

# DEMO FINAL REPORT ROTTAL-INN (CROSS-BORDER ON-DEMAND BUS)

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## 1. Objectives of the pilot

The cross-border area between the district of Rottal-Inn and the region around Braunau am Inn was highlighted as the study area for a cross-border on-demand bus system due to the prevailing close interdependencies. The district of Rottal-Inn borders Austria in the south with the Inn River as a natural border. There are many interdependencies between the southern district and the area of Braunau am Inn and its surroundings: Working, shopping, going to school, spending leisure time, visiting family and acquaintances and much more. The population moves very often from one side of the border to the other.

For quite some time, there have been efforts to better connect the southern district of Rottal-Inn (especially the municipal areas of Julbach, Kirchdorf am Inn, Simbach am Inn, Stubenberg and Ering) with the area around Braunau am Inn. This existing supply gap is to be closed with a cross-border concept. Against the background of sustainable and demand-oriented mobility, the establishment of a cross-border on-demand bus system appears to be a plausible and implementation-oriented solution to the future mobility problem.

Although there is an hourly train connection between Simbach am Inn and Braunau am Inn, this is only accessible to a limited extent by residents in the rest of the study area. For remote (outlying) areas, there is often only a limited public transport service outside of the school transport trips. On the other hand, it can be understood that from an economic point of view it does not always seem to make sense to integrate these areas into regular public transport services.

In addition to the main focus on the cross-border connection, it should be examined whether the planned transport can also cover other mobility requirements in the communities of the Rottal-Inn district.

As part of the concept, a system was to be developed that would strengthen public transport connections in the cross-border area across commuter movements and also lead to an improvement in the connection of remote parts of towns and communities. The aim was to supplement existing transport services with flexible forms of service in order to raise the status of public transport for the population in the study area and thus create an attractive alternative to private motorized transport.

Following the conception, a pilot operation of the cross-border on-demand bus was to take place within the project period. By monitoring and evaluating the pilot, important experiences and parameters were to be collected, which would allow an assessment of the effectiveness of the transport. This pilot and the accompanying studies should give the transport authorities the possibility to get a better picture of the costs and benefits of the on-demand bus.

Due to the Corona-related pandemic situation that prevailed during the project period, the originally planned implementation could not be pursued. The closure of the borders between Austria and Germany hampered the general implementation and made it impossible to implement the services. Therefore, the originally planned implementation of the conceptual planning including the continuous reporting was postponed indefinitely. Due to the circumstances, the focus of the project is on the conception of a cross-border on-demand bus system, in which the expert opinions and voices from the population were taken into account. For this purpose, the mobility needs in the study area were first recorded and evaluated. Spatial analyses as well as analyses of the public transport and the local rail passenger transport were carried out. Based on the analyses, the spatial development and the development quality were determined and the community-specific requirements were evaluated. The latter were developed through a survey of the mayors of the municipalities and cities in the study area and a survey of the resident population. Based on the presented analyses and surveys, the conceptual design of a cross-border on-demand bus system followed. This conceptual design includes the conception of the demand transport, the determination of the requirements for the operating components as well as a cost estimate for the planned transports. The aim was to show which options in the Simbach am Inn - Braunau am Inn area could lead to an improvement and which measures were considered unsuitable. The project showed the district solutions that could be considered in the future.

## 2. Pilot area description

The study area on the German-Austrian border is mainly characterized by the cities of Simbach am Inn and Braunau am Inn. Around 60% of the population in the study area lives in the two cities, with Braunau having a significantly higher population of around 17,500 than Simbach with around 10,000. At the same time, the two cities function as a common middle center for the region.

