

URBAN LAB - SYNTHESSES 2025



“RER Métropolitains” in Europe

Realities and Impacts for Post-Carbon Mobility

**MASTER Governing Ecological
Transitions in Cities**

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PREFACE

The Urban School at Sciences Po partnered with AREP to develop a project to explore the realities and impacts of “*RER Métropolitains*” in Europe. The objective was to better understand how regional express rail (RER) systems across Europe have evolved and what lessons they may hold for France’s ongoing efforts to deploy similar systems beyond the Paris Region.

Beginning in October 2024, the team of four students from the Master’s program Governing Ecological Transition in Cities – Marion Dejean, Victor Duchastel de Montrouge, Patrizio Gravina, and Bui Luu Quynh Nguyen – brought professionalism and analytical rigour to a comprehensive analysis of European RER networks. Their research focused on governance structures, environmental impacts, and the integration of these systems into spatial planning strategies. The project unfolded at a pivotal moment, as the French government elevated RER Métropolitains to a national priority, identifying 15 cities for targeted financial and technical support – offering AREP a timely and strategic opportunity to align its expertise with evolving policy and infrastructure agendas.

Over the course of nine months, the team conducted 34 in-depth interviews, three international field visits, visited 30 stations, and analysed 26 French cases. Fieldwork was carried out in Asturias, Salzburg, and Vaud, with additional case studies from Freiburg and Zürich. These investigations allowed the team to capture the diversity of existing RER systems and extract key insights for future applications in the French context.

The Capstone was structured in three phases: a literature review and case selection; detailed field research combining interviews, site visits, and qualitative analysis; and the development of an operational framework and strategic recommendations for AREP. Particular attention was paid to identifying benchmarking indicators, assessing policy integration, and evaluating how RER systems can support the goals of post-carbon mobility and territorial equity.

This project has provided AREP with a robust analytical foundation and a comparative perspective to inform the design, implementation, and evaluation of future *RER Métropolitains* in France. The findings will contribute to AREP’s mission of shaping the built environment for a post-carbon future and reinforce its role as a thought leader and technical expert in sustainable mobility at the European level.

Roberto RODRIGUEZ, Capstone Academic Tutor



AREP's offices at Porte d'Ivry in Paris. Image and logo from AREP's website.

Founded in 1997, AREP is a multidisciplinary design and consulting firm renowned for its expertise in architecture, urban planning, engineering, and environmental strategy. As a subsidiary of SNCF Gares & Connexions, AREP has grown into a global practice with over 1,000 professionals from 28 different nationalities, operating in France and internationally, including significant presences in Europe, China and Vietnam.

AREP, as expressed through the acronym name, stands for Architecture, Research, Engagement, and Post-Carbon – reflecting the firm's commitment to addressing the ecological emergency through its EMC2B approach. This holistic methodology integrates energy efficiency, carbon reduction, material sustainability, and biodiversity enhancement into every project.

Innovation is at the heart of AREP's practice. The firm harnesses advanced technologies and innovative design approaches to craft solutions that respond to the dynamic challenges of contemporary urban environments. These solutions frequently involve smart city strategies, the revitalisation of existing structures, and the incorporation of emerging transportation systems.

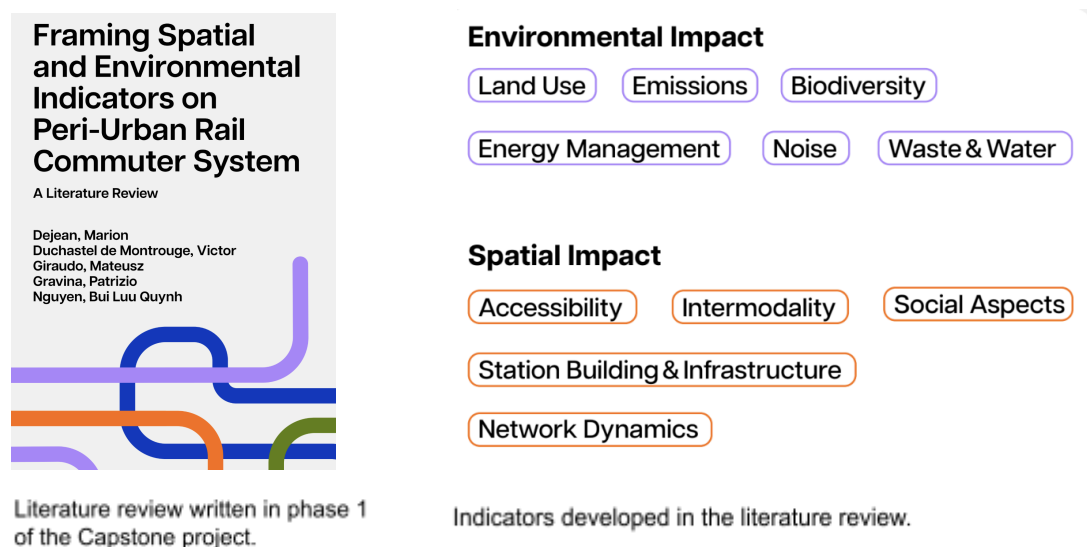
AREP's portfolio includes over 500 active projects annually, working with a broad spectrum of clients, such as government agencies, private sector developers, and global institutions. Recent standout projects led by AREP include the interior design of the new French TGV, the design of the future high-speed station in Jihlava, or the refurbishment of the Parisian Gare du Nord.

