DELIVERABLE D. T1.2.13

Transnational study on regional/cross-border railway and PT connections	Version 1.0 052018

Table of Content

1. Introduction

CONNECT2CE – "Improved rail connections and smart mobility in Central Europe" – tackles the sparse public transport (PT) links between rural areas – peripheral border areas in particular – and the hubs of national and continental transport networks, with a special focus on enhancing weak or missing cross-border links. Its main objective is therefore to improve planning and coordination processes for regional passenger transport systems as to improve the quality of those connections.

Primary causes of the actual situation are related both to geographic, economic and demographic circumstances and trends, as well as to the persistent phenomenon of urbanisation which is steadily decreasing rural populations and sparsely populated peripheral areas. This poses policy makers and service providers responsible for efficient, sustainable public transport services in front of significant and ever-increasing challenges. CONNECT2CE is tackling those challenges by enhancing the awareness of this situation by increasing the qualitative and quantitative understanding of present as well as future regional public transport systems in Central Europe (CE). This will be in particular achieved by endowing project partners, authorities and regional PT operators with innovative tools and new skills as to improve the capability of the public sector in CE to efficiently plan peripheral and cross-border public transport connections.

CONNECT2CE efforts are therefore focused on achieving all this by elaborating coordinated strategies and tools to be refined at regional and cross-border level through pilot actions, before being applied widely. More into detail, three specific areas of interventions have been identified as essential to the enhancement of relevant PT services:

1. Connectivity – harmonisation of multi-modal scheduling and Public Service Obligations / Contracts (PSO/PSC) for regional and cross-border transport services;
2. Integrated ticketing and tariff schemes;
3. Infomobility.

Considering project's pre-defined aim to enhance regional cooperation on PT planning at policy, legal and institutional level, three categories of actions have been defined:

1. design of cross-border PSOs/PSCs including the harmonisation of multi-modal scheduling;
2. integration of tariff and ticketing schemes;
3. implementing infomobility solutions.

Internal project output is therefore summarised and developed into 'Tools' at transnational level, as to provide shared solutions to common problems also by making use of best practices which were already successfully applied in some areas. Tools will be applied and then tested within pilot actions belonging the above three main thematic areas mentioned above, and then developed into a general transnational 'Toolbox' with the aim of delivering useful results outside the project related context.

"Enhancement of PT planning capacities for better regional and cross-border passenger transport in Central Europe" work package includes therefore a general introductory volume and three thematic volumes as reported below:

- 1. volume: includes an introductory study summarizing the main socio-economic and cross-border transport conditions of the related regions. It gives a general introductive overview of the main characteristics of the regions involved in the light of the main proposed challenges with particular reference to transport and cross-border traffic situation.

- 3 thematic volumes dealing with:
    - designing PSOs/PSCs as well as on harmonising multimodal timetables/implementing regional/cross-border rail services;
    - developing regional/cross-border multimodal integrated tariff schemes and tickets;
    - applying Intelligent Transport System/Information & Communication Technology ITS/ICT to info mobility systems.

All of them summarized the results of individual reports and available EU best practices in order to feed transnational tools, training, pilots and strategies.

1.1. Aim of the deliverable: scope and objectives

This document provides a comprehensive overview of the border regions within the geographic area of CONNECT2CE, and of the main findings of thematic work package WPT1 on the actual situation of regional transport within the countries project partners belong to. It furthermore represents the baseline for developing transnational tools to be used in promoting and improving PT services and connectivity in border regions. Following the general structure of the project, both the study and tools are structured as to represent the three main areas of improvement already mentioned: connectivity, tariff and ticketing, and infomobility.

After the overview of border sections, the study first contextualises the demographic and background of the macro region. Then it summarises and expands input provided by project partners in their analysis of territorial needs and in the related: questionnaires, reports on stakeholder involvement, and reports on cross-border governance structures.

More into detail, the above mentioned analysis has been carried out by keeping in mind the main challenges already identified by CONNECT2CE:

a) increase of urban population vs. rural depopulation;

b) peripheral/cross-border areas not linked efficiently to urban areas;

c) no integration of different public transport modes

d) decline of passenger rail transport and higher growth rates in car traffic, leading to increases in CO_2 emissions and other external costs of transportation.

Finally, proposed lessons to be outlined have been enumerated and elaborated in the Transnational Tool.

1.2. Contextualisation within a wider European development perspective

To deal with the latest international challenges, the European Commission has proposed the **"White Paper on Transport – Roadmap to a Single European Transport Area"**. This programme is part of the Europe 2020 strategy and its flagship initiative for a resource efficient Europe. The document defines ten goals grouped in three main topics aiming at **achieving the 60% GHG emission reduction target**. The main topics listed in this programme are the following:

- developing and deploying new and sustainable fuels and propulsion systems;
- optimizing the performance of multimodal logistic chains, including by making greater use of more energy-efficient modes;
- **increasing the efficiency of transport and of infrastructure use with information systems and market-based incentives.**

As part of the last topic, **the framework for a European multimodal transport information, management and payment system has to be established by 2020**. The reference scenario foresees, that the accessibility gap between central and peripheral areas will widen, especially if new policies did not intervene to modify the trends. The Paper also emphasizes that the development of the European mobility network should have **a focus on missing cross-border links, intermodal connecting points and key bottlenecks**.

The four volumes of the Study are dealing with designing PSOs/PSCs, harmonizing multimodal timetables, implementing regional/cross-border rail services, developing regional/cross-border multimodal integrated tariff schemes and tickets applying ITS/ICT to info mobility systems in order to **support the realization of the above mentioned goals**. CONNECT2CE is also complementary to European Union strategies for various regions and may draw upon other projects co-funded by EU Programs

- ***EU Strategy for the Baltic Sea Region***. – The focus of CONNECT2CE is on peripheral areas whose issues are similar to those of the Baltic Sea regions. According to the EUSBSR PoA, "The improvement of internal and external transport links, increasing the efficiency and minimising the environmental impact of transport systems, should increase its accessibility and attractiveness". The implementation of the EU Strategy for the Baltic Sea Region (EUSBSR) is based on three overall objectives, which are reflected by the Action Plan of the EUSBSR. The concrete implementation of the EUSBSR objectives takes place in joint transnational actions, projects and processes. Flagships are projects and processes demonstrating the progress of the EUSBSR and may serve as pilot examples for desired change. The three objectives are save the sea, connect the region and prosperity. The second goal of EUSBSR is the most important for CONNECT2CE.

- ***EU Strategy for the Danube Region***. – CONNECT2CE will support the implementation of EUSDR, in particular the following (quote from PoA): 1) "To improve the regional/local cross-border infrastructure and the access to rural areas"; 2) To develop further nodal planning for multimodality"; 3) "To develop further ITS by using environmental-friendly technologies, especially in urban regions".

- ***EU Strategy for the Adriatic and Ionian Region***. – CONNECT2CE will support the implementation of EUSAIR, in particular the following (quote from PoA): 1) "Improving the accessibility of the coastal areas and islands"; 2) "Cross-border facilitation – example of possible actions: - Re-launch cross-border bus or train connections for passengers".

- ***EU Strategy for the Alpine Region***. – CONNECT2CE will support the implementation of EUSALP, in particular the following: 1) "To promote inter-modality and interoperability in passenger and freight transport. Example of possible projects: Coordination of local and regional transport planning at macro-regional level"; 2) "To connect people electronically and promote accessibility to public services. Example of possible projects: Develop ITS interconnecting modes and devices".

Relevant projects and how CONNECT2CE may capitalise, or which synergies it offers:

- **ADRIA A (CBC Italy-Slovenia):** The simulation of a new cross-border railway service may support the public transport planning capacities of the public sector for regional and cross-border accessibility.
- **TRADOMO (CBC Italy-Slovenia):** Infomobility tools developed for bus stops provide a reference for CONNECT2CE's infomobility activities – Transnational Tool (WPT1), pilot actions (WPT2), Toolbox (WPT3).
- **MICOTRA (CBC Italy-Austria):** The existing cross-border rail service serves as the basis for a pilot action in (WPT2).
- **ALPINFONET (ASP):** Sustainable mobility information systems provide a reference for CONNECT2CE's infomobility activities – Transnational Tool (WPT1) and pilot actions (WPT2).

- **RAIL4SEE (SEE):** Studies for improving cross-border and transnational PT will serve as a reference for improved connectivity (PSO/PSC) for the Transnational Tool (WPT1), for pilot actions (WPT2), territorial strategies and the Toolbox (WPT3).
- **RAILHUC (CE):** Studies supporting the feeding functions of CE cities for PT will serve as a reference for improved connectivity (PSO/PSC) for the Transnational Tool (WPT1), pilot actions (WPT2) and territorial strategies (WPT3).
- **EDITS (CE):** An information exchange tool for PT timetables will serve as a reference for infomobility activities – Transnational Tool (WPT1) and pilot actions (WPT2).
- **INTER-REGIO-RAIL (CE):** The report on regional passenger rail transport in Europe will serve as a reference for CONNECT2CE's activities related to connectivity (PSO/PSC) – Transnational Tool (WPT1), pilot actions (WPT2) and territorial strategies (WPT3)
- **LivingRAIL (FP7):** From this research project that developed a vision for rail transport in a sustainable Europe with a 2050 time horizon, best practice examples and strategic guidelines will serve as a reference for the Transnational Tool (WPT1) and territorial strategies (WPT3).

1.3. Introducing the macro regional context

The following chapter intends to provide a structured overview of the regions participating in CONNECT2CE, as well as the broader area of Central Europe with a **focus on border regions**. In order to prepare the research activities, a **detailed questionnaire** has been sent out to the Project Partners and stakeholders concentrating on three main topics:

a) PSO, PSC contracts on Regional/cross-border railway and PT connections, timetable coordination

b) Existing travel information and ticketing systems

c) Multimodal integrated tariff and ticketing schemes

Partially based on the questionnaires **Territorial Needs Assessments** have been also submitted by each of the participating regions with information on basic geographical background, recent population and demographic trends, transport network and accessibility conditions, organization of transport sector and key stakeholders, connectivity, infomobility systems, integrated ticketing and tariff schemes together with a SWOT analysis.

Based on the two inputs provided the following topics will be summarized in the next subsections.

1. **Regions, stakeholders and key players**: description of the actors and their roles regarding organization of transport, defining different models based on the regional and national characteristics.

2. **Main socio-economic features and performances:** overview of the regions with a focus on the main challenges already identified by CONNECT2CE.

3. **Transport modal split and demand analysis:** evaluation of data on modal split, transport needs provided by Project Partners in questionnaires.

The project area includes nine countries: Austria, Croatia, Czech Republic, eastern states of Germany including Bavaria, Hungary, Northeast Italy, Poland, Slovakia and Slovenia. Project Partners are located in these countries except for Slovakia and Poland, Associated Partners linked to a given Project Partner hail from all these countries except Slovakia. Pilot project areas implicate all of a given country or certain regions therein.

1.3.1. Regulations and regions

Regulation 1370/2007 (EC) of the European Parliament and the European Council which came into force on the 23th October 2007 rules the commissioning by competent authorities and the finance public-interest passenger transport services on rail, roads and waterways which cannot be rendered based on revenues obtainable next to market conditions. This regulation is immediately valid in all member states if the Member State has no public service contract or the contract has expired. Otherwise, the eighth Article of the Regulation shall enter into force as follows:

- before 26 July 2000 on the basis of a fair competitive tendering procedure (a);
- before 26 July 2000 on the basis of a procedure other than a fair competitive tendering procedure (b);
- as from 26 July 2000 and before 3 December 2009 on the basis of a fair competitive tendering procedure (c);
- as from 26 July 2000 and before 3 December 2009 on the basis of a procedure other than a fair competitive tendering procedure.

The contracts referred to in (a) may continue until they expire. The contracts referred to in (b) and (c) may continue until they expire, but for no longer than 30 years. The contracts referred to in (d) may continue until they expire, provided they are of limited duration comparable to the durations specified in Article 4.

Its three fundamental aims:

- avoid legal gaps and uncertainties from differences in national legislation,
- elaborate rules in line with transport policy aims as of the Charter of Fundamental Rights,
- regulate a liberalised passenger transport market next to decreasing differences in service levels between member states.

By “competent authority” the regulation means those governance bodies of member states who have an exclusive right to apply this regulation and to regulate public transport within their geographic scope. It is a responsibility of member states to name such authorities and rely functions to them. The two main instruments at the disposition of authorities are, public service contracts and general tariff prescriptions. Extra finance for social tariff benefits for certain groups can be exempted from the general rule by way of a notification of the European Commission.

The following table (Table 1) shows which competent authorities in each region are responsible for public transport services. it can be seen that most of the railway decision/order level is performed on the state level while the local and urban bus, metro or tram services are implemented at settlements or regional level.

Table 1: Competent authorities for public passenger transport services at different levels in different regions

Region	Urban/local	Suburban	Regional	Long-distance
	Bus, metro, tram etc.	**Bus, train etc.**	**Bus, train etc.**	**Bus, rail**
South Tyrol	Municipality	Region		State/market competition
Friuli Venezia Giulia	Municipality	Region		State/market competition
Veneto	Municipality and Metropolitan City of Venice	Region, provinces and Metropolitan City of Venice		State/market competition
Slovenia	Municipality	Central Government		
Continental Croatia	Municipality	Central Government		
Western Hungary	Municipality	Central Government		
Burgenland	Gemeinde	Länder		State/market competition
Pilsen region	Municipality	Region		State
Berlin and Brandenburg	Kreise	Länder		State/market competition
Lubusz and West Pomeranian	Municipality	Region		State

It generally makes sense for central suppliers and infrastructure management to be located on a national level. Infrastructure development is equally concentrated on the level of state administration, even though in Italy a regional planning dimension can be also observed.

1. Looking at the provision and commissioning of public services there are several countries where only national authorities are in charge, but the Italian provinces, Polish voivodships, Austrian and German provinces, and Czech regions are commissioning their own regional transport.

2. Obviously regional transport organisers are primarily in charge of transport on their own level, apart from cooperation with other regions and agencies. This can be regarded as an ideal constellation as locals know best their own municipalities, thus it will be easier for a regional organiser or authority with local staff to establish best ways to meet needs and improve connectivity within municipalities. Regional organisers are well able to integrate local experience when it comes to the fine tuning of travel times, connectivity and service frequency best matching local needs.

3. Mobility and passenger information agencies currently are only operating in two regions – both of them within the context of a regional governance structure, in a federalist or regionalist environment. In such a setting, these agencies – whose profile is much wider than merely a passenger information office – reinforce the regional character of transport organisation. Next to a lean administration, they produce significantly more information useful for better transport organisation, strengthening ties with both individuals and representatives of target groups in the process. It would therefore be useful if other regions were to emulate the concepts of Italian and Austrian mobility agencies, learning from their experience.

Mobility Centres are facilities that offer information and services in the field of mobility and all sustainable means of transport. The aim is to create a "one-stop-shop" for all questions around sustainable mobility and transport. A Mobility Centre's main aim is to ease the access to information about public transport for customers and to provide information and services on public transport , sustainable modes and services, e.g. ticket services, journey planner car sharing, carpooling and bicycle renting. Thus, a Mobility Centre is a valuable contribution to change people´s mobility attitude and travel behaviour. Mobility Centres in many cases cover a specific geographical area. While some of them are providing information about mobility services for one single city/municipalities, others are covering larger areas like administrative regions/districts or functional regions. Target groups of a Mobility Centre are current and potential public transport users, and even people who don't use public transport at all – both from the region itself and visitors. Mobility Centres are typically non-profit ventures, some rely on EU-funds, or funding provided by local and regional governments.

4. As for the existing railway and bus operators, many are state-owned companies, the larger ones in particular. Hungarian-Austrian GYSEV Raaberbahn is a curiosity as a regional railway in the majority ownership of two states managing a cross-border network and operating in three countries. Even though the setup might remain unique there are lessons to learn here, examples to emulate for partners. (see details in 2.3.2 chapter Examples of best practice) We might also note that regional transport organisers are able to integrate smaller local operators in a sustainable manner.

5. As already noted infrastructure development and management is predominantly a national domain. The tasks related to selecting, preparing, prioritising and managing transport developments are achieved or overseen by agencies on a national level. The Autonomous

Province of Bolzano can be mentioned as a positive example for integrating the regional dimension into that process.

6. Most supervisory authorities are also to be found within a national setting, typically they are either a ministerial department or subsidiary or a state-owned independent body.

7. Ownership and profile of background and research organisations is much more variegated. Looking only at those who are associated with CONNECT2CE: some are owned by the state or regional government (Hungary's KTI or Slovenia's Institute of Traffic and Transport), others belong to a university (FPZ Faculty of Transport and Traffic Sciences), there are regional agencies (Regional Development Agency of Northern Primorska, Regional Development Centre Murska Sobota Posavje Regional Development Agency) and foundations (such as Instituto Italiano di Tecnologia).

8. A wide variety of regional or national professional associations exists. The profile of is transport or the representation of a particular transport subsectors, others (such as chambers of commerce and industry) may have a transport sections, or transport is far up on their agenda.

9. Transnational organisations with a transport focus take an increasing role in organising cross-border connectivity and infrastructure developments, although they are not yet present in all regions, some are not yet active or under organisation. It takes much patience and a big administrative leg to establish a European Grouping for Territorial Cooperation (EGTC) such as those present in CONNECT2CE who have a transport priority, but the effort is worth the while as the Italian-Austrian example of the “EGCT Euregio Senza Confini r.l.-Ohne Grenzen mbH” initiative dating back to 2001 shows, when the first bilateral agreement was signed between Carinthia and Friuli-Venezia Giulia regions. Another EGTC “European Region Tyrol-South Tyrol-Trentino” is formally composed by three members: The Region Tyrol, the Autonomous Province of Bolzano/South Tyrol and the Autonomous Province of Trento. Two other EGTC's "Pannon" and "Euroregio West/Nyugat Pannonia" pursuit cross-border plans in the area of Austria, Slovakia and Hungary. Another form of cooperation was chosen by the members of the Euroregion Danube-Vltava consisting of neighbouring regions within Bavaria, Bohemia and Austria. During past years these border regions have worked, within that framework, on a number of transport issues that brought them closer both physically and mentally.

10. Amongst other organisations concerned with transport are non-governmental organisations with a transport policy agenda, passenger federations or clubs, other research institutions not listed under 'background organisations' with a different profile but who take an occasional or constant interest in transport issues, as well as a wide variety of privately or state-owned companies executing tasks somehow related to governance. Some of these are also associated with CONNECT2CE.

11. The tasks of ministries and a number of other organisations appears evident, in each country the same governance functions have to be fulfilled in slightly different settings, e.g. changes in needs and technologies have to be monitored and acted upon on a national scale. Regional authorities or transport system associations equally have a straight-cut role in regional transport organisation. Mobility centres are an interesting innovation inasmuch they both take over or supplement tasks of operators in a market-neutral way, and they also fill in a gap within governance both in the area of 'micro-managing' transport and with assisting further development. All this serves the spirit of regionalism, bridging the gap between policy makers, legislators, big stakeholders and passengers, small local

stakeholders. Mobility Center Burgenland is a service from the Regional Government of Burgenland. Its team provides all kind of passenger information and works on various local mobility projects.

The above findings are summarized in the following table, which shows that the examined regions are in large measure heterogeneous (*Table 1)*. Whereas it cannot be stated categorically due to lack of data but it's also visible differences between the regions. At one extreme is the federal member states type such as Berlin and the Italian regions, especially the autonomous ones (Autonomous Province of Bolzano/Südtirol, Friuli Venezia Giulia Region)[1]. Federal Member States, Member States with more than one system of law or Member States having autonomous territorial units shall be free to appoint more than one Central Authority and shall specify the territorial or personal extent of their functions.

While the other is the centralised group of countries (former socialist countries of Easter Europe). The acts for the implementation are needed after delegation. Therefore, the authority for taking the decisions can be spread with the help of the delegation of the authority. The centralisation of the authority can be done immediately, if complete concentration is given on the decision-making at any position. This concept is generally referred to as the centralisation of the authority. The centralisation can be done with a position or at a level in an organisation. Therefore, the extension of the organisation is referred to as the centralisation of the authority. And the decision-making power must be hold in a few hands.

[1] In this purpose, it is to recall how currently, according to the Italian Constitution five regions (including Friuli Venezia Giulia) together with two autonomous provinces (including Bolzano Bolzano/Südtirol) are granted of a special legal regime of autonomy.

Table 2: The key players' geographical location

	Autonomous Province of Bolzano/Südtirol	Friuli Venezia Giulia Region	Veneto Region	Slovenia	Continental Croatia	Western Hungary	Province of Burgenland	Pilsen Region	Berlin and Brandenburg	Lubusz and West Pomerania
1. Public service order (higher level)	Transport Office of the Autonomous Province of Bolzano	Autonomous Region Friuli Venezia Giulia	Veneto Region	Integrated Public Passenger Transport Authority (Ministry of Infrastructure) Sežana Municipality	Ministry of Maritime Affairs, Transport and Infrastructure (MMATI)	NFM Ministry of National Development Cities with own local transport	SCHIG (owned by Federal Ministry of Transport) (Regional Government of Burgenland is one of the 3 public stakeholders)	Ministry of Transportation of Czech Republic	- Ministry for Infrastructure and Spatial Development, Brandenburg - Senate Department for the Environment, Transport and Climate Protection Berlin	Marshal's Office of the Lubuskie Voivodship Marshal's Office of the Zachodniopomorskie Voivodeship Ministry of Infrastructure
2. Regional transport organiser	STA - Strutture Trasporto Alto Adige	- Friuli Venezia Giulia Region	Veneto Region, Provinces and Metropolitan City of Venice	- Alpetour - AVRIG - Slovenian railways	IPZP Integrirani promet zagrebačkog područja (Integrated Transport of Zagreb Area)	Northwest Hungarian Transport Organising Office	- VOR Verkehrsverbund Ost-Region	POVED - Plzeňský Organizátor Veřejné Dopravy	VBB Verkehrsverbund Berlin-Brandenburg GmbH	-
3. Mobility and passenger information agencies	Provincial Agency for Mobility	-		-	-	-	Mobility Centre Burgenland	-	-	-
4. Operators	- SAD Trasporto locale Dolomitibus - SASA bus - Car Sharing Südtirol - LiBUS - Trenitalia Direzione Provinciale Bolzano - ABD Airport SPA	- Udine Cividale Railways Company - APT Gorizia - ATAP - Trieste Trasporti - SAF - Trenitalia S.p.A.	- Trenitalia S.p.A. - Sistemi Territoriali S.p.A. - About 30 bus and waterborne transport operators including - AVM/ACTV - ATVO - ATV - BUSITALIA - DOLOMITI BUS _MOM - SVT	- SŽ-PP Slovenian Railways Passenger Transport - Avtobusni promet Murska Sobota Alpetour (Arriva Group) - AVRIGO Brebus - Ljubljana urban and interurban passenger transport provider	HŽ Passenger Transport	- GYSEV - MÁV-START - ÉNYKK Northwest Hungarian Transport Centre	ÖBB-Personenverkehr, GYSEV/Raaberbahn and 12 bus operators	- České dráhy (Czech Railways) - ČSAD autobusy Plzeň - PMDP - Smaller intercity bus operators	- DB Regio Nordost - NEB Betriebsgesellschaft mbH - Ostdeutsche Eisenbahn GmbH - DB Fernverkehr	- PKP Intercity S.A. - Przewozy Regionalne sp. z o.o. - Koleje Dolnośląskie S.A
5. Infrastructure provider / authority	STA - Strutture Trasporto Alto Adige	-		Ministry of Infrastructure Slovenian Infrastructure Agency	HŽ Infrastructure	NFM Ministry of National Development by MÁV & GYSEV Network	ÖBB INfrastuktur, Raaberbahn, NSB/ Federal Ministry of Infrastructure and Transport, Regional	-	- DB Netz AG	- PKP PLK S.A.

						railway and Magyar Közút (Hungarian Road Administration)	Government of Burgenland			
6. Most relevant supervising authorities	-	-		Public Agency for Railway Transport Ministry of Environment and Spatial Planning	-	NFM Ministry of National Development	-	-	Eisenbahn Bundesamt	-
7. Background and research organisations	Istituto Italiano di Tecnologia (IIT)	-		Institute of Traffic and Transport Ljubljana Regional Development Agency of Northern Primorska Regional Development Centre Murska Sobota Posavje Regional Development Agency	FPZ Faculty of Transport and Traffic Sciences	KTI Institute of Transport Science West Pannon	SCHIG	-	-	-
8. Regional, national professional associations	-	-		Chamber of Commerce and Industry of Slovenia, Section of Transport	Intermodal Transport Cluster	Hungrail KTE Association for Transport Science	-	-	Pro Rail Alliance (Allianz pro Schiene)	- Rail Business Forum
9. Transnational organisation with transport focus	EGTC Tyrol - South Tyrol – Trentino	- EGTC "Euregio Senza Confini" - EGCT „GO"	- EGTC "Euregio Senza Confini"	-	-	- Pannon EGTC - Euroregio West/Nyugat Pannonia	-	- Euroregio Danube-Vltava	- Transport Round Table of the Oder-Partnership	- Transport Round Table of the Oder-Partnership
10. NGOs and other relevant organisations	European Academy of Bolzano/Bozen IDM Südtirol	-		-	-	Győr-Moson-Sopron County Vas County (Zala County)	-	-	-	-

Legend:

Regional/local level

Meta or crossover level

National level

Transnational organizations

1.3.1.1. Governance types and their compatibility

Part of the reality of the CONNECT2CE region is the considerable variety of governance forms present here. Common to all of them is the absence of purely market-based systems and consequently a high degree of state involvement next to the presence of national operators at least for railways, or for railways and buses. This has not always been the case: typically, in the 19th century private companies and interests were the driving force behind the development of railway networks, the states creating legal frameworks and policies for regulation. During the second half of that century and early 20th century in most countries, a shift in interests and public perception along with the failures of significant private railway operators lead to the organisation of state-owned and -controlled integrated railway companies, alongside local networks that remained under private or regional control. Typically, today most of the rail infrastructures are owned by the state (in some states all but private sidings), but there are various legal constrictions as for the titles of ownership (some form of direct state ownership, or ownership by a state-owned railway or infrastructure / asset management company), the relationship between the state and the infrastructure operator, and the legal background for the operations of private railway companies (if any).

The cross-border cooperation of state railways is governed by international agreements. The base of transport right, the fundamental legal resource for international rail transport is the COTIF (Convention de Transport Internationale Ferroviaire) that came into effect in 1985. This International Railway Transport Convention contains joint dispositions for passenger and freight transport. The CIV is Annex A of COTIF. Passenger rights are another significant subdomain of transport right. Railway authorities are the primary competent bodies to enforce passenger rights as evidenced by regulation (EC) 1371/2007 and appropriate national ordinances, and part of the business rules of railways. Security regulations are another very significant part of legal ordinances as they ascertain technical and HR requirements for the safe performance of services which equally apply to all railway companies and are part of national legislation. Competent transport security agencies are controlling conformance with such requirements in the course of licensing and certification procedures equally applying to all market participants. Additionally, state railways have concluded a number of agreements and conventions, mostly to regulate the mutual rendering of cross-border services. Most of these are part of the case-book (written collection of precedence cases) maintained by UIC, the International Union of Railways. Private carriers are not bound by these and rarely resort to them as they tend to organise cross-border cooperation themselves, either within a group or by resorting to subcontractors. The most important regulations concern the clearing of income and the joint use of rolling stock. The more sophisticated regulations are needed to govern the cooperation of coordinative partners jointly performing a continuous transport service. At a bilateral or multilateral level lower than UIC annual timetable and tariff agreements meetings are being organised by groups of passenger transport and infrastructure operating companies who on their level agree on the parameters of their services and conclude the appropriate contracts based on various corporate business rules.