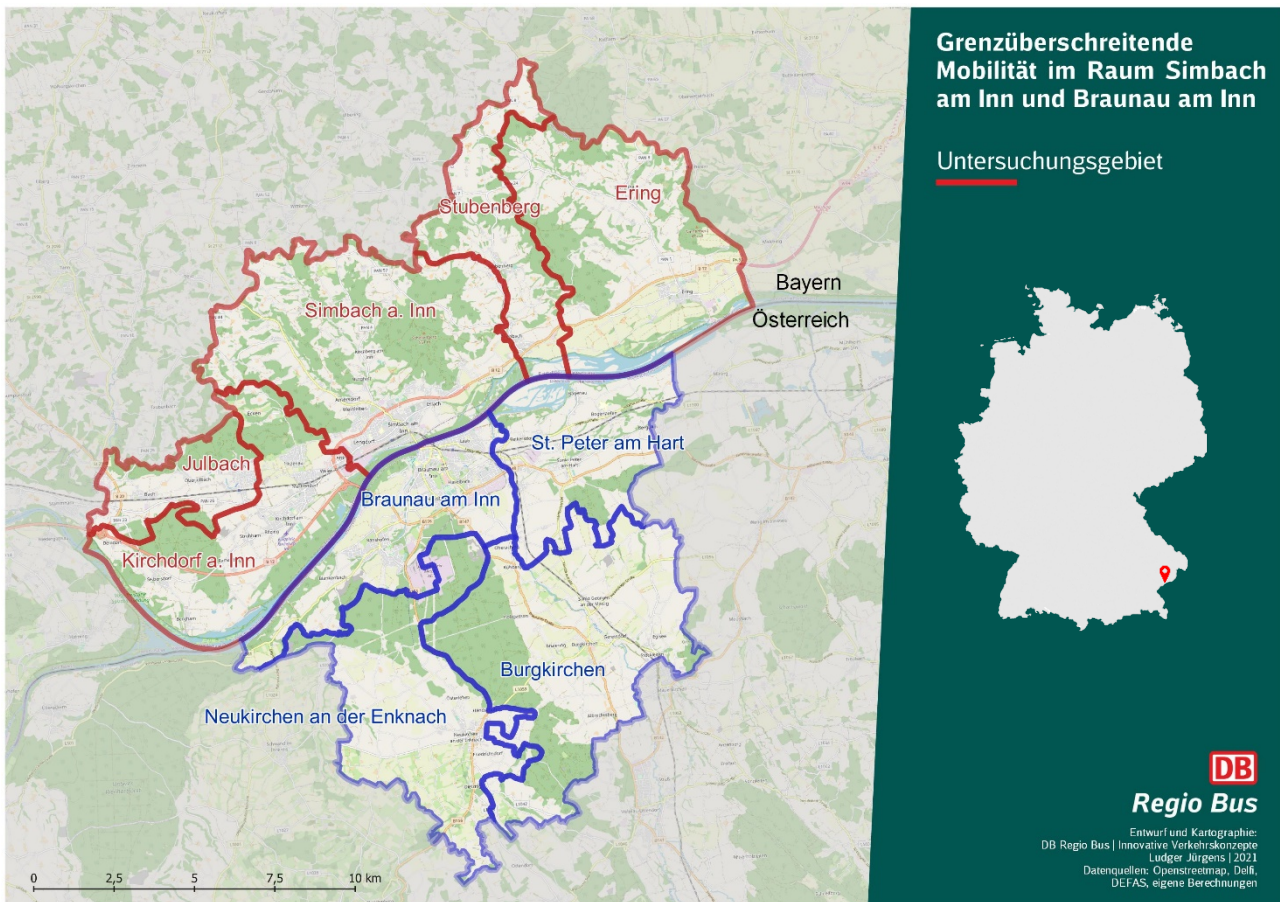


Figure 1: Location and overview of the study area; own illustration

In the investigated area, there are five stations used for passenger service, which are served by two rail lines. The line from Mühlendorf via Simbach and Braunau to Neumarkt-Kallham and Linz (KBS 941/Innkreisbahn) is of interest for the cross-border analysis. In addition to stops in Braunau and Simbach, the train also stops in Julbach and Hagenau im Innkreis.

In the southern direction, the Mattigtalbahn connects Braunau with Steindorf near Straßwalchen and from there on to Salzburg and Freilassing. St. Georgen a.d. Mattig is the fifth railroad stop in the study area.

Both railroad lines run every hour and connect the Braunau/Simbach region with the centers of Salzburg, Linz and Munich.

In the case of local public transport, it makes sense to consider the sub-regions in Lower Bavaria and Upper Austria separately. Since there are no cross-border offers except for the above-mentioned rail connection between Simbach and Braunau, these sub-areas can be analysed separately without any problems.



With its four bus lines that run every half hour on weekdays, Braunau's city transportation system offers a dense service in the city area. The bus stop Stadtplatz serves as a transfer point between the city bus lines and the bus stop Bahnhofsvorplatz as a transfer point to the ÖBB service. The bus stop Busbahnhof (Kolpingplatz) serves as another transfer point to the regional bus lines. On Saturdays and Sundays, there is no service on the regional bus lines or in the city.

On the Lower Bavarian side, the bus network is comparatively not so strongly oriented toward the city of Simbach. This can be explained, among other things, by the fact that there is a strong commuter magnet in nearby Burghausen and the industry located there, which attracts many commuters, especially from the western study area. This leads to the fact that there are bus lines that serve this area and run to Burghausen without the detour via Simbach. For the other bus lines, however, the centrality function of Simbach is again recognizable, since most of them start or end here.