METHODOLOGY

During the Capstone project, research was organised into multiple phases conducted between October 2024 and June 2025. The project's main focus lies in analysing case studies, thereby showcasing best practices or effective solutions to challenges in suburban rail systems, with a focus on their ecological and socio-spatial impacts. The chosen systems had extensive development histories and ample data for robust comparison.

Phase 1: Indicator development and case study selection

The study targeted European regional rail systems, selecting diverse cases to reflect varying historical, political, and spatial contexts. A set of indicators was developed for comparability, covering qualitative and quantitative ecological and spatial impacts. The indicators were identified and categorised based on an exhaustive literature review evaluating transport systems.



The indicators developed for the study were grouped into three main categories: contextual/descriptive indicators, which included demographic data, infrastructure, and socio-political context to support comparisons, particularly between European and French cases; environmental indicators, focusing on aspects such as land use, CO₂ emissions, and biodiversity impacts to reflect national climate strategies; and spatial indicators, which addressed intermodality and integration with planning and mobility strategies, highlighting network performance and effects on land use, including phenomena like urban sprawl. The resulting structured list of indicators was delivered in December 2024.

Relevant case studies were identified through a review of academic and grey literature, with the multilingual team accessing sources in English, German, French, Italian, Spanish, Dutch, Swedish, Polish and Czech. This long list of cases was then refined in coordination with AREP. In parallel, descriptive indicators were applied to 26 French SERM systems to collect data on population, public transport development, and topographic conditions. To ensure alignment with AREP's perspective, the team also conducted interviews and participated in seminars focused on current trends in SERM planning.

Phase 2: Data Collection and Fieldwork

Six case studies were initially selected, later reduced to five for detailed analysis. The research combined semi-structured interviews and desk research, complemented by field observations and photographic documentation.

Three cases – Asturias, Salzburg, and Vaud – were studied on-site due to limited online data, with visits, led by two team members, lasting three to five days. Two cases, Zürich and Freiburg, were analysed online. Fieldwork included direct use of local public transport and documentation of stations, vehicles, park-and-ride, and cycling infrastructure as well as interviews. For each case, one flagship station was selected based on AREP's typology, representing key features such as intermodality or architectural significance.

A total of 34 semi-structured interviews were conducted across the cases, involving diverse local stakeholders so as to reflect broad perspectives and validate findings. Interviewees thus included officials of different levels of government (national, regional, and municipal), researchers, operators, the private sector, and members of civil society. The interviews followed a tailored guide based on the indicators, lasting 30 to 90 minutes, and were recorded under data protection rules, when consent was given.

Phase 3: Analysis and Synthesis

Interview transcripts and data were analysed in categories: regional specificities, environmental and spatial indicators, innovations and limits, and relevance to the French SERM context.

Results were visualised via comparative tables and thematic maps created with GIS datasets from official sources and CORINE land cover data by the European COPERNICUS programme. Where official data did not isolate regional rail systems, OpenStreetMap data supplemented spatial analysis.

Flagship station layouts were standardised using AutoCAD to allow comparison of design, integration, and intermodality. A summary table presented these findings visually.

Results

The project concluded with an exhaustive presentation accompanied by an in-depth analysis, a summary table, and this executive summary. The outputs offer actionable recommendations for AREP, highlighting successful practices and common challenges. These reflect the perspectives of selected European countries and broader trends in regional rail system development.

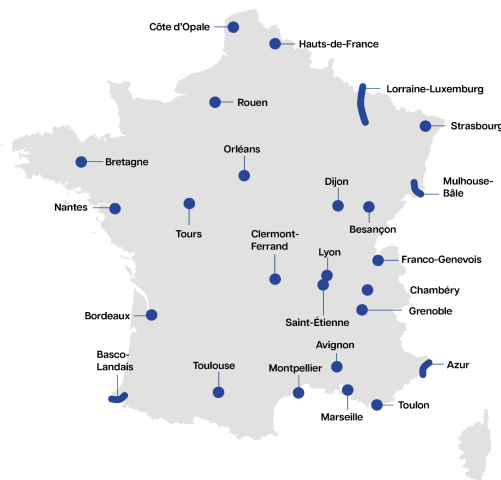
FIELDS STUDIED

The focus of the capstone project gradually narrowed down to five diverse European cases of peri-urban rail systems: Asturias (Spain), Vaud (Switzerland), Zürich (Switzerland), Freiburg (Germany), and Salzburg (Austria). These cases were selected to represent a wide range of contexts. Our objectives were to observe the operational and infrastructural realities of the networks, and collect qualitative and quantitative data to inform a comparative analysis.

Asturias, Vaud, and Salzburg were prioritised for field visits due to limited online data availability, enabling firsthand observations of public transport use, station design, and multimodal connectivity. In contrast, Zürich and Freiburg were studied primarily through desk research and remote interviews, given the abundance of accessible data. Throughout our research, we aimed to understand local ambitions around environmental considerations, network performance, and spatial planning, embedded in the governance framework guiding development in each region.

