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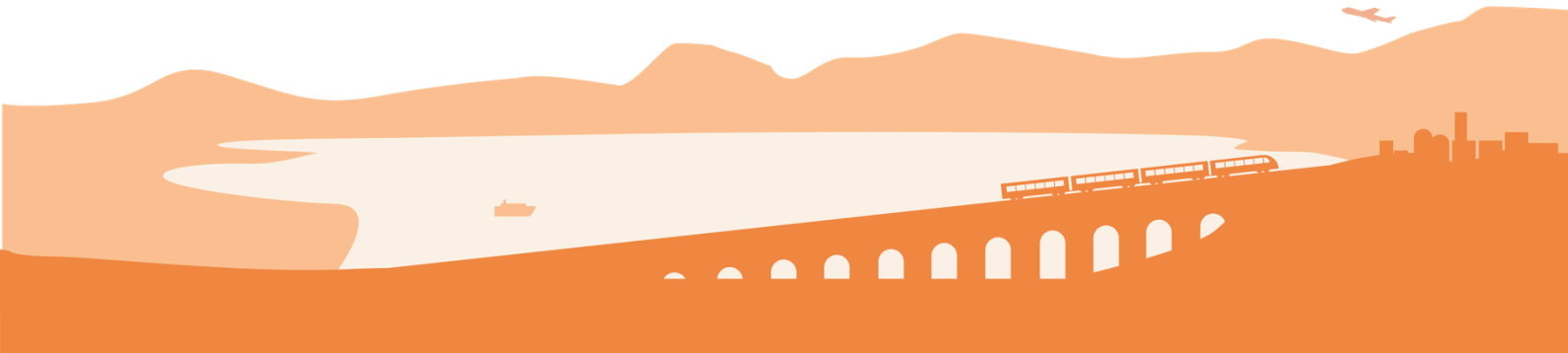
WORK PACKAGE 2

VISION CO-CREATION BASED ON TRANSNATIONAL COOPERATION

DELIVERABLE D2.4.4: Regional / local action plan of Crawinkel (DE)-DRAFT

Version1
04/2026



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1. DELIVERABLE 2.4.4 overview

PROJECT TITLE	streNgthening pUblic TranSport to enHance accEssibility in ruraL centraL Europe
PROJECT ACRONYM	NUTSHELL@CE
PROJECT ID	CE0200933
PROGRAM SPECIFIC OBJECTIVE	SO3.1: Improving transport connections of rural and peripheral regions in central Europe
START DAY OF THE PROJECT	1 May 2024
DURATION	36 months
DELIVERABLE TITLE	D2.4.4 Regional / local action plan of Crawinkel (DE)
DUE DATE OF THE DELIVERABLE	30.04.2026
ORGANISATION RESPONSIBLE	PP 9 - ZossenRail operating company ltd PP 10 - Municipality of Crawinkel/Local community of Crawinkel PP 2 - Technische Universität Wien (TU Wien)
PROGRAMME	Interreg CENTRAL EUROPE 2021-2027

2. DELIVERABLE 2.4.4 description

Deliverable 2.4.4 describes the Action Plan (mainly the Pilot Action) for Crawinkel with an extended introduction on the regional background.

3. DELIVERABLE 2.4.4: Regional / local action plan of Crawinkel (DE)

Background

Transport and Mobility – Problems and Challenges

Transport Policy Objectives

The transport policy objectives for the region surrounding the Crawinkel district are guided by overarching societal, environmental, and economic requirements. The main priorities include:

▸ the establishment and safeguarding of equivalent living conditions in urban and rural areas

▸ ensuring a high level of transport safety and the consistent integration of environmental and climate protection considerations

▸ the development of attractive alternatives to private motorised transport, with the aim of increasing the modal share of public transport (PT)

▸ the adequate consideration of the needs of persons with reduced mobility as well as those who are particularly dependent on public transport

▸ ensuring a high level of safety and comfort for all users

Baseline Situation and Analysis within the NUTSHELL Project

Within the framework of this project, a comprehensive analysis of the existing public transport system in the Crawinkel district was conducted. The objective was to systematically assess and evaluate the current state of public mobility services and, on this basis, to identify weaknesses as well as development potential.

The analysis constitutes a key foundation for the planned reactivation of the Ohratal railway, which is intended as a pilot measure to improve regional mobility.