The frequency of the individual lines varies greatly. They range from two to 18 trips per line on school days. The timetables also do not show a uniform frequency but are very clearly geared to the needs of the students. This means that, especially in the morning, there are many travel options in the direction of Simbach am Inn with the school center and bus station located there. At noon and in the afternoon, the corresponding return trips are offered in the opposite direction. Outside of these travel times for schoolchildren, the public transport offer is very sparse. In contrast to the Austrian sub-area, isolated trips are also offered on Saturdays and Sundays in the German sub-area.

In both the Austrian and the German sub-areas, the stops are mostly located along the federal and state roads. Between these main traffic axes, spaces are formed that are not located in catchment areas of stops and have no connection to public transport. This problem is particularly prevalent in scattered settlements. In addition, there are also larger settlements that have not yet been served by public transportation (spatial development deficits).

In addition to the undeveloped settlement areas, there are also settlement areas that are located in the catchment area of bus stops, but the bus stops are served only irregularly or very rarely (temporal development deficits). For these areas, too, an improvement of the public transport service is necessary. This type of stops or settlement areas can be found especially in the German subarea of the study area.

What is again noticeable in the entire study area is the inadequate (German sub-area) or missing (Austrian sub-area) public transport service on Saturdays and Sundays. Except for the railroad lines, there is no regular service anywhere.