The fieldwork revealed significant contrasts in how regional rail systems are planned and integrated within their wider territorial and environmental contexts. By combining these cases, our project provides a nuanced view of peri-urban rail's role in structuring the territory, while responding to mobility needs under environmental considerations across Europe.

Ultimately, the research fieldwork and comparative framework enabled a comprehensive understanding of the dynamics shaping regional rail systems today. It underscored the importance of tailoring policies and infrastructure to local contexts while learning from broader European experiences. This foundation was essential for formulating practical recommendations and insights to support AREP's future work in peri-urban rail planning and development in France. Throughout the research project, applications to the context of the planned French SERM projects (see following page) were systematically made, to inspire AREP in its upcoming role as a key player in the development of these systems.



Map situating the 26 labelled SERM projects in France (Ministère de l'aménagement du territoire). See following page for more information.



Map situating the 5 case-studies.

ISSUES

The introduction of the *Service Express Régional Métropolitain* (SERM) marks a turning point in French transport policy, following the adoption of the December 27, 2023 law that legally defines these multimodal regional services outside the Paris region. The SERMs aims to significantly improve the quality of daily transport through frequent, reliable, and integrated services for suburban and peri-urban areas. While its foundation lies in enhancing rail infrastructure, the SERM concept also mandates integration with high-level express bus lines, cycle networks, potential river transport, tramways, on-demand transport, and car-sharing services. For AREP, which plays a central role in the architectural and operational design of stations and interchanges, the implications of this new framework are substantial. Existing transport hubs must be reimagined for multimodal access, while potential new infrastructure completing the network must anticipate evolving forms of mobility.



Salzburg Aiglhof station on S-Bahn Salzburg.
Image by Bui Luu Quynh Nguyen.



Narrow-gauge train entering Salinas station on Cercanías Asturias.
Image by Victor Duchastel.

AREP's work is at the heart of enabling this transformation. The firm is uniquely positioned to interpret and apply the technical ambitions of SERMs at the local scale, particularly in relation to stations as key intermodal nodes, in line with their EMC2B framework (see page 17). Furthermore, the SERM's emphasis on reducing air pollution, combating solo car use, and addressing the transport needs of underserved suburban and rural areas speaks directly to AREP's mission of designing inclusive, sustainable urban environments. However, AREP must operate within a national context marked by fragmentation and significant funding challenges.

Despite being identified as a national priority since the 2019 *Loi d'orientation des mobilités* (LOM), France's progress in developing peri-urban express rail services has lagged behind its European neighbors. Countries like Germany, Switzerland, and Spain have developed robust systems such as the S-Bahn, RER, and Cercanías networks. In contrast, France's railway development is characterised by a historically limited interest from the SNCF in peri-urban services, focusing mainly on its high-speed rail network. AREP's task, therefore, unfolds in an environment where expectations are high, but systemic constraints persist.

One critical issue is the lack of clear, coordinated funding. While the SERM initiative sets ambitious targets, the necessary investments in railway nodes, station capacity, and infrastructure upgrades are not yet backed by concrete financial plans. This funding gap puts pressure on project partners, including AREP, to deliver high-impact design and planning within uncertain and often insufficient budgets. Another major structural issue lies in the fragmentation of responsibilities: in most French regions, separate authorities govern urban and inter-urban mobility, which has led to duplicated infrastructure and planning efforts. AREP must navigate these compartmentalised governance structures while promoting a vision of integration across transport modes. Additionally, unlike Germany's S-Bahn model or Spain's Cercanías, France has lacked a unifying national narrative or strong branding for peri-urban rail (apart from Paris), which has hindered the public and political momentum needed to drive ambitious projects.

Nonetheless, signs of change are emerging. The 2023 law confirms a stronger role for metropolitan authorities in shaping SERM networks, and recent shifts in SNCF's position suggest a growing recognition of the need to prioritise peri-urban transport. AREP stands at a crucial moment: it can help transform this legislative momentum into tangible outcomes by providing technical expertise, spatial understanding, and user-focused design for the stations and systems that will define the SERM era.

