioned relations. These can vary from region to region.

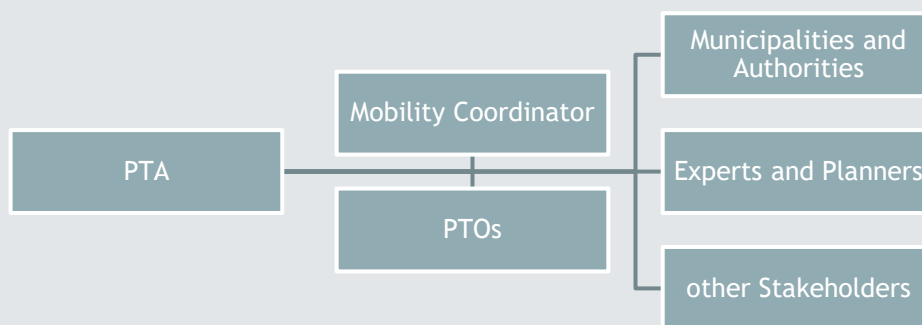


Figure 4: simplified governance scheme in East Tyrol

The lesson learned is that governance must not be an afterthought. Mobility often ranks low on the agenda of individual stakeholders, who may prioritise education, healthcare, or tourism. The risk is that without a dedicated structure, progress will stall. The mobility coordinator role is thus not merely symbolic, but a functional necessity to bridge diverse interests and keep DRT initiatives on track.

With the local governance structures clarified, the next logical step is to involve those who are ultimately meant to benefit from the system: the users, municipalities and other stakeholders. The next step therefore is about engagement and participation as cornerstones of sustainable planning.



5. Engagement of municipalities, general public and stakeholders

User engagement is central to ensuring that local needs are genuinely understood and addressed. Planning without listening risks creating services that look good on paper but fail in practice. Engagement can take many forms: living labs, bilateral discussions, community surveys, and participatory workshops. Each of these methods provides a platform for citizens to express their expectations and concerns.

In total five living labs were held during the project lifetime. They started off with a general perspective on PT in East Tyrol and developed a more specific view in cooperation with experts towards the end. The final workshop contained the presentation of the findings and included the most important stakeholders to discuss the integration of these findings into a new tender of PT in the region. The dates and topics discussed during the individual living labs were the following:

Date	Topics discussed
1 st living lab: DEC 11 th 2023	Stakeholder Mapping, Awareness and Engagement, Synergies with other modes of transport
2 nd living lab: Feb 22 nd 2024	Scenario development, schedules and offers in early and late hours, unifying Apps, broadening accessibility
3 rd living lab: JUN 17 th 2024	DRT integration to PT, extending DRTs, comparison to best practices, prioritization of solutions
4 th living lab: MAY 6 th 2025	Discussion of first results, Company transport integration, planned knowledge exchange by study tour, funding opportunities
5 th living lab: JUN 25 th 2025	Discussion of results, presentation of DRT-solutions by experts, identification of most relevant approaching points and next steps

Table 1: Dates and topics of Living Labs



6. Technical Analyses and Tools

Evidence-based planning depends on reliable technical analyses. Tools such as GIS mapping and demand modelling are indispensable for identifying underserved areas and projecting potential ridership. These tools not only provide a scientific basis for decision-making but also serve as powerful communication instruments. For this step, it is advisable to cooperate with external experts who provide the know-how and skills to conduct these analyses.

In East Tyrol, GIS maps highlighted clear coverage gaps in municipalities such as Heinfels and Stronach. Presenting these visualisations to stakeholders proved far more convincing than abstract data tables. A map showing communities cut off from reliable transport evokes immediate understanding and urgency.

In the below figure, population (white-blue squares) and PT-quality grades (red-green-grey areas) were cross-cut. By doing so, it is easily recognizable which settlements are outside of the areas served by PT. Therefore, the potential areas for an improved PT- or DRT system are identified.