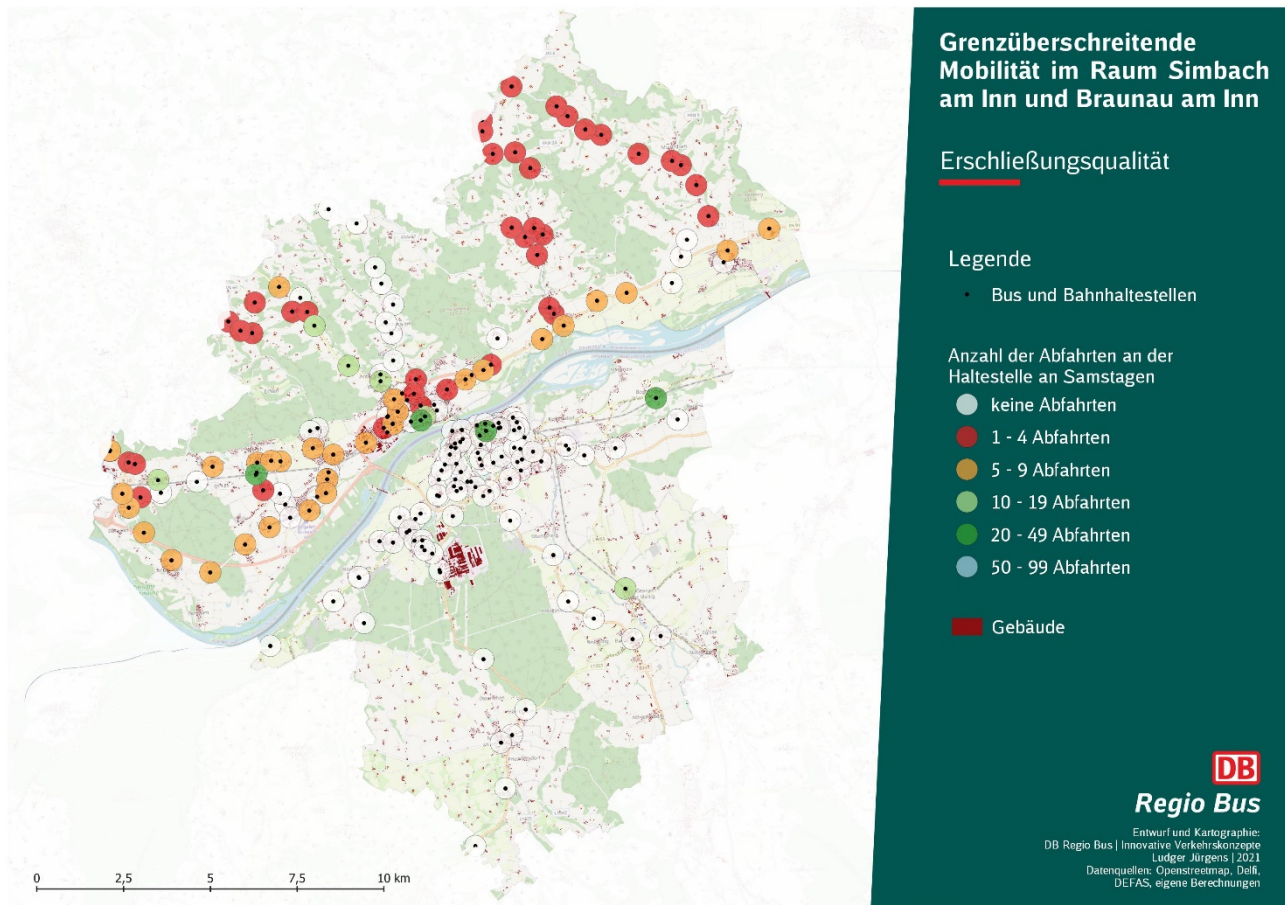


Figure 2: Quality of access in the study area on Saturdays according to the number of departures; own illustration

### 3. Pilot implementation

#### 3.1. Realization of the pilot

The timeline of the entire project was impacted by the Corona pandemic. With the border closures in March 2020, international interaction was largely shut down. At the same time, the focus of community and city interests and efforts was on implementing the Covid-19 provisions. As a result, many items in the project kept shifting within 2020 and further into 2021.

It was started with the analysis of the study area, which formed the basis for the design of a cross-border on-demand bus system. Therefore, the spatial, public transport and local rail passenger transport analysis was started. This included the research on available data, the compilation of these data and the processing in geo-information systems. The analyses include socio-demographic data as well as commuter structures, community structures, transport networks and public transport structures. A questionnaire was prepared to capture the communities' sentiment towards public transport. This was handed over to the communities as a fillable PDF file on June 24, 2021. The deadline for returning the questionnaires was set for 09 July 2021. By the deadline, eight of the nine municipalities or cities had returned the questionnaire.

Parallel to the community survey, an online survey was conducted through which the resident population was to be given the opportunity to provide their input and also provide insight into mobility behaviour. The online survey was prepared using the survey tool "Sosci". The resulting link with access to the questionnaire was passed on to the citizens via the district of Rottal-Inn. The survey was activated on June 26, 2021 and ran until July 25, 2021, after which the collected results were evaluated. Unfortunately, the online survey did not register the expected response rate. The study area comprises approximately 38,000 inhabitants, which would have provided a high potential for meaningful mobility behaviour from the population. In the end, 192 questionnaires were processed, of which only 96 questionnaires were completed in full. As a result, the online survey could not be used to create a meaningful picture and make reliable statements. Nevertheless, the results of the online survey were able to underline and support the statements from the community survey.