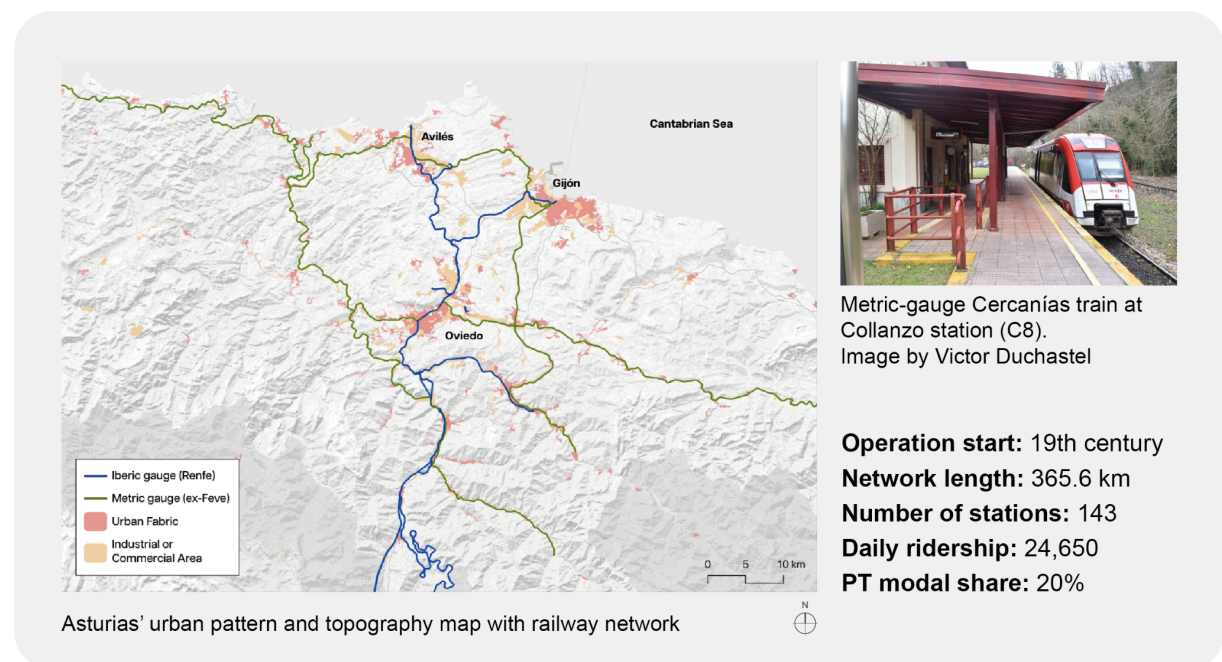
This project is connected in its very essence to the ecological transition and aligns closely with the priorities of Sciences Po's Urban School, which emphasises equitable and resilient cities and territories. Peri-urban rail systems like the SERM offer a critical pathway toward reducing carbon emissions by providing much-needed alternatives to car dependency, a key driver of climate change through greenhouse gas emissions. By focusing on multimodal integration, improved frequency, and accessibility in suburban and peri-urban areas, this research supports the shift towards low-carbon mobility, a cornerstone of ecological transition strategies in cities and regions. Moreover, the project's emphasis on spatial considerations, the reduction of urban sprawl and also accessibility resonate with the Urban School's commitment to holistic approaches that balance environmental imperatives with social justice. Through its partnership with AREP, the project also illustrates how design, infrastructure, and policy must come together to build transport systems that are not only efficient but also sustainable and socially equitable, reflecting the comprehensive vision promoted by the School.

MAIN RESULTS

To best convey the findings of our project, they have been grouped as they have appeared to us: by case-studies. Each case of this section thus gives a brief overview of the context of the different studied systems, the main observations made, and key lessons learned.

Cercanías Asturias

Situated in the central part of the Asturias Principality, a region on the Atlantic coast of Spain, Cercanías Asturias provides a capillary network serving the territory's main urbanised area. The region is post-industrial and mountainous, with a historically dense and intricate rail network originally oriented towards carbon and iron freight.



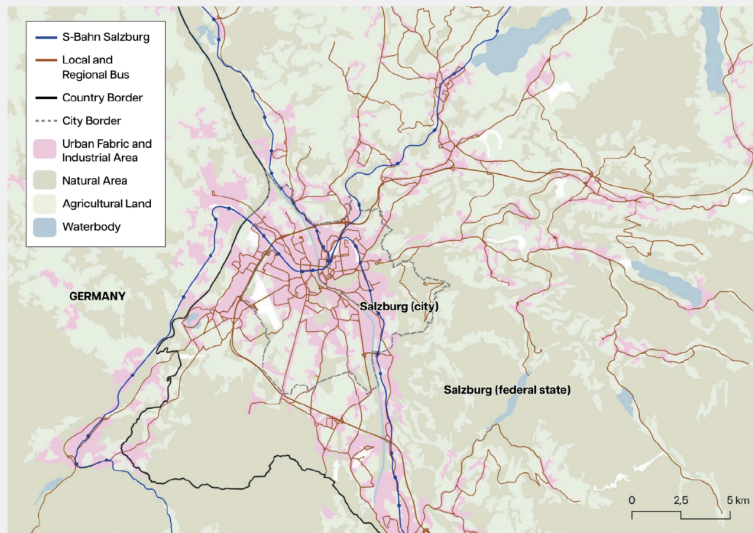
The core of the urbanisation of Asturias is situated in its central zone, in a Y-shaped archipelago. Home to about 80% of the regional population, the zone benefits from the highest Cercanías service, with a 15 minute interval on the main line. The impressive capillarity of the network gives Asturias a very high ranking in the Rail Performance Index (32,4), placing it among the top 10 European regions with the highest proportion of people that can be reached within a 1.5 hour travel by train, thereby underlining the network's potential.