Returning to governance types for organising and regulating passenger transport on a national scale, these governance types in much of Europe can be considered as historically grown. One determining and disruptive factor within this larger CE region was the need – arising from the 1989-90 shift of Central Eastern and Southeastern Europe from a highly centralised command economy towards a market economy – to adapt transport governance to a radically changing environment. Historic models could only serve as a pattern to a very limited extent given the decades which had elapsed and the profound changes the transport industry had gone through in the 2nd half of the 20th century. Most of these countries looked into governance models elsewhere, at times leaders made reference to an existing model upon effectuating change, but typically they tried to forge their own compromise model suiting the requirements of their transport sector for a reasonable degree of continuity. Former state agencies were turned into companies under the new corporate laws, and

the 'winds of change' caused them to more or less adapt to the new realities, while a significant number of their employees moved either to private spinoffs or to other sectors or decided to pursue a career abroad. Most of these states, being of a moderate size, maintained a centralised type of governance typically at the ministerial level, although due to the European integration process they had to adapt those structures time and again to make them more compatible with requirements of liberalisation and interoperability.

The western part of Central Europe also underwent profound changes in governance, even if less accentuated and over a period of decades – change required by the massive evolution of the transport sector itself and by the same process of European integration. Here, too, part of the process was the de-integration of passenger and freight operations with infrastructure ownership and/or management, as a precondition for a liberalised transport market. This was partly achieved within a group or holding structure, partly by creating entirely independent companies; the essence of change is to create a neutral environment safeguarding infrastructure access on equal terms to all market participants. The main overall challenge, however, was to successfully integrate public transport and position it as a viable alternative to individual transport. As for the first challenge, we should at least go through a process of refining, finalising, stabilising as in some areas doubts remain as to how neutral and efficient the present setting actually is: Although the chosen arrangements may formally comply with European regulations, there is always the risk that own interest will be put in favour through still-existing back doors. Notwithstanding such doubts, naturally there is also a temptation to overact one's tasks out of a spirit of market purism; distortions and imbalances caused by the change of setting or by new market entrants threaten to protract instability. As for the second integration challenge: Apart from the existing and performant patchwork of best practice, very much remains to be done in most parts of Europe and CE. This is the reason for projects like CONNECT2CE.

In this part of the world, most typically in the German-speaking countries governance forms evolved to meet that challenge: tariff unions and transport associations.

Tariff unions (Tarifverband) are agreements to create the possibility for joint or complementary ticketing and/or a customer-friendly tariff structures; typically, they have a lean administrative organisation sometimes undertaken by a major stakeholder. Tariff unions may provide rail clients with a single ticket option valid for city transport following a rail trip; other more sophisticated tariff unions may function in ways approaching a full-fledged transport system.

A *transport association or system (Verkehrsverbund)* is a special type of a special purpose union (Zweckverband) of local government bodies intended to serve as a legal and organisational framework for the joint and harmonised performance of PT. Just as in the case of tariff unions, there are various subtypes of transport systems or associations. In fact, virtually all of these complex settings include particular features, locally grown solutions or approaches. One of the differences is that in some cases operators are or have been part of the setting, but the tendency is to keep out operators from these unions of local and regional government units and reserve membership to those bodies charged by law with ordering transport services, and let operators have a contractual status within the system.

The Czech Republic – given its strong geographic, economic and cultural links with Germany and Austria – has gone the longest way in adopting the governance structures which evolved in these neighbour countries and make them work within its own setting. Most particularly they consistently introduced integrated cyclical scheduling in national long-distance transport and they created a system of regional governance including competences of regions for commissioning transport services and creation of two dozen regional transport systems (IDS - Integrovaný Dopravní Systém). Later on this approach was partly reproduced by the Polish and Slovakians who also bestowed governance and certain competences to their voivodships or regions, even though Poland also created regional railway operators, while the much smaller Slovak Republic only relayed road PT to the regional level; at present Slovaks only maintain one single integrated transport system in the

capital area. For all three countries it can be noted that on a regional level in particular there might still be plenty of room for improved governance: either because of persisting regional differences as for connectivity and the degree of integration, because regional systems could still be established or expanded, or because there are no appropriate structures yet in place for effective bus-rail integration. For the early days of Czech PT integration in particular, it can be noted that the increased competences for regions allowed.

As for the compatibility of governance types, differences in governance do not generally exclude a high level of cross-border cooperation and interoperability. Provided the functions are replicated both sides there will usually be a counterpart within the other country's system of governance, from the highest political level down to the technical and specialised levels. Cooperation can be more difficult – even though by no means impossible – if a country with a centralist structure and little to no regional competences is next to a country where competences for regional transport have been relayed to the regional level. Representatives of such regions may have to deal with the central authority in the neighbour country's capital each time an issue arises and naturally it would be better for them to turn to a colleague on the regional level who has a similar perception of the issue and is closer to where things actually happen. In such a constellation cross-border connectivity is typically low, although there may be exceptions with an improved or even satisfactory connectivity due to historic reasons, local initiatives, EU projects, or special geographic situations where a particular need has been successfully addressed. Best results are achieved between neighbour transport systems who have similar standards and service levels, thus essentially they just have to agree in the scope and type of cooperation while they can rely on each other's existing structures; e.g. when introducing a cross-border day pass that boils down to an extended offer of the two transport associations, at best all which has to be added is a clearing routine for ticket revenue, updating passenger information, and briefing of staff members on the new product. Achieving cross-border solutions can become more complex in case of larger differences in standards or practice for connectivity, service levels, tariff, ticketing, and terms of carriage.

Complementary to the government structures outlined above a whole range of stakeholders exists (research institutes, privately and state-owned companies and organs, associations, foundations etc.) who are involved in research, analytic, planning, regulatory and various kinds of other background tasks, all necessary for a well-balanced approach to the commissioning of PT services, as well as to the development of transport infrastructure and operations. Thus, they also provide valuable input for developing our macro-themes of connectivity, tariff and infomobility as expanded below in section 1.4. Within a mature society, professional and civic associations contribute in many ways towards progress and a climate of transparency and accountability. In the table of subsection 1.3.1.2 they are classified in row 7 and 10 as "Background and research organisations", and "NGOs and other relevant organisations"; the enumeration is far from complete, mainly associated and active project partners are listed here next to some other well-known examples.

For a more detailed analysis of governance types and stakeholders active in the CONNECT2CE area, please refer to chapter 2.1.

1.3.2. Main socio-economic indicators and performances

In this section a comparative overview will be provided about the regions concerned in pilot actions of CONNECT2CE (pilot regions), based primarily on the data provided by Project Partners, with regard to the most important indicators (such as population density and demographic development, migration balance, active workforce, economic growth rate, GDP per capita, unemployment rate, domestic and international commuters etc.) and to the four main challenges mentioned in the introduction:

- a steadily decreasing rural population resulting in sparsely populated rural and peripheral areas,
- peripheral/cross-border areas not linked efficiently to urban areas,
- a lack of efficient public transport systems, in particular a lack of integration of the various PT modes,
- the most dramatic decline in passenger rail transport occurred in Central Europe, putting a higher-than-average strain on this region as for external costs and negative consequences of transport.

As we will shortly see, substantial differences as for economic performance and the demographic situation exist amongst project regions, next to the even stronger similarities between countries and societies. Rather than for a relentless blueprint, this situation calls for toolbox-type approach to governance and development that will create enough compatibility to attain the (r)evolution of a cohesive, seamless European transport system, but – with due regard to the principle of subsidiarity – still leaves enough room for countries and regions to take into account their specific situation. the regions are presented in the annex.

Following the introduction of certain regions, **the aim of the first chapter is to compare the socio-economic and cross-border traffic situation of the regions involved in the project**. Prior to the completion of the first chapter, the partner responsible for the work package asked each partner for a territorial need assessment (TNA) and had a questionnaire filled out, edited by the responsible. Based on the data provided by the partners and the completed questionnaires, a methodology has been developed, which made it possible to compare the individual regions. In order to produce a summary of results in relation to each data, it was necessary to set up a ranking for the regions. One of the possible solutions was to rank the regions according to individual data. The answers to the questions and the results of the TNA were not used for the ranking, only the data related to the four challenges:

A. rural population has been steadily decreasing, leading to lower density and sparsely populated rural and peripheral areas;
B. regional peripheral areas are characterised by long distances to reach urban areas
C. no efficient public transport systems, not to mention the integration of different PT modes
D. passenger rail transport shows the highest decline in the CE region *(Table 2)*

and some major indicators linked to these factors (Population, Population density, Share of PT within modal split, Railway lines density, Number of rail border crossings, Economic potential GDP/cap. and change over time, Modal split in cross-border transport, Number of daily cross-border commuters). Based on the results *(Table 4)*, three values were developed (strong, average and weak), which are defined and explained in the below table *(Table 3)*. Based on the established ranking, certain types of regions can be interpreted, which can be found in the rest of the chapter.

Table 3: Four challenges in the region (red true for the region; green not true for the region)

Region	A	B	C	D
1. Bolzano/Bozen Region (South Tyrol)				
2. Friuli Venezia Giulia Region				
3. Veneto				
4. Slovenia				
5. Continental Croatia				

Region	A	B	C	D
6. Western Hungary (Vas and Gy-M-S county)				
7. Burgenland				
8. Pilsen Region				
9. Berlin and Brandenburg and Polish voivodships of Lubuskie and Zachodniopomorski				

As shown on the summary table **the regions show strong homogeneity** considering in the first two challenges *(Table 3)*. For all regions it can be stated that the number of people living in rural areas is decreasing and that the rural, mountainous settlements of most regions are far from urban areas or difficult to access. There is also a **small degree of homogeneity** in the other two challenges. Two larger groups can be formed if the four challenges are examined together. Exceptions are Friuli Venezia Giulia Region Friuli Venezia Giulia Region and Berlin-Brandenburg and Polish voivodships of Lubuskie and Zachodniopomorski.

- **First category: Burgenland, Pilsen Region, Friuli Venezia Giulia region** and **South Tyrol** can be considered a larger group. Which is visible to the rural population of the areas show a decreasing trend, which is next to the urban areas are far away. But in order to eliminate this, the region operates a well-functioning and integrated public transport system, thus making it more attractive to rural areas, which can be seen, for example, in the growth of rail passenger transport because the number of people using this mode of transport increases in all three mentioned regions. All three regions are characterized by the presence of the four levels of challenge and the strong presence of regional level, so control and improving the local-level transport systems and the local problems.
- **Second category: The other group includes the former socialist countries** (Slovenia, Croatia and Hungary). The consistency of the three territorial units is that the population is declining in rural areas, urban areas are difficult to approach, and the number of rail passenger transport is decreasing in all three areas. There is another similarity between Western Hungary and continental Croatia, where public transport systems are ineffective as the integration of different public transport modes has not yet been realized. Centralized government is also characteristic of the three regions.
- **Friuli Venezia Giulia Region; Veneto Region and Berlin and Brandenburg and Polish voivodships of Lubuskie and Zachodniopomorski regions** cannot be classified into any of the groups. Only the population decline of rural areas prevails in Berlin-Brandenburg and polish Voivodships of Lubuskie and Zachodniopomorski regions, thus forming a separate unit compared to other regions *(Figure 1)*.

It can be said that those regions that already integrate public transport modes are grasped by their rural areas more easily with the further decline in the area and by the simpler and more logical transport. They can reverse this negative process and so its population retention might be increased.

Therefore, the development of transport organization and the more attractive public transport make are important for not only the state but also its regions.

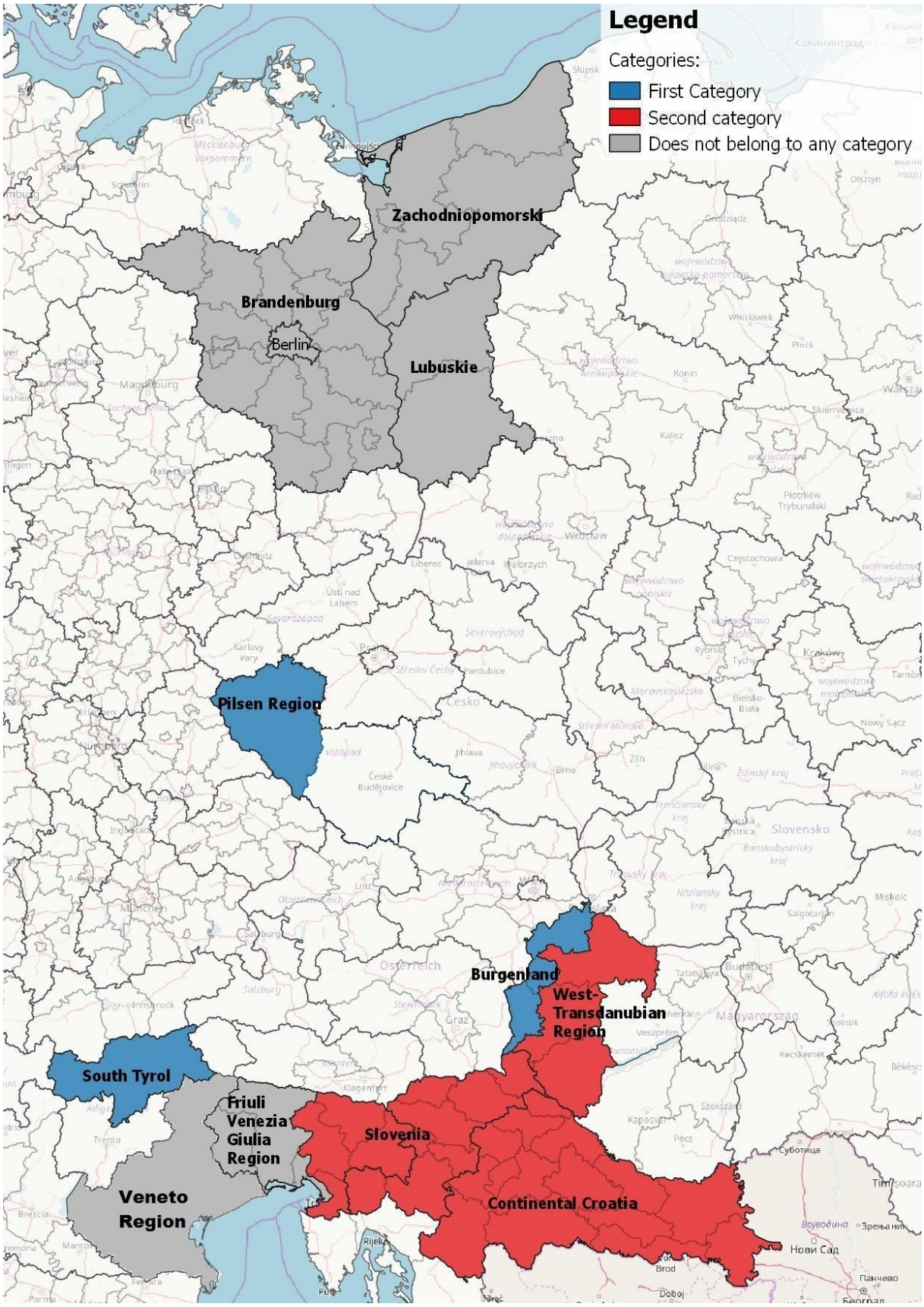

Figure 1: Group of partner regions

Source: Source: own construction using QGIS open source software; map data ©OpenStreetMap contributors, CC BY-SA; © Google, 2018

Table 4: The region comparison methodology

	Strong	Average	Weak	Note	Conclusion
Population (capita) Average of the regions (2016): 1.974.077 capita Average without value of Berlin-Brandenburg (2016): 1.470.230 capita	Above the 120% of calculated average	80-120% of calculated average	Below the 80% of calculated average	It is defined without Berlin, because its population is too high (6.004.857 capita) and it distorts the result.	**Population of regions as statistical sample are heterogeneous. The regions are largely heterogeneous. The gap between the largest and the smallest population is more than 20 times different. The highest value (Berlin) is left, the heterogeneous persist so the difference is still 7,5 times.**
Population density (capita/km2) Average of the regions (2016): 307 capita/km2 Average without value of Berlin-Brandenburg (2016): 91 capita/km2	Above the 115% of calculated average	85-115% of calculated average	Below the 85% of calculated average	It is defined without Berlin, because its Population density is too high (2034 capita/km2) and it distorts the result.	**The regions are also heterogeneous in this regard, also in case of if outlying value of Berlin metropolitan region doesn't take into account.**
Share of PT within modal split (%) Average: 18%	Above the 115% of calculated average	85-115% of calculated average	Below the 85% of calculated average	Whole Partnership	**The share of public transport also shows great heterogeneity in the case of modal split**
Number of rail border crossings (piece) Average: 6 pieces	Above-average (6+2<)	Average (6+/-2)	Below average (6-2>)	Whole Partnership	**The regions are very heterogeneous with the number of border crossings. The geographical background (Alps, Mura, Odera), the historical background and the size of the investigated territorial unit obviously influence it.**
Economic potential GDP/cap. and change over time (eur) Average: 25.689 eur	Euro area's average (29.300 eur<)	EU 28's average (26.600 eur +/-2700 eur)	Below 23.900 eur	Whole partnership EU 28's is largely the same as the average of this sample.	**A smaller degree of homogeneity can be seen in GDP per capita. Those regions have better results that were not part of the socialist bloc or after its break-up, it was a rapid development thanks to the reunification of Germany**
Modal split in cross-border transport (%) Average: 13%	Above-average (13%<)	Average close	Below half the average	Whole partnership	**The regions are heterogeneous. Data from many regions is missing so it can distort it**
Number of daily cross-border commuters (capita) Average of the regions (2016-2017): 9.536 capita Average without value of West Hungary (2016-2017): 4.443 capita	Above the calculated average (4443)	60-100% of calculated average	Below the 60% of calculated average	It is defined without West-Hungary (35.000 capita), because its cross border commuters is too high	**The regions are heterogeneous. Data from many regions is missing so it can distort it.**
Railway lines density (km/1000 km2)[2]	>75	50-25	<25	Whole Partnership Based on Eurostat data	**The regions are heterogeneous.**

[2] Source: http://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Map_2_Railway_lines_density_by_NUTS_2_regions,_2014.PNG&oldid=310145

Table 5: Economic, social and traffic data of the regions participating in the project

Region	Population (capita)	Population density (capita/km2)	Urban areas difficult to reach	Share of PT within modal split (%)	Railway lines density (km/1000 km2)	Traversing TEN-T corridor	Number of rail border crossings	Economic potential GDP/cap. and change over time (EUR)	Modal split in cross-border transport (%)	Number of daily cross-border commuters (capita)
1. Bolzano/Bozen Region (South Tyrol)	2001: 461.101 2011: 501.815 2016: 520.891	70	✓	Urban bus: 9.7% Suburban bus: 5.8% Train: 6.2% **All: 21,7 %**	>75	✓	2 (both with Austria)	2001: 30.421 2011: 38.667 2015: 41.140	rail: 15% bus: 3% company or school bus: 7% **All: 25%**	South Tyrol – Switzerland: almost **1,500** South Tyrol – Austria: about **50**
2. Friuli Venezia Giulia Region	2001: 1.181.238 2011: 1.220.849 2016: 1.221.218	152	✓	Bus: 4,7% Rail: 2,2% **All: 6,9%** in domestic regional transport	25-50	✓	3 (1 with Austria, 2 with Slovenia)	2001: 25.000 2011: 29.000 2015: 29.000	n.a.	**2700** commuters in 2016
Veneto	2001: 4.508.580 2011: 4.851.958 2016: 4.907.529	267	✓	**Public transport: 14%** With particular reference to commuting (where a relatively higher share of PT is expected with respect to the overall mobility)	65	✓	0	2001: 26.000 2011: 31.000 2015: 31.000	n.a.	**n.a.**

3. Slovenia	 2001: 1.992.035 2011: 2.052.496 2016: 2.064.241	101		11,8 % Bus, 2,1 % Rail **All: 13,9%**	>75	✓	15 (4 Austria, 1 Hungary, 8 Croatia, 2 Italy)	 2001: 11.714 2011: 17.973 2016: 19. 576	15% bus 10% rail **All: 25%**	**2.780** foreign daily migrants (year 2016). There is no available data about daily migrants from Slovenia to neighboring countries.

Region	Population (capita)	Population density (capita/km2)	Urban areas difficult to reach	Share of PT within modal split (%)	Railway lines density (km/1000 km2)	Traversing TEN-T corridor	Number of rail border crossings	Economic potential GDP/cap. and change over time (EUR)	Modal split in cross-border transport (%)	Number of daily cross-border commuters (capita)
4. Continental Croatia	↓ 2000: 4.428.072 2010: 4.328.153 2017: 4.189.353 (All country)	92		58% road (bus + car) 24% Rail All: 24%<	25-50	✓	14 (6 Slovenia, 3 Hungary, 3 Serbia, 4 Bosnia-Hercegovina)	↓ 2001: 4.222 2011: 11.705 2016: 9.733 (All country)	n.a.	n.a.
5. Western Hungary (Vas and Gy-M-S county)	↑ 2001:703.358 2011: 707 655 2016: 708.915	92	✓	Bus: 27% Rail: 11% (West Transdanubia) All: 38%	<25	✓	8 (6 Austria, 1 Slovakia, 1 Slovenia)	2001: 12.298 2011: 18.041 2015: 22.570	Bus: 1% Rail: 7% All: 8%	At least 35.000 in 2017
6. Province of Burgenland	↑ 2001: 277.569 2011: 285.000 2016: 291.023	73	✓	Public Transport 6,8%	25-50	✓	7 (6 Hungary, 1 Slovakia)	↑ 2001: 17.864 2011: 24.277 2015: 27.627	3% Rail	19.000 Hungarian commuters Census Hu, 2011)
7. Pilsen Region	↑ 2001: 549.600 2011: 571.709 2016: 577.638	75	✓	In whole Czech Republic the ratio is 12% Bus, 6,5% Rail All: 18,5% no summary regional data	<25	✓	2 (with Germany)	↑ 2000: 8557 2011: 12.964 2016: 15 971	1 % Bus 4 % Rail All: 5%	3183 daily cross-border commuters from whole our region in 2011
8. Berlin and Brandenburg and Polish voivodships of Lubuskie and Zachodniopomorski	↑ Berlin/Brandenburg: 2001: 5.981.474 2011: 5.779.182 2016: 6.004.857 Polish voivodships of Lubuskie and Zachodniopomorski 2016: 2.188.557	Berlin/Brandenburg: 2034 Polish voivodships of Lubuskie and Zachodniopomorski 74	✓	Public transport: 16 %	<25	✓	3 (each other)	↑ Berlin/Brandenburg 2001: 22.064 2011: 27.080 2016: 32.790 Polish voivodships of Lubuskie and Zachodniopomorski 2004: 10.000 2011: 14.100 2015: 16.500	n.a.	n.a.

Legend:

Strong | Average | Weak | n.a.

The regions are not even homogeneous in potential and needs and the current situation of cross-border, sustainable transport. When comparing regions the following categories *(Table 5)* have been established based on the above criteria[3]:

- **Regions with a high degree of cross-border commuting (CBC) and medium to low CBC modal split.** Quasi functional regions where only a small part of the large commuting population uses PT. These regions have a growth potential as for future PT shares where PT developments may be strongly indicated. Typical for such regions are the two NUTS-II regions of the Austrian-Hungarian border area and Pilsen region.
    - Western Hungary
    - Burgenland
    - Pilsen Region

- **Regions with a lower cross-border PT share compared to national average modal split.** Passengers in these regions use PT to a larger degree on domestic routes than on cross-border routes. It is likely the difference points to a PT growth potential in the case of a more satisfying service level.
    - Western Hungary
    - Burgenland
    - Pilsen Region

- **Regions with a relatively high PT share in modal split both for domestic and cross-border mobility.**
    - Bolzano/Bozen Region

- **Regions with lower than average population density and a high PT share in modal split.**
    - Bolzano/Bozen Region
    - Pilsen Region
    - (Polish voivodships of Lubuskie and Zachodniopomorski)

  Next to South Tyrol with its high PT share, mostly those regions from formerly Socialist countries belong to this group where relatively solid PT systems operate in low-income areas with a lower motorization rate.

- **Regions with a higher than average population density and a relatively low PT share in modal split.**
    - Friuli Venezia Giulia
    - Veneto
    - Berlin-Brandenburg

  In these cases, there is a significant growth potential for PT due to relatively high population density. In this respect the situation of Berlin as a capital and European metropolitan region, with an extended gravitation active even across the national border.

[3] *The categories are flexible, not exclusive. These may overlap, meaning that a region may be part of several categories.*

- **Regions with a relatively dense railway network and a high domestic and cross-border PT share in modal split.**
    - Bolzano/Bozen Region (high share of railways in modal split)

  From a public transport point of view, the Bozen/Bolzano Region can be regarded as very strong which to a large degree could be due to the regional governance level introduced in the previous section. A local transport organiser is at work here who takes into account the needs of the local population and is in a position to focus on locally emerging issues. This results in the high share of those who choose PT both for domestic and international travel. As for international regional travel we should note the high share of railway transport here and the positive effect of periodic timetable.

Despite the fact that the pilot regions are heterogeneous in most of the indicators analyzed above, as well as there are slight differences in potential and needs, the following demand analysis reveals that **all the border-regions of the Central European countries can be regarded as a booming area concerning cross-border commuting**, therefore, **developing the conditions of public transportation is essential in every pilot region** in order to help the overall implementation of the Europe 2020 Strategy.

1.3.3. Transport modal split and demand analysis

The section originally intended to evaluate the results of the cross-border transport related parts of the completed questionnaires submitted by the Project Partners *(Table 5)*. During the submission process it became clear, that **there is a significant shortage of available, official data on cross-border public transport**. 50% of the requested data is missing, as well as further 10 percent is rough estimation.

Due to the lack of data defining categories is not relevant, and will not provide added value, however **common patterns can be identified** based on the results. Except for Slovenia, **share of car usage in cross-border transport is higher** compared to the data of domestic modal-split. The reasons can be complex, including the flexibility of using own vehicle, lack of cross-border public transport connection or timetable problems. Regarding the purpose of cross-border the trip, the **higher share of work-related trips** can be connected to the degree of pay inequality – countries with higher average wages and better conditions can drain workforce, especially from the border regions. Split of the cross-border commuters by profession type is mainly influenced by the characteristic of the specific region. Split of the cross-border commuters by gender is highly dominated by male population, however, due to the low amount of sample available no regularity can be determined.