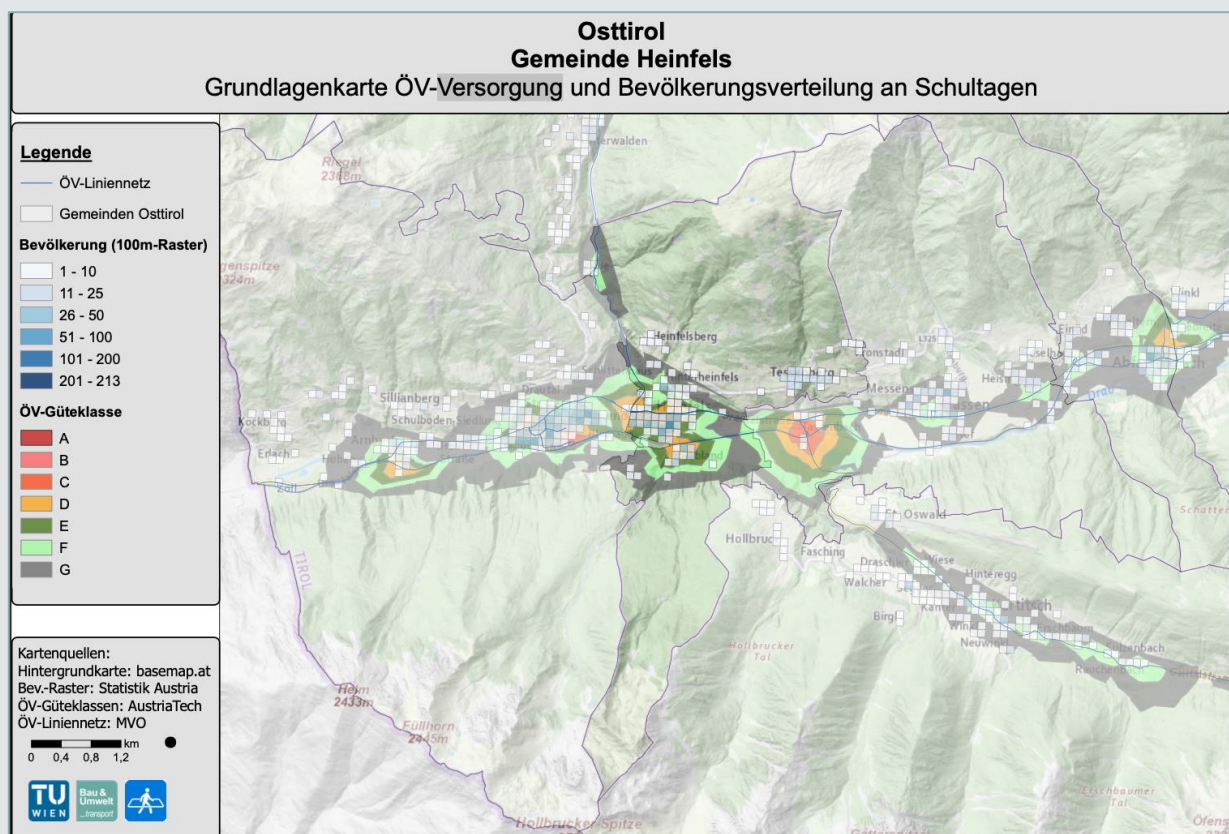


Figure 5: GIS Analysis of population and PT-quality grade cross-cut



Out of this analysis, we could learn that over 16% of the region's population is living outside of any PT quality grade and is thereby not unserved by public transport. Another 46% are only served in the two lowest quality grades out of seven, as the below table illustrates:

PT-quality grade	Sum population	% of total population
A	426	0,9
B	1027	2,1
C	2046	4,2
D	6909	14,1
E	7719	15,8
F	12056	24,7
G	10777	22,1
außerhalb	7895	16,2
	48855	

based on 100m-scheme of PT-quality grade in 2024 and population in 2024

Table 2: percentage of population served by PT-quality grades

Visual representation strengthens argumentation and decision-making. Yet reliance on data also brings risks: gaps, inaccuracies, or biases can distort conclusions. Care must therefore be taken to validate data sources and cross-check with local knowledge.

To deepen the discussion and take the situation of the individual municipalities of the region into account by themselves, also bilateral discussions with most of them were held and by that individual profiles for each of them were designed. The profiles include the municipalities' number of residents, distance to the capital city of Lienz, schools and kindergartens, touristic attractions and hotspots, the current PT-offer and Lines available as well as the objectives and wishes from the residents and municipality.