A defining feature of the region's rail geography is the coexistence of two parallel systems: the iberian gauge and metric gauge lines. While the iberian gauge network benefits from greater integration into national operations and better maintenance, the metric gauge lines, predominantly serving more remote or rural areas, suffered from chronic underinvestment and poorer service provision. Unlike in many other European regions, Asturias shows limited evidence of urban sprawl. Urban growth patterns have remained compact, with limited artificialised area expansion or car-oriented suburbanisation.

Despite service and intermodality shortcomings, ongoing infrastructure upgrades, new rolling stock acquisitions, and accessibility improvements indicate the Cercanías Asturias' future potential and incremental progress.

S-Bahn Salzburg

The S-Bahn Salzburg serves as the backbone of mobility in an Alpine corridor surrounding the city of Salzburg. It operates a star-shaped network, extending into Land Salzburg and crossing the border of German Bavaria. The system has grown into a high-performing transnational commuter rail, serving a region marked by low density and dispersed settlements.



Land Salzburg's integration of the bus system into the S-Bahn network



S-Bahn train at the Neumarkt am Wallersee station (S2).
Image by Marion Dejean

Operation start: 2004
Network length: 130 km
Number of stations: 64
Daily ridership: 22,000
PT modal share: 12.3%

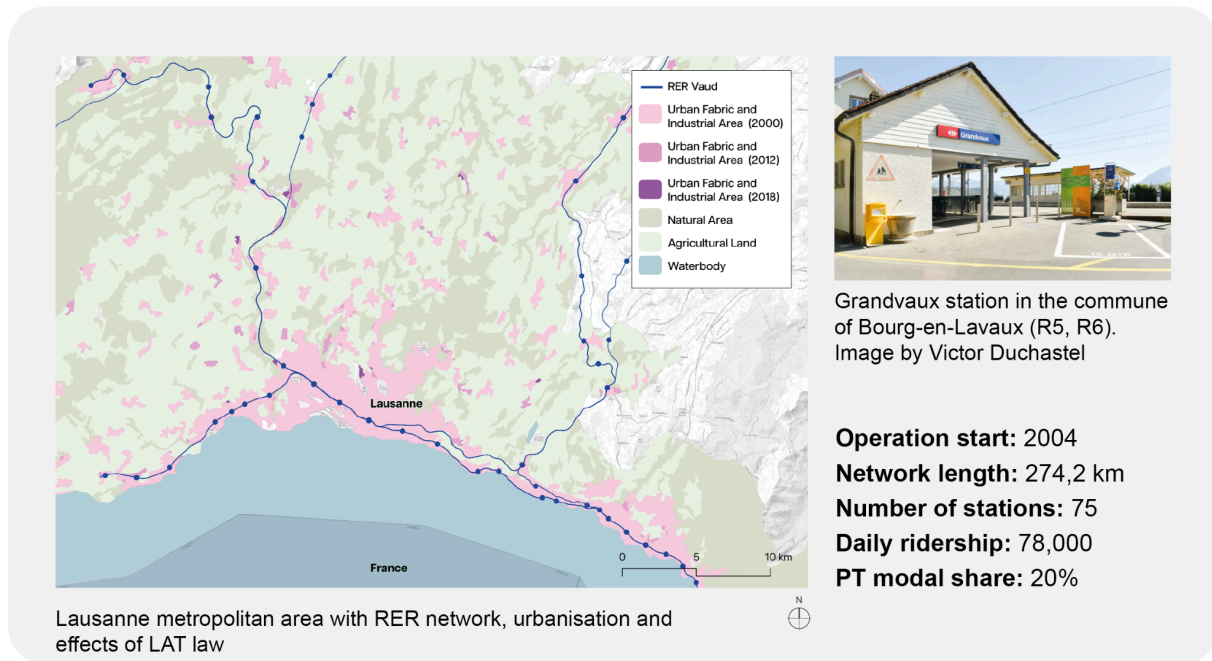
Most S-Bahn lines are electrified, supported by ÖBB Infrastructure's 100% renewable energy production for traction current. Biodiversity and climate concerns, once secondary, are gaining weight. New stations like Maishofen/Saalbach exemplify efforts to reduce land use and embed biodiversity-sensitive design. At the same time, environmental debates remain sharp: the rejected S-Link tunnel project illustrates how CO₂ savings are not the only metric in infrastructure planning, which must also account for biodiversity and wide ecological impact.

The S-Bahn system is characterised by the strategic integration of bus networks, which extends the system's capillarity while reinforcing modal complementarity. However, the system operates in a context of high urban sprawl. The S-Bahn alone cannot compensate for the region's high land consumption and decentralised planning, which have led to declining urban cores and expanding peripheries. Tools like park-and-ride and on-demand mobility improve accessibility but risk reinforcing low-density patterns if not paired with densification policies. Actors insist that the S-Bahn itself did not trigger this sprawl, yet acknowledge how planning instruments to limit dispersion remain insufficient.

In the face of network saturation, ambitions are shifting from rail infrastructure expansion to operational optimisation: Capacity is being increased through double-deck trains and more frequent services. Moreover, already capillary bus systems will be enhanced by further routes and better alignment with other transport modes. In general, intermodality is continually reinforced through integrated station design, cycling facilities, and real-time coordination across modes.