Key Problems and Challenges

The analysis reveals significant structural deficiencies in the existing transport system:

1. Insufficient service quality

▸ A large proportion of stops exhibit only medium to low service frequency (categories B and C)

▸ Long service intervals, particularly during evening hours and on weekends

2. Limited accessibility

▸ Key facilities (e.g. schools, healthcare services) are only partially accessible outside peak hours

▸ Elderly persons and individuals without access to private transport are particularly affected

3. Lack of network integration

- Insufficient coordination with rail transport (Gotha–Erfurt corridor)
- Lack of direct connections to neighbouring municipalities

4. Deficits in infrastructure and information

- Partial lack of barrier-free access at stops
- Insufficient digital passenger information systems and lack of real-time data

5. Limited integration of tourism

- Key tourist destinations are insufficiently integrated into the public transport system

Development Potential and Strategic Perspectives

The results of the analysis demonstrate significant potential for improving regional mobility. A key measure is the reactivation of the Ohratal railway. This can:

- establish a continuous and efficient rail connection between Gotha and Gräfenroda
- significantly improve regional accessibility
- provide an environmentally friendly alternative to private transport
- sustainably strengthen tourism in the Thuringian Forest
- enhance social inclusion for mobility-impaired groups

Furthermore, integration into supra-regional transport networks (e.g. TEN-T via Gotha) opens up long-term economic development perspectives.

Recommendations for Action

The analysis leads to the following priority measures:

- introduction of an integrated regular-interval timetable (at least hourly frequency)
- improvement of connections between bus and rail services
- expansion of flexible mobility services (e.g. on-demand transport)
- modernisation and barrier-free upgrading of stop infrastructure
- introduction of digital passenger information systems
- pilot operation for the reactivation of the Ohratal railway

PTSQC-Outcomes

PT services accessibility

Accessibility represents a key quality criterion for an efficient and inclusive public transport system. Within the PTSQC-based analysis conducted in the Crawinkel district, it became evident that significant deficits in terms of accessibility persist within the existing public transport system.

A large proportion of the existing stops is currently not fully accessible. In particular, level boarding facilities, tactile guidance systems, and appropriate information services for persons with mobility or sensory impairments are often lacking. In addition, insufficient infrastructure standards and the absence of digital passenger information considerably hinder access for elderly people and individuals with reduced mobility.

The analysis further shows that limited accessibility, combined with inadequate service frequencies and restricted access to key facilities, leads to an additional disadvantage for these user groups. This particularly affects access to healthcare services, educational institutions, and essential service facilities.

Against this background, the planned reactivation of the Ohratal railway is of particular importance.

Fig. 2. Regional Rail Network Map: Central Germany (VSN, NVV, MDV, VMT Areas)

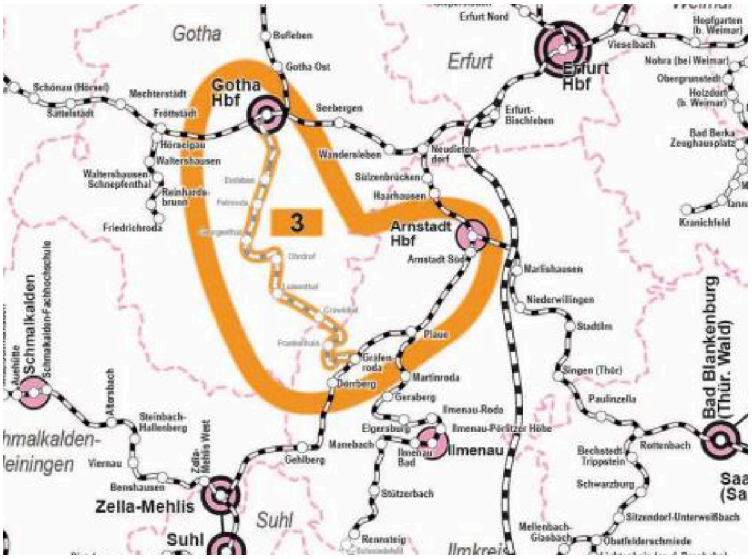

Fig. 3. Ohratal Railway (marked in orange)

Already at the planning stage, full compliance with legal accessibility requirements is being ensured. This includes, among other measures:

- barrier-free platforms with level boarding
- provision of tactile guidance systems at stops
- step-free access to all stations
- provision of clear and digitally supported passenger information
- integration of modern, accessible rolling stock concepts

Furthermore, the reactivation of the Ohratal railway will serve as a catalyst for the gradual upgrading of the existing public transport infrastructure (in particular bus stops) to ensure accessibility and improved integration with rail services.

In line with the PTSQC framework, improving accessibility constitutes a major contribution to enhancing service quality and has a positive impact on accessibility and social inclusion across all population groups. In particular, elderly people, persons with disabilities, and individuals without access to private motorised transport will benefit from significantly improved mobility opportunities.

In conclusion, the consistent implementation of accessibility standards in the context of the reactivation of the Ohratal railway not only fulfils legal requirements but also makes a decisive contribution to the development of an inclusive, sustainable, and future-proof transport system in the region.