Albeit this section of the Study did not intend to deal with data collection methods, it is important to go deeper to understand the unequal quantity and quality of available data in the different regions. As it can be seen in the table – besides Bolzano/Bozen Region (South Tyrol) – the most accurate dataset is available for Burgenland and Western Hungary, two neighboring regions of the area. The reason for the detailed results is the project *„EMAH -Ecomobility in the Austro-Hungarian border region"* implemented within the framework of Interreg Austria-Hungary Cooperation Programme. The aim of the project was to **survey the mobility patterns of commuters** in the Austrian-Hungarian border region, and to encourage environmentally friendly means of transportation among people. First the travel practices were surveyed with a **questionnaire and precise data was collected regarding motivation, personal needs and behavior**. Implementation of such a project in the other regions would significantly improve the conditions of further research and planning actions.

Table 6: Summary of cross border transport related data based on the questionnaires

	1.3.2.1. Bolzano/Bozen Region (South Tyrol)	1.3.2.2. Friuli Venezia Giulia Region	1.3.2.2 bis Veneto	1.3.2.3. Slovenia	1.3.2.4. Continental Croatia	1.3.2.5. Western Hungary (Vas and Gy-M-S county)	1.3.2.6. Province of Burgenland	1.3.2.7. Pilsen Region	1.3.2.8. Berlin and Brandenburg and Polish voivodships of Lubuskie and Zachodniopomorski
Modal split in domestic regional transport	Car (driver+ passenger): 36% On foot: 25% Bike: 13.9% Urban bus: 9.7% Suburban bus: 5.8% Train: 6.2% Motorcycle: 2.2%	4.7% bus, 2.2% Rail, 93.1% Car (comprehensive value)	14% Public transport, 67% Car, 7% Bicycle, (with reference to systematic mobility)	11,8 % Bus, 2,1 % Rail, 86,1 % Car	58% road (bus + car) 24% Rail	22,6 % Bus, 9,9 % Rail, 67,5 % Car (Full country) 27% Bus, 11% Rail, 56% Car, 5% Bicycle (Western Transdanubia)	Walking 14,7% Cycling 5,9% Car 54,8+17,3% Public Transport 6,8% Others: 0,3%	No data on regional level On national level: 12% Bus, 6,5% Rail, 81,5% Car	Public transport: 16 % Foot: 27 % Bike: 12 % Car: 45 % Data from 2008 (!), newer data available 2019 for 2018 Data for Berlin and Brandenburg
Modal split in regional transport by purpose of the trip (work vs. leisure)	Free time: 31.8% Work: 27.9% Personal reasons: 20.5% Familiar reasons: 14.3% School: 5.4%	No data	No data	50 % Work, 30 % Leisure, Other 20% (estimation)	No data	40% work 14% education 18% shopping 9% administration, healthcare 9% visiting 7% leisure 3% other, N/A	To workplace 21,8 Business: 3,6 To school: 5,3 Pickup trips: 6,1 Shopping: 11,1 “Errands”: 12,9 Leisure: 19,2 Visits: 13,7 Others: 0,3	Work or school 75%, Leisure 25%	No data
Modal split in cross-border transport	Modal Split from the Autonomous Province of Bolzano to Austria, Germany and Switzerland: 15% train; 3% bus - suburban service; 7% business or scholar bus; 66% car (as driver); 8% car (as passenger); 1% other vehicles	No data	No data	15 % bus, 10 % rail, 70 % car, 5 % other	No data	1 % Bus, ca. 7 % Rail, ca. 92 % Car	3% Rail, 97% Car	1 % Bus, 4 % Rail, 95 % Car	No data

	1.3.2.1. Bolzano/Bozen Region (South Tyrol)	1.3.2.2. Friuli Venezia Giulia Region	1.3.2.2 bis Veneto	1.3.2.3. Slovenia	1.3.2.4. Continental Croatia	1.3.2.5. Western Hungary (Vas and Gy-M-S county)	1.3.2.6. Province of Burgenland	1.3.2.7. Pilsen Region	1.3.2.8. Berlin and Brandenburg and Polish voivodships of Lubuskie and Zachodniopomorski
Modal split in cross-border transport by purpose of the trip (work vs. leisure)	Split from the Autonomous Province of Bolzano to Austria, Germany and Switzerland (17% study - included nursery school and professional training courses; 83% work) (Overall split at the Provincial level: 33.3% work + school; 16.4% retired; 66.7% leisure, including free time, personal services and familiar services)	No data	No data	Estimation: 30 % work, 70 % Leisure 2.800 daily work related migrants to Slovenia (2016)	No data	52% work 4% education 11% shopping 6% administration, healthcare 11% visiting 9% sport, leisure 7% other, N/A	55% Work, 3% School/University, 15% Shopping, 10% Tourism-free time, 3% Administration, 2% Healthcare, 5% Visit, 7% Others	Work 20 %, Leisure 80 %	No data available (unfortunately); from Poland to Berlin high share of working commuters; from Germany to Poland high share of leisure
Split of the cross-border commuters by profession type	Not available (Overall split at the Provincial level: 67.3% workers; 16.4% retired; 13.0% students; 0.7% unemployed; 2.7% Housewife)	No data	No data	No data	No data	11% Agriculture 38% Industry 28% Services 7% Health & Education 4% Transport, Telecomm. 12% Others, N/A	39% Industry, 5% Education, 26% Agriculture, 4% Legal Services, 12% Services, 14% Others/No answer	No data	No data
Split of the cross-border commuters by gender	Split from Autonomous Province of Bolzano to Austria, Germany and Switzerland: 58% male; 42% female (Overall traffic at the Provincial level: 41.6% female; 58.4% male)	No data	No data	81 % male, 19 % female (2016)	No data	72 % Male, 28 % Female	No data	No data	No data available but higher share of women than in average

Despite the lack of data from the questionnaires, it is possible to **identify some of the "hot-spots"** by analyzing Eurostat provided datasets. For the analysis the following indicators have been used:

1. Employment and commuting by NUTS 2 regions, 2011–2016 (1 000 – C_WORK Foreign country)
2. Employment by sex, age and NUTS 2 regions (1 000 – From 15 to 64 years)

However, the target area of this project is the countries of Central Europe, to make the results comparable, all the countries of Europe have been involved in the analysis. As the *Statistics on commuting patterns at regional level published by Eurostat* highlights *"patterns of cross-border commuting are asymmetrical: the greater the difference in average earnings or the availability of job vacancies between two regions, the more likely the region with more favorable labor market conditions will attract a higher number of cross-border commuters."* This statement is in line with the results of the completed questionnaires provided by the Project Partners.

The following map represents the **share of total employment commuting across national borders** *(Figure 2)*. Due to the different economic development and the difference in salaries the well-known **trend of westward movement of labor force** – even on a daily level – is obvious based on the results. This socio-economic phenomenon especially applies to Poland, Czech Republic, Austria, Hungary, and generally, for the whole Central European area.

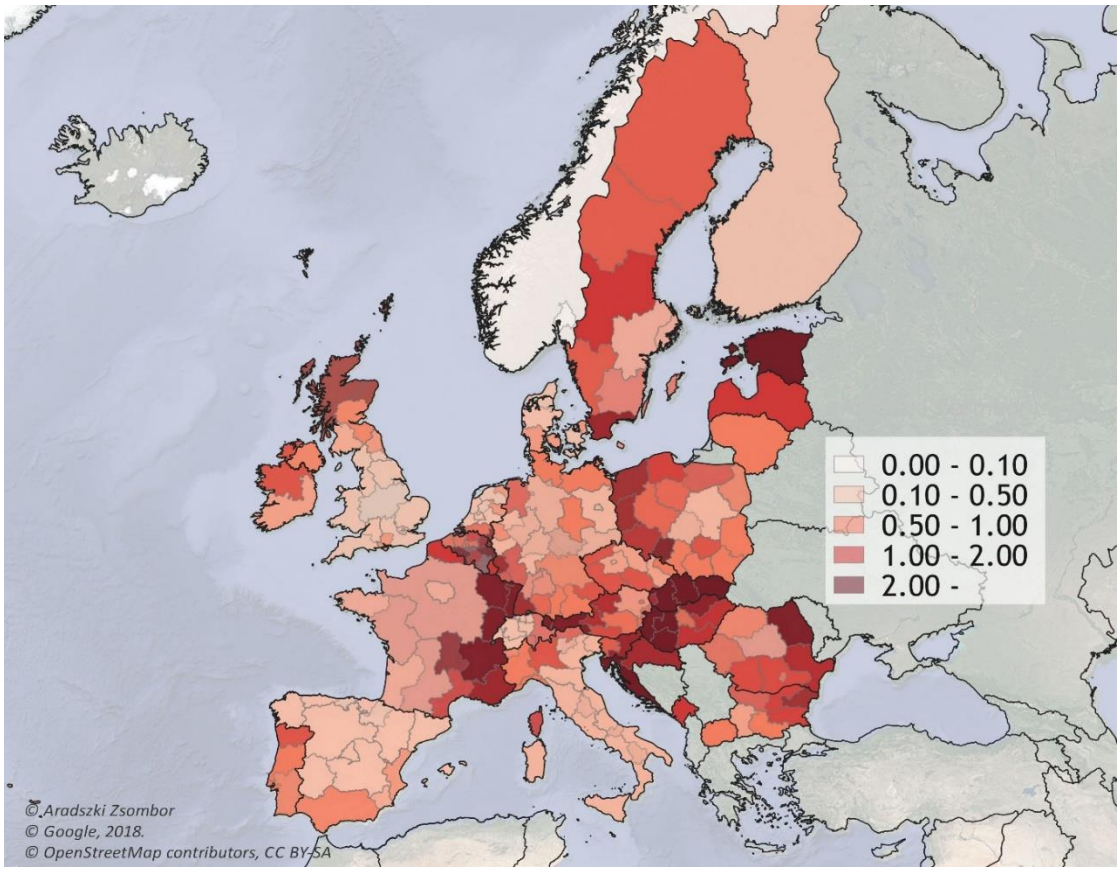

Figure 2: Share of total employment commuting across national borders, by NUTS 2 regions, 2011-2016 average [% of total employment]

Source: own construction using QGIS open source software, data provided by Eurostat; map data ©OpenStreetMap contributors, CC BY-SA; © Google, 2018

The results of the map are in correlation with the study published by the European Union Committee of the Regions, which aimed to analyze the problems faced by European border regions (and eventually other European regions) due to missing links in small scale infrastructures. The study highlights, that ***"for determining cross-border infrastructure requirements, daily commuting is the most important factor"***. It also identified five main increase zones in Europe including the following two, which are important in view of CONNECT2CE *(Figure 3)*.

- **Central Europe between Germany, Austria, Slovakia, Hungary, Czech Republic, Slovenia. Here the share of daily commuters is also relatively high**, especially between Austria and Germany as well as between Hungary and Austria.
- North-western and Western Europe: France, Germany, Belgium, Netherlands, Luxembourg representing about 40 % of all European commuters. Here the share of daily commuters is high, probably because of well-developed transport connections.

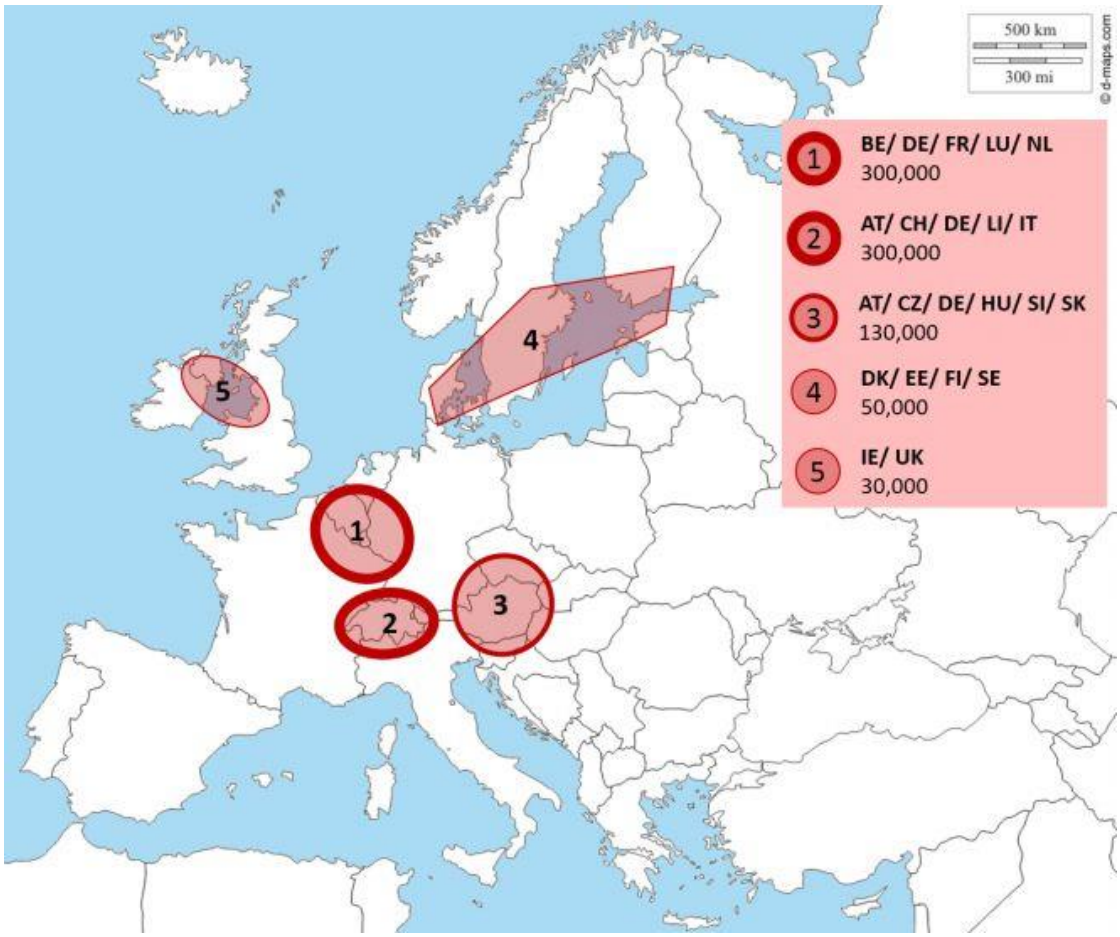

Figure 3: Cross-border commuting - main increase zones in Europe

Source: JÜRGEN PUCHER-WOLFGANG SCHAUSBERGER-JAKOB WEISS 2016: The potential of closing the missing links of small scale infrastructure in Europe's border regions for growth and employment

1.4. Introducing macro-themes

The essential output of CONNECT2CE consists of concerted strategies and tools tested in a pilot action environment, designed to be widely disseminated and implemented at regional and cross-border level. Three focus areas have been identified as critical for the enhancement of peripheral and cross-border PT services of Central European regions:

1) Connectivity (adapting PSOs/PSCs to the needs of cross-border mobility, harmonising multimodal schedules, developing regional and cross-border rail services);

2) Integrated ticketing and tariff schemes (integration of regional and cross border multimodal tickets will be tested and implemented for the first time);

3) Implementation of the most efficient and innovative infomobility ICT tools. The study continues with the previous three volumes.

1.4.1. Connectivity and public services

The sequence is not by chance. Time and again it has been noted that smart tariff, ticketing and passenger information systems are important in view of accessibility to transport and they are definitely part of a modern, efficient transport system, but on themselves they will not significantly improve modal split. The primary and most significant issue in making public transport (PT) a popular, viable alternative to individual cars is connectivity. Looking at best practice towards the end of this chapter, the basic 'ingredients' for improving connectivity are, frequent departures next to a regular timetable and optimal connections next to intermodal integration. The challenge is, how can PT become approximately as flexible as cars? How to reach a maximum level of efficiency and sustainability in public service? What to do if on a certain route it doesn't appear viable to maintain an attractive level of connectivity? Upon elaborating or updating Public Service Obligations (PSO) it is fundamental to know the answers and translate them to a regional level.

This section describes and compares Public Service Obligations (PSO) for public transport and the stakeholders involved in governance related to PSO, their policy and organisational background, and their functioning in pilot regions. What are the advantages and disadvantages of respective solutions in terms of the quality of PT services?

Generally speaking, what is a public service obligation (PSO) in the context of European Union law? It signifies “an obligation imposed on an organisation by legislation or contract to provide a service of general interest”. PSOs can be applied in any field of public service, but some areas including transport are identified as sectors where the concept of PSO is particularly relevant.

“The main objectives of European public transport policy are to provide safe, efficient and high-quality passenger transport services through regulated competition. It takes social, environmental and regional development factors into account to guarantee their transparency and performance. Many public passenger transport services that society needs as part of its general interest cannot be run commercially, so the relevant national, regional or local EU authorities must be able to make certain they are provided. There are several ways for them to do this:

- by awarding exclusive rights to those running public services, compensating them financially, and also
- by defining rules for how public transport is operated.

Article 14 of the Treaty on the Functioning of the European Union (TFEU) and Protocol No 26 on services of general interest annexed to the TFEU sets out the general principles of how Member

States define and provide services of general economic interest. The European Union has developed legislation to avoid disparities between Member States in the procedures and conditions they apply to the execution of public service obligations. This legislation differs slightly between the different forms of transport - particularly regarding competition - and takes the specific features of each transport means into account, including its operational characteristics."

1.4.2. Tariff and ticketing

Regional tariffs, including tariff reductions for social reasons - so-called social tariffs, which apply to the entirety of national passenger services (regional and long-distance services) - are defined on a national basis. In addition, the regions themselves define specific social tariffs on their territory, and, sometimes, specific commercial offers or tariffs.

Passenger rail travel is currently experiencing a renaissance in many parts of Europe. The European Union (EU) and national governments are investing in new cross-border routes, both for long-distance and local services, and there is more competition on our railways, for example in Austria between open-access operator Westbahn and incumbent Austrian Federal Railways (ÖBB). From a sales and ticketing perspective, the rise of the internet and digital platforms allows for greater transparency across operators and the ability to purchase tickets more easily. All in all, the EU is heading towards a Single European Rail Area (Sera).

There are more different problems for the cross-border integration. There are some legal issues, some organisation problems (different systems and different responsible organisations), some economic problems (higher cost of cross-border connections for the operators, more problematic regional subsidies) and also some taxes problems (different level of VAT in domestic and cross-border transport...) etc.

The people are also not very much used to use the cross border public transport yet and it is also a problem of language barrier.

One of the biggest challenges of cross-border traffic is ticketing, since they have to confine to each other different national systems. In the coming year(s), these issues should be solved.

Examples of tariffs and ticketing:

Bolzano/Bozen Region (South Tyrol): The article 36 of the Provincial law 23 November 2015, n. 15 states that the Autonomous Province of Bolzano Bozen encourages the integration in a unique tariff system of all public transport services operating in South Tyrol. This integration, which is valid for all owners of the Südtirol Alto Adige pass, includes regional trains for routes within the jurisdiction of the Province as well as for those reaching Trento and Innsbruck, urban and long-distance buses, city buses and certain cable car lines and funiculars.

Western Hungary: Organisational and financial framework and the public passenger transport of the selected region; GYSEV is owned by the Hungarian State (65,7%), the Austrian State (28,2%) and the Strabag SE (6,1%). The costs of the operation are financed by the Hungarian State in Hungary and by the Austrian State in Austria. Categorization of the ticketing mediums and ticketing products per transport mode – or per transport operators if needed; There are paper tickets issued at the cashier desks / on board or printed at home.

VBB: VBB provides a ticketing system for the entire region of Berlin and Brandenburg. All regional operators in Berlin-Brandenburg sell exclusively tickets according to the VBB system for rides within

Berlin-Brandenburg. Only the (few) open access long-distance operators on rail and road sell own tickets, which are not part of the VBB ticketing system.

VBB-wide around 50 % of the costs of operation are covered by the sale of tickets, the other 50 % are covered by public grants. As already mentioned in the previous chapter, the operators sell tickets to the passengers and share revenues based on surveys.

These three examples are just demonstrative because the third volume will contain such detailed introduce.

1.4.3. Infomobility

Intelligent Transport Systems (ITS), as well as Information and Communication Technology (ICT) solutions are increasingly considered as essential tools for more efficient and economically sustainable transport solutions, and to make PT more attractive, more accessible. Within the present effort we will primarily deal with the area of travel information by analysing information tools designed for passengers. Pilot actions on info-mobility systems aim at regions where such tools do not yet exist, or multi-modal and geographic integration is not yet implemented. As will be pointed out in this Study technical maturity and rendering of tools is only one prerequisite for meeting challenges related to infomobility. As standards and tools for multimodal and transnational, multilingual integration of Mobility Information Systems have to be created, political collaboration, goodwill and flexibility of stakeholders and agreements among transport providers are decisive.

The aim of infomobility is to provide passengers with real-time information about public transport services including, for example, up-to-date timetable information or estimated departure, arrival and travel times. This allows for improved trip planning for passengers via information displays at stations and bus stops and in buses, trams or trains. Real-time PT information can also be retrieved via PC and mobile devices such as smartphones, tablets and laptops, making it available almost anywhere.

With regard to all three macro-themes, there has to be a growing consensus and willingness on a professional, political and societal level to identify and adapt best practice so we can make it work everywhere.

Info-mobility can be defined as “the use and distribution of dynamic and selected multi-modal information to users, both pre-trip and, more importantly, on-trip, in pursuit of attaining higher traffic and transport efficiency as well as higher quality levels in travel experience by the users” (Ambrosino et al., 2010). Indeed, a reliable info-mobility is part of the so-called “pull-measures” (Nocera and Cavallaro, 2011), which aim at encouraging the shift from the private vehicle to more sustainable transport modes by improving the attractiveness of public transport. Info-mobility is typically provided by a Mobility Information System (henceforth, MIS), i.e. a system (in most cases a website or a mobile application) providing information to an end-user.

This deliverable, which aims at describing the MISs available in the areas covered by the project CONNECT2CE, is structured into four main parts. The first one (section 1.1) tries to address some important preliminary questions: why is infomobility important for public transport? Which is the benefit that can be provided to passengers? How is infomobility perceived by users? Then, it presents the most important technical aspects related to MISs in Friuli-Venezia Giulia, South Tyrol, Slovenia, Western-Hungary and Győr-Moson-Sopron, Zagreb County, Pilsen Region, Burgenland and Berlin-Brandenburg. The analysis of the MISs is provided through technical information, relevant

images, as well as a final table that summarizes the main characteristics of the different solutions. For sake of clarity, results are divided into four sub-sections:

- general characteristics of the Info Mobility Systems (IMSs) (Section II.a of the questionnaire);
- pre-trip component of the IMSs (Section II.b of the questionnaire);
- on-trip component of the IMSs (Section II.c of the questionnaire);
- ticketing systems of the IMSs (Section II.d of the questionnaire).

Summary

This introductory study of the 'transnational study phase' of the Connect2CE provides a comprehensive overview of the border regions within the geographic area of CONNECT2CE, and of the main findings of thematic work package WPT1 on the actual situation of regional transport within the countries project partners belong to. This document is largely based on the analysis of partners' replies to the questionnaires and on partner's Territorial Needs Assessments which were presented in Berlin on the 28th of November 2017. The scope of the research carried out in the study covers three areas: the general socio-economic characteristics; the governance type; and the transport modal split of the relevant CONNECT2CE regions.

Taking into account the four challenges identified by CONNECT2CE the **socio-economic analysis** of the regions concluded that the *regions show strong homogeneity considering in the first two challenges* (increasing of the urban population; non-efficiently linked cross-border areas) and there is also a *small degree of homogeneity in the other two challenges* (no integration of different public transport modes; decline of passenger rail transport). Based on the examined challenges two groups can be formed:

- *The first group* (Burgenland, Pilsen Region and South Tyrol) where the rural population of the areas show a decreasing trend, which is next to the urban areas are far away. On the contrary the region operates a well-functioning and attractive integrated public transport system, which can be seen, for example, in the growth of rail passenger transport.
- *The second group* includes the C2CE regions of some former socialist countries (Slovenia, Croatia and Hungary), where the population is declining in rural areas, and the surrounding urban areas have low accessibility, moreover the number of rail passenger transport is decreasing in all three regions. There is another similarity between Western Hungary and continental Croatia, where public transport systems are ineffective as the integration of different public transport modes has not yet been realized.
- Friuli Venezia Giulia Region, Veneto Region and Berlin and Brandenburg and Polish voivodships of Lubuskie and Zachodniopomorski regions cannot be classified into any of the groups.

Reviewing the decision-making processes of the public services of the transport in the C2CE regions and the roles, responsibilities of the stakeholders and key players it can be said that the examined regions are in large measure heterogeneous considering their **government type of the public service ordering**. On one hand of scale the decentralized structure can be found like in the federal Member States, Member States with more than one system of law or Member States having autonomous territorial units – Berlin, Autonomous Province of Bolzano/Südtirol, Friuli Venezia Giulia Region. In this case the authority of the region or the federal unit, who is responsible for the

suburban and regional public transport. At the other end the centralized government structure can be found in the regions of the former socialist Eastern-European countries (Slovenia, Croatia and Hungary, the Czech Republic). Those different structures are paired in the neighbouring C2CE countries like Hungary-Austria, Italy-Slovenia, Germany-Czech Republic, which could be a serious administrative barriers designing an effective and integrated cross-border public transport.

Despite the fact that the pilot CONNECT2CE regions are heterogeneous in most of the challenges and governance threats analysed above, as well as there are slight differences in potential and needs, the **transport demand analysis** reveals that all the border-regions of the Central European countries can be regarded as a booming area concerning cross-border commuting, therefore, developing the conditions of public transportation is essential.

During the transport demand analysis it became clear, that there is a significant shortage of available, official data on cross-border public transport, but some findings can be made: regarding the purpose of cross-border the trip, the higher share of work-related trips can be connected to the degree of pay inequality – countries with higher average wages and better conditions can drain workforce, especially from the border regions; split of the cross-border commuters by profession type is mainly influenced by the characteristic of the specific region; split of the cross-border commuters by gender is highly dominated by male population. Quoting the study of the European Union Committee of the Regions in 2016 it can be stated that the Austria- Czech Republic-Germany-Hungary-Slovenia-Slovakia transnational area is of the 5 main cross-border zone of the EU where the share of daily commuters is relatively high, and the number of the cross-border commuters are growing – which was estimated 130.000 capita in 2016.

The last decades proved the less attention to the cross-border regional public transport on governance, administrative and legislative level, which resulted a nearly unexplored area of the transnational public services without former – success – examples. Next to the four challenges identified by CONNECT2CE, the Regional Policy of the EU Commission categorized 3 general categories of border obstacles emerging from local, regional national or EU legislation as well as from different administrative practices in 2015:

- *Legal obstacles* caused by an absence of EU legislation in policy fields;
- *Legal obstacles* caused by incoherent or inconsistent domestic laws of EU-Member States in policy fields where no or only a partial EU competence does exist;
- *Administrative obstacles* caused by inadequate procedural and adverse behavioural aspects at the local, regional or national levels".

All of these obstacles are detected in the case of the Connect2CE regions based on the case studies of the Commission (legal obstacles) and the governance analysis of this introductory study (administrative barrier). The examination of the socio-economic and the transport demand indicators show the heterogeneity of the CONNECT2CE regions which suggests the complexity of the possible solutions. The transport analysis also identified the increasing trend of the regional cross-border demand for transport in Central Europe.