RER Vaud

Located on the northern shore of Lake Geneva, RER Vaud embodies a high-performing and successful network that structures the whole cantonal territory. The network reflects national operator SBB's high ambitions in performance, service, and technological inventiveness as well as overarching Swiss strides toward a comprehensive territorial planning centred on rail and on meeting environmental targets.



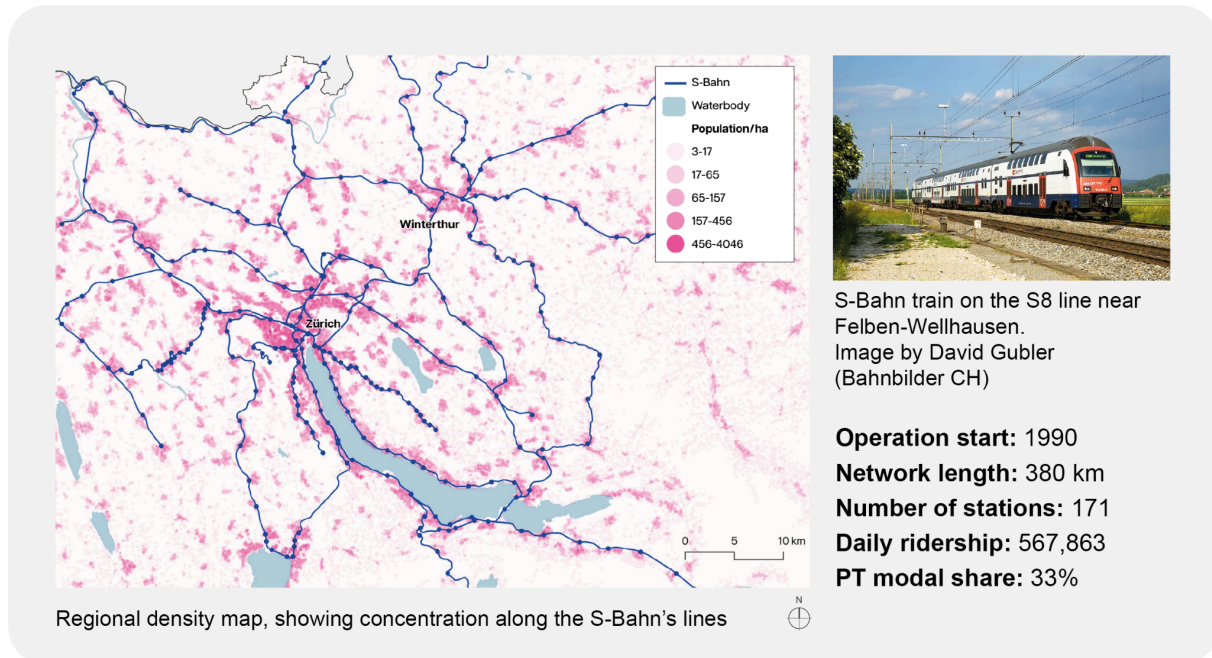
The lines constituting the network have been gradually implemented on pre-existing SBB infrastructure since 2004, and accompanied by significant efforts to modernise and improve railway and station capacity. It functions as a star-shaped system centred on the station of Lausanne.

The system is embedded in a region experiencing strong demographic growth, leading to increased pressure on housing and mobility infrastructure. It is being continuously developed within the framework of Switzerland's federal planning logic, which promotes territorial densification along rail corridors, applied through the Cantonal Territorial Strategy 2050 and the LAT framework (*Loi de l'aménagement du territoire*), which was enforced in 2012. In this context, rail becomes a key structuring element of spatial planning, reinforced by tight coordination between transport authorities and land use policies.

The system excels in seamless ticketing and intermodal integration, promoting modal shift and increasing stations' catchment areas. It has implemented a well-developed park-and-ride offer at stations, whose large size and proximity however reveal a deficiency in prioritising less carbon-intensive transport modes. This reflects a broader shortcoming in climate adaptation and greening measures at the stations' level – which remain highly mineralised and standardised. It may therefore not be surprising that the Swiss cases, and RER Vaud in particular, are seeing the emergence of concepts such as 'hypermobility'. This concept questions whether an endless growth of mobility systems is 'sustainable' by nature – prefiguring, in this way, the possible advent of a new, more minimal paradigm.

S-Bahn Zürich

S-Bahn Zürich is a high-capacity, high-frequency rail network that structures Switzerland's most populated region. Centred on the city of Zürich, it spans the canton and adjacent areas, extending even into southern Germany. Developed from the 1990s onward, it exemplifies how rail infrastructure can coordinate dense territorial development in a topographically constrained corridor between the Jura and the Alps.