Identified gaps and missing links with reference to pilot actions

The evaluation of the public transport system in the Crawinkel district, carried out within the framework of the PTSQC analysis, reveals significant structural deficiencies in terms of service provision, connectivity, and network integration. These particularly concern the insufficient coordination between different modes of transport, the lack of continuous connections, and an overall low level of service frequency outside peak hours.

A key finding of the analysis is the absence of an integrated transport system in which suburban rail passenger transport (SPNV) functions as the structural backbone and is systematically linked with regional and local bus services (StPNV). Currently, only limited connections exist, particularly during off-peak periods, which reduces the overall attractiveness of public transport.

Furthermore, the analysis shows that existing bus services are often not optimally aligned with the timetables of higher-level transport corridors (e.g. Gotha–Erfurt). This results in extended travel times, insufficient accessibility of key destinations, and limited usability for commuters, pupils, and tourist target groups.

Another deficiency lies in the lack of intermodal infrastructure. Existing stops frequently lack adequate parking facilities for bicycles and motor vehicles, which hampers the integration of different modes of transport. Modern mobility hubs as interfaces between SPNV, bus services, and individual and active mobility are not yet sufficiently developed.

Against this background, the pilot measures envisaged within the project – in particular the reactivation of the Ohratal railway – represent a key lever for closing these gaps. The reopening of the railway line will enable the establishment of an efficient SPNV backbone to which regional and local bus lines can be systematically connected.

Within the scope of the pilot measures, the following development priorities are envisaged:

- establishment of an integrated transport network with SPNV as the backbone and coordinated connections to regional and urban bus services
- further development of SPNV services using the planned infrastructure measures, particularly through the introduction of a reliable regular-interval timetable
- expansion of intermodal interfaces through the creation of mobility hubs with secure parking facilities for bicycles and motor vehicles
- integration of the region into the ThüringenTakt system to improve service quality and increase service frequency
- strengthening and expansion of state-relevant bus lines to improve accessibility in peripheral areas

The implementation of these measures will significantly contribute to improving accessibility, reducing transfer times, and increasing the overall attractiveness of public transport. At the same time, it will support the reduction of private motorised transport and contribute to the achievement of climate protection targets.

In summary, the PTSQC analysis demonstrates that there is considerable development potential, particularly in the areas of network connectivity and service integration. The planned pilot measures provide an appropriate basis for systematically addressing these deficits and for establishing a future-oriented, integrated mobility system for the region.

Description of the PTSQC Analysis and the Status Quo

Within the framework of the Interreg project NUTSHELL, a comprehensive status quo analysis of public transport (PT) was conducted for the Crawinkel district. The objective of this study was to systematically assess the existing mobility situation, identify structural deficiencies, and establish a robust basis for the further development of sustainable transport solutions. The methodological foundation was provided by the PTSQC method (Public Transport Service Quality Classification), which enables a standardised and comparable evaluation of service quality in public transport.

The analysis is based on an extensive data foundation, in particular GTFS data from the Verkehrsverbund Mittelthüringen, including timetables, route alignments, stops, service frequencies, and operating hours. These data were complemented by georeferenced information, including settlement structures, demographic developments, locations of educational institutions, healthcare facilities, workplaces, and tourist attractions. The integration of these datasets into GIS-based models enabled a detailed spatial and temporal assessment of accessibility to key destinations within the study area.

A central element of the analysis was the classification of all stops within the study area according to the PTSQC criteria. Three quality levels were distinguished: Category A includes high-frequency, centrally located stops with good transfer options; Category B describes stops with basic service provision; and Category C includes stops with low service frequency and limited accessibility. The results show that a significant proportion of stops fall into categories B and C, indicating an overall limited level of service provision, particularly in peripheral and rural areas.

The geographical analysis highlights clear disparities in the accessibility of key infrastructures. Particularly outside peak hours, substantial service gaps exist, resulting in limited access to essential facilities such as schools, healthcare services, and retail opportunities. Isochrone analyses demonstrate that accessible areas vary significantly depending on time of day, mode of transport, and location. Population groups without access to private cars are particularly affected, including elderly people, young people, and socially disadvantaged groups.

The PTSQC-based evaluation identifies several structural weaknesses in the existing transport system. These include long service intervals, particularly in the evenings and on weekends; a lack of direct connections to neighbouring municipalities; and insufficient integration into regional rail services, particularly in terms of coordinated connections. In addition, deficits in digital passenger information and accessibility at many stops were identified. A lack of alignment between timetables and school-related requirements was also highlighted as a challenge.