The above mentioned propose the needs of:

- enhancing the *public planning capacities, practices, solutions* towards improved policies on regional and cross-border public passenger transport; and
- changing the mobility patterns through more *efficient and better coordinated services* able to link public transport systems.

2. Thematic transnational focus on PSO and connectivity

Following the general introduction on the project area, pilot regions and macro-themes, this chapter will focus on the first macro theme “Connectivity and public services”.

The primary and most significant issue in making PT a popular, viable alternative to individual cars is connectivity. Looking at best practice towards the end of this chapter, the basic 'ingredients' for improving connectivity are, frequent departures next to a regular timetable and optimal connections next to intermodal integration. Therefore, the challenges are: how can PT become approximately as flexible as cars? How to reach a maximum level of efficiency and sustainability in public service? What to do if on a certain route it doesn't appear viable to maintain an attractive level of connectivity?

Upon elaborating or updating Public Service Obligations (PSO) it is fundamental to know the answers and translate them to a regional level.

The first section of this chapter is a comparative analysis of Public Service Obligations (PSO), transport governance and connectivity, including the legal framework thereof, and the aspect of finance and ordering, and timetable harmonisation with particular regard to the need for integrating, harmonising rail and road PT. The second main section summarises and endeavours to interpret within a Central European perspective project partners' SWOT input. The third section zooms in on a number of best practice examples with particular regard to this CONNECT2CE macro theme.

2.1. Transnational analysis of PSO, governance and connectivity

This section describes and compares Public Service Obligations (PSO) for public transport (PT) and the stakeholders involved in governance related to PSO, their policy and organisational background, and their functioning in pilot regions. The advantages and disadvantages of respective solutions are in terms of the quality of PT services.

Generally speaking, what is a public service obligation (PSO) in the context of European Union law? It signifies an obligation imposed on an organisation by legislation or contract to provide a service of general interest. PSOs can be applied in any field of public service, but some areas including transport are identified as sectors where the concept of PSO is particularly relevant.

“The main objectives of European public transport policy are to provide safe, efficient and high-quality passenger transport services through regulated competition. It takes social, environmental and regional development factors into account to guarantee their transparency and performance. Many public passenger transport services that society needs as part of its general interest cannot be run commercially, so the relevant national, regional or local EU authorities must be able to make certain they are provided. There are several ways for them to do this:

- *by awarding exclusive rights to those running public services, compensating them financially, and also*
- *by defining rules for how public transport is operated.*

Article 14 of the Treaty on the Functioning of the European Union (TFEU) and Protocol No 26 on services of general interest annexed to the TFEU sets out the general principles of how Member States define and provide services of general economic interest. The European Union has developed legislation to avoid disparities between Member States in the procedures and conditions they apply to the execution of public service obligations. This legislation differs slightly between the different forms of transport - particularly regarding competition - and takes the specific features of each transport means into account, including its operational characteristics." The overview of PSO is located on the European Commission page.[4]

2.1.1. Legal and policy background & stakeholders

With regard to governance and to the background for Public Service Obligations and Contracts (PSO/PSC) the pilot regions appear representative for the entire CONNECT2CE project region – even though they may be more or less typical for the given country or wider area.

In principle, as a consequence of the EU integration processes the various member states are now expected to cooperate closer than in the past. Typically, the everyday mobility of citizens is on the rise: many more accept jobs away from their place of residence, more and more youth keep on studying as there is a bigger emphasis on secondary and tertiary education, not to mention spare time mobility, intensifying business relations, and last but not least a steep increase in freight transport.

On 30 January 2013, the European Commission published its proposal for a Fourth Railway Package, composed of two main legislative pillars:

- Technical Pillar aimed at harmonizing technical rules on interoperability and safety and to reform the European Rail Agency;

- Market Pillar aiming to open the domestic passenger market in the years to come, thus completing the process of gradual market opening started with the First Railway Package.

Already in its Transport White Paper of 2011[5] the Commission had set out its vision for establishing a Single European Railway Area (SERA) as well as the necessary steps for ensuring the competitiveness of EU transport and enhancing inter-modal competition in the long term. The main rationale behind the new Railway Package was aptly stated in the Commission's proposal for amending Directive 2012/34: *"In the last decade, three legislative 'railway packages' have progressively opened up national markets and making railways more competitive and interoperable at the EU level. However, despite the considerable development of the 'EU acquis', the modal share of rail in intra-EU transport has remained modest."* The problem of EU regulation is that it cannot be a real solution to the management of cross-border public transport, it is only a solution for the infrastructure manager.

The new Directive 2016/2370 amending Directive 2012/34 established the right of every European railway operator to provide passenger services, at both international and domestic level in every Member State. The only eligible limitation of this general right of access to railway infrastructure is the objective of safeguarding the economic equilibrium of existing public service contracts, as well

[4] https://ec.europa.eu/transport/themes/pso_pl

[5] European Commission White Paper Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system, COM(2011) 144

as the indirect limitation stemming from exclusivity rights granted to operators under PSO contracts concluded before 16 June 2015. Moreover, Member States may limit access to domestic lines when an additional right/license to operate commercial passenger services in competition with another operator between specific stations was awarded before the end of the transposition period of the new Directive on the basis of a fair competitive tendering procedure.[6]

It was also clear, however, that the objective of opening up the domestic market could not be achieved without addressing the PSO market *(figure 4 and figure 5)*. To that effect, Regulation 1370/2007 was amended by Regulation 2016/2338. In a nutshell, the new Regulation clearly envisages the idea of facilitating access to the market for the provision of domestic services by establishing compulsory tendering as a general rule and limiting the practice of direct awards only to cases where the contract is awarded to an in-house operator or where one of the particular cases foreseen in the Regulation text is applicable in the given context.[7]

Even if political motivation and an appropriate legal framework is present, cooperation and coordination are necessary among stakeholders. This is particularly true for the main obstacles which face with passenger rail liberalization. Typically for the rail sector of EU member states, incumbent state railways have still a more or less dominant position, and they are backed by their respective governments who have applied for derogations and – quite understandably – follow their own national interests. Rail infrastructure managers and operating company have either been completely separated or became separate companies within a holding structure, but historic ties remain strong. In theory international passenger services have been completely opened up as of January 2010. But state operators remain dominant as there are little incentives to commission trans-national services, and domestic passenger services remained largely closed – within CONNECT2CE Germany and Italy are the most notable exceptions. Domestic markets represent more than 94% of all rail passenger-kilometres (pkm) in the EU and are still strongholds of national incumbents. Two-thirds of domestic rail services across the EU are provided under Public Service Contracts (PSCs) or concessions. The rest is managed through competition in the market, with several operators providing services on a commercial basis on the same route. Current rules allow the competent authorities to directly award rail PSCs without any tendering procedure - directly awarded PSCs amount to 42% of all EU passenger-kilometres. As a result, in 2013, in 16 out of 25 Member States with a rail network, the incumbents held a market share of more than 90%.

State of rail market liberalisation within CONNECT2CE (based on Commission/Council rail monitoring report): There are no fully liberalised markets within CONNECT2CE. Largely liberalised markets – more than 33% of pkm are in open access or awarded in competitively tendered PSCs: Germany and Italy

Partially liberalised market – less than 33% of pkm are in open access or awarded in competitively tendered PSCs but new entrants have already taken up an important share of the liberalised traffic: Austria, Czech Republic, Slovakia (considering on on-going tendering). Quasi-liberalised markets - open access applies to the whole market but there is no effective competition, new entrants operate directly awarded PSCs: Poland.

[6] See Aricle 11 paras 1 and 5 of the amended text of Directive 2012/34/EU.

[7] See Article 5 of the amended text of Regulation 1370/2007. With regards to the various exceptions from the general rule of public tendering, see more specifically paras 2, 3a, 4, 4a, 5 and 6.

Non-liberalised markets - the incumbent operates all PSO and commercial services (if any): Croatia, Hungary, Slovenia.

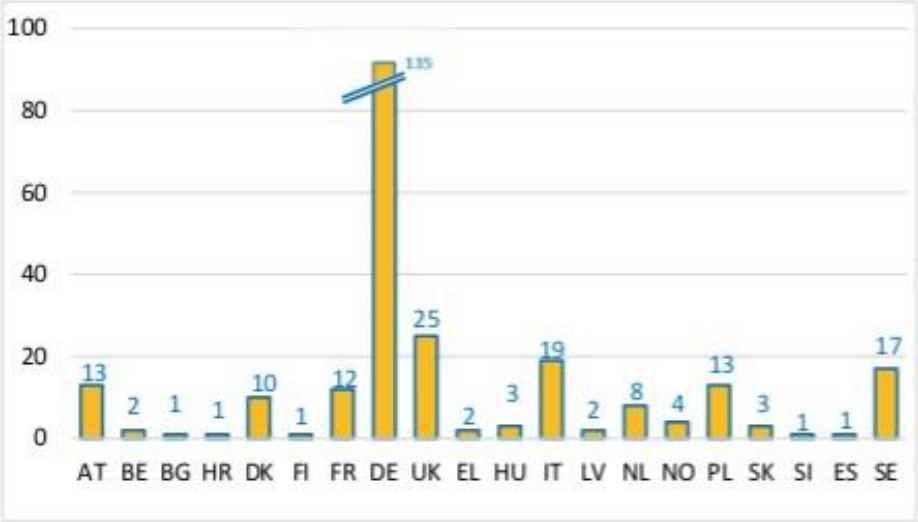

Figure 4: Number of active railway undertakings in passenger market (2014)

Source: 4th Annual Market Monitoring Report (2016) – IRG Rail

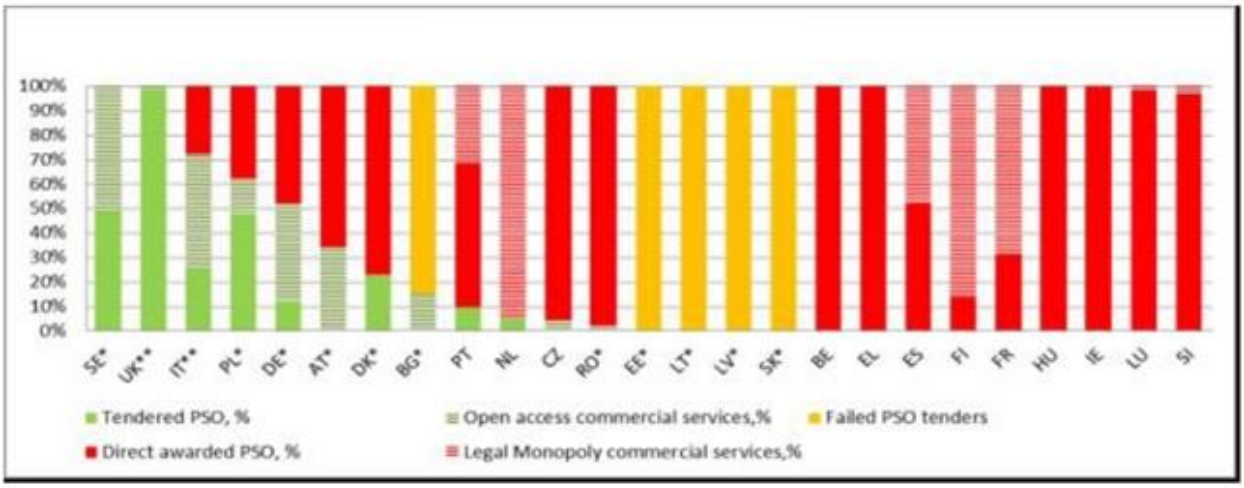

Figure 5: Rail market structure
Source: RMMS questionnaires, impact assessment 4th railway package, CER (2014)

Types of Stakeholders in governance and their responsibilities

The most obvious and general distinction is between centralised and regional organs of transport governance.

The key actors and stakeholders examined it can be stated that in the project participating regions are largely heterogeneous. At one extreme is the federal member states type such as Berlin and the Italian regions (Autonomous Province of Bolzano/Südtirol, Friuli Venezia Giulia Region). Federal Member States, Member States with more than one system of law or Member States having autonomous territorial units shall be free to appoint more than one Central Authority and shall specify the territorial or personal extent of their functions.

While the other is the centralised group of countries (Eastern block). The acts for the implementation are needed after delegation. Therefore, the authority for taking the decisions can be spread with the help of the delegation of the authority. The centralisation of the authority can be done immediately, if complete concentration is given on the decision-making at any position. This concept is generally referred to as the centralisation of the authority. The centralisation can be done with a position or at a level in an organisation. Therefore, the extension of the organisation is referred to as the centralisation of the authority. And the decision-making power must be hold in a few hands.

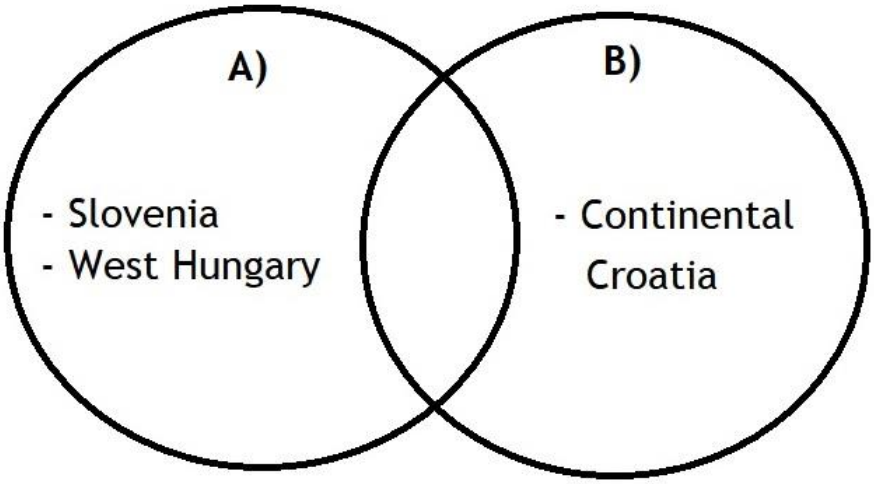

Figure 6: Centralised governance

A): Ministries of national government and central authorities directly under the control of ministries
B) Government-independent central organs

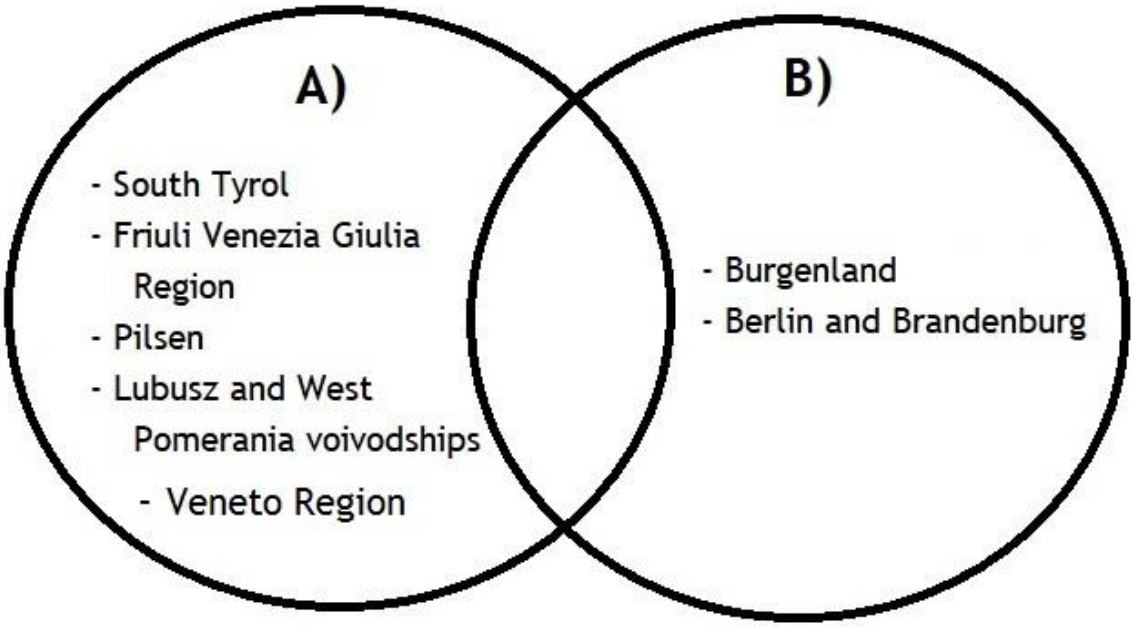

Figure 7: Decentralised governance
A): Regional government or local government and their entities
B): Specialised regional organisations, transport schemes (Verkehrsverbünde)

Basically centralised governance can be exercised in two ways *(Figure 6)*:

A. *Ministries of national government and central authorities directly under the control of ministries*

Given the significance and comprehensive scope of transport issues ranging from the transnational to the micro-level, it is evident that each government will have a responsibility and more or less implicit or explicit policies on this sector. This will also extend to some type of 'ownership' of PT, and corresponding responsibility for regulating, ordering and supervising public services.
The following regions belong to this category:

- Slovenia
- Western Hungary (Vas and GYMS counties)

B. Government-independent central organs

Some governments are delegating any or all of these responsibilities to independent, specialised bodies and authorities on a national, federal and/or regional level. Other governments – especially of smaller countries with centralist traditions or policies – concentrate all or most responsibilities within a ministry or in separate organisations directly controlled by the ministry. In some countries some or most responsibilities are delegated to a central authority independent of government, or similar organs operating on a national level.
The following region belongs to this category:

- Continental Croatia

Countries rarely organise governance purely in one way or another. Even though some have integrated even most supervising functions into one transport ministry or 'super ministry' with functions organised in competent state secretariats and departments, at least some tasks are

'outsourced' to a central organisation independent of the government, and central organs may have some form of regional structures.

Basically decentralised governance can be exercised in two ways *(Figure 7)*:

A. Regional government or local government and their entities

Commonly countries with regional transport governance structures apply a mixed model wherein central agencies are typically responsible for ordering long-distance transport and supervising transport affairs regulated on a national or federal level, while responsibilities for ordering and supervising regional PT are delegated to governmental or specialised organisations operating on that level. Usually transport organisation operations on the regional level are not directly controlled by national government or an independent central organ, only in indirect ways, in particular by allotting resources and finance to the regional level, and by supervisory functions of national transport authorities.

The following regions belong to this category:

- South Tyrol
- Friuli Venezia Giulia Region
- Veneto Region
- Pilsen
- Lubusz and West Pomerania voivodships

B. Specialised regional organisations, transport schemes (Verkehrsverbünde)

This form of governance has become a typical component of the professional culture of the German-speaking countries, but it is by far not limited to this region. Within Central Eastern Europe the Czech Republic, and more recently Slovakia, have successfully adapted schemes similar to German, Austrian and Swiss transport associations and tariff unions. Other countries like Croatia, Slovenia and Poland have also taken first steps on a similar path towards tariff integration, timetable harmonisation or eventually even full-fledged transport systems.

The following regions belong to this category:

- Burgenland
- Berlin and Brandenburg

Organisations functioning on a supra-national level (even if technically incorporated on one or the other side of a national border) are a special case of regional organisations. In most cases of cross-border cooperation between transport systems, however, the systems of both sides of the border will remain separate legal bodies just cooperating under a joint brand with common products, next to a certain degree of cross-border integration and mutual recognition of transport titles.

Transnational linkage - EGTC-type and other supra-national organisations on a regional level

High-level EU administration has recognised a long time ago the need for stronger cooperation between member states. A more recent expression of this long-standing concern is EC Regulation 1302/2013 amending and simplifying the establishment and functioning of so-called European Groupings for Territorial Cooperation (EGTC). Some of these non-profit organisations have transport issues and cross-border mobility high up on their agenda as they try to facilitate the dissemination

of good practices, mainly by initiating and accompanying joint projects beneficial for both sides because they render more efficient the use of public resources.

According to La Mission Opérationnelle Transfrontalière (MOT) (http://www.espaces-transfrontaliers.org/) there are two more options for establishing cooperation one less popular is The Euroregional Co-operation Grouping (ECG) and The Local Grouping of Cross-Border Cooperation (originally designated as Groupement Local de Coopération Transfrontalière (GLCT). This latter one is considered as best practice as it takes transport organisational and operational duties as well.[8] The specific case of the Swiss city of Genf/Genéve made local authorities for establish a transnational cooperation which can fully act as a transport organiser authority with the dedicated financial sources. Nevertheless this is example can be adopted elsewhere if beside the political will the appropriate legal background exist in the respective national or regional legislative system.

[8] Barth, E. (2014), How international borders affect local public transport: analyses and evaluations of cross-border agglomerations in Switzerland, France and Germany. Thesis submitted to attain the degree of doctor of sciences of ETH ZURICH. Zürich, 2014

The above findings are summarized in the following table, which shows the three examined levels *(Table 6)*:

Table 7: Overview of Stakeholders relevant for governance (and their tasks)

Region	*National level* *Organisations of national government, other organs operating on this level*	*Regional level* *Transport schemes (Verkehrsverbünde) and organisations of regional/local government*	*Transnational level* *Supra-national organisations operating on a regional level*
South Tyrol (Bolzano/Bozen Region)	*Ministry of Infrastructure and Transport* *(Government ministry for transport.)*	*Bozen-Bolzano Autonomous Region, Department for Transport* *(Political territorial body responsible for passenger mobility and transport - due to specific competences in public transport delegated by the national government* *(Decree-Law No 111/2004)).* *Landesmobilitätsagentur (2012-2017)* *(Mobility management.)* *STA - Strutture Trasporto Alto Adige Spa (2017 -)* *(In-house society of Department for Transport Office, who manages infrastructural works, info-mobility and payment-system.)*	*Europaregion Tirol-Südtirol-Trentino / Euregio Tirolo-Alto Adige-Trentino* *(Supporting sustainable mobility actions in the cross-border area of EGTC (Article 5 of statutes).)*
Friuli Venezia Giulia Region	*Ministry of Infrastructure and Transport* *(Government ministry for transport.)*	*Friuli Venezia Giulia Autonomous Region, Central Directorate for infrastructure and territory* *(Political territorial body responsible for passenger mobility and transport - due to specific competences in public transport delegated by the national government* *(Decreto Legislativo 111/2004))*	*EGTC Euregio Senza Confini - Ohne Grenzen* *EGTC „GO“* *Joint Committee Slovenia-Friuli Venezia Giulia, Working Group “Transport, Energy, Environment and Spatial Planning”* *(Supporting sustainable mobility actions in the cross-border area of EGTC. (Article 2 of EGTC “GO”)*

Region	National level Organisations of national government, other organs operating on this level	Regional level Transport schemes (Verkehrsverbünde) and organisations of regional/local government	Transnational level Supra-national organisations operating on a regional level
Veneto	Ministry of Infrastructure and Transport (Government ministry for transport.)	Veneto Region administration is entitled to the overall coordination and steering of the regional PT. Furthermore it acting it tenders rail services while bus and waterborne services are tendered by the provinces, the Metropolitan City of Venice and some municipalities.	EGTC Euregio Senza Confini - Ohne Grenzen
Slovenia	Ministry of Infrastructure, Public Transport Department Integrated Public Passenger Transport Authority (Government ministry for transport.)	-	EGTC „GO“ (Supporting sustainable mobility actions in the cross-border area of EGTC. (The items of Article 2 define the competences of EGTC in accordance with the limitations laid down in Article 12 of the Regional Law No 23/2007 “Implementation of the Decr ee-Law No 111/2004 regarding regional and local public transport, transport of goods, motorisation, road transport and road network.”)
Continental Croatia	Ministry of Maritime Affairs, Transport and Infrastructure (MMATI) (Government ministry for transport.) Agency for railway safety. (Government office for railway issues.)	Integrated Traffic of Zagreb Area (IPZP) (Preparation and implementation of projects related to the establishment of a new model of passenger transportation and management of the same in the geographical area of the City of Zagreb, and Zagreb County.)	-

Region	*National level* *Organisations of national government, other organs operating on this level*	*Regional level* *Transport schemes (Verkehrsverbünde) and organisations of regional/local government*	*Transnational level* *Supra-national organisations operating on a regional level*
Western Hungary (Vas and GYMS counties)	*Ministry of National Development* *(Government ministry for transport.)* *VPE* *(Rail Capacity Allocation Office, an organ independent from railway companies and directly owned by the state train path allotment)*	-	*(Euroregio West Pannonia)*
Burgenland	*Federal Ministry of Transport, Innovation and Technology* *(Government ministry for transport.)* *SCHIG* *(Schieneninfrastruktur-Dienstleistungsgesellschaft mbH - owned by Federal Ministry of Transport. SCHIG mbH is capacity allocation body and in charge of ensuring non-discriminatory access to the railway network in compliance with the statutory framework conditions.)*	*Regional Government of Burgenland VOR* *(Regional transport organiser.)* *RMB - Mobility Center Burgenland* *(Service from the Regional Government of Burgenland which provides all kind of passenger information and works on various local mobility projects.)*	*(Euroregio West Pannonia)*
Pilsen Region	*Ministry of Transport* *(Government ministry for transport.)*	*POVED* *(Regional transport organiser in Pilsen region.)*	*Euroregio Danube-Vltava* *(Cross-border mobility platform.)*
Berlin and Brandenburg	*Federal Ministry of Transport and digital Infrastructure* *(Government ministry for transport.)*	*VBB* *(VBB organises the regional railway transport on behalf of the federal states of Berlin and Brandenburg.)*	*Oder Partnership* *(Cross-border network cooperation focuses on economy, tourism, science, transport and infrastructure*

Region	*National level* *Organisations of national government, other organs operating on this level*	*Regional level* *Transport schemes (Verkehrsverbünde) and organisations of regional/local government*	*Transnational level* *Supra-national organisations operating on a regional level*
		Ministry of Infrastructure and Spatial Development Brandenburg *(Organiser of regional railway transport in Brandenburg.)* *Senate Department for the Environment, Transport and Climate Protection Berlin* *Organiser of regional railway* *transport (and S-Bahn) in Berlin.)*	*issues.)*
Lubusz and West Pomerania voivodships	*Ministry of Infrastructure* *(Government ministry for transport.)*	*Regional governments (Voivodships)* *(Organiser of local railway* *transport and regional bus* *transport)*	*Oder Partnership* *(Cross-border network cooperation focuses on economy, tourism, science, transport and infrastructure issues.)*

Legend: red = centralised governance model, green = regional governance model

Governance arrangements in CONNECT2CE project regions

In the following section 2.1.2. we will look in more detail on the nature of finance and ordering models and also endeavour to compare their output. Therefore, in this section we will only outline the solutions applying to project regions, adding some information about how and why these structures evolved.

Generally, there have been a lot of changes in transport governance within CONNECT2CE countries, along with the related public and background discussions. Also quite a few structures were envisaged but not put to practice, or they were aborted by a subsequent administration (or even by the same government in some instances) before the reform efforts they incorporated could yield substantial results. It is beyond the scope of the present study to provide a comprehensive history of the evolving transport policy in this regard, not even for the 9 countries covered in CONNECT2CE, however, we will at least partially relate changes inasmuch they appear relevant to understand the dynamics and overall development prevailing in our region, and project partners brought them to our attention. The need for change in governance is apparent for the east of the CONNECT2CE

region in particular which is made up of formerly Communist countries, but other countries like Italy have equally seen come and go a score of governance organs.