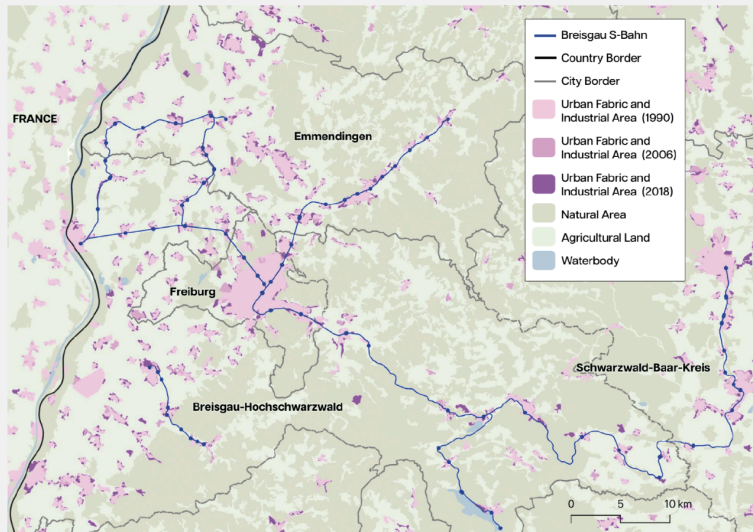
Much like RER Vaud, it builds on pre-existing infrastructure, applying the LAT planning framework to direct urban growth toward station nodes rather than the periphery. This approach has fostered the emergence of new high-density poles, where major station upgrades have amplified their role as regional anchors.

A distinctive feature of the Swiss cases lies in the role played by SBB Immobilien, the real estate branch of the national railway operator. As a major landowner around station areas, the company acts as a key agent of densification by developing mixed-use projects that generate revenue reinvested in railway infrastructure. However, this market-driven model limits its role to that of a facilitator rather than a regulator: while it enables efficient land use, it does not actively counteract gentrification. Densification is further supported, especially around secondary hubs like Zürich Altstetten, through the alignment of national planning laws and tightly integrated spatial and transport planning, making rail access a central criterion in urban development decisions.

Environmental concerns are integrated into planning through modal shift policies and infrastructure reuse, with added value placed on intermodality and noise mitigation. A broader aim of the S-Bahn Zürich system is to shift from a historically radial layout focused on Zürich's core toward a polycentric mesh, redistributing economic activity and demand across the canton. This strategy responds to mounting pressure on central districts, where high demand and real estate prices threaten affordability and spatial balance. The upcoming "2G S-Bahn" upgrade, aimed at increasing capacity and tangential connections to promote polycentricity, raises new questions about the long-term sustainability of such high-intensity, hypermobile systems.

Breisgau S-Bahn

The Breisgau S-Bahn serves a region of ecological and topographical complexity surrounding the city of Freiburg in southwestern Germany. Operating through the Black Forest, the Kaiserstuhl, and a patchwork of valleys and wetlands, the system crosses multiple protected natural areas and connects dispersed rural settlements to Freiburg's compact, tram-centred urban core.



Map of Breisgau S-Bahn crossing urbanisation, green and blue spaces



Höllentalbahn along the Schluchsee on the S1 line.
Image by Charly Kissel (Deutsche Bahn)

Operation start: 1997
Network length: 235 km
Number of stations: 77
Daily ridership: 14,204
PT modal share: 12%

Led by the regional transport association ZRF and co-developed with SWEG, Deutsche Bahn and the state of Baden-Württemberg, the system emerged from a multi-decade planning process. The “Breisgau S-Bahn 2020” initiative modernised infrastructure, improved service frequency, and completed full electrification by 2021. Today, all trains are powered by renewable energy, and station upgrades prioritise user comfort and accessibility. Tram and bus networks provide key intermodal links, as the S-Bahn itself serves few inner-city stops.

Building through Natura 2000 sites and protected habitats required complex compensatory measures, including biodiversity offsets (*Ökopunkte*), tree replanting, and species relocation. The expansion entailed forest clearing for overhead lines, tunnels, and safety zones, making the system a textbook case of trade-offs in green infrastructure. In the region's warming and flood-prone microclimate, new lines also had to respect local airflow and water retention patterns. Indeed, local adaptation played a pivotal role in planning.

Spatially, the system might enable polycentric development in the long-term and avoid car-based sprawl, yet it faces governance gaps. Population growth has partially shifted housing pressure to well-connected outlying towns, some at risk of becoming dormitory suburbs. While Freiburg limits urban expansion through strict codes, municipalities along the rail line retain control over land use, hindering coordinated densification.

Freiburg's active mobility culture supports seamless first- and last-mile connections, reinforced by digital tools such as cycling reward apps and real-time multimodal coordination. Rather than replicating Freiburg's tram-centric model, the S-Bahn demonstrates how regional rail can complement compact urbanism while adapting to dispersed geographies. Its evolution illustrates that sustainable rail systems can thrive not by avoiding ecological sensitivities, but by carefully working within them.

LEARNINGS

From the analysis of the studied cases, a few main takeaways can be highlighted together with their respective implications for SERM planning. Gaining insight into both the best practices and the challenges of diverse European systems offers a renewed perspective on how SERMs can be most effectively implemented.

Evaluation Metrics and Frameworks

There is no unified framework for evaluating the different RER systems across our cases. While not acquiring an integral overview of any system's full evaluation indicators, we did get glimpses into their main thematic focuses and their order of priority. This confirmed our established indicator set. The following takeaways manifest these focuses, completed with observations and refinements from the studied literature when necessary.