This method shows very well the big differences in the both the current situation of the PT-offer in the municipalities and also in their needs and objectives for future considerations which also proves the importance of taking these profiles into account when designing new PT and DRT offers. Some municipalities, especially those along the main valleys will be quite satisfied with the current PT offer, others with a bit more peripheral setting will have a lot of objectives and ask for change and improvement of the PT and DRT System.

An example for a municipality profile is illustrated in table 3 below.

Inhabitants	1.015
Distance to region's capital city and mobility hub	29 km
Schools and kindergartens	Day care, after-school care, Volksschule in Tessenberg with 4 municipalities, Abfaltersbach, Strassen, Heinfels, Sillian until 16/17:30 Uhr, supplemented by company-run after-school care with the involvement of large companies, transport by municipalities/volunteers, vehicle available from Hella, expansion desirable
Touristic attractions and hotspots	Hiking trails, Heinfels Castle, Thurntaler ski area, Loacker including Moccheria Café (approx. 420 employees in total), Drau cycle path



Current PT offer	960X (IBK-Lienz): all year round, 4 times daily 961 (Sillian-Lienz): all year round, Monday-Friday: 7 times daily, Saturday: 2 times, Sunday: no service 965 (Obertilliach-Sillian): all year round, hourly 966: all year round, Monday-Friday: almost hourly, Saturday: 8 times, Sunday: 6 times, to Villgratental Station Heinfels: S2, 1 time hourly per direction, in general good demand Nightliner 901N: Friday/Saturday night and before public holidays 4 times per night between 20:30 and 4:30 Uhr Tessenberg no connection at all, ca 200 inhabitants!
Objectives and wishes of municipality and residents	Closing the gap between the train station and bus lines, e.g., 965 (most frequent service) Restaurants near Burg open on May 1, 2026 Route Tessenberg, Heinfels, Strasse Hintenburg, Burg, Loacker (?) Loacker factory transport, Hella, etc. Stop name Villgratental junction (?) Tessenberg connection/service

Table 3: Example of municipality profile



7. Define Service Options

Once demand and supply have been mapped, and user needs identified, planners face the task of defining service options. DRT is not a single model but a spectrum of approaches. Line-based services mimic bus routes with flexible stops, while area-based services allow pick-up and drop-off almost anywhere within a defined zone. Each model has its advantages and limitations.

In East Tyrol, the RegioAST service represents a line-based approach, while the RegioFlink and Postbus Shuttle operate area-based. The experience shows that while area-based services increase coverage and accessibility, they require greater coordination and are more complex to manage.



Figure 6: line based DRT in East Tyrol (RegioAST) ©TVB Osttirol/VVT/Johannes Plattner

Important to notice is, no model fits all contexts. Vulnerable groups, especially elderly citizens unfamiliar with digital tools, must not be excluded. Providing alternatives such as telephone booking or on-site assistance reduces the risk of exclusion in a digital-first system like area-based DRTs.



8. Integrated Network

DRT should not be a standalone experiment. For long-term sustainability, it must be embedded into a wider, integrated mobility system to reach a well-balanced and efficient overall PT-coverage. Valley corridor backbones need to be strengthened, while DRT services cover peripheral and side-valley settlements. Integration with school transport, company shuttles, and seasonal services ensures efficiency and avoids duplication.

In East Tyrol, proposals included “modernizing” fixed-line services in Deferegggen and Pustertal, while introducing new DRT zones in Virgen, Kals, and Villgraten. Some other areas might also be interesting to DRT-offers but probably do not have enough user potential. The experience demonstrated that DRT works best when layered on top of a reliable backbone, rather than substituting for it.

In the end, efficiency and user trust require strong backbone services first. Overextending DRT into too many areas risks raising costs and diluting service quality. Therefore, in rural regions with widespread population, valley structures and long travel times, the right mix of classic PT, DRTs and other modes of transport should be tailored to each region itself.



9. Funding and procurement

Even the best-designed mobility plan will fail without sustainable financing. Funding models must be negotiated transparently between public transport authorities and municipalities. Pilot projects may be supported through temporary budgets, but long-term stability requires clear commitments. Especially during financially tough times, there is no budget to improve PT with increasing cost at the same time. Therefore, it is of even higher relevance to design PT as efficient as possible by implementing DRTs where it is most useful.

Also, local sponsors or foundations can be contacted to fund a pilot or even some years of providing the service. After a while, if the service is successful it can be taken up into the general offer of the PTA or PTO. Finally, also for the local municipalities' mobility offers are factors to be more attractive as home or location.