The regions will be looked at now, starting with bilateral or multilateral structures if any because of their significance for cross-border mobility.

- *Bolzano/Bozen Region (South Tyrol)*

The region jointly operates EGCT "Europaregion Tirol-Südtirol-Trentino" / "Euregio Tirolo-Alto Adige-Trentino" together with Austria's Tyrol Province and Italy's Trentino Region comprising close to 1.8 million inhabitants, the Italian regions both having more than half a million. GDP per capita is significantly higher in Austria (28.8) while it is just above or below 20 in Italy. For Austria, in 2011 this was the first of its kind, for Italy the second one; transport policy and mobility is one of the EGCTs priorities, as well as tourism, an essential and transport-related sector for all three regions, in North and South Tyrol even more so than in Trentino. Roads are more or less evenly distributed but Tyrol – the largest in surface – in spite of its topography has well more than twice the length of railways compared with Trentino.

- *Friuli-Venezia Giulia Region (FVG) and Veneto*

Friuli Venezia Giulia region covering almost the entire border between Carinthia and Italy where it jointly operates EGCT Euregio Senza Confini r.l.- Ohne Grenzen mbH. Its shareholders are the neighbouring regions of Friuli Venezia Giulia, Carinthia Veneto Region, which also shares a short border section with Austria, while the both the Italian regions are covering the entire northern tip of the Adriatic Sea. The three constituent regions have 6.7 million inhabitants, 4.9 of which in Veneto and 560 thousand in Carinthia, the rest in FVG. GDP per capita is highest in Carinthia but very similar throughout the three regions. "Transport, infrastructures and logistics" is one of the open thematic table of this EGCT. Within the 2014-16 period it started to address cross-border connectivity and to get involved in activities of timetable harmonisation, software developments for real-time trip info and single ticketing, as well as improving accessibility of the remote mountainous areas; they also contributed to CONNECT2CE output.

The Joint Committee Slovenia-Friuli Venezia Giulia, Working Group "Transport, Energy, Environment and Spatial Planning": The Joint Committee was set up in 2015 between Friuli Venezia Giulia Region and the Republic of Slovenia and has a general meeting at political level once per year, whilst the thematic working groups are the place where specific topics are tackled at technical level. With reference the issue related to transport, within the working Group "Transport, Energy, Environment and Spatial Planning" it has been agreed to relaunch the crossborder rail passenger transport services starting from September 2018.

- *Slovenia*

EGCT "GO" is active since 2012, a grouping of the Municipalities of Gorizia (Italy), Nova Gorica and Šempeter-Vrtojba (Slovenia). One of its standing committees is dedicated to transport topics.

The Ministry of infrastructure as the competent authority for transport is in the process of establishing an integrated public transport authority which will coordinate and harmonise domestic timetables of bus and rail operators.

The Ministry's Department of Public Transport is operating both as a regulatory and commissioning body for all long-distance and regional PT commissioned as a compulsory public service. Local urban transport which is being administered and financed by local city government, compulsory for the

two biggest cities and as an optional public service by another four municipalities below 100,000 inhabitants.

- *Continental Croatia*

The region is not engaged in any bilateral organisation relevant for transport governance.
Croatia's governance structures are centralised with an organisation called Integrated Transport of Zagreb Area (IPZP) being set up in order to establish a new model of PT and transport management within the geographical area of the City of Zagreb and Zagreb County. On a national scale the Ministry of Maritime Affairs, Transport and Infrastructure (MMATI) is the main stakeholder of transport governance, also as a national organ responsible for concluding PSCs.

- *Burgenland*

Regionalmanagement Burgenland Ltd. (RMB) is a province-owned service agency. One of the departments is the Mobility Centre Burgenland. The team of the Mobility Centre Burgenland is closely working together with the Regional Government Burgenland. Especially the unit transport coordination and spatial planning of the Regional Government Burgenland is a strong partner and stakeholder in all of our projects. The team of the Mobility Centre Burgenland was responsible the project-management of all cross-border and transnational EU-funded Mobility projects of the Regional Government Burgenland. It was also involved in the development of the "Gesamtverkehrsstrategie Burgenland" (= Mobility and transportation strategy for the region of Burgenland) in 2014.

The VOR is the biggest Public Transport Association in Austria and works in the Regions of Vienna, Lower Austria and Burgenland. Their task is the planning, coordination and financing-coordination of the entirely public transport system in the eastern region of Austria. The VOR is owned and financed by the three provinces Vienna, Lower Austria and Burgenland. As Burgenland is the smallest region among the three partners, it owns 12% of the VOR. In the whole region the VOR offers a ticket system including online tickets and a general public transport information platform (www.anachb.at). Different public transport modes are very well harmonized. Regional and temporary special events as beginning of school after summer holiday, village fairs or music festivals find inclusion in planning process. The team of the Mobility Centre and the responsible team of the Regional Government are regularly in contact with the VOR, every two to three week there is a jour fixe and additional there are planning and strategic meeting between this three partners. The planning processes also include regular meetings and close cooperation within the three Regions of Vienna, Lower Austria and Burgenland.

Besides these two ASP the ÖBB Austrian Federal Railways, the Federal Ministry of Infrastructure and Transport, as mentioned the Regions of Lower Austria and the City of Vienna, the Austrian neighbour region Styria and because of our very strong cross boarder services the Gysev (PP4) are important stakeholder for the CONNECT2CE project. There are regularly meetings with these stakeholders to coordinate and plan the activities in and beyond the region.

Additional to the public transport system of railway and busses, several well establishes Micro Public Transport-systems complete the transport services. Micro Public Transport is not organised by VOR but in general by regional associations of municipalities. In the future, the micro public transport systems should be included in the general public information system of VOR.

- *Western Hungary (Vas and Győr-Sopron-Moson counties)*

These counties are dealt with together as – even though they form two distinct project regions covered by separate territorial needs assessments – they share the same governance structure and stakeholders.

The Austrian-Hungarian *West Pannonia Euroregio* is dysfunctional for reasons not detailed by project partners. Hungarian-Slovakian *EGCT "Arrabona"*, however, has a relatively long-standing and fruitful record irrelevant to CONNECT2CE output but it is part of the cross-border governance structures within the project area. It was established by the City of Győr, the capital of GySM County, together with the smaller cities of Mosonmagyaróvár (Hu), Dunaszerdahely/Dunajská Streda and Somorja/Šamorín (both Slovakian cities with an ethnic Hungarian majority). Its geographical scope is limited to parts of the regions involved, obviously including the Hungarian-Slovakian border territories. There have been results related to rail freight and micro-mobility but apart from consultations also involving PP GYSEV Raaberbahn no efficient use has been made of the structure to date towards improving cross-border connectivity, generally at a very low level between the two countries. Reactivation of the railway crossing is linked to other stakeholders but the EGCT currently takes an interest in developing the transport systems of its bipolar territory with close ties to both the City of Győr and Slovakian capital Bratislava, with significant demographic change not yet properly covered by appropriate transport links.

The *CENTROPE Initiative* focusing at a territory including four major cities and very peripheral areas of Hungary, Slovakia, Austria and the Czech Republic is a multilateral structure dealing with transport and spatial planning issues, largely without any direct links to project output but nevertheless the concern for better connectivity between peripheries and urban hubs is an overlap, just as those regional stakeholders participating in both CENTROPE and CONNECT2CE. This is related to pilot action no. 4, designing a PSO for Austrian-Hungarian micro PT.

Both Hungary and Slovakia have a strong centralist component in transport governance, next to Slovakia adapting the Czech model of transferring part of the responsibilities to the regional level, an approach not followed by Hungary to date. As in Austria regional transport is clearly a competence of provinces, typically in cross-border consultations the former are represented by secretaries of state of the competent ministries while provincial government of Burgenland is the competent Austrian partner. On-going or recent negotiations concern long-distance trains Vienna–Zagreb and Prague–Split both passing through western Hungary, as well as the question of reactivating railway lines from Szombathely to Austria including reconstruction of dismantled border sections, and electrification of the first Austrian section of the Szombathely–Graz line to create a fast railway link via Hungary towards the provincial capital for Austrian citizens of Burgenland's Jennersdorf/Gyanafalva district.

In Hungary the entire PT is ordered by the ministry in charge of transport. As the current administration adapted a governmental structure with only few 'super ministries' all including a multitude of secretariats and departments, at present *Ministry of National Development* is the name of the ministry incorporating the transport portfolio. PP4 *KTI (Institute of Transport Sciences)* is a background institution of the ministry the scope of activities and competence of which has envolved over the decades. During the Communist period is was almost exclusively concerned with road infrastructure and related transport sciences as all railway-related issues were dealt with inside Hungarian State Railways MÁV which had the status of a government authority, and bus PT was done by state companies organised on a county level. Railway and PT successively became a focus of KTI as there was increasing need for a neutral actor, today they organise some of the training tasks and exams for railway professionals are conducted at KTI. Next to the classic research functions and other delegated transport-related activities, a Directorate of Passenger Transport was

organised within KTI, which in turn set up a network of *Regional Transport Organising Offices* – currently five after the latest reorganisation. The office for Northwestern Transdanubia in Szombathely covers the counties of Vas and Győr-Sopron-Moson next to two other counties. These local bodies are meant to represent the regional level within the Hungarian system, but notwithstanding their name they only have limited consultative competence as PSO/PSC and the annual ordering of actual services is the Ministry's exclusive competence based on the proposals of service providers and considering the input from local offices. Regional office duties include holding annual timetable meetings with local governments (all other parties including the NGO sector have been excluded from this process) and processing, screening local input for the central administration. The final reconciliation is then achieved between the staff of the Ministry and service providers; any regional proposals are incorporated at the discretion of the central administration following deliberation with railway or bus company representatives as necessary. Cross-border connections are no exception, in case of a political agreement or initiative proposals technically go down the same track although it may make a difference who is behind a given proposal. Ministerial staff is involved in technical negotiations for the development of cross-border connections. Between a technical agreement and the actual ordering of a public service often considerable time elapses and local stakeholders may perceive a lack of transparency in the process. Other governance stakeholders – previously or temporarily independent organs of the centralised Hungarian governance system – have been incorporated into the Ministry by the current administration of Orbán governments II. and III., last but not least the formerly independent National Transportation Authority which in turn had integrated in 2008 the Hungarian Railway Authority established in 2006. The allocation of rail track capacity including related tasks, however, has been delegated to *VPE Rail Capacity Allocation Office*, an organ independent from railway companies and directly owned by the state.

- *The Pilsen Region*

The Euroregion Danube-Vltava (ERDV) consists of northern and eastern Bavaria, southern Bohemia, the Province of Upper Austria, as well as the western districts or 'quarters' of Lower Austria. Chairmanship of its governance committee annually rotates between participating regions. It is led by a political body called Presidium. Advocacy for modern transport infrastructure and cross-border connectivity is part of ERDV's agenda, in particular: cross-border transport planning, improved connectivity between peripheries and trans-European transport routes, target-group-specific mobility offerings, and improved infomobility for cross-border transport. Some outstanding achievements were, the reactivation for PT of the Haidmühle–Nové Údolí crossing (Číčenice–Haidmühle regional line), and the acceleration of the Vienna–České Budějovice railway link.

- *Berlin and Brandenburg*

The Oder Partnership is an informal cooperation network of German federal states Berlin, Brandenburg, Mecklenburg-Vorpommern and Saxonia and the Polish voivodships Wielkopolskie, Lubuskie, Lower Silesia and Zachodniopomorskie established 2006 in Berlin. The Polish cities of Szczecin, Wrocław, Poznań, Gorzów Wielkopolski and Zielona Góra are also involved in this informal cooperation network due to their strong position in the Polish system of territorial self-governance. Its aim is to deepen political, economic and infrastructural links between the cities and regions in the German-Polish area of interactions. The area's population is of 21 million, overall GDP amounted to 430 billion EUR. Their “Transport Round Table” is coordinated by PP13 Berlin-Brandenburg Public Transport Authority (VBB) and attending to joint initiatives for the improvement of cross-border rail transport, railway in particular. A remarkable 'spin-off' of their activities is a transport

infrastructure map of the German-Polish border area. During an intensive phase of cooperation in the years 2011-2014 cross-border needs have been identified:

- Revitalisation of cross-border long-distance transport between the major cities in the German-Polish border area
- Clarification of responsibilities and competences for the tendering of cross-border transport services
- Development of model solutions for cooperation in the tendering process and in the operation of cross-border transport services
- Facilitation of the reciprocal approval of railway vehicles
- Facilitation (and simplification) of railway operations between German and Polish border stations
- Additionally, priorities for the development of infrastructure and offers along German-Polish cross-border railway connections have been specified.

- *Lubusz and West Pomerania voivodships*

- Directly awarded contracts for 1-2 years

- Subsidised long-distance train services (as opposed to Germany's open-access long-distance trains)

- Still mostly demand-oriented timetables

- Financial instabilities and need to provide sufficient capacity of skilled and experienced personnel in administration

According to CONNECT2CE project output, in these two Polish regions contracts are directly awarded for 1-2 years for bus companies, for regional rail PT there were annual contracts until recently, and for Lubusz also currently, while West Pomerania has a 4-year contract in force from the end of 2016 for the 2017-2020 period. Both voivodships are shareholders of the former subsidiary of the state rail operator (PKP), regional railway company Przewozy Regionalne (Regional Transport); those voivodships own that operator who, unlike some major voivodships, do not have an own regional railway company. Today this regional railway company operates under the Polregio brand while the formal name has been retained *(Figure 8)*.

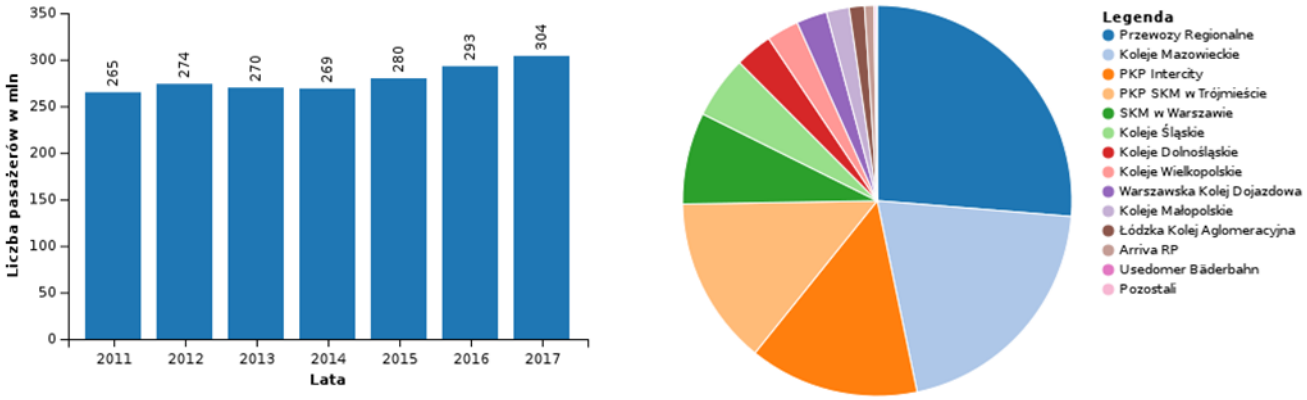

Figure 8: Passenger numbers of Przewozy Regionalne and passenger split of Polish railway companies

Source: http://pkpsa.pl/en/

In the first decade of the new millennium Polish regional transport governance and railway PT in particular was reformed in several steps, regions received finance and powers to commission regional PT from 2001 onwards and later many established their own railways. Long-distance train services are state-subsidised in these regions just as in all of Poland, as opposed to Germany's open-access long-distance trains. Interregional trains (TLK, Intercity) are operated by PKP Intercity based on a ten-year PSC. A few EIC (Express Intercity) and EIP (Express Intercity Premium) long-distance trains between Warsaw and other major Polish cities are operated on commercial basis. The Marshal's Office of voivodships are the competent authority to commission regional rail and bus PT and they own the largely EU-financed modern rolling stock. The typical timetable scheme is still demand-oriented with significantly lower connectivity outside of daily and weekly traffic peaks, therefore connections in interchange stations often require longer waiting periods. Timetables change very often (up to 4-6 times per year) adding uncertainties both for travellers and for German cross-border partners as previously agreed interchange connections may only work out for short periods due to timetable changes because of construction works or any other consideration. According to German partner PP13 financial instabilities and personnel fluctuation, lack of skilled personnel in administration are some of the problems afflicting transport governance of these Polish voivodships.

Both from CONNECT2CE project output and general observation it becomes apparent: Regions with a high level of cross-border connectivity have various settings for PSO/PSC; just as generally speaking, regions that have a fully or at least partially implemented integrated regular timetable scheme and therefore perform well in connectivity may have significantly different approaches for organising transport integration. To the contrary, regions with a similar policy and structure of governance may still have very different levels of cross-border mobility at least in some instances. It appears the essential is to set up a successful trans-border cooperation, the exact methods and approaches are of secondary importance, even though not indifferent. A question to be tackled within CONNECT2CE is, is more structural and regulatory uniformity effectively needed to make more headway towards a seamless Europe, or can there a large degree of 'creative freedom' for stakeholders to come up with their respective solution, because too much uniformity might turn out to be counterproductive? If we lean towards the second option, how can it be avoided that present huge differences in connectivity between peripheral, neighbouring regions and urban hubs connecting to main transport routes both sides of national borders will persist? Such a lack of connectivity is contrary to the spirit of the Schengen Agreement (amongst other Acquis Communautaire) with respect to freedom of citizens of change of locality, as their access to mobility is overly restricted in many regions of Europe. Related project output (Transnational Tool of WPT-1 and Toolbox in WPT-3) should endeavour to provide answers to these questions to be further adapted in Territorial Strategies.

2.1.2. Transport finance and ordering models

"Wer zahlt, schafft an" - he who pays may tell what to do. In each language there are several ways to express the same basic principle: "He who pays the piper, calls the tune." It should be that way in transport. Although this sector is the playing ground of a great many interests, ultimately the interests of passengers and tax payers ought to carry the day.

In this section we will first take a look how the governance entities outlined in the previous section are handling the area of commissioning and financing public services, and what are the differences between the countries of project regions. We will then single out two areas central to the aims of CONNECT2CE that are or should be an integral part of the process: In what ways is the integration of

railway, bus and other means of transport encouraged and coordinated within commissioning of public services? What kind of monitoring and sanctioning routines make sure public services are rendered according to PSC?

2.1.2.1. Commissioning and financing public services

As for PT finance, since the end of 2009 Regulation (EC) No. 1370/2007 is in force – next to transitory conditions valid for 10 years – which is immediately applicable in European Union member states for all transport services commissioned as a public service. National legislation may only remain in force inasmuch it concerns areas not covered by this Regulation. National governments and governance organs on their territory are basically complied to tender transport performances – for a time span of up to 10 years for road transport and up to 15 years for rail transport (next to certain conditions/investments, up to 22.5 years) – co-financed by them as a public service. National legislators and governments have to name those "competent authorities" within their respective system of transport governance who will fulfil the respective functions and responsibilities according to the Regulation.

What is common to all countries within the CONNECT2CE area (even though not to all European states) is that every system provides some kind and measure of co-finance for rail and road transport performances rendered as a public service. The two major form of subsidies:

- compensations for km-based performances and refund of the portion of costs not covered by ticket sales due to ticket price levels and fare reductions set by the state as an instrument of social policy.
- transport performances rendered on a commercial basis and not commissioned as a public service neither by a central governance body nor by a regional transport authority or organiser are not covered by such a finance model, even though operators are supervised, regulated and licensed by the state just like transport ordered as a public service.

In some countries such a public service finance model extends to all domestic PT services rendered by state-owned operators, only a few international trains and long-distance bus links by private companies are operated on a commercial basis.

In other countries (outside of CONNECT2CE) whole subsectors like regional bus transport are only regulated by the state but not financed as a public service.

Other states (within and without CONNECT2CE area) have set up certain criteria for distinguishing between public-interest domestic services to be commissioned as a public service and other domestic transport performances to be rendered on a commercial basis.

Many tariff unions extend to the public-service domain but not to long-distance bus services on the liberalised market and not to certain types of commercial trains, like IC/EC and high-speed links. In some instances, some of these trains are covered by a tariff scheme so they can be used by commuters on lines or in times with no appropriate or sufficient suburban services or with capacity problems – e.g. InterCity trains may run in some periods instead of a suburban train to leave slots for freight trains –, but in such a case the train operator will usually be paid a compensation for rendering public service on the section where the trains can be used with a certain tariff. In other countries regional tariffs (including network passes co-financed within the public service system) will apply to all types of services, but this also requires an agreement between the commissioning governance body and operators which includes compensation payments. Now this compensation is

not always considered appropriate by all operators, and some private carriers have opted out of tariff unions or transport systems following unsuccessful negotiations for a level of compensation deemed sufficient.

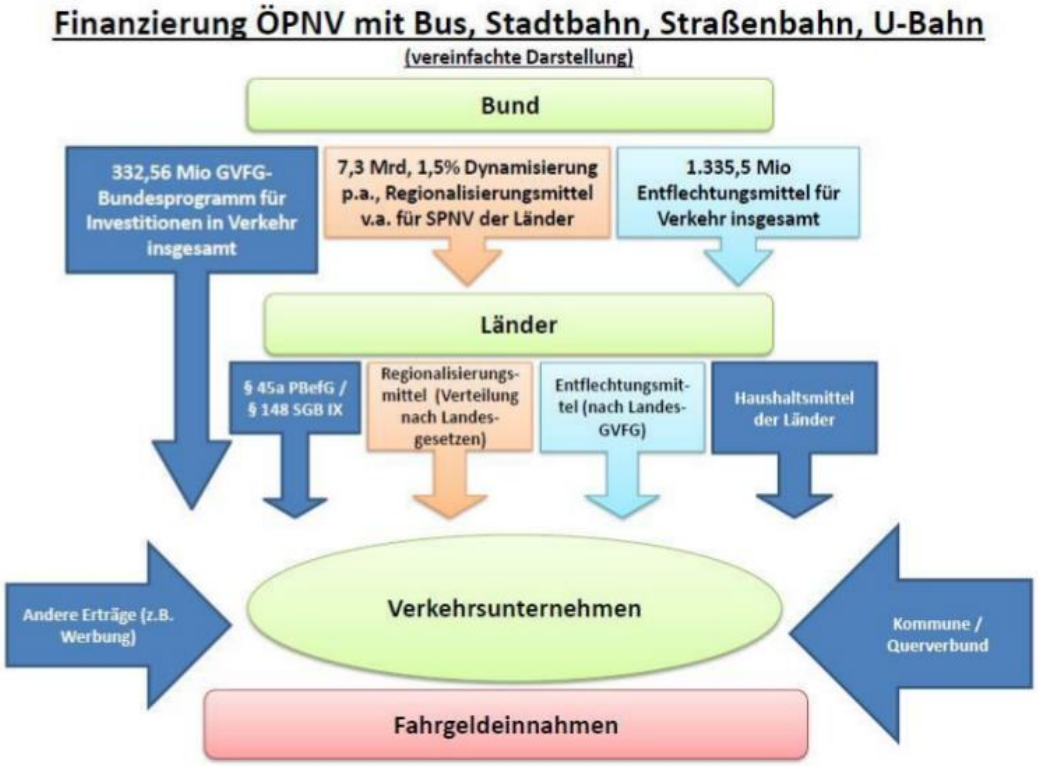

Figure 9: Simplified scheme of regional transport finance in Germany around 2014. Green levels: federal government, federal states, transport operators. The lowest level is ticket revenues, horizontal

Sources: local governments, transport systems, and other revenues (e.g. publicity), vertical sources: various transfer payments by levels of governance (Source: leaflet by ver.di trade union of 2010-2014)

Ticket sales are another major revenue source. The average ticket revenue is by far not the biggest income source of operators, but there are huge differences as to the extent ticket revenues cover the entire cost of PT, ranging from zero for systems with free travel for all (or at least for certain groups of travellers) to more or less 100% for systems or subsectors with no commissioning of public service. In some European states ticket revenues reach or exceed 90%, which may be partially linked to the huge differences in infrastructure charging as there are countries where railway operators do not pay anything because the state maintains the rail network from tax revenues just as road networks are largely maintained from tax and excise revenues to be freely used by the public. In many countries ticket prices are regulated by the state even though operators may have the option to offer benefits or a tariff of their own on a commercial basis. In that case the difference between magisterial prices (including but not limited to social benefits) and the price which would be commercially viable must be settled by the state within the transport governance system, and this is included in PSO/PSC. Historically and currently this was/is not always the case, either because the level of compensation is not realistic or because the state does not always

honour its obligations under PSC, which is more easily done with state-owned operators. This leads to growing operating deficits which may result in quality problems up to a general deterioration of service level, and sooner or later governments are forced to consolidate state operators on an ad-hoc basis. Some countries within CONNECT2CE afflicted by such disparities have made efforts to stabilise and regularise transport finance, and typically. These efforts were part of, or concurrent with measures to bring the governance system in line with EU requirements in order to prepare for market opening, meaning that European integration favours a more balanced, sustainable practice in transport finance – one of the prerequisites for the kind of improvement envisaged by CONNECT2CE.

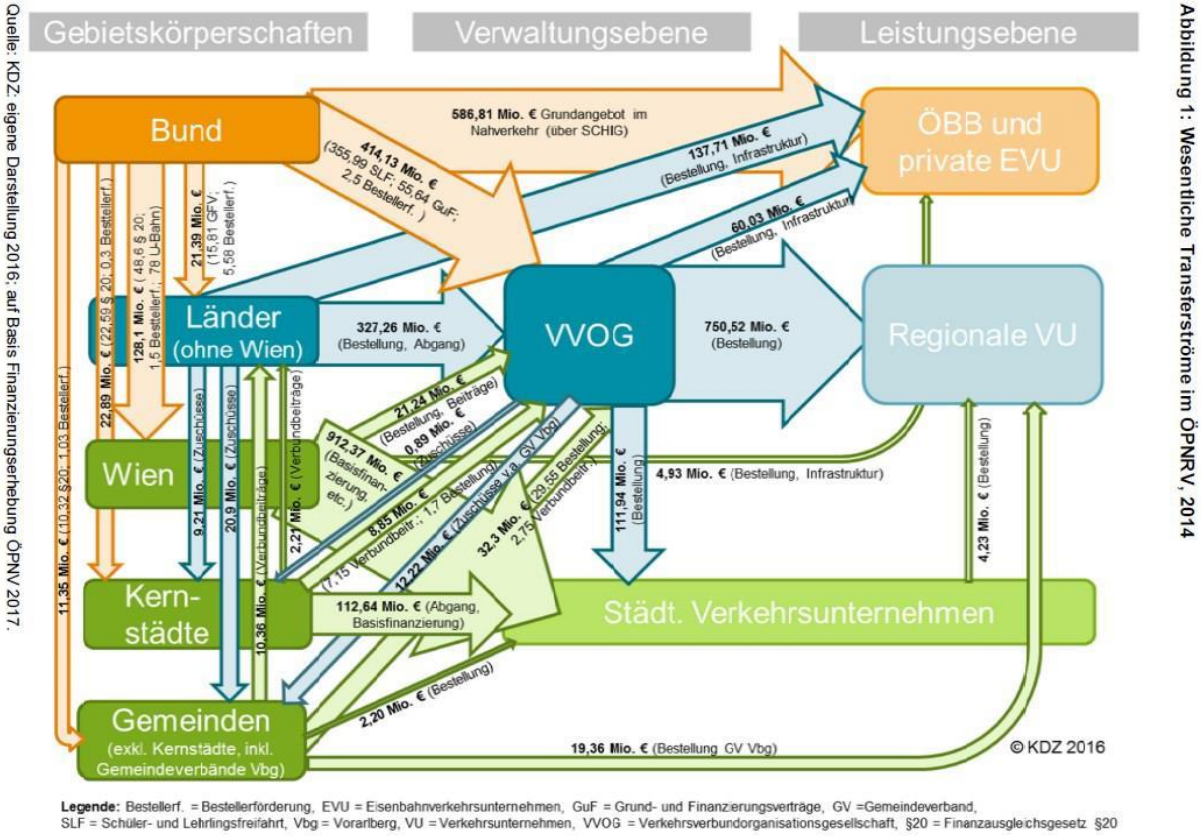

Figure 10: A schematic representation of most essential regional transport finance transactions in Austria around 2016, where law rules that all territories of the state must be covered by a regional transport system (VVOG). Payments of federal government, provincial governments, the capital Vienna/Wien, major cities, and municipalities are directed partly to the regional transport system, partly directly to operators, according to interest in or benefits of transport services. The three stakeholder categories (grey) are: territorial entities, administration, service providers.