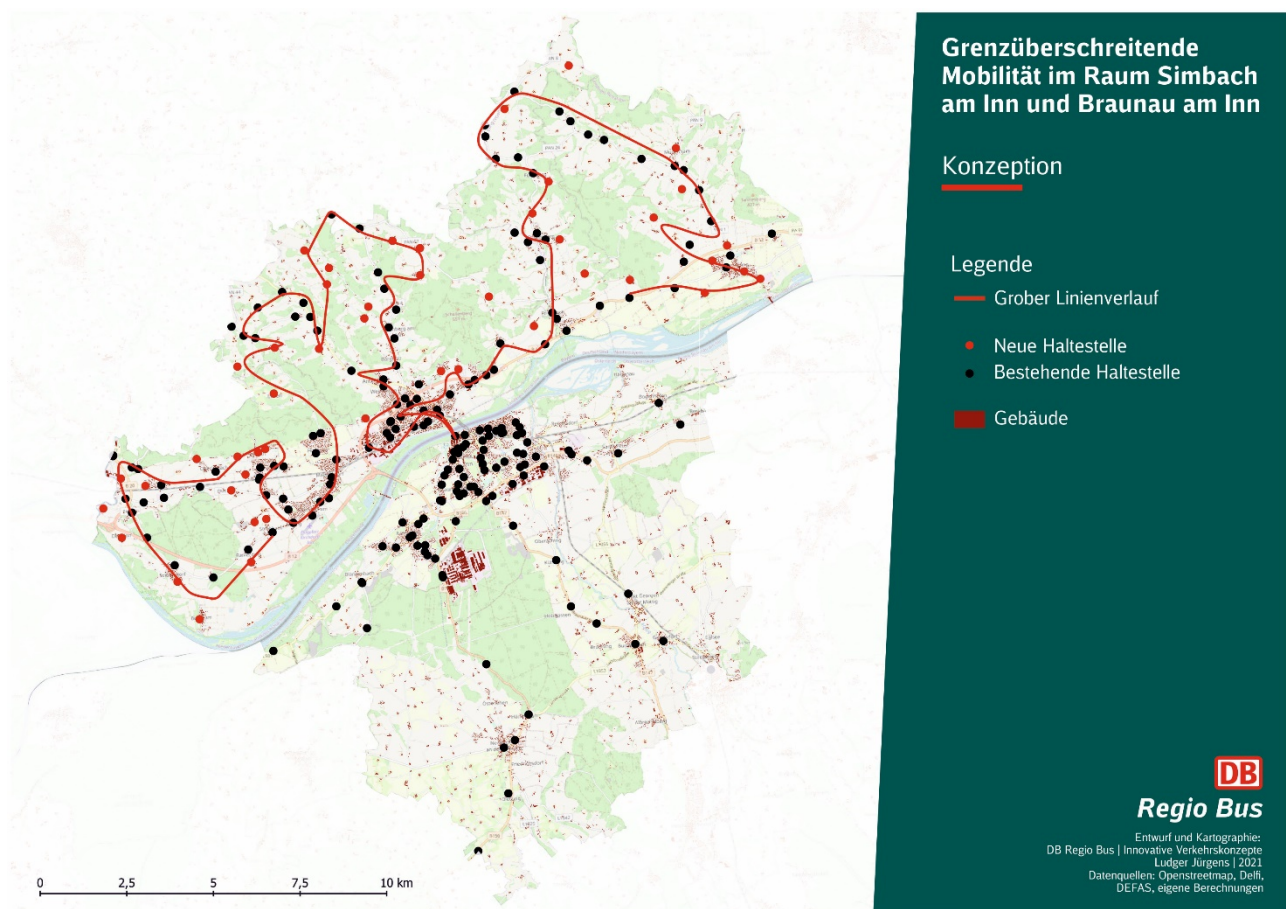


Figure 3: Illustration of the route of the on-demand bus and the new stops; own illustration

The results of the two surveys were then used to develop the concept for the cross-border on-demand bus system. For this purpose, it was first decided which on-demand bus system seemed most suitable for the situation at hand. A line-based on-demand bus system was preferred to an area-based system (see figure 3). The advantage of this is that connections to existing public transport systems can be better guaranteed.

The following concept includes both the concept with routing and new stops of the on-demand bus as well as the corresponding transfer points to the city transport and the local rail passenger transport connections. The optimization of the connections on the Upper Austrian side (cross connections in the interior and spatial development of the districts) are also an aspect for which it would be desirable to find a solution. However, since these connections are only indirectly related to the cross-border connections, these considerations

were initially not considered further in the conception phase. At the same time, new stops were integrated into the existing system in order to improve spatial accessibility in the study area (see figure 4).

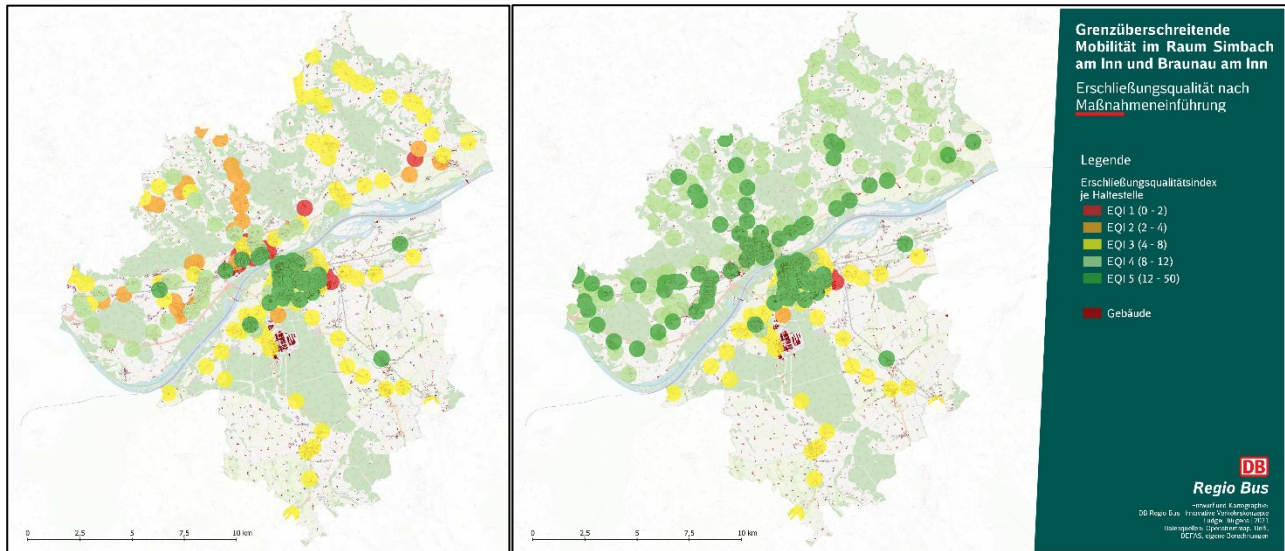


Figure 4: Comparison of the development qualities before and after the introduction of the measures; own illustration