In East Tyrol, the funding model of the public transport authority VVT comes into play in which the VVT contributed 75% of costs, with municipalities covering the remaining 25% (see figure 7 below). For additional services, the split is at around two-thirds to one-third. Such clarity reduces conflict and allows municipalities to plan reliably.

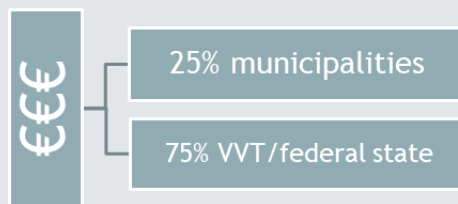


Figure 7: Funding key in East Tyrol

Transparent and stable funding arrangements build trust among partners. The risk is evident: without secure financing, pilot projects—even when successful—often disappear once the initial funding runs out.



10. Conclusions

Planning mobility in rural, peripheral, or mountainous regions is quite complex. Unlike dense urban areas, where high passenger volumes allow for frequent services and straightforward route planning, rural areas must balance geographical constraints, dispersed settlement patterns, demographic realities, and limited financial resources. Seasonal peaks, often linked to tourism further complicate planning. These characteristics create unique mobility needs that require both flexibility in service design and strong coordination among stakeholders.

Across such regions, analyses repeatedly show that while public transport networks along main corridors can provide a reliable backbone, many peripheral areas remain underserved. Fixed bus routes and rail lines typically connect central towns, yet smaller settlements at higher elevations or inside valleys often remain dependent on private cars. Here, demand responsive transport (DRT) emerges as a valuable complement. By providing flexible, smaller-scale services that can be booked on demand, DRT helps bridge accessibility gaps and ensures that residents, tourists, and vulnerable groups remain connected to the wider transport system.

At the same time, lessons learned underline that DRT should not be understood as a replacement for conventional public transport. Its role is to complement strong backbone services with targeted solutions in areas where regular lines are not feasible. Flexible systems—often using app-based reservations, small vehicles, and defined service areas—offer a useful model, but they also introduce challenges, such as higher coordination needs, digital literacy requirements, and the risk of inefficiency under high demand. Careful integration of DRT into existing transport ecosystems is therefore essential.

A sound governance framework provides the foundation for such integration. Successful governance in rural areas depends not only on public transport authorities but also on municipalities, transport operators, tourism boards, schools, and social service providers. Each of these actors brings unique perspectives and responsibilities: schools influence timetables, the tourism sector drives seasonal demand, and social services safeguard accessibility for vulnerable groups. Effective governance is therefore multi-layered, requiring cooperation, transparency, and shared responsibility.

A particularly important governance tool is the role of a regional mobility coordinator. Since most stakeholders deal with mobility only as one among many priorities, a dedicated coordinator ensures that local needs are heard, feedback loops are established, and innovative solutions are pursued. Beyond technical coordination, this role also includes awareness-raising, quality monitoring, and fostering shared mobility options. In this way, the coordinator becomes a catalyst for both incremental improvements and transformative change.

Also, the methodology of planning is a key factor. Participatory and evidence-driven processes, such as living labs, bilateral consultations, and GIS-based analyses, help ensure that plans are both legitimate and actionable. Living labs create spaces for dialogue and co-creation, bilateral discussions reveal the diversity of municipal needs, and GIS analyses provide an objective foundation for identifying underserved areas. Together, these methods not only distil concrete measures but also build trust and legitimacy among stakeholders.

Looking ahead, several strategic directions stand out for rural and low-demand regions more generally. First, strengthening backbone services along central corridors remains crucial, especially during peak commuting and school hours. Second, upgrading fixed-line DRT into flexible, area-based services can significantly improve accessibility in peripheral communities. Third, ensuring digital inclusion is vital so that booking systems do not exclude older residents or those without smartphones.

Ultimately, mobility in rural and peripheral areas is not simply about building infrastructure. A well-balanced combination of fixed routes and flexible services, embedded within a participative governance model and supported by a local mobility coordinator, offers a resilient and inclusive pathway. By aligning traditional public transport with innovative DRT solutions, regions can provide efficient, sustainable, and high-quality mobility even under challenging conditions.