Even states with highly performant networks that generate a lot of revenue massively subsidy public transport in some way or another. Similar to the case of road network development and maintenance this is generally justified by the notion of public interest at the basis of public service models. One special case of transport finance is tourist associations offering free transport titles to guests – which usually goes with some form of blanket compensation to operators or transport organisers – because they recognise the traffic-stimulating effects of such incentives next to the

benefits of guests arriving by public transport rather than private cars, or at least leaving their cars in the parking lot after arrival. Similarly, states recognise the benefits of PT in reducing the external costs of transport, not least its lower level of carbon emissions, as well as the benefits of highly accessible mobility for national economies. Europe adopted and advocates the principles of costs-by-cause and sustainability, e.g. those who benefit from transport and those who pollute the environment through transport should eventually pay for it. In transport it is a long-term goal to close in on this. As long as the external costs of individual transport and road transport in general are as complex and massive as they presently are, and as long as technical / conceptual innovations will not render transport more efficient and sustainable, and thus cheaper and more available, an appropriate level of PT subsidies should be maintained (or in some cases, attained). This is not an end in itself, rather one instrument to attain a more balanced transport system and to reach long-term sustainability goals. One aspect to be considered is, not only those who travel themselves benefit from transport and mobility as even persons who never go anywhere indirectly benefit from freight transport and mobility of others starting with next of kin, as well as being more or less directly affected by mobility choices of others.

Some developments in national legislation have led to disparities in the procedures applied, resulting in uncertainty as to the rights and duties of competent governance bodies and operators rendering public service. PSO at its best supports transport operators and facilitates the intensification of multimodal integration.

2.1.2.2. Coordination of intermodal integration

As for intermodality in passenger transport a distinction can be made between creating and maintaining integration:

- The first group of tasks achieved by regional transport organisers or central organs charged with intermodal transport integration is the design of integrated networks. Next to monitoring transport needs, it must be established how to best serve such needs on a given infrastructure, next to informing and guiding the process of infrastructure development in view of systematic progress.
- The second group of tasks relevant for PSO is how to maintain a culture of cooperation. Operators participating in the rendering of public services need to be aware of and adapt to each other, following a certain set of parameters.

Perhaps the most important aspect: Drivers and traffic managers in interchange stations must be attentive to timetables of the other modality and to the needs of transferring passengers. There must be a fair degree of predictability even in case of unforeseen events and delays. Typically, it has to be defined what to do in case of a delay, and how long will the other modality wait in case of a delay – taking into account in a balanced way the interests of all groups of travellers and also technical parameters at the base of timetables and traffic control. This must be recorded in service instructions of drivers, traffic control personnel and train-masters so it becomes part of the routines in traffic control, customer service and complaints handling.

In countries with a low degree of integration such tasks are only being completed if some regional staff members or stakeholders are conscientious enough to take an initiative, attend to the needs of their travellers. Thus in some parts of such countries we can find pockets of good intermodal connectivity that will remain upright as long as someone will keep an eye on them, or until a major change occurs in the timetable or service structure of one of the modalities. A special case of

“temporary integration” in Central Eastern Europe are the replacement bus lines in case of – generally unpopular – discontinuations of regional railway lines. Often such bus links created to appease the public and to carry passengers on sections of the railway network where PT is discontinued are maintained for a certain period, but typically locals don't accept them well. After one or several years’ bus operators are allowed to modify the service according to their own interests and priorities, or to abandon the “intermodal route” altogether, to the point that no meaningful connection is left towards or between rail hubs. A bus trip alongside some discontinued lines requires several changes, or far-fledged detours as sections are no longer served.

In this context the action of one local railway manager deserves special mention: On a discontinued section this gentleman arranged for train-masters being obliged by way of service instructions to watch out for the arrival of the replacement bus, and in case of a small delay the train was to wait up to 5 minutes for passengers changing from the bus to the train. This is noteworthy as it is far more common for bus drivers to look for a delayed train than the other way round; in particular bus drivers would do so if most or many of the passengers habitually arrive by that train, and owing to the fact that train timetables are less flexible, on single-track lines in particular. Thus in regions with a low integration, the quality of intermodal connectivity much depends on the culture of goodwill of local servicemen. In some places railway traffic control personnel personally informs bus drivers about expected delays, or at least bus drivers are attentive. Feeder lines adjust to the delays of long-distance trains no matter if rail or road, but traffic personnel have only little margins to adjust departures of long-distance trains to delays of feeder lines. Within railway there are priority rules in place between different types of trains. Within an integrated network such rules have to be established, included in PSO and routinely applied to intermodal routes. As traffic control is being modernised, in best practice rail-bus interfaces are established fed with real-time GPS data, there is direct communication between railway and bus staff on delays and unexpected situations, and some form of joint or integrated traffic control is established. Railway and bus personnel is updated and instructed on what actions to take in order to maintain a performant network with a high degree of connectivity, both by way of service instructions and by life communication / instructions by dispatchers in case of unforeseen situations. All this is regulated in PSO to a reasonable degree, and compliance to connectivity rules is subject to a bonus-malus scheme.

2.1.2.3. Monitoring of public service parameters

Monitoring PSO parameters is crucial for a performant PT system, as the case of some countries in CONNECT2CE illustrate with a system less performant than average in terms of parameters like punctuality, connectivity, or cleanliness of vehicles. To a considerable degree lower performance is caused by not well defined, inefficient or completely lacking monitoring routines, by unclear or inexpedient definitions of parameters, or by a lack of adequate sanctioning.

Sanctioning by withholding penalties from transfer payments is not the only available tool to ensure compliance with PSO. Based on the PSC between the Zurich Transport Association (ZVV) and state operator SBB the railway receives bonus payments if their S-Bahn trains meet punctuality requirements in a given month, according to the bonus-malus system included in PSC a decade ago. In 2015, SBB received 1.3 million CHF bonus payments from ZVV for complying with punctuality and other PSO requirements, according to a point system. The arrangement also contains a provision that ZVV will spend funds reserved for bonus payments to which operators are not entitled based on their performance on service improvements in other areas. PP13, German Verkehrsverbund Berlin-Brandenburg (VBB), too, uses such a bonus-malus arrangement when paying for S-Bahn services in

the German capital, which is beset by a number of chronic problems as is widely known. Thus, VBB in 2015 paid more than 10 million € less, which amount had to be spent on transport development – based on a decision by city senate, on the refurbishment of class 480 train sets.

Summary table of PP settings of finance and ordering *(Table 7)*

Here is an overview of CONNECT2CE project partners who are a subject to or an acting party as for finance and PSO/PSC.

Table 8: Organizations

***Name** (state)*	***Type of organisation***	***Contract type(s)***	***Time frame(s)***	***Finance model***	***€/km fee***	***Price comp.***
FUC (It)	Regional railway operator		16 years		"not avail."	
SISTEMI TERRITORIALI (IT)	Regional railway operator	Public Service Contract		Direct award		
GYSEV (Hu)	Regional railway operator	Public service master contract, annual commission of services	10 years	Direct central finance	8.05	Y
HŽPP (Hr)	National railway operator	Public Service Contract	1 year	Direct award	?	?
SŽ (Si)	National railway operator	Public Service Contract			4.3	Y
PK (Cz)	Contracting authority (regional government)	Public Service Contracts			1.27 (bus) 4.15 (rail)	
VBB (De)	Transport system	Public Service Contracts	10-15 years	Mixed model with central finance allocated to federal provinces and up to 40 sources of finance	?	Y

2.1.3. Service/timetable harmonisation processes

In this paragraph we will take a closer look into the actors and the structure of coordination processes for timetable and the parameters of public services within the regions of pilot actions. The organisation of cross-border services is a special case of such a coordination process and typically requires an additional bilateral setting, but it is not uncommon for international services to be routinely dealt with in the framework of national annual timetable reconciliation, using input from the habitual annual coordination meetings between state railways. Based on project output and best practice examples, we can distinguish between two basic long-term approaches:

a. bilateral approach involving regular consultations between existing stakeholders both sides, and

b. creation of a transnational governance and/or transport organising structure responsible for service/timetable harmonisation within the given trans-border region including the necessary agreements within the national settings.

In both cases the tendency is to create a routine so trans-national timetable harmonisation can become part of regular national or regional finance and PSO procedures. In case of a bilateral setting it should become a routine to include cross-border services in the regular national or regional PSC, usually on the basis that both sides provide finance for their own border section of the cross-border service – except for a differing arrangement in case of special geographic conditions or interests, such as sections of one state's railway cutting through the territory of a neighbour state, or a region of one state only accessible by rail from or cutting through the territory of the neighbour state.

2.1.3.1. Timetable harmonisation

It is not a trivial task to combine timetables of operators both within a certain region and on the European long-distance networks into well-balanced regional, national and continental PT networks. Timetables should take into account operational, modality-specific and local realities for connectivity to be achieved in reality. Some reserve for 'troubleshooting' should generally be maintained without overly compromising the possible journey time. Given the large number of interchanges within such a regional, national or continental network, even a small adjustment may cause chain reactions or uncertainties, and it is difficult to retain an overview of system repercussions of change.

Another fundamental requirement is optimising vehicle turnaround. At times the interests of passengers related to cross-border connectivity conflict with operational restraints, or considerations due to infrastructure conditions or aspects of efficiency and sustainability. Many passengers would like to travel without changes or with as few changes as possible, but direct trains are not viable on all routes from an operational or economic point of view – true particularly for cross-border services where we might have to deal with additional issues of interoperability and the need for two or more operators to cooperate. What can be learned from regions with the best connectivity:

Periodical scheduling next to optimising hubs and connections even across national borders provides an adequate solution to most of these issues. Obviously, changes cannot be avoided altogether. Changing between two trains or vehicles is not a big deal even with luggage if we can use all trains and buses in our route with a single ticket, personnel and fellow travellers are attentive and helpful, we do not have to waste our time waiting, and perhaps the two trains stop at the same platform of a pleasant, barrier-free station. Also, in places without a transport policy favouring integrated periodic scheduling, or between regions with a different timetable philosophy the desire for at least a minimum of direct connections may create obstacles in the way of better connectivity. For example, even though much of the Ljubljana–Budapest rail link has been upgraded using hundreds of millions of EU-funds, on the Hungarian side the state continues to finance as a public service bus lines parallel to the upgraded railway the potential of which is still not being used. Presently a single direct InterCity train a day running between the two capitals is in the way of a system leap, introducing a significantly faster periodic link between the Hungarian national capital and a county capital on a route with a much stronger traffic volume than through traffic

between the two national capitals. Obviously, people are also constantly “trickling” between Budapest and Ljubljana in long-distance buses and private cars.

So while the stronger relation ought to be the priority, in the short run in such a case a periodic link with one change can be created so people are no longer forced to use buses or cars next to railways upgraded from their tax money, and next to one change they even can travel by train any time instead of once a day only. Besides, on the longer run there can also be planning for service and infrastructure development in view of a periodic direct train link between national capitals which also serves some other transport needs both sides of the border and therefore can be economically viable, just as links existing elsewhere between similar cities within and around the CONNECT2CE area. In fact, the Hungarian–Slovenian link is part of a potential rail link between Romania and Italy where railways exist but – next to the realities of transport policy and lacking interoperability – presently scores of people are travelling by car, plane and bus.

Within CONNECT2CE currently the two main approaches to timetable harmonisation is the procedure adapted in centralised top-down systems of governance and the procedure adapted by governance systems which include strong local and regional levels. In practice there is always a mixed approach:

- Systems including a regional level also need to harmonise and, partly at least, commission far-distance transport services, and centralised systems may solicit some form of input from grassroots, like consultations with municipalities or even channels for input from civil organisations and passengers. Within centralised government systems there are also municipalities commissioning their own local transport services.

Within the centralised systems of most Central Eastern European countries typically there still is a low degree of integration between railway and bus operators. Timetables are harmonised using the input and resources available within operators, and the national authority approves respectively commissions the timetables elaborated by staff of national operators. A higher degree of connectivity is only attained in areas where railway and bus people take the initiative to entertain a personal professional relationship, paying attention to what the other modality is doing, and then send up the appropriate input resulting in better connectivity by way of a locally harmonised timetable. Mostly within the last 1-2 decades there have been efforts to adapt the system to EU requirements in view of market liberalisation. (Most governments in our region make maximum use of transitory and derogation rules to delay and limit market entry of competitors of their state railways. As for the liberalised segments of European freight and passenger rail transport, a certain market consolidation has occurred. In particular, for passenger transport most competitors have been established by, or meanwhile have been purchased by a foreign state railway; and Greek State Railway – albeit in a particular situation – is the first to have been completely purchased by another European state railway.) As for timetable harmonisation, one approach is to create some kind of regional structure such as regional transport organising offices while retaining the centralised commissioning of services. Amongst other tasks such offices organise timetable hearings on a micro-region level with representatives of municipalities. To some degree they function as a contact point for concerned citizens and municipalities for all kind of transport issues. Yet they are not an agency of the region for the region, like the mobility centres organised in a growing number of areas, rather kind of a prolonged arm of the central administration.

- This approach could start to function as a hybrid version of governance, but the two main conditions to make it perform better on a regional level are:

1. Clear guidelines, standards and targets on integration and connectivity, periodic timetable and intermodal cooperation, and

2. Regional offices should have substantive competence as they are in the best position not only to 'harvest' information on local transport needs but also to advocate and implement regional solutions for such regional needs. In practice timetables are still essentially drafted by operators and approved by the central authority, grassroots proposals may or may not be forwarded and taken into account. Lacking clear-cut standards, it largely depends on the expertise, attitudes and priorities of regional office staff what they will submit to the central authority, and the process of evaluating / adapting regional proposals is not very transparent at present.

As for the procedures within regional transport systems, they may involve a significantly larger number of stakeholders than in a centralised national setting. Typically, such systems operate in a liberalised environment, in some area the transport association contracts with several dozens or even hundreds of small to medium operators who gain multiple-year concessions for lines in periodic tender procedures, and with a high degree of connectivity thanks to integrated periodic scheduling adjusted to the long-distance timetable.

Today increasingly software support and mathematical optimization is becoming part of the standard for timetable harmonisation, but local professional expertise is still required to feed the programme with appropriate data, interpret and implement results properly. Periodic scheduling narrows down the manoeuvring room for accommodating to some special requirements; at the same time, it affords passengers with excellent connectivity, next to a degree of flexibility, predictability and operational efficiency unheard-of in other timetable settings. Once they understand and experience its advantages, communities are usually understanding face the limits of periodic scheduling as they are well aware that it is worthwhile to adjust to the regular timetable. Flexibility is even greater in railway systems with half-hour periodicity, or next to even denser frequencies in metropolitan areas (e.g. a train ride every 20, 15, 10, 5 minutes just like tramways or metros).

Table 9: Dominant timetable philosophy, governance type and Institutional background of regions

Region	***Dominant timetable philosophy***	***Governance type***	***Institutional background***
South Tyrol (Bolzano/Bozen Region)	Integrated periodic scheduling (except for some long-distance links)	Regional transport organiser (national for long-distance)	
Friuli Venezia Giulia Region	Mixed with a high degree of periodicity	Regional (national for long-distance)	
Veneto	Mainly periodic scheduling with partial adjustments for coping with specific demand needs	Regional (national for long-distance)	
Slovenia	Demand-oriented scheduling	Centralised national	Proposals by operators in line with PSC
Continental Croatia	Demand-oriented scheduling	Centralised national	
Western Hungary (Vas and GYSM counties)	Demand-oriented scheduling with pockets of periodicity	Centralised national	Regional transport organising offices, proposals by

	mostly on railway mainlines		operators
Burgenland	Periodic scheduling with a fair degree of integration	Regional transport organiser (national for long-distance)	Mobility Centre
Pilsen Region	Periodic scheduling with a fair degree of integration	Regional and integrated transport system (national for long-distance)	POVED
Berlin and Brandenburg	Periodic scheduling with a high degree of integration	Regional transport organiser (national for long-distance)	Specialised Verkehrsverbund staff; operator for long-distance rail
Lubusz and West Pomerania voivodships	Mixed	Regional (national for long-distance)	

2.1.3.2. Coordination procedures for the commissioning of cross-border services

There are differences between the following types of procedures:

- annual meetings between state railways on cross-border cooperation the results of which are being communicated with national governance bodies within the commissioning process;
- cross-border transport developments based on bilateral agreements, habitually preceded by series of technical negotiations involving relevant stakeholders and experts and then being included by governance bodies both sides in PSCs and commissioning;
- regular and ad hoc coordination meetings between neighbouring transport organisers of different states where developing and commissioning of cross-border services is agreed;
- individual agreements of transport organisers with municipalities (or other governance bodies) and/or operators belonging to different states in view of extending the range of a tariff union by including cross-border services.

The 'traditional' coordination mechanism between state railways is structured the following way:

- At least once a year delegation meets to agree business concepts (nature of services, target groups, aspects of on-board comfort, basics of pricing, emphases of sales strategy, etc.). With regard to international suburban and regional systems, at the basis of such deliberations it has to be clarified which potential ridership the system should serve and what are the most important connectivity requirements. In the case of completely new products this may require a lengthy harmonisation process.
- At another occasion scheduled at least annually, delegations will meet for a multi-discipline analysis of aspects of business, technology, timetable, and technical feasibility, most of all concerning rolling stock, personnel, train paths, train buffering, turnaround and preparation.
- Another meeting is dedicated to finalising questions of train path allocation.

- A coordination meeting is being held to agree other technical questions related to rolling stock and technology.
- Another separate coordination meeting is dedicated to sales, tariff and related regulations.
- Additionally, in the case of new products sometimes extra meetings are scheduled to agree marketing communication and sales channels.
- Before major changes or system leaps, habitually there will be a last meeting to coordinate the system change.

2.2. SWOT analysis and findings on PSO and connectivity

A SWOT analysis usually provides a fresh approach from a different angle to view a problem area already analysed beforehand, including factors internal and external to the stakeholders. Such an analysis can inform later steps to achieve the objective, to successfully meet the challenges identified in CONNECT2CE. It may also provide valuable hints as to what extent and according to what timing our objectives are attainable, given the balance of strengths and weaknesses, opportunities and threats. If a specific objective is *not* attainable, or only partially, respectively at considerable risk of losses and failure, the objective should be reconsidered and the process repeated.

Given the limitations of this study some classic parts of a SWOT analysis are relayed to the Transnational Tool, namely proposals as for priorities and strategic realignment. Here the emphasis is on the actual state of affairs as it appears from project output complemented by our general knowledge about the transport situation in CONNECT2CE border areas.

Separate S.W.O.T. tables are presented for cross-border PSO and connectivity, next to a written joint juxtaposition of strength and weaknesses, opportunities and threats in the analytic text section. This should keep the tables shorter and better accentuate each of the two areas. At the same time connectivity and PSO / governance are quite closely related, not only because they form one single macro-theme under CONNECT2CE.

Turning weaknesses into strengths for best use of resources

The most regions have mature infrastructure networks and their average quality is good on a continental or even global scale. This is crucial because infrastructure is the hardware at the base of good governance and connectivity. Some regions in some countries, however, have a clearly weaker infrastructure and maintenance quality – especially in rural, peripheral areas –, and to know that in richer countries like Germany, France, and even Switzerland, too, cyclically arrears in investments and finance for infrastructure arise – not to speak of the poor infrastructure of some cross-border lines that never became a priority next to the big national schemes. Also deactivated or completely missing sections of cross-border links are named as a weakness.

It is the entirety of our macro-theme: connectivity and accessibility, public service obligations and financial schemes. More closely, the 'kernel' of this operating system consists of timetables.

Basically, there are two approaches to timetable design (scheduling):

- irregular demand-driven scheduling
- cyclical, periodic, supply-driven scheduling

Both have their merits and their place in railway history, but – especially in our European setting – meanwhile the merits of regular, periodic timetable have become just as evident as the insufficiencies (most of all in terms of cost-efficiency) of a demand-driven timetable. Obviously, there are a number of prerequisites for making regular timetable work, and it may have its apparent or actual disadvantages and limitations. Not by chance it took the transport sector more than a century to find out.

Looking at SWOT tables and best practice, a close link becomes apparent between cyclical scheduling and strengths, respectively between the lack of integrated regular timetable and weaknesses. Increasingly the question inside the profession is no longer whether integrated regular timetable is necessary or beneficial, the question is: how, when, and to what extent introduce cyclical scheduling? Part of the answer is implicit in project output, namely: as soon as reasonably possible – without precipitation, but without unnecessary delays. It clearly needs to be embraced by authorities ordering services (operators will do what they are told even though typically they are partly or fully aware of the merits of cyclical scheduling), and its introduction has to be comprehensive (avoiding exceptions and aiming at least at hourly frequency – anything below that, like trains every two hours, should only be a transitory solution where absolutely necessary). Modification of the rules for transport financing can be a critical aspect for introduction in countries where performance is mainly measured in train-kilometres and there are considerable delays for some related transfer payments. Cyclical timetables mean the rail system will be 'running at peak' all day long – no more idle trains waiting in some stations most of the day. This results in a significantly higher output as for the annual kilometres the rolling stock is performing. Now if the focus is on this annual train-kilometre output next to a delay of up to two years for the clearing of all transactions between state, train operators and infrastructure managers, the authority will not be interested in ordering more train kilometres, or simply may not be in a position to do so because of household restraints if rules are not changed to speed up the process and allow for compensation of higher payments within the same household period. If to the contrary, a lower performance is being commissioned, railway industry players (and ultimately the economy and tax payers) will settle the bill for a less efficient railway system; first and above all the track access income of the infrastructure manager will decrease, which sooner or later will have to be compensated to avoid network degradation. Payment increases for extra orders generate extra income for network managers and this might as well be considered within the finance to managers of the same year. In countries where cyclical scheduling is part of the culture there is no exclusive focus on train-kilometres but PSO and finance take into account realistic, optimised performance parameters.

A strong regional embedding for both operators and governance – the latter including competence to order regional timetables - is seen as a strength, particularly if it goes hand in hand with a mature professional culture. In turn the distance between authorities and stakeholders as well as clients, the lack or limited competence of regional structures are seen as a weakness, sometimes going hand in hand with a lack of awareness of the same authorities for regional cross-border connectivity, or generally speaking for integration and modern, efficient rural transport systems. Indeed, transport systems can be compared to a stream or to a tree. Just as rivers and branches cannot subsist without contributories and the sea, without the soil, roots, twigs and leaves, transport on all levels is a complex, interdependent, interrelated system. Of course, many countries survive with no railway at all, or with a very limited network and/or simple operations falling short of technical possibilities but easier and perhaps less costly to maintain. As long as a country cannot live up with the demanding requirements face modern railway operations, or face cross-border

interoperability for that matter, its leaders would be better advised to be careful about major upgrades, rather taking one step at a time.

Countries involved in CONNECT2CE all have solid century-old railway traditions, but some countries are afflicted to various degrees by a general deterioration of the professional culture, suffering from a lack of resources and quality management next to a brain-drain and lack of trained manpower with many employees migrating to countries or industries with better conditions. Looking at former Yugoslavia, some of the SWOT input can be seen from the background of this deterioration, as well as from the overall insufficiencies of transport policy and economic performance. The two states participating in CONNECT2CE are least affected by this, while most drastically it can be seen in Kosovo, and parts of Bosnia-Hercegovina. These countries will have to review their policy, taking a complex approach of a longer and more balanced planning horizon next to improving the professional culture which requires making appropriate resources for the railway and PT systems a priority. This will have to go hand in hand with improved governance, and good management at an operator level, for the extra finance to yield appropriate results. In any case these countries just as all others will have to find their way within the larger setting. From best practice and project output we know, the quality of connectivity is not strictly linked to a particular finance or government model, but the chosen model must have an efficient regional outreach and it must favour integrated periodic timetables for the connectivity output to be well-balanced, adjusted to local needs and a sustainable, viable alternative to individual transport.

Rolling stock is best when it goes unnoticed – few if any strengths are being linked to it, although rolling stock properties obviously play a roll, not least in cross-border interoperability. The absence of appropriate rolling stock, its insufficiencies, and inconsistent or poor quality is all the more perceived of as a weakness. Best practice teaches us the merits of a uniform but flexible fleet next to a high maintenance culture. This should go hand in hand with two basic wisdoms: 1. You can operate with old trains on a good-quality network, but never operate new trains on a bad infrastructure. 2. It is possible to operate according to an integrated periodic timetable with old but well-maintained resources. The success and increased cost-efficiency of such a timetable development will create the base for rejuvenating and developing both rolling stock and infrastructure.

Turning threats into opportunities for improved connectivity

Project stakeholders have identified a host of opportunities next to an equally large number of more or less interrelated threats. A number of opportunities could as well be moved to the Strengths, but it might not be by accident partners put them where they are. The transport situation is perceived in its complexity and thus partial results or positive properties remain a possibility rather than a strength as long as such results are either not systemic or questions remain whether they are sustainable in the long run.

Apart from that, most opportunities concern either a scheduled, planned development (at times without the dedicated finance yet – cf. threats) or a possible, perhaps even likely development. ...