After the concept was completed, a cost estimate for the operation of the on-demand bus system was prepared. This includes all components that are important for the operation of a demand response service. This includes the estimation of the operating performance with kilometers and operating hours, the pricing of the cost factors vehicle, kilometer allowance and personnel, as well as costs for the operation of dispatching systems, telephone exchanges and administration. The latter three are necessary to give the on-demand bus system a digital background and make schedule information, booking and ticket sales possible online or via an app. The project was completed at the end of February 2022.

### 3.2. Involved stakeholders

Public transport is reflected in the everyday lives of citizens. Therefore, it is of particular importance to include them in the conception. As representatives of the interests of the citizens, the mayors of the communities and cities are at the forefront. To give these opinions space, a questionnaire was designed, which was sent to the mayors as a fillable PDF file. The mayors had so the possibility of giving their view of the present situation in the public transport. Different categories were used to find out how the mayors would evaluate public transport in their community or city and where they would locate important focal points relevant to public transport. For this purpose, the mayors were first asked to rate the public transport within the municipality and the cross-border public transport services for the municipality in general. The evaluation scale ranged from "very good" to "insufficient". In the next step, public transport was divided into different areas, for each of which weak points and opportunities for improvement were to be named. The following areas were addressed: Journey offer, connections, development, vehicles/travel comfort, tariff, passenger information, other.

To record the local points that are important for the municipality or city, it was also asked to name these focal points in the areas of "workplace", "retail", and "relevant facilities" and to evaluate them with regard to their connection to the public transport system. For a holistic view, important goals outside the municipality, cross-border goals were also queried and future relevant developments in the municipality were queried.