Urbanisation and Sprawl

The extent to which urban sprawl is effectively limited depends primarily on two factors: the presence of demographic pressure around metropolitan areas and the existence (and enforcement) of legal frameworks limiting land artificialisation. Zoning laws such as the LAT in Switzerland provide best practice in this regard, where a thorough enforcement of the *loi ZAN* (*Zéro artificialisation nette*) in France could play a similar role to accompany the development of SERMs.

Network Shape and Spatial Development

The observations confirm a trend toward targeted densification around intermodal hubs. This could lead to intermodality options tailored to the specific role of each hub. Furthermore, efforts towards the creation of tangential lines confirm the emergence of polycentric systems. By doing so, it is estimated that network performance resilience would be enhanced while more equal and multidirectional exchanges would be promoted.

Intermodality

All networks integrate intermodality, albeit at different development phases. Swiss cases have come the farthest, with efficient park-and-ride systems and strong modal connections. Prioritisation of transport modes at intermodal hubs is typically guided by pragmatism rather than a clear goal to promote active and public transport over cars. SERMs could learn from best practices, while going further in prioritising active and public mobility at intermodality hubs.

Energy Use and Electricity Sourcing

Electrification and renewable sourcing have become the norm, with multiple rail operators even producing their own energy (SBB, ÖBB, DB) while the others purchase 100% of their electricity with renewable energy certificates (RENFE). SERMs should aim for 100% electrification and integrate on-site renewable energy production wherever feasible to reduce emissions and increase energy autonomy.

Station Greening

While there are emerging pilot stations that integrate greening and biodiversity considerations, the studied networks continue to prioritise functionality in stations. This often results in heavily mineralised surfaces and monotonously grey and artificialised environments, further exacerbating urban heat island effects and limiting biodiversity thriving at the station level.

Climate Adaptation and Resilience

No observed network actively incorporates climate resilience measures like stations serving as heat shelter or refuge for other extreme events. Nonetheless, literature raises this potential role through which rail networks and their stations could play an active role in reducing climate risks, in disaster response, and in enhancing overall regional resilience. SERMs could strive to move in this direction.

Habitat Preservation and Ecological Compensation

While compensation for habitat loss is imposed by EU legislation, some regions apply even stronger measures. Breisgau S-Bahn and the Swiss cases provide advanced examples of high ambitions on this topic. SERMs can likewise explore how to go beyond ecological standards, by integrating and further pushing best practices in habitat compensation, such as extending infrastructure use to support ecological functions.

Material Footprint

There is an emerging focus on the embedded material carbon footprint of infrastructure and stations. All cases promote recycling, and some, such as the Breisgau S-Bahn, also use material bio-sourcing, especially for station furniture. However, this push is constrained by concerns about the durability and maintenance costs of low-impact materials compared to conventional ones. Planning low-impact SERM stations requires acknowledging potential tensions between carbon reduction goals, budget limits, and standardisation practices.

LOOKING FORWARD

SERMs present a unique opportunity for France to reimagine stations and networks in response to today's pressing challenges, including extreme heat, urban sprawl and gentrification. Achieving such transformation requires a shift in how mobility is conceptualised: one moving beyond the assumption that rail is inherently sustainable, towards an evaluation framework that assesses the full socio-spatial and environmental footprint of infrastructure projects.

Collaborating with AREP, a leading actor in the urban ecological transition, has been instrumental for us to develop this approach. It encouraged a deeper interrogation of mobility systems and their wider impacts, pushing us beyond conventional assumptions and toward more critical and forward-looking perspectives.



Image of the Avilés station on Cercanías Asturias, showing the interior of the new bus terminal and the exterior of the old train station building in the background. Image by Victor Duchastel.

FIND OUT MORE

Websites

AREP: <https://www.arep.fr/>

AREP's EMC2B approach: <https://www.arep.fr/en/emc2b/>

SERM framework (French Ministry for Territorial Development and Decentralisation):
<https://www.ecologie.gouv.fr/politiques-publiques/services-express-regionaux-metropolitains-serm>

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Notes

All maps have been created by the authors of this report, using QGIS and open source data.

The cover-page image has been taken by Patrizio Gravina in Renens (Switzerland).

The Capstone project: an original educational tool

Thanks to this original tool, students are placed in a work situation on a real problem posed by a public, private, or associative organisation. For all the Masters of the Urban School, the structure and management are identical: the project is jointly monitored by the the Urban School and the partners, at all phases of the project, and regular methodological supervision is provided by a professional or academic tutor specialised in the issue. The Capstone projects allow the partners to take advantage of the research and training acquired within the Urban School, to benefit from the production of studies and quality work, and to have a capacity for innovation.

Capstone projects are a great tool to study, diagnose, forecast, lead a comparative analysis, even to prepare for evaluation, and more generally to deal with any problem that can enlighten the organisation concerned in a logic of "R&D ". Each project mobilises a group of first-year students from one of the Urban School's Master's. Students work between 1.5 days and 2 days per week on dedicated time slots, for a period of 6 to 9 months (depending on the Master's concerned). In Executive education, collective projects concern the Executive Master "Territorial governance and urban development" and mobilize professionals for a period of 4 months.