At the same time, the analysis reveals significant development potential. In particular, the possible reactivation of the Ohratal railway is assessed as a key strategic measure to sustainably improve regional accessibility. Such a measure would not only strengthen connections to regional and supra-regional rail networks but also enable intermodal links with bus services, cycling infrastructure, and park-and-ride systems. Furthermore, it could contribute to reducing private motorised transport, unlocking tourism potential, and promoting regional economic development.

Key Findings of the Analysis

The evaluation clearly shows that the quality of public transport services in the study area is overall limited, with significant deficiencies particularly in peripheral areas.

1. Stop structure and service quality

The classification of stops reveals an imbalanced structure:

• Only 5 stops correspond to Category A (high-frequency, well-connected nodes)

• 12 stops fall into Category B (basic service provision)

• 8 stops are assigned to Category C (low service quality)

This demonstrates that the majority of the population has only limited or insufficient access to public transport.

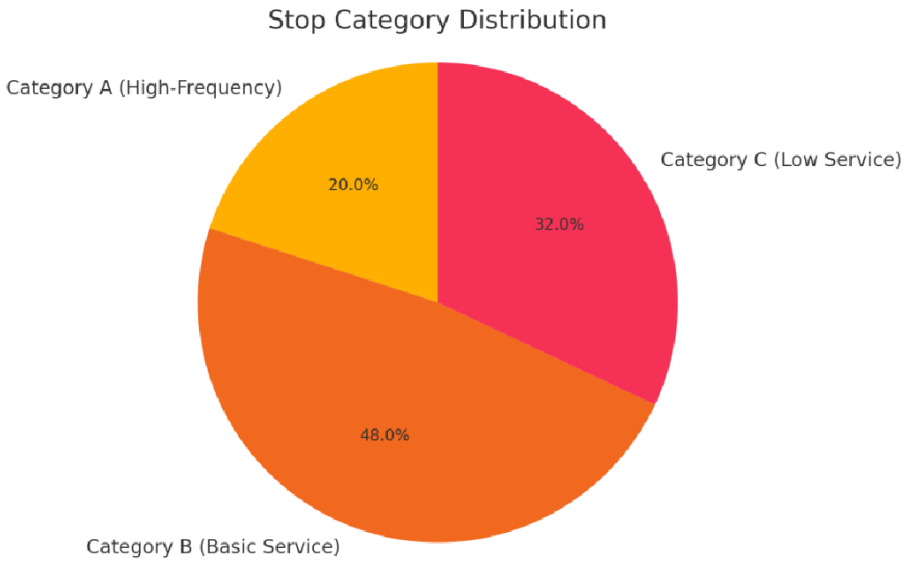

Fig.4. Stop Category Distribution

2. Accessibility and spatial disparities

The GIS- and isochrone-based analysis shows:

• Large parts of the area are only partially or not at all accessible outside peak hours

• Key facilities such as schools, healthcare services, and retail opportunities are unevenly accessible in terms of time and space

• Accessibility strongly depends on proximity to main transport corridors

• Non-motorised population groups, such as elderly people, young people, and low-income households, are particularly affected.

3. Structural deficiencies in the transport system

The analysis identifies several key weaknesses:

• Insufficient service frequency, particularly in the evenings and on weekends (in some cases exceeding 120-minute intervals)

• Lack of direct connections to neighbouring municipalities

• Weak integration into rail services, particularly missing coordinated connections to the Gotha–Erfurt corridor

• Deficits in accessibility at many stops

• Lack of digital passenger information and real-time data

• Insufficient alignment with school-related needs

These factors collectively result in reduced attractiveness and usability of public transport.

4. Deficits in tourism and regional connectivity

Touristically relevant destinations such as the Rennsteig, Tobiashammer, and Marienglashöhle are insufficiently connected. At the same time, there is a lack of direct cross-regional links, further limiting mobility within the region.

5. Development potential and strategic opportunities

The analysis also highlights significant potential:

• The reactivation of the Ohratal railway could serve as a key measure to substantially improve regional accessibility

• It would provide an environmentally friendly alternative to private transport

• Intermodal connections (bus, rail, bicycle, park-and-ride) could be strengthened

• Positive impacts on tourism, economic development, and social inclusion can be expected

In addition, integration into the TEN-T network via Gotha would support long-term international connectivity and economic impulses.

Summary of Findings

Overall, the PTSQC analysis presents a clear picture of structural deficiencies in the existing public transport system in the Crawinkel district, particularly regarding accessibility, service frequency, and integration. At the same time, it identifies concrete opportunities for improvement and highlights the strategic importance of infrastructure measures such as the reactivation of the Ohratal railway.

The analysis thus provides a robust basis for further planning and delivers evidence-based arguments for policy decisions as well as for the development of sustainable mobility concepts in rural areas.