Ripe for a strategic realignment

Without venturing into the Transnational Tool, at this point the question arises from project output and general knowledge: What can be attained with limited and isolated results, like prolonging some existing services or reactivating border crossings with only a few trains in peak hours, next to busy roads or even motorways? How can border connectivity and modal split be improved next to

more or less obsolete regional railway networks both sides of a national border, used for freight only, or waiting for a politician bold enough to pronounce their death sentence (given that railway closure is still a very sensitive issue in most places)? How can improved mobility serve peace and prosperity on the threshold of the Alpine, Balkan and Carpathian regions when new “iron curtains” are being raised, cutting right through railway lines and disrupting the remainder of cross-border mobility here? It is evident some external factors cannot be easily influenced, neither can all the local and geopolitical risks be mitigated. Still there are ways forward to turn threats into opportunities. It will be up to the Tool to tell just how, in some detail.

2.2.1. Cross-border Public Service Obligations

Based on the TNAs and completed questionnaires from Project Partners, the analysis of the regions has been completed with the following results. General similarities have been outlined during the organization process of the SWOT table. It became clear that besides the specific, unique challenges there is a significant difference between the eastern and western countries of the Central Europe programme area. Regarding cross-border public service obligations only two weaknesses (negative internal factors) have been identified, therefore in the next chapters the focus will be on how to face with the external challenges by relying on the strengths and external opportunities. The examined regions be divided into three groups with similar features:

1. Economically more developed countries with high integration of public transport system, or at least cross-border public transport services are clearly identified as a priority. However, in some cases, the awareness on national level on the importance of cross-border regional services is still missing: Berlin-Brandenburg (BB), South Tyrol (ST), Burgenland (BU), Friuli-Venezia Giulia (FV)
2. Eastern countries of the Central Europe programme area with lower degree of cross-border connectivity, as well as consistent transport policy or support for integration is not strong enough, furthermore there is a distance between stakeholders and national authorities regarding operational work: Continental Croatia (CC), Western Hungary (WH)
3. There are existent agreements between transport operators for cross-border transport services or cross-border links are systematically included in national PSO negotiations, at the same time there is a distance between stakeholders and national authorities regarding operational work: Pilsen Region (PR), Slovenia (SL)

(Legend for SWOT tables: BB: Berlin and Brandenburg; BU: Province of Burgenland; ST: Autonomous Province of Bolzano/Südtirol; PR: Pilsen Region; FV: Friuli Venezia Giulia Region; SL: Slovenia; CC: Continental Croatia; WH: Western Hungary, Vas + Győr-Moson-Sopron counties)

	Strengths	Regions	Weaknesses	Regions
Direct (regarding PSO)	• **Existent agreements between transport operators for cross-border transport services**	FV, PR	• **Financial clearing based at flat rate agreements on sharing ticket revenues may lead to distortions or unsustainable situations**	SL
	• **Cross-border links systematically included in national PSO negotiations**	SL	• Lack of awareness for cross-border regional services on national level (national ministries of transport)	BB
	• **Cross-border public transport services clearly identified as priority**	ST, FV		
	• Integration of all public transport into a unique system, managed by regional government or transport organiser	BB, ST, BU, PR		
	• Some degree of existing quality connectivity at least with some neighbouring regions, tourist destinations etc.	ST, WH		

	Strengths	Regions	Weaknesses	Regions
	• Technological know-how about innovative connectivity solutions locally available and can be integrated in PSO	ST		
Indirect (regarding PSO)	• Mature transport networks, relatively good quality of infrastructure (better than national average)	BB, ST, FV, WH, PR	• Distance to stakeholders and operational work of national authority (in case of a centralised system)	WH, SL, CC, PR
	• Innovative cross-border transport link implemented thanks to specific EU project	FV	• Neglected infrastructure of cross-border railways	BB
	• Commissioning regional transport is a regional competence, or strong regional component within the national system	BB, ST, FV, BU, PK	• Inconsistent quality of rolling stock	BB
			• Bus fleet older than regional or national average, delays in rejuvenation	ST, WH, PR

	Opportunities	Regions	Threats	Regions
Direct (regarding PSO)	• **Existing or forthcoming regional mobility plans and/or cross border projects may set the priorities straight for future developments**	ST, FV, BU, WH	• **Inefficient implementation of monitoring systems or lack of sufficient enforcement of PSO/PSC**	FV
	• **Presence of several road and/or rail operators due to opening up of market, together with consistent PSO/PSC the advantages of liberalisation can be exploited**	ST	• Unstable, evolving financial and/or legal situation	BB, WH
	• Regional setting contains instruments for monitoring, enforcement of PSCs, and integration of feedback (e.g. from local governments, NGOs)	FV	• Different planning horizons	BB
	• Ongoing or upcoming tenders provide opportunities to reshape, harmonise and integrate regional transport, possibly including standards for and improvement of cross-border connectivity	FV, BU	• Economic prosperity along with inadequacies of PT may result in negative modal shift	BB, ST, FV, BU
	• PSC creates a more balanced, predictable environment and operators may receive proper funding for rolling stock development	SL	• Lack of consistent transport policy, and/or support for integration, cross-border links and PSO not strong enough	CC, WH
			• Lack in drivers and other transport personnel potentially threatens service quality, PSC fulfilment	WH, PR

	Opportunities	Regions	Threats	Regions
Indirect (regarding PSO)	• Monitoring system to be adopted at regional level favours timely corrective measures thanks to stakeholder involvement	FV	• Lack of funding for sufficient rolling stock and infrastructural improvements of mobility	FV, SL, CC
	• Integration with alternative forms of mobility (road micro-transport systems, biking, walking, car-sharing etc.) provide an opportunity to complete mobility chain, overcome classical distinction between private/public transport	ST, BU	• Insufficiencies of spatial planning, in particular new residential areas with no proper planning for PT, provisions for individual transport only, or motorway construction without previous or concurrent upgrading of parallel weak PT connections	PR, CC, WH
	• Creation of regional structure within a national authority (in case of a centralised system) and/or widening its competencies	WH	• Lack of a policy safeguarding a balanced development of road and railway PT – insufficiency of railway investments	SL, CC
	• Additional competences for the regional level transferred to regions or regional transport organiser better aware of specific territorial transport needs	FV		
	• New regional competences allow regional authority to go ahead with integration	FV, PR		

2.2.2. Harmonisation of multimodal timetables and regional/cross-border rail services

In case of the SWOT analysis of factors related to multimodal-timetable harmonisation and cross-border services, the results are much more fragmented compared to the PSO SWOT, however, some cause-effect relations can be identified based on the results.

1. Mostly in the western regions of the programme area at least hourly direct high-quality services are existing (Berlin-Brandenburg – BB / South Tyrol – ST / Pilsen Region – PR / Burgenland - BU), which can be regarded as a positive factor. Therefore, in some cases modal share of PT is higher than national average (BB/ST). Strong regional commitment for improvements, consistent political support over several cycles are key-factors for efficient development.
2. In most cases, flexible, customer-oriented local operators are present, however, mainly in the eastern regions (Continental Croatia – CC / Western Hungary – WH / and Slovenia – SL) the absence or insufficiency of inter-modal integration and background, as well as lack of commitment of national level hinders the progress. Integration of transport may result in redistribution of passengers to the more convenient transport options.
3. Replacement of missing sections of railway crossings could be useful within an integrated regional transport system at the border region of Austria and Hungary. Participation in bilateral/cross-border strategic grouping (including EU funded platforms) for revival of international rail connections has already improved the situation. Service upgrade is also possible after the planned electrification.

	Strengths	Regions	Weaknesses	Regions
Direct (regarding harmonisation of multimodal timetables and regional/cross-border rail services)	• **Hourly direct high-quality services (clock-face scheduling)**	BB, ST, PR, BU	• **Absence or insufficiency of inter-modal integration and background therefore, in particular systematic timetable harmonisation between rail and road**	SL, CC, WH
	• **Improvements in timetable coordination**	BB	• **Lack of direct long-distance / international connections or services**	BB, CC, SL, ST
	• **Strong regional commitment for improvements, consistent political support over several cycles**	BB, PR	• Problems with interoperability of trains	BB, FV, SI, WH
	• Planning activities consistent with regional/national strategy for transport development in harmony with best practice for connectivity	BB, FV, BU	• Insufficient, inconsistent service frequency at least on some routes	BB
	• International transit route within the region with a strong long-distance service, or at least a strong potential	ST, SL, CC, WH, PR	• Condition, layout of road-rail interchange hubs not always adequate	PR
Indirect (regarding harmonisation of multimodal timetables and regional/cross-border rail services)	• Modal share of PT higher than national average	BB, ST	• Bad infrastructure quality particularly on cross-border railways	BB
	• Presence of flexible, customer-oriented local operators	ST, FV, SL, WH, PR, BU	• Often poor quality of rolling stock	BB
			• Missing sections of railway crossings which could be useful within an integrated regional transport system	WH, BU

	Opportunities	Regions	Threats	Regions
Direct (regarding harmonisation of multimodal timetables and regional/cross-border rail services)	• **Integration of transport may result in redistribution of passengers to the most convenient transport options, modal shift towards rail**	SL, WH	• **Large number of road transport operators may represent an obstacle to integration**	ST, FV
	• **Participation in bilateral/cross-border strategic grouping for revival of international rail connections**	SL, BU, WH	• Lack of commitment of national levels to international railway transport	ST, FV, WH
	• Participation in EU-projects including funding and measures for improved connectivity	ST, BU, WH	• Areas with low population density where it is challenging to build up services based on integrated regular scheduling in a sustainable way	FV, SL, CC, BU
	• Realisation of major new high-performance railway line	ST		

	Opportunities	Regions	Threats	Regions
	• Implementation of cross-border regional bus system (now largely missing from most CONNECT2CE regions) to complement and feed railway links	WH, BU		
Indirect (regarding harmonisation of multimodal timetables and regional/cross-border rail services)	• Direct (regarding harmonisation of multimodal timetables and regional/cross-border rail services)	BB, WH	• Leaving implementation of multi-modal integration to a central governmental agency may slow the pace, amongst other obstacles due to administrative hindrances or difficulty to recruit highly skilled staff	SL, WH
	• Demographic change, growth in cross-border mobility, in particular more cross-border commuters creates chances to improve PT system	SL, CC, WH	• Difficult topography and/or areas with dispersed settlements	ST, FV, WH
	• Service upgrade possible after electrification, upgrade of railway lines	BB, WH, PR, BU	• Insufficient maintenance, investments in regional rail network	CC, WH, PR

2.3. Best practices highlighted on PSO

Recalling the basic challenges all struggle to meet, keeping in mind the strengths enumerated in the above SWOT analysis – at this point the bits and pieces are joined together to display what already works in an around CONNECT2CE project areas. Naturally the focus will be on the areas of connectivity and governance while at some points brief references will be made to aspects belonging to subsequent tariff and infomobility chapters.

As it was outlined in the first part of the Transnational Study, the border-regions within the Central Europe area are completely heterogeneous in many ways, including demographic profile, as well as in governance types and traffic management systems. Therefore, it is not possible to provide a "universal" method that gives answer to every challenge of every region. Despite all that, there are several good practices that can be used to solve particular issues on how to harmonise timetables and PSOs in such differentiated cross-border regions. The following chapter intends to demonstrate **what the key factors are of a well-functioning cross-border public transport system are and how the regions cope with different challenges identified before**.

2.3.1. Features of best practice in connectivity and governance

- High connectivity by consistent application of an integrated regular timetable scheme
- Improved connectivity and cost-benefit ratio of infrastructure investments by timetable-based infrastructure development
- Improved connectivity by successful integration of all transport modalities → **example: Friuli Venezia Giulia Region – PSO; Harmonisation of timetables for cross-border services in Friuli Venezia Giulia Region**

- Improved connectivity by way of integrating the entire door-to-door transport chain: organisation and integration of local demand-driven micro transport services, car and bike sharing schemes, as well as pedestrian infrastructure

- Improved mobility through intelligent design of barrier-free transport hubs and optimised changes between lines and transport modalities

- Improved cross-border connectivity by way of harmonising standards in transport planning and coordinating developments:→ **example: Sopron - PSO**
    - introducing an integrated regular timetable scheme both sides of the border → **example: Harmonisation of timetables for cross-border services between South Tyrol and Switzerland/South Tirol and Austria**
    - joint planning and proper timing of infrastructure developments, introduction of better services
    - modernising regional railway systems both sides of the border, introducing simplified, cost-efficient operational and technical standards for regional railway operations in sparsely populated regions
    - integrating road and rail transport both sides of the border following the same principles: make best use of existing infrastructure including local cross-border railway lines and create an integrated road-rail transport system with regional 'artery' lines next to local feeder and micro-transport networks → **example: Harmonisation of timetables for cross-border services in Friuli Venezia Giulia Region**

- Improved cross-border and rural mobility by way of intelligent conjunction of existing services including 'overlap' of train categories in order to serve several existing needs with a given vehicle capacity in a sustainable way (so-called 'hybrid' and 'zonal' trains, e.g. a fast long-distance train behaving like a local train in one end or in some sections of the route) → **example: Harmonisation of timetables for cross-border services between Germany and Poland**

- Strong regional governance component: the authority or organisation in charge of commissioning transport services is close to local clients and stakeholders → **example: "South Tyrolean model" of public transport; Province of Burgenland – PSO**

- Expedient split of competence for commissioning services between the regional and the national or supra-regional level

- Central appropriation of finance including accountability, but regional level of responsibility for the use of resources and the commissioning of services → Germany and Poland - PSO

- Merging existing regional/suburban systems both sides of the border by targeted infra and service development and creation of permanent bilateral or multilateral structure for governance and transport organisation → **Harmonisation of timetables for cross-border services in Friuli Venezia Giulia Region**

- Merging existing regional/suburban services by way of creating a common brand or 'virtual transport association' and offering joint tariff / ticket products, while in formal and organisational terms transport systems remain separate entities both sides

2.3.2. Examples of best practice

As it was outlined in the first part of the Transnational Study, the border-regions within the Central Europe area are completely heterogeneous in many ways, including demographic profile, as well as in governance types and traffic management systems. The following examples give partial answer on how to harmonise timetables and PSOs in such differentiated cross-border regions. Following the best practices of each participating partner will be presented.

Harmonisation of timetables for cross-border services between South Tyrol and Switzerland/South Tirol and Austria:

The following example demonstrates that despite the different organizational and structural background, it is possible to harmonise timetables – even in the case of a trilateral border, as well as it is good example of the integration of different public transportation modes.

Before taking a closer "best practice" look on the South Tyrolean System as a whole, we will start this section by zooming in on these rural links for several reasons:

- This service area has dispersed settlements with no city and only a few village centres, with the population of end points ranging from 1500 to 5000 inhabitants. Thus, it is exemplary of all those sparsely populated places within the CONNECT2CE area we wish to link up better amongst themselves and with urban centres, transit routes.
- Nevertheless, these cross-border bus links are served in an exemplary way from early morning to night by an immaculate periodic timetable connecting inhabitants to the railway stations both ends of bus lines. In the outset the Swiss setting shall be explored which is not part of this project but serves as a reference for our macro-themes in multiple ways.

Current cross-border connections from South Tyrol involve both Austria and Switzerland. Timetables are harmonized with the railway line Merano-Malles, but the integrated payment is not possible and separate tickets have to be purchased. Indeed, the bus connection from Malles to Nauders and Martina (and vice-versa), guaranteed by the provincial concessionaire SAD, is integrated into the South Tyrolean information and ticketing systems.

Regarding AT-IT connections, the train connections to/from Lienz and Innsbruck are performed hourly in both directions, either with a direct train (by SAD or Trenitalia in collaboration with ÖBB) or with a change at the Brenner station (in this case, timetables between Italian and Austrian railways are harmonized). It is possible to pay with the South Tyrolean Mobility pass, but tariffs are not harmonized (the Austrian ones are more expensive than those applied in South Tyrol are).

"South Tyrolean model" of public transport

As it was identified in the first part of the Study, in most cases, rural population has been steadily decreasing in the regions participating in CONNECT2CE, leading to lower density and sparsely populated rural and peripheral areas, while regional peripheral areas are characterised by long distances to reach urban area. Even though the following example does not have a cross-border dimension, it shows how public transportation can be organised in such an area.

South Tyrol may serve as a model in quite a few respects, amongst them certainly spatial planning and public transport. The advantages of this region are a performant economy, a satisfactory autonomy statute respecting ethnic and other regional realities, and the proximity of countries with a developed transport culture. On the other hand, the province's transport system is serving well against the odds of alpine topography and demography: a few urban centres and a host of smaller village centres in a system of lo surrounded by dispersed small settlements.

From a legislative perspective, the Provincial law 23 November 2015, n. 15 rules all main aspects related to public transport. According to this law, the operation of public transport services has to be regulated by public service contracts, which have a validity of less than 10 years for buses and less than 15 years for trains, cableways and funiculars. Worthy to be mentioned, there is currently not any ongoing air Public Service Operation. In the previous years (until 2016), the link from Bolzano to Rome Fiumicino via airplane was guaranteed as PSO, but it is currently suspended.

South Tyrolean model is a good practice because it takes advantage of the opportunities in PSO but does not make it cross-border. As for the transport costs, unitary contracted cost for bus operations are equal to €2.6298/km for suburban buses and €2.8897/km for urban buses. For rail transport, costs are different according to the service providers and the railway line: for Trenitalia, they are €10.99/km; for SAD, they are €12.23/km (RFI network) and €7.86/km (Val Venosta line). Overall, the proportion of total operating costs covered by fares at the provincial level is relatively low (about 24%). This percentage is higher than in 2011 (about 16%), but noticeably lower than the values recommended by the EU (35%). This determines a high provincial subsidy for public transport (€5,500M), equal to about 64% of Public Transport Department's budget and 2.17% of total Provincial budget. This large amount of money used to subsidize public transport has positive results in terms of use of public transport, which is among the highest values per capita in Italy. Also results in terms of public satisfaction are positive: on a scale from 1 to 10, average values are evaluated equal to 7.5. Constant surveys are performed to monitor this indicator, with a focus on specific transport modes and specific types of users (residents or tourists). This best practice would be also necessary to apply later on across borders.

Veneto Region, dealing with a wide a polycentric metropolitan context

Veneto region, a part from being a crossroad of relevant transnational corridors, is affected by a highly urbanised context (especially in its central part). In order to cope with this second aspect an ambitious strategic vision aiming at the development of a Regional Metropolitan system (SFMR, "Sistema Ferroviario Metropolitano Regionale") was developed in the recent past.

The key aspects of the related approach are meant to integrate urban and suburban transport in the vast hinterland through the conversion of the regional rail network into metropolitan service by using the existing rail lines with several infrastructure improvements. In particular, with reference to infrastructural realisation and facilities provision, it addresses: higher safety standards, elimination of level road crossing points, building of new stations, and purchase of new metropolitan trains. In terms of service organisation, it implies the adoption of the clock-face timetable for rail services, an increase in their frequency and the application of train-bus rendez-vous mechanism at stations aiming to promote intermodality.

In December 2013, a relevant step was made since the new clock-face timetable started to be operational for the first time with a substantial change of the previous rail transport supply system. In practical terms, it implied the adoption of this paradigm as to improve the regularity and coordination of rail services with reference to the whole regional network (though without reaching the high frequencies foreseen in the initial approach). However, to a certain extent, the structural

inelasticity compared to the traditional flexible time table implied some further adjustments in the following period.

In general, the performed interventions let to achieve remarkable improvements, as also testified by general positive outcomes in customer satisfaction surveys (esp. related to increased punctuality). Nevertheless, given the current limited availability of funds its full realisation of the SFMR in the medium-short term is deemed not feasible (even though the main concepts are essentially still valid).

Other relevant improvements are associated to the modernisation of the rolling stock, also with reference to the next improvements foreseen in the new service contract signed between the Region and Trenitalia in January 2018. Furthermore, with reference to the main centres in the Metropolitan Area, Padua and Venice, it is mention the innovation provided by the new tram system; this experience will be used for developing similar interventions in two other relevant centres: Vicenza and Verona.

Fig. 1 – SFMR planning vision

Germany and Poland - PSO

The following example provides an overview about how setting-up a strategic platform can help to tackle with differences in the organisation of public transport regarding procurement procedures and harmonising timetables. As it can be seen, the platform does not completely solve this lack of harmonisation, still provide an opportunity for the stakeholders to maintain continuous discussion in order to improve the efficiency of cross-border public transportation.

The organisation of public transport differs between Germany and Poland. In Germany, long-distance services on rail and road operate on a commercial basis without subsidies, whereas in Poland only few long-distance services operating from Warsaw to major Polish cities operate without subsidies. Here, interregional TLK and Intercity services receive public grants.

In both countries, regional railways receive public funding, but the organization is quite different. In Germany, the "Länder" or "Verkehrsverbünde" carry out the planning and the operation is tendered in competitive tendering processes to the operators. In Poland the operators are either public operators owned by the regions who are directly awarded to carry out services or the services are tendered usually to Przewozy Regionalne / Polregio, the former national and now region-owned operator of regional railways.

Whereas in Germany contracts run for around 10 years and tendering processes start 3-5 years before the award of contract, in Poland contracts usually run only for very short periods (1-2 years, in exceptional cases 4 years) and are awarded in short term. The PSC for interregional TLK and Intercity services has been directly awarded to PKP Intercity for 10 years.

Harmonisation of timetables for cross-border services between Germany and Poland

Another difference between both countries is that in Germany railway services are based on the "Taktfahrplan" so there are services running regularly every 30 or 60 minutes during the whole day. On the contrary in Poland services on most lines run irregularly according to demand with denser services in morning and afternoon and larger gaps before noon and in the evening, and in general with less services over the day.

This difference in the organization is crucial to understand the difficulties in the harmonization of timetables. In Germany the timetables are defined for long periods and have defined times when nodes in the network have to be reached. Therefore, there is hardly any flexibility for changing timetables in order to reach connecting trains in Poland. In Poland the timetables change very often (up to 4-6 times per year) and interchange connections which have been agreed often are cancelled again due to construction works or other changes within the Polish railway network.

Nevertheless, VBB is in continuous dialogue with the neighbouring Polish regions to harmonize timetables. This is done during the normal national planning process once a year in winter before the operators register their timetables at the rail network operator. The long-term strategic questions concerning the development of cross-border services are discussed within the "Transport Round Table" of the Oder-Partnership once (up to twice) a year.

Friuli Venezia Giulia Region - PSO

The following paragraphs provide details on how Friuli Venezia Giulia region organize its cross-border public transportation services, including multimodality as well as cross-border maritime service. Furthermore, this region is a good example regarding how interregional projects can contribute to the harmonization of timetables and test new kinds of services.

Additionally, some well-established international cross-border services have also to be mentioned:

- a cross-border interregional bus service between Venice and Villach/Klagenfurt (passing tough Udine) is operating with 2-6 daily bus routes. This service is operated by Austrian OBB company. A specific agreement allows to buy an integrate ticket to combine train from Salzburg to Villach, bus from Villach to Venice and then ATVO bus services to reach beaches near Venice;

- As for cross-border rail sections, it has to be mentioned the operating line connecting Italy with Austria, where the MICOTRA train service is connecting daily Villach to Udine, while potential cross-border sections with Slovenia – even if functioning in the past – are currently not operating. Experimental extension of the MICOTRA train to Trieste will implement and extend the already existing cross-border train connecting Villach (Austria) to Udine (Italy), thus enhancing and developing a consolidated axis Udine – Trieste.

- a specific cross-border maritime service was activated in 2014 thanks to the EASEAWAY Project funded under the IPA Adriatic Programme 2007-2013. In particular, a passenger service was tested in terms of connection between Trieste, Slovenia (Pirano) and Istria Region (Rovigno and Pola). After the testing phase, Friuli Venezia Giulia Region decided to finance with own resources on yearly basis this service during summer period.

- since 2016, a daily bus service connecting Ljubljana to Trieste operated by Slovenske Zeleznice, Slovenian railway company.

- the railjet is the premier service of the ÖBB and operates both domestically within Austria and on international services to adjacent major cities in Germany, Hungary, Switzerland, the Czech Republic and from December 2017 Italy. Vienna - Klagenfurt - Villach (- Lienz or Udine - Venice from December 2017).

In the case of public service obligations, specific contracts and agreements and legal situation are in the background which has been assessed by Italian-Slovenian TRADOMO project when they assessed to run a service across the border (which can be used/would allow cabotage/ for domestic trips too) near Trieste and not just having the different stops on either side and walk between with harmonised timetable.

"[9] In making such plans it would be necessary to observe the provisions of Slovenian, Italian and also EU legislation. In compliance with the Regulation (EC) No 1073/2009 of the European Parliament and of the Council of 21 October 2009 on common rules for access to the international market for coach and bus services cabotage is conceded to "*regular services, performed by a carrier not resident in the host Member State in the course of a regular international service in accordance with this Regulation with the exception of transport services meeting the needs of an urban centre or conurbation, or transport needs between it and the surrounding areas. Cabotage operations shall not be performed independently of such international service.*" (Article 15c).

[9] Gabrovec, M. (2013), Open borders with uncoordinated public transport: The case of the Slovenian-Italian Border. In: European Journal of Geography, Volume 4, Number 4, December 2013

According to this provision, within international transport the Italian bus operator shall not transport passengers inside Koper or between Koper and neighbouring settlements, and, in turn, the Slovenian bus operator shall not transport passengers inside Muggia or between Muggia and surrounding settlements in the municipality. However, Regulation 1073 specifies in Article 25 that "*Member States may conclude bilateral and multilateral agreements on the further liberalisation of the services covered by this Regulation, in particular as regards the authorisation system and the simplification or abolition of control documents, especially in border regions*".

Harmonisation of timetables for cross-border services in Friuli Venezia Giulia Region

Some minor and limited examples of this harmonization are present in some specific territorial contexts also at cross-border level. This is the case in particular of:

- a cross-border urban bus service between Gorizia (I) and Nova Gorica (SI) active on a daily basis (20 routes/day). It represents a service contract between the Italian transport operator APT Gorizia (http://www.aptgorizia.it) and Slovenian one AVRIGO (https://www.avrigo.si/it/) and which entails the harmonization of timetables between the two transport companies;

- a cross-border train service operating between Udine (I) and Villach (AT) is active since 2012. This service was developed as an output of the MI.CO.TRA Project (Improvement of cross-border public transport connections) which was financed under the Interreg IV Italia-Austria 2007-2013 Programme. Service is jointly operated by FUC (Italy) and OBB (Austria) with two couples of trains on a daily basis and included the development of harmonized timetables between the two services.

As for internal areas, some examples are also available of harmonized timetables:

- extra-urban and urban bus service with maritime transport service between Lignano and Marano, operated by SAF;

- train and bus service interconnection between Udine – Gemona and Tarvisio, jointly operated by Trenitalia and SAF.

Usedom

Railway experts with a mix of idealistic determination and a realistic sense of business brought back this remarkable 'island operation' from the brink of annihilation. Following initial successes, the ultimate challenge was also met: prolonging the line to Świnoujście/Swinemünde on Polish territory in order to create a link with Szczecin/Stettin's urban system as realised by 2008. On the other side, the rail link with 'continental Germany' reconstructed by 2004 was of a similar significance. Usedomer Bäderbahn is now a recognised part of regional and cross-border transport in northeastern Germany and the Polish neighbourhood.