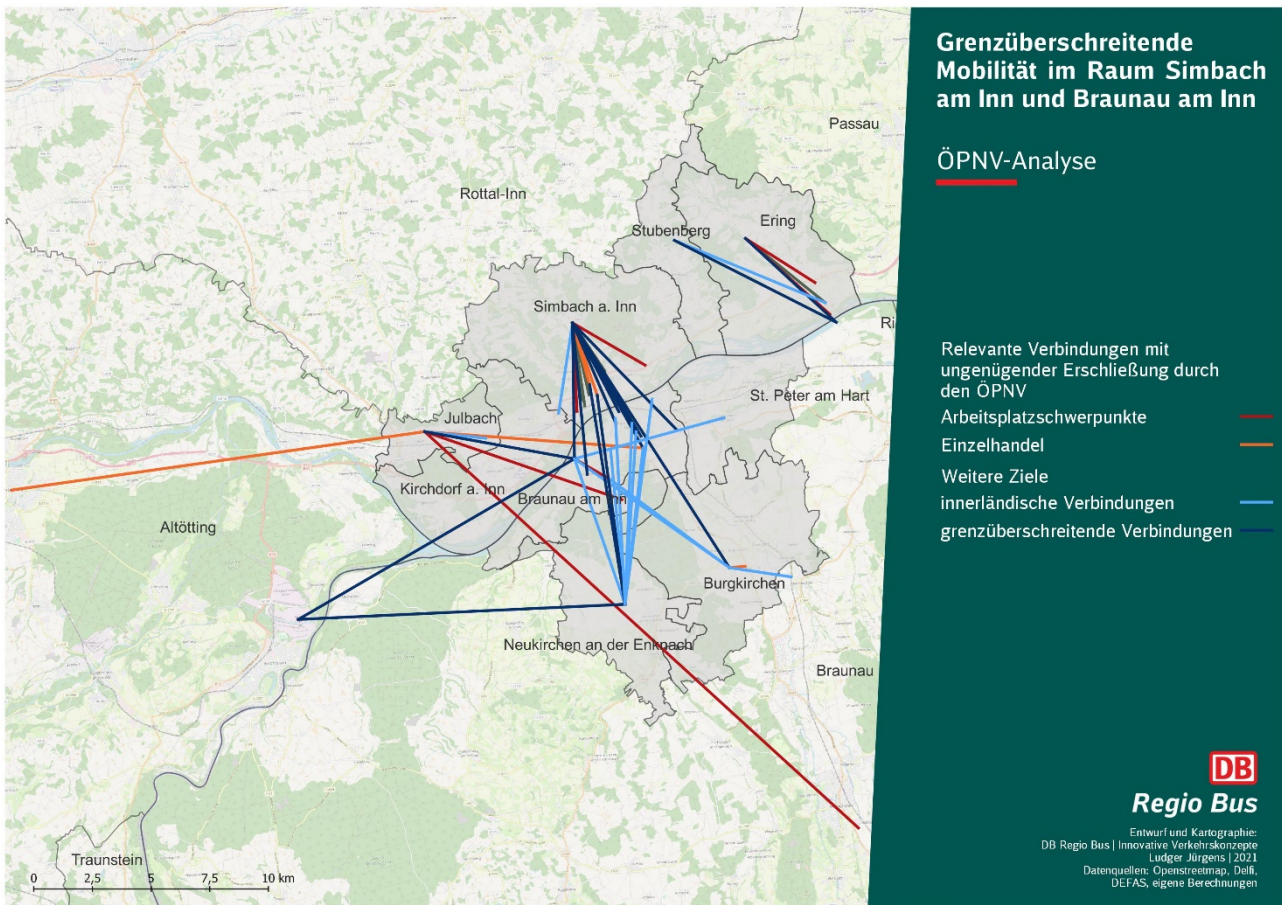


Figure 5: Mention of relevant connections with insufficient accessibility by public transport. Evaluation of the community questionnaire; own representation

In order to also include the population in the region near the border, an online questionnaire was activated over a period of one month to determine the mobility behaviour of the inhabitants.

The questionnaire was divided into different areas. All questions were related to cross-border traffic. By asking for the three most frequently used routes, the most important connections were to be highlighted. Parallel to the start and destination, the purpose, frequency, time and means of transport were also queried.

In addition to the existing journeys, the criteria that a future cross-border transport system would have to reflect were also to be mapped. For this purpose, the frequency, connection to the existing public transport system, booking options, service type and price structure were addressed.

Finally, the general, non-cross-border public transport was also included. The frequency of use, satisfaction, possibilities for improvement, information options and functionalities via digital platforms were also used to capture the mood of the population.

In order to also include participants who stated that they did not use cross-border transport, they were forwarded directly to questions on general public transport via a filter option.



### 3.3. Promotional activities

To draw attention to the survey, press releases were distributed to the regional media (print, TV and radio). Attention was drawn to it on social media channels by both the Rottal-Inn District Office and the Upper Austrian Regional Management. Several posts on the Facebook pages referred to the project and called for participation. At the same time, the link provided was available on the website of the Rottal-Inn district.

### 3.4. Final service

Due to the Corona pandemic, it was not possible to implement the project. Information on testing and operation is therefore not available.

However, important approaches could be developed through the project in the context of RegiaMobil, which can be used for further applications in the district of Rottal-Inn. The concrete approaches are listed in chapter 4.4.

### 3.5. Changes

As previously reported, the project could not be implemented in its original form. All plans listed in the original demo report were affected by the Corona pandemic, the extent of which could not be estimated at the time of the demo report. This impacted a shift in the schedule from the very beginning, culminating in the abandonment of a trial run and implementation of the concept. While the survey and conceptual design could be implemented after the postponement of the launch, the implementation of the concept will not be done in the foreseeable future. As a result, a comparison to KPIs, business models or infrastructure cannot be made.

Since the project focused on cross-border traffic, it was difficult to launch a new and cross-border mobility service at a time of exit restrictions, contact restrictions and temporary border closures between Austria and Germany.

For a long time, it was not foreseeable when regular public transport operations in minibuses (envisaged in the pilot) would be fully legally possible again. To make matters worse, the required lead time including tendering of services, issuance of permits, etc. would have allowed a pilot operation in 2021 for only a few weeks, which in our view would have had a strong impact on the evaluation of the pilot operation.

Due to the delays and the lack of implementation of the pilot operation, the topic of tariffs was only touched on very briefly and superficially. The topic was not pursued further because it was not required at the current stage of the concept. Furthermore, only one stop on the Upper Austrian side of the study area is planned in the concept, for which no independent fare system is required. Rather, this stop would be integrated into the existing fare system. For these reasons, no further discussion of the tariff issue took place. The experiences and results of the CONNECT2CE project and the associated TOOLBOX would have been of great help for a more in-depth examination of the tariff issue. For the reasons mentioned above, however, this intensive work did not take place.



## 4. Pilot evaluation

### 4.1. Results

Due to the lack of implementation, the established KPIs could not be audited.

### 4.2. Target groups

Due to the lack of implementation, a review of the target and stakeholder groups reached could not be conducted.