Based on the analysis, concrete recommendations for action were formulated. These include the development of integrated regular-interval timetables with reliable service frequencies, the strengthening of key transport hubs, the expansion of flexible mobility services such as on-demand transport, and improvements in accessibility and digital information systems. Furthermore, stronger involvement of citizens and relevant stakeholders in planning processes is recommended in order to develop demand-oriented solutions.

Action plan

The pilot action focuses on the gradual reactivation of suburban rail passenger transport (SPNV) on the Ohratal railway and serves as a model project for the sustainable further development of regional mobility structures in rural areas of Thuringia. Building on comprehensive analyses, in particular the PTSQC-based status quo assessment as well as the initial evaluation of reactivation potential, the Gotha–Ohrdruf section has been identified as the priority core segment. With a projected passenger potential of approximately 700 passengers per day, this section meets the requirements for in-depth implementation and forms the starting point for a phased reactivation of the entire line.

Pilot Action Revitalising Passenger Services on the Ohratal Railway

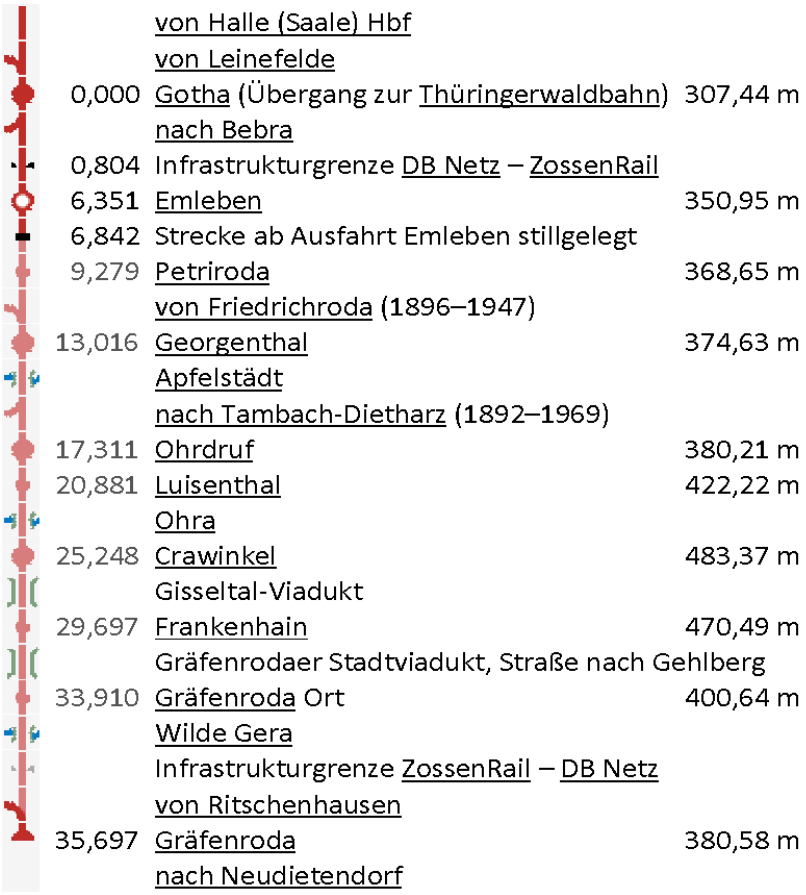

Fig.5. Railway line between Gotha and Gräfenroda with stations, distances and elevation profile; decommissioned sections are indicated in grey/light red

The pilot measure integrates infrastructural, technological, and organisational components into a holistic mobility approach. In terms of infrastructure, the upgrading of the approximately 36 km long single-track line is planned, including the rehabilitation of track systems and key engineering structures. A significant milestone has already been achieved, as the section up to Ohrdruf has been usable for freight transport again since 2025, thus providing a solid technical basis for the resumption of passenger services.

An innovative element of the pilot action is the planned use of battery-electric multiple units (BEMU), which enable emission-free operation without continuous electrification. The use of existing electrified infrastructure at the Gotha junction allows efficient integration into the regional transport network while simultaneously supporting climate policy objectives.

In parallel, the modernisation and functional upgrading of existing stops are planned. In addition to ensuring accessibility and improving user comfort, particular emphasis is placed on strengthening connections to economic and social centres. The planned establishment of an additional stop in the Ohrdruf industrial area represents a key component in effectively tapping commuter flows and increasing the attractiveness of SPNV for employees and businesses.

The pilot action is closely linked to regional development processes and is accompanied by a structured work plan that ensures coordination with the Thuringian Ministry for Infrastructure and the involvement of relevant stakeholders. Participatory formats are used to take regional needs into account and to strengthen acceptance of the measure.

From a financial perspective, the project is based on a clear distinction between investment and operating costs and makes use of existing funding instruments at the state and federal levels. At the same time, potential risks, for example in relation to cost developments or the financing of additional infrastructure, are taken into account at an early stage.

Overall, the pilot action serves not only to improve regional mobility but also as a transferable model for other rural regions facing similar challenges. It contributes to strengthening the regional economy, improving quality of life, and achieving climate and sustainability objectives.

Geographic area– micro location

The region under consideration comprises the area of Ohrdruf as well as, locally, the Crawinkel area. Several coordination and exchange meetings with regional stakeholders have already taken place on the relevant topics. The insights gained from these discussions, as well as the resulting in-depth approaches to measures, are to be presented, jointly reflected upon, and further developed within the framework of a planned workshop with representatives of the Ohrdruf region and the Crawinkel area. The objective is to establish a coordinated basis for future regional development.

The results to date clearly show that the regional living environment is perceived as an economically and culturally significant centre with strong attractiveness. For companies, the region represents an important soft location factor, particularly with regard to quality of life, infrastructure, and regional identity. Many companies have consciously chosen this location and actively contribute to the economic stability and development of the region.

At the same time, it becomes evident that, alongside general regional attractiveness, the accessibility of workplaces plays a central role for both companies and municipalities. The integration of living, working, and everyday life within a functioning regional structure represents a decisive competitive factor compared to other regions.

Regional centres such as Ohrdruf and the Crawinkel district offer significant potential for enhancing quality of life, as they integrate various aspects of daily life and are therefore attractive to both residents and businesses. At the same time, they are in competition with other regions, which makes the targeted further development of location attractiveness necessary.

Against this background, the regional project aims to systematically analyse and further develop the attractiveness of the towns and municipalities of Ohrdruf and Crawinkel. In particular, relevant influencing factors are to be identified and specifically strengthened in order to promote the sustainable development of the region.

On this basis, the initiation of a structured development process is envisaged, involving various stakeholders and designed to achieve long-term impact.

Description of pilot and technical concepts (Intraplan)

The pilot action aims to reactivate the suburban rail passenger transport (SPNV) on the Ohratal railway and thus represents a key measure for the sustainable improvement of regional mobility. Based on the analyses carried out, the Gotha–Ohrdruf section was identified as particularly high priority, as it shows the highest demand potential with approximately 700 passengers per day. In a second phase, the Ohrdruf–Gräfenroda section is also to be reactivated, provided that the first phase proves successful. Against this background, the "Final Design" follows a phased implementation approach, starting with the reactivation of this core section and aiming in the long term at the full reactivation of the entire line.

Technical concepts:

- In terms of infrastructure, the rehabilitation of the entire 36 km long single-track line is planned, which is to be upgraded for an operating speed of up to 80 km/h. This includes, in particular, the repair of track systems as well as the refurbishment of key engineering structures, including the Gisseltal viaduct. An important milestone has already been achieved: since summer 2025, the section up to Ohrdruf has been accessible again for freight transport, thereby providing a solid technical basis for the reactivation of passenger services.

- With regard to rolling stock technology, the use of battery-electric multiple units (BEMU) is planned. These enable locally emission-free and energy-efficient operation without the need for costly continuous electrification. The batteries can be charged at the already electrified platforms at Gotha main station, allowing optimal use of existing infrastructure while simultaneously contributing to the decarbonisation of the transport sector.

- A further key component of the pilot action is the modernisation and functional upgrading of the stops along the line. In the first phase, the stations Emleben, Petriroda, Georgenthal, and Ohrdruf are to be upgraded; in the second phase, the stations Luisenthal (Tobiashammer), Crawinkel, and Gräfenroda Ort will follow, taking into account accessibility, user comfort, and intermodal connectivity. Of particular importance is the establishment of at least one additional stop, including in the Ohrdruf industrial area. This is intended to specifically serve commuter flows from local industry as well as the Bundeswehr site (Homeland Security Regiment), thereby significantly increasing the attractiveness of SPNV for commuters.

Overall, the pilot measure combines infrastructural modernisation, innovative rolling stock technology, and demand-oriented service planning into an integrated mobility concept that addresses ecological as well as economic and social objectives.

Stakeholders' involvement and their roles

The successful implementation of the pilot action for the reactivation of the Ohratal railway is largely based on the active involvement of a wide range of stakeholders at municipal, regional, and state level. The participation of these actors is crucial for the technical quality, political feasibility, and long-term sustainability of the project. Cooperation takes place within a multi-level and participatory approach that integrates institutional, economic, and civil society perspectives.

At the state level, the Thuringian Ministry for Economic Affairs, Agriculture and Rural Areas (TMWL) plays a central role as a strategic partner. It is responsible for shaping state policy in the areas of infrastructure, mobility, and regional development and supports the project both technically and structurally. In particular, the Ministry aims to improve accessibility in rural areas, promote climate-friendly mobility solutions, and sustainably strengthen structurally weak regions. Involvement at this level also ensures alignment with funding programmes and the strategic development objectives of the state.