### 4.3. Feedback

Due to the lack of implementation, no feedback was collected.

### 4.4. Post-pilot plans

Even if the concept presented here will not be implemented for the originally intended use, the approaches developed can be used for other applications in the district of Rottal-Inn. Particularly in rural regions, as is the case in the study area, on-demand transport is becoming increasingly important. Flexible, demand-responsive forms of service can be used to supplement the existing public transportation system. This combination of fixed and flexible forms creates a network that can serve both high traffic flows on strong lines and create an economically interesting offer for weak demand times and areas. In addition to a on-demand bus, which follows a fixed route, more flexible forms are also conceivable. An area service offers the possibility to serve areas completely freely. Both the route and the travel time can be freely selected. Only the service area and the time period are defined. In which areas such a form would make sense would have to be examined in further studies. Particularly in rural areas, bundling effects are more difficult to achieve the more freely and flexibly the form of service is selected.

As in the district of Rottal-Inn, these statements also apply to the study area on the Austrian side. As shown in the conception, temporal and spatial development gaps are also found here. Especially cross connections between individual lines and the development of scattered settlements are insufficiently served. Instead of new fixed-route services, forms of on-demand transport can close these gaps and effectively supplement the existing public transport system.

In general, it remains to be considered in the design of future mobility: To continue to make public transit more attractive and minimize the need to own a car, all options must continue to be exhausted. The implementation of on-demand transport will not be the sole solution to convince large-scale residents to use the motorized private transport less. Other forms of mobility such as mobility sharing offers and micro mobility solutions such as e-bikes must be considered in the overall concept in order to create a cohesive mobility offer that is accessible to everyone at all times.



## 5. Lessons learned

Due to the fact that the pilot project did not take place, the valuable results that could be collected within the pilot project refer exclusively to the conception phase, the communication with the stakeholders and the challenges within the implementation of such transports that already occurred during the conception phase.

The biggest challenge of the project was actually related to the "state border" issue. This became clear again and again in all process steps. Already during the phase of spatial analysis, it could be noticed that so far only very few uniform and common surveys, information and data were available for the entire cross-border study area. In most cases, the investigations ended at the Inn River and thus at the national border. This fact could also be observed in the public transport analysis. Here, too, planning has rarely been done beyond the state border from either side. A positive balance of the project could therefore have led to a highlighting of this topic but was unfortunately thwarted by Corona.

Beyond the cross-border planning, issues would certainly have arisen in the study area during implementation that would not have arisen during planning within a nation-state. These issues were not pursued initially because implementation was not in the cards, for example:

- Which telephone number is offered for booking (Austrian or German area code)?
- What are the requirements for a cross-border public transport concession and who grants it?
- Which tariff will be applied and can the tariff structure be adapted/integrated into the existing systems?
- How will the costs be shared between the public transport authorities?

There have also been challenges with communication. Among other things, we also attribute the low response rate to the online survey to this issue. The identification of the population for the common cross-border area is only moderately present and thus the willingness to participate in a survey is not indirectly given.

In addition to the lack of identification, planned cross-border measures and the associated conceptual steps, such as a survey, must be more widely disseminated. In order to generate as high and successful participation in surveys as possible, strong and joint public relations work is absolutely necessary. This should also always include transparent communication of what is planned for the space and what impact this could have. A play on the population should be done about it through various channels (newspaper, social media, website, flyers) to reach all target groups. To reach all age groups as well, both digital and analogue forms of survey should be offered.

Through the design of cross-border transport, it was possible to determine that an area-based call-bus service, such as the one we encountered with the virtual study visit in Modena with the Prontobus, is not suitable for every type of space. Especially if the existing topography makes an intra- and inter-municipal service difficult and an integration into the existing public transport/local rail passenger transport is desired as in the study area, the operation of the on-demand bus as a line-related variant still has advantages, which are especially reflected in the operating costs.

This on-demand bus service is not intended to replace the existing regular service, but to supplement it. One issue that this raises is the cannibalization of existing transport services. It must be avoided that on-demand services are offered at the same time as regular services. The consequence would be a displacement of passengers, which would lead to a loss of revenue for the transport companies of the scheduled services. However, through targeted planning and the use of intelligent software, such a scenario and the emergence of parallel traffic can be ruled out.





## 6. Annexes

### 6.1. Concept report

During pilot activities a separate document was formulated with the following chapters:

- Current state
- Collection and assessment of mobility demand in the study area
- Conception of a cross-border on-demand bus
- Further concept components
- Conclusion

Language: German.

Length: 39 pages.

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