In addition, regular coordination and presentation of project progress take place within the Thuringian Ministry for Digital Affairs and Infrastructure (TMDI) in order to ensure close alignment with state-level digitalisation and infrastructure strategies.

Furthermore, the Thuringian Ministry for Health, Social Affairs, Labour and Family (TMSGAF), under the leadership of Minister Katharina Schenk, is an important actor, particularly with regard to social inclusion, public services of general interest, and the provision of equivalent living conditions. Improving mobility is a key prerequisite for access to employment, healthcare, and social services and is therefore directly linked to the objectives of this ministry.

At the regional level, the district of Gotha, under the leadership of District Administrator Onno Eckert, assumes a central coordinating function. The district acts as a link between municipal interests and state-level objectives, supports the strategic integration of the measure, and contributes to coordination with regional development and infrastructure planning.

The municipal level – consisting of the towns of Gotha, Ohrdruf, Gräfenroda, and the municipality of Crawinkel – is directly involved in project development. Particular emphasis should be placed on the role of Stefan Schambach, Mayor of the town of Ohrdruf, who, as a key municipal actor, represents the interests of the local population and the regional economy and actively contributes to both the political and practical implementation of the project. The responsibilities of the municipal level include, in particular, the identification of local needs, ensuring connectivity for the population, the organisation of school transport, and the development of tourism infrastructure.

Transport stakeholders also play a central role, in particular the Verkehrsverbund Mittelthüringen (VMT), regional transport companies (districts of Gotha and Ilm-Kreis), and planning institutions. These actors are responsible for integrating the planned railway connection into existing public transport structures, coordinating timetables, and ensuring connecting services.

The early involvement of these stakeholders is essential in order to exploit operational synergies and ensure a functioning overall system.

The stakeholder landscape is further complemented by actors from tourism, education, and civil society. The Thuringian Forest / Gothaer Land Tourism Association contributes expertise particularly in the development and marketing of tourism and supports the assessment of the tourism potential of a reactivated railway connection. Schools and educational institutions have indicated a concrete need for reliable mobility services for pupils, thereby providing important input for the design of service schedules.

In addition, specialised planning offices and engineering consultancies make a significant contribution through the implementation of needs assessments, cost estimations, and technical evaluations of

infrastructure. Their expertise forms the basis for informed decision-making processes and the preparation of feasibility studies.

Stakeholder cooperation is organised within a structured coordination framework characterised by regular meetings, workshops, and bilateral consultations. The objective is to bundle different interests at an early stage, exploit synergies, and minimise potential conflicts. At the same time, participatory formats ensure that regional needs and perspectives are incorporated into the planning process.

Overall, it is evident that the broad and early involvement of all relevant stakeholders is a key success factor for the pilot action. It contributes to ensuring the feasibility of the project, increasing acceptance within the region, and developing a sustainable and viable long-term mobility solution.

Detailed pilot work plan

The pilot work plan is closely linked to the ongoing coordination processes of the Thuringian Ministry for Digital Affairs and Infrastructure (TMDI) as well as to the active involvement of regional and local stakeholders. The objective is to ensure a coordinated, feasible, and widely accepted implementation of the reactivation of suburban rail passenger transport (SPNV) on the Ohratal railway.

The work plan is structured into several consecutive phases. In the initial phase, detailed technical and operational planning is carried out, including the updating of existing feasibility studies, the detailed planning of infrastructure measures, and coordination with relevant authorities, transport associations, and infrastructure operators. At the same time, legal, financial, and organisational framework conditions are reviewed and specified.

In the subsequent phase, the focus is on intensified stakeholder involvement. This includes municipalities, districts, transport companies, economic partners, educational institutions, as well as representatives from tourism and civil society. Through workshops, consultations, and participatory formats, it is ensured that regional needs are taken into account and that acceptance of the measure is established.

Another key component is the development of an integrated operational and service concept. This includes timetable planning with coordinated service intervals, integration into existing bus and rail networks, and the design of intermodal interfaces (e.g. park-and-ride facilities, bicycle connections). In addition, innovative mobility solutions such as on-demand services are examined in order to improve accessibility, particularly in peripheral areas.

In parallel with the planning phase, preparatory infrastructure measures are coordinated and implemented, including the rehabilitation of the railway line, the modernisation of stops, and the provision of barrier-free access. At the same time, suitable rolling stock technologies are selected and integrated, in particular battery-electric multiple units (BEMU), including the required charging infrastructure.

The work plan also includes the development of an accompanying communication and dissemination concept. This aims to involve the public at an early stage, ensure transparency, and highlight the benefits of the reactivation. Information campaigns, public dialogues, and digital formats support this process.

Time and work plan (by months)

May 2024 – April 2025: Strategic Preparation & Stakeholder Dialogue

- Project launch
- Intensive coordination meetings with various planning offices, the Thuringian Ministry (TMDI), and regional stakeholders to define the project objectives
- Preparation of the tender for specialised transport planning

May 2025 – December 2025: Technical Planning & Operational Concept Development

- Commissioning of the transport planning office Intraplan
- Development of detailed timetable variants and technical baseline analysis
- Resumption of freight transport on the Emleben–Ohrdruf section (summer 2025)

January 2026 – May 2026: Validation & Cost-Benefit Analysis

- Integration of NVG counting data (as of the end of January 2026) into the transport models
- Presentation of the project status at the Ministry (12 February 2026) and coordination with the Bundeswehr (German Army) regarding the relocation of charter bus services
- Milestone: implementation and completion of the cost-benefit analysis (CBA) by the end of May 2026

June 2026 – December 2026: Financing & Political Decision

- Evaluation of the CBA results by the State of Thuringia
- Definition of the investment framework (approx. €9 million for Phase 1) and decision on inclusion in the State Public Transport Plan

Months 33–36 (January 2027 – April/May 2027): Final Phase

- Preparation of the Final Design and the transfer report
- Preparation of approval documents for the Federal Railway Authority (EBA)
- Completion of NUTSHELL pilot reporting

Financial plan (budget, investments, deviations foreseen)

The financial plan is based on a clear distinction between one-off infrastructure investment costs and the ongoing operating costs of suburban rail passenger transport (SPNV). This differentiation enables a transparent presentation of financial requirements as well as a targeted planning of funding sources and financing opportunities.

- The infrastructure investments for the prioritised section Gotha–Ohrdruf are estimated at approximately EUR 9 million, based on 2023 price levels. This estimate includes, in particular, the renewal of the track infrastructure, the modernisation and adaptation of signalling and safety systems, as well as the barrier-free upgrading and functional improvement of the stops along the line. In addition, measures to ensure operational safety and the integration of the line into existing regional transport networks are taken into account.

  However, these overall investment costs are not part of the NUTSHELL project budget, but rather represent a long-term perspective for potential future implementation.

  Within the framework of the project, the allocated budget for pilot activities amounts to EUR 208,915, jointly implemented by OT Crawinkel and ZossenRail. These funds are dedicated to conceptual development, preparation of technical and organisational planning documents, and the establishment of the necessary groundwork for future infrastructure implementation
- The ongoing operating costs for the planned rail services are currently estimated at approximately EUR 2.3 million per year. Through the planned operating concept of so-called “through-routing” (Variant 1), in which existing lines are meaningfully interconnected, synergies can be achieved. These particularly relate to the more efficient use of rolling stock and personnel, as well as optimised circulation planning, thereby contributing to a reduction in operating costs.
- With regard to possible deviations, it should be noted that the cost-benefit analysis (CBA), scheduled for completion in May 2026, may lead to a refinement of the current cost estimates. In particular, developments in construction price indices as well as potential adjustments to technical requirements may have an impact on final investment costs.
- A further potential risk lies in the financing of the required charging infrastructure for battery-electric multiple units (BEMU). If this cannot be fully covered by existing funding programmes, such as the Municipal Transport Financing Act (GVFG), additional financing requirements may arise. Corresponding scenarios will be examined in the further course of the project and integrated into the financial planning.

Overall, the financial plan provides a solid and realistic basis for the implementation of the pilot action, as the necessary preparatory activities, in particular feasibility studies, are adequately funded. The resulting recommendations prepared by the contracted service provider constitute a sound basis for decision-making and play a key role in the overall process of the revitalisation of the Ohratal railway line.

Monitoring plan

Monitoring ensures that the pilot achieves its defined objectives for sustainable rural mobility.

1. **Demand monitoring:** The target value is approximately 700 boardings per day on the Gotha–Ohrdruf section. Comparisons will be carried out semi-annually after commissioning against current bus passenger figures.

2. **Operational quality:** Monitoring of travel time competitiveness (target: 22 minutes travel time). Achievement of connections to the RE1 (Gotha–Erfurt) with a transfer time of a maximum of 8–10 minutes.

3. **Environmental impact:** Calculation of CO_2 savings resulting from the shift from private motorised transport and Bundeswehr charter buses to rail (projected potential: 750 tonnes CO_2 per year).

4. **Stakeholder feedback:** Regular evaluation meetings with the Thuringian Ministry and the municipalities to assess regional value creation and acceptance of the new service.