Friends in the Heart of Europe: Vogtland-lines and Egronet

EgroNet is a 'virtual cross-border regional transport system' serving 3.2 million inhabitants and visitors of a 15 thousand square-kilometre large area within the Euregio Egrensis, consisting of German federal states of Saxonia, Thuringia, Bavaria, and the Bohemian part of the Czech Republic. Within that service area, EgroNet provides a framework and a brand for the cross-border cooperation of 63 German and Czech railway, bus and urban transport operators, a cooperation also extending to bus-rail integration, to the harmonisation of infrastructure investments and transport

development activities. The main force behind the project to create this tariff union and governance structure was the Saxonian Ministry for the Economy and Labour. In 2014 the Czech service area was increased. Day passes are valid with the same conditions on almost all means of public transport in the area, including the trolleys and cable cars in Karlovy Vary popular with tourists.

From a passenger point of view, the virtue of EgroNet is its cross-border ticket offer and a focus on improving client service. An important practical aspect of this is that all operator radio communication channels are bundled in the Saxonian ministry's Department of Tourism and Transport in view of a timely, accurate passenger information. Ticket prices take into consideration the differences in wages and purchasing power, day tickets are considerably cheaper on the Czech side. Ticket prices for 2-4 companions are much cheaper than for the 1st passenger, up to 3 children from age 6-14 may accompany adults and bicycles can also be carried for free.

Brno – Integrated Transport System of South Moravia *(Figure 13)*

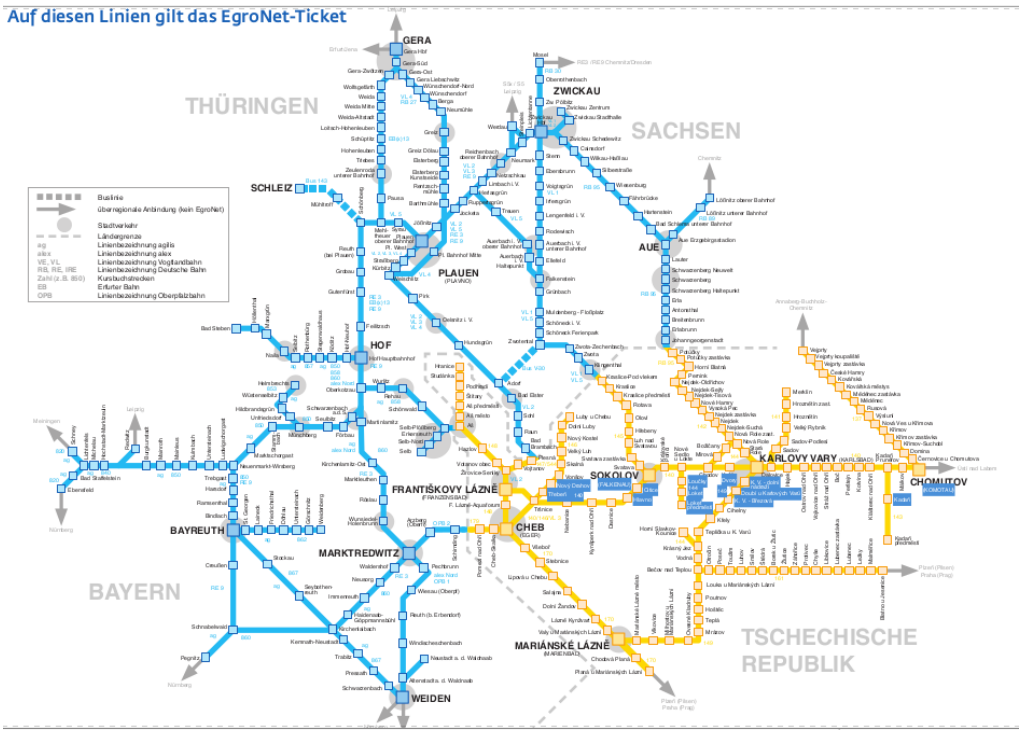

Figure 11: Brno -Ticket System of South Moravia

Source: http://www.kordis.cz/onas.aspx/cenik/EN/mapa/Map/kontakt.aspx

The next example demonstrates an Integrated Transport System, which is able to harmonise the large number of stakeholders and operators in order to improve the overall efficiency – including time-table harmonisation – of public transportation.

The South Moravian Integrated Transport System (Czech: Integrovaný dopravní systém Jihomoravského kraje (IDS JMK)) operative since 2004 is a transport association with more than 20 operators based on an integrated periodic timetable and a zonal tariff union with headquarters in Brno, the largest city in the country's Moravian part. Following the 2005-2008 period when the system area was successively expanded to its present limits including 721 municipalities, after 2010 IDS JMK has successively managed to organise or integrate those cross-border lines matching the transport needs which had evolved during the decades since the change of political systems and ascension to EU membership, even though some of these lines only run at daily traffic peaks serving cross-border commuters. Next to some regional railway and bus lines to Slovakia and Austria, the case of the Vienna–Mistelbach–Hřusovany–Brno railway line is outstanding. Austria developed their section until the border into a performant electrified suburban railway line, but the 1-km Laa/Thaya–Hevlín border section including a small river bridge was never rehabilitated and finally the Czech side, although generally in favour of reactivations, discontinued PT on the low-traffic Hrušovany–Hevlín section and later started to serve the Brno–Laa/Thaya route periodically by bus. This link is part of the Moravian system, therefore Laa/Thaya railway station, as well as the area of Poysdorf with many Czech cross-border commuters, are served both by IDS JMK and Austrian VOR.

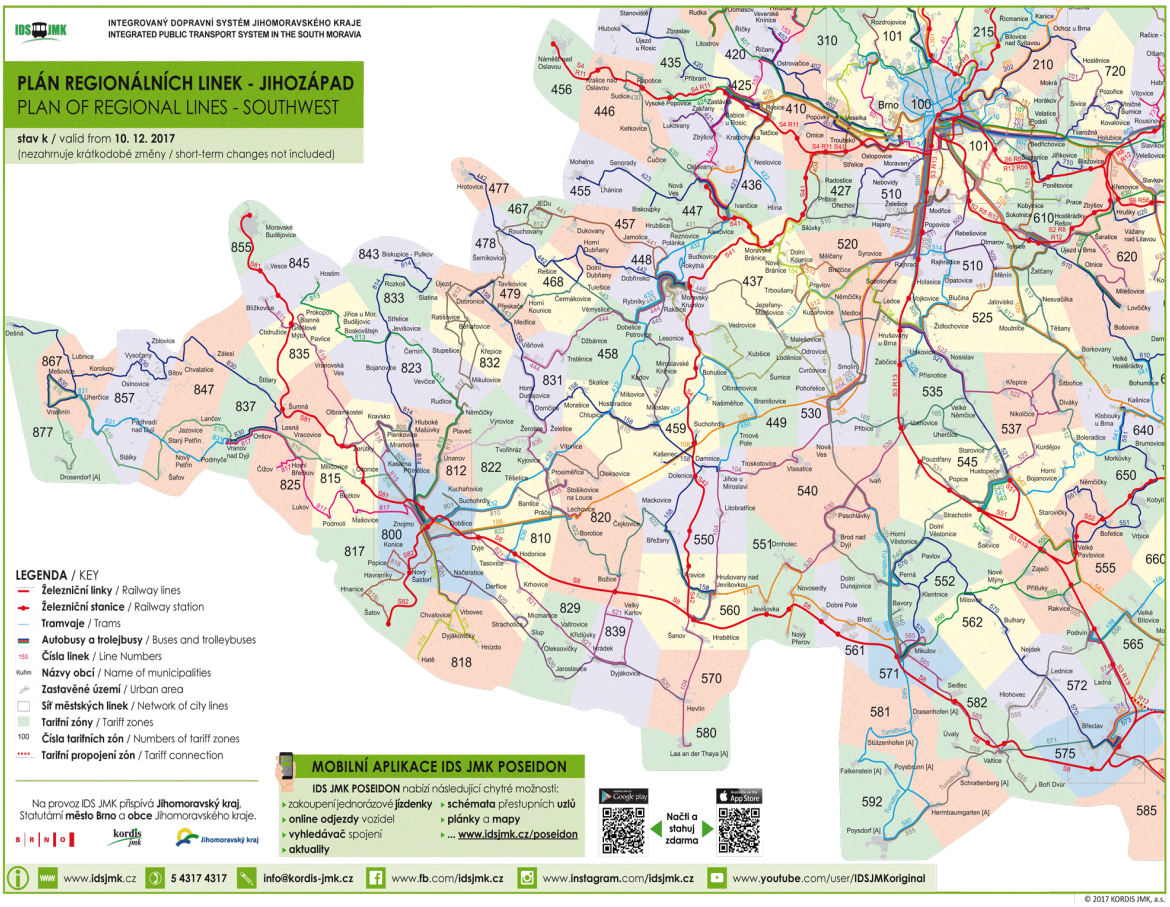

Figure 12: Zonal plan of the southwestern IDS JMK service area including three Austrian territories, and cross-border sections with Slovakia including regional railway lines and a cross-border bus line ending and starting on Czech territory.

A remarkable recent cross-border initiative is the "Turistbus" launched by the IDS integrated transport system of the South Moravian Region, creating an attractive service for both Czech and Austrian tourists with a regular timetable throughout the warmer season.

Sopron/Burgenland PSO

The following subchapter shows an example about how to deal with cross-border public transportation in a border-region where the level of economic development, the regional structure, degree of integration of public transportation, time-horizons of contracts are completely different, at the same time on both sides of the border the awareness for cross-border regional services is lower on a national level. As most of the border regions participating in CONNECT2CE are affected by significant systematic differences, the structure of an existing PSC will be presented, which is able to cope with the difficulties mentioned above.

This city called Ödenburg in German is located within a bulge of Hungarian territory. Its then predominantly German-speaking population in what was the only plebiscite organised here following WW1 voted to remain within Hungary, hereby earning the label, "City of Faithfulness". The headquarters of regional integrated railway operator GYSEV Raaberbahn are close to Sopron's

railway station which has a very special status: By virtue of contracts and transactions involving certain infrastructure elements it is officially part of the ÖBB network, and it is also part of VOR Verkehrsverbund Ostregion, the Vienna-based transport system of northeastern Austria. We will take a look at the short version of the story how this constellation came into existence, what advantages come from it, and what lessons can be emulated from local best practice.

This phenomenal railway with the full historic name 'Győr–Sopron–Ebenfurti Vasút Rt. / Raab-Oedenburg-Ebenfurter Eisenbahn-AG' has retained its bi-national corporate form and part of its cross-border connectivity throughout the darkest cold-war years. Since 2017 they operate in three countries, and they manage an extended regional network, both recognising and meeting local needs, and taking advantage of political constellations and opportunities afforded by the EU structural funds and the weakness or different priorities of the larger, purely Hungarian state railways. Its current ownership structure valid since the expansion of the railway's Hungarian network: The Hungarian state holds a majority of just below two-thirds of shares next to the Republic of Austria with slightly more than 28% and the small share of STRABAG SE, the holding firm of a private Austrian building company firmly positioned within the larger region's economic and political realities. Especially on the Hungarian side passengers are satisfied with GYSEV Raaberbahn's above-average service quality and sensitivity to regional needs. On the Austrian side the railway is equally part of local identity and operates to the satisfaction of clients, at a service level in no way inferior to the bigger state railways.

Taking a closer connectivity look at Sopron, the question ought to be raised: How come this railway serves the region according to two different timetable systems? At Sopron the periodic schedule as routinely commissioned within VOR meets with a partly regular, partly demand-driven timetable structure as ordered here by the Budapest ministry.

There are a number of public service obligations in Hungarian and Austrian terms, this characteristic, that there is not comprehensive public service obligation instead of several small PSO.

The following are the main PSOs by area of activity.

- Vienna-Sopron-Deutschkreutz destination: The customer is the Austrian State and Province of Burgenland. The trains move on GYSEV-owned lines between Sopron and Ebenfurth. GYSEV assigns the train path and the VPE prepares it. ÖBB bear the costs of the Hungarian section too.
- Wiener Neustadt-Sopron-Deutschkreutz destination: The customer is the Austrian State and Province of Burgenland. GYSEV and ÖBB operate the line. GYSEV assigns the train path and the VPE prepares it. ÖBB bear the costs of the Hungarian section too. the railway provides the service, but GYSEV devices are also running (Jenbacher DMU).
- Fertőszentmiklós-Nezsider (Neusiedl am See) destination: The customer is the Austrian State Province of Burgenland, Hungarian State. GYSEV is the operator of the line. GYSEV assigns the train path and the VPE prepares it. On the Hungarian section based on a public service contract with the Hungarian state
- (Hegyeshalom)-Rajka-Bratislava destination: The railway line works based on the basis of the specific agreement from December 2017. The line is owned by the Hungarian state and GYSEV operate it. GYSEV does public service on both Hungarian and Slovakian sides.
- Budapest-Győr-Szombathely-Szentgotthárd-Graz destination: The customer is the Austrian and Hungarian State. Path: from Budapest to Győr (MÁV: Magyar Államvasutak), from Győr to Szentgotthárd (GYSEV), from Szentgotthárd to Graz (ÖBB) *(figure 15)*.

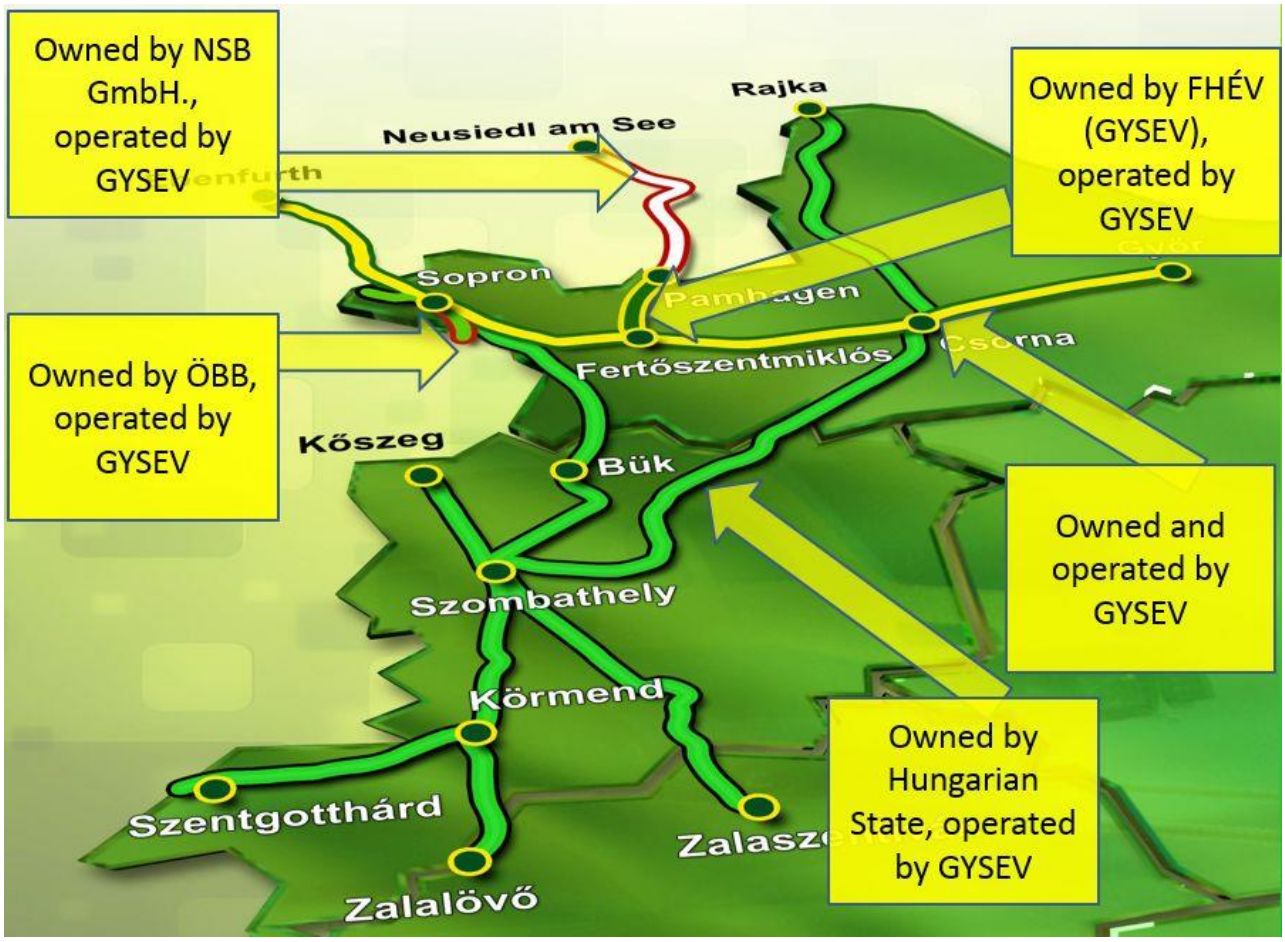

Figure 13: Special operational situation in the Austrian-Hungarian border area

Source: Presentation by Mr. Csaba UNGVÁRI – Deputy CEO of GYSEV Zrt

Public service contract between the Hungarian and Slovakian railway operators GYSEV and ZSSK

The goal of the contract is to offer a common cross-border traffic/ticketing in the area of Bratislava and to make an arrangement concerning the ticket revenue between the two national railway operators. The contract focuses one concrete cross-border railway line between the two member states. Distribution of ticket revenue between the two railway operators see Annex I.

2.4. Proposed lessons on PSO and connectivity to be told in the Transnational Tool

Based on project outputs summarised in this study, it can be ascertained that the challenges identified at the outset – urbanisation and sparsely populated areas next to weak links within peripheries and towards hubs, lack of integration, decline in regional rail PT – well grasp the essence of the situation.

There is nothing bad or threatening about being a sparsely populated area – population density is a factor to be considered, which can bring both advantages and disadvantages. Within the overall

urbanisation processes, there are cyclically repeating movements, demographic shifts between centres and peripheries. As it is commonly known, there are parallel movements, people at times gravitating towards the centres, and others – at the same time or at other times – away from the cities towards the suburbs even including some peripheries.

The dismantlement of the Iron Curtain has amplified such movements in certain border areas within the CONNECT2CE region. Some peripheral areas have seen significant socio-economic or even demographic growth in the process, and cities are about to reclaim those parts of their natural 'catchment area', previously lost because of the strict border regime and/or new borders cutting through historically grown regions. Due to the more or less well-known interoperability and policy challenges, PT networks and systems in most cases do not yet properly take these changes into account: in particular, the need for more cross-border connectivity and integration due to the increase in trans-border mobility and commuting is not properly taken into account.

Upon tackling these areas, we should bear in mind two sides of a changing reality: on the one hand, there is a more or less urgent need to develop and 'sew together' regional transport systems both sides of almost all border areas within the CONNECT2CE area, as the lack of PT links either forces people to rely solely on individual transport (and in case of future developments it will be all the more challenging to change modal split favourably), or they are prevented from improving their situation by increasing their mobility for a lack of accessibility to transport. On the other hand, for a number of reasons, the level of trans-border mobility still remains low between peripheral areas in particular, partly again due to a lack of transport links. Creating transport links can be a long-term investment into a desirable and possible development, inducing mobility-related development. By creating the facts, we can generate (desirable) mobility. It all requires a thorough, complex approach:

The Transnational Tool should promote the elaboration of models for such an approach (process) based on insights from the Study and best practice examples. It should support the identification of methods for increasing cross-border and peripheral connectivity by timetable and tariff integration, as well as enhancing governance and finance including cross-border PSO/PSC, and smart but manageable infomobility solutions including ticketing.

As for connectivity the best-known method to serve a wide variety of diffuse transport needs in difficult terrain is the organisation and progressive, focussed development of integrated regular timetable and tariff schemes for rail and road transport. Such a system creates optimal links between peripheries and hubs: once fully implemented similar to Switzerland and the Netherlands passengers will be able to travel between any given places at least once an hour. This includes timetable-based infrastructure development. It is no longer tolerable to advocate costly isolated infra developments and later on take a look what kind of service might be offered. It is significantly more cost-efficient to first determine what kind of a service and timetable is needed 10 or 20 years down the track, then the parameters and the timing of infrastructure projects necessary for the next timetable development step can be established and scheduled according to available resources. All this must be harmonised between regions and countries to result in an intra-regional / national and international / continental transport system. A comprehensive development goal within this effort is the introduction and integration of demand-driven micro transport services in sparsely-populated areas in order to systematically cover entire door-to-door mobility chains. The Tool should provide proper definitions and a fair understanding of such an integrated system.

What has been said on cost-efficiency in infrastructure planning, also applies to rolling stock: Regular timetable allows for significantly higher efficiency in rolling stock management. Resources are limited everywhere, but cost-efficiency is all the more crucial for those eastern countries within

CONNECT2CE with less than average resources. They have to realise and should always bear in mind that an integrated regular timetable is in no way a luxury only the richest countries can afford to maintain. It is the best known 'operational system' for just about any transport system and an opportunity for less developed regions to make the best of their resources. So said, it should not be forgotten that by and large, the present differences in development and available resources are precisely the result of the deficiencies in cost-efficiency. Operating a railway or an integrated transport system, generally requires a high level of cooperation and professional culture an experience clearly shows a regular timetable cannot be successfully introduced if planned in some office without due regard to outside realities. On the one side bringing PSO/PSC and governance in harmony with the above principles should go hand in hand with improving overall discipline and professional culture, also including efficient monitoring and sanctioning in the letter and practice of PSCs. On the other side regular timetable design must take into account as much as possible the properties of existing rolling stock and infrastructure, including traffic control eventualities, in order to create an executable timetable.

Above it was proposed to focus on opportunities rather than threats. Working on the SWOT section this author came across a sentence which doesn't really fit the tables the three macro-topics. Nevertheless, this point is so typical for much of the CONNECT2CE region: *"The low image of public transportation. Some people consider it only as the transport for poor people or children."* So many people still think PT is for those who cannot afford a car. In the formerly Communist states in particular, the utter failure of most policy makers and operators to provide services attractive for all possible target groups, next to questionable arrangements for free travel and reduced pricing on social grounds, and the still omnipresent urge of owning a car as an expression of the freedom we attained in 1989, no matter how partial and elusive – they all result in a system mostly serving those who do not have any alternative. Yet people are creating their own alternatives, think at the popularity of car-pooling services and the potential of self-driving cars. Naturally the latter also has the potential of becoming an ideal 'missing link' in micro-transport systems. This threat might as well be balanced with an opportunity not voiced by project stakeholders: *"Changing behavioural patterns of younger generations. They no longer insist on owning a car no matter the cost..."* The statistics of Hungarian state passenger transport operators show a marked increase in passengers and ticket revenues for a certain period that cannot be nearly explained by any other factors but the concurrent peak in fuel prices. The next peaks, accompanied by the delays in our area on the way to electro-mobility, will inevitably create a higher demand for PT. The only way to meet the challenge here in Central Europe is to offer spatially inclusive services with a periodic timetable next to multi-modal and transnational integration.

Summary

The public service is the backbone of the connectivity in the cross border areas and the regions with lower population density, where the insufficient market conditions led out the private sector from the public transport market. As a soft infrastructure the Public Service Contract (PSC) plays a fundamental role to ensure the efficient and integrated public transport. In this study *three areas were dealt with*: the comparative analysis of the Public Service Obligations (PSO) and of the practices of the timetable harmonisation; the summary of the SWOT analysis came from the partner's SWOT; and the case studies as best practices.

The first section of this document comparatively examined the **Public Service Obligations** (PSO) by the type of transport governance, legal framework, finance and ordering model, and timetable harmonisation practices. It can be stated that there is not any correlation between the rail market type (liberalized, semi-liberalized, or non-liberalized type by the share of the open access or the competitively tendered PSC's) and the transport governance, but a stronger correlation between the transport governance type and the timetable philosophy can be detected. In countries with centralized transport governance (Slovenia, Croatia, Hungary) the *demand-oriented scheduling* is the general practice, however in the countries with decentralized governance (Austria, Italy, Germany) the *integrated periodic, supply-driven scheduling* or a *hybrid-mixed philosophy* plays dominant role.

Based on the TNAs and completed questionnaires from partners, the PSC - **SWOT analysis** of the regions has been completed with the results that regions suffer from the issues rooted from same financial (unstable funding) and coordination (ineffective communication) difficulties on internal and external level. The timetable harmonisation related SWOT analysis identified the insufficient intermodal integration of some regions and the lack of the long distance and international services as the main barriers. Synthetizing the SWOTs the results show similar outcomes as the case studies of the inventory of the Regional Policy of the EU Commission. The Commission in 2015 has launched a 2 year long project called 'Easing legal and administrative obstacles in EU border regions' where it was concluded that the potential solutions in the most of the cross-border transport related cases require local authorities intervention to launch a joint service tendering or to form a joint corporation to overcome the legal and financial difficulties of the cross-border public benefit services.

Last but not least the third area of the study aimed to explore the positive experiences from the **best practices** of the transnational cooperation on cross-border public transport. Ten case studies were elaborated concentrated on the designing the Public Service Contracts and the harmonisation of the timetable on transnational level. Several *transnational cooperation form*s showed up, for example the EGTC, the Euregio and the Commission's newly introduced initiative, the Border Focal Point. There are many necessary but not sufficient conditions were gained for the successful cooperation: cross-border regions with economically, socially and culturally integration; the overall plan for the involved region where the (legal, administrative) obstacles were identified; creation of a transnational platform where the stakeholders can cooperate directly to develop a common, comprehensive and integrated strategy for the modernisation and expansion of cross-border public transport.

This transnational study tried to cover many relevant research areas (PSC, SWOT, best practice) with all the relevant administrative, legal, organisational and cooperation aspects. Main findings were also identified, but the **main of the main conclusions** left to be mentioned:

- the cross-border PSC's have to be based on real cross-border travel demands;
- both the political and the policy will are a must;
- the transnational solutions are not possible without the commitment of all the involved stakeholders on national, regional, local level: authorities and the politicians.

List of tables

List of figures

Annex I - Distribution of ticket revenue between GySEV (HU) and ZSSK (SK)

Ticketing

The prices of tickets were defined on distance and target groups basis:

Full price tickets	**one way ticket**	**round-trip**	**round-trip (7 days)**	**round-trip (1 month)**
Destination HU 1 – Destination SK 1	1,50 EUR	2,00 EUR	8,00 EUR	22,00 EUR
Destination HU 1 – Destination SK 2	2,00 EUR	4,00 EUR	12,00 EUR	38,00 EUR
Destination HU 2 – Destination SK 2	3,00 EUR	6,00 EUR	24,00 EUR	78,00 EUR
Destination HU 3 – Destination SK 2	8,00 EUR	14,00 EUR	-	-

Children, dogs, bicycle	**one way ticket**	**round-trip**	**round-trip (7 days)**	**round-trip (1 month)**
Destination HU 1 – Destination SK 1	1,00 EUR	1,00 EUR	4,00 EUR	11,00 EUR
Destination HU 1 – Destination SK 2	1,50 EUR	2,00 EUR	6,00 EUR	16,00 EUR
Destination HU 2 – Destination SK 2	2,00 EUR	3,00 EUR	12,00 EUR	39,00 EUR
Destination HU 3 – Destination SK 2	4,00 EUR	8,00 EUR	-	-

Youth	**one way ticket**	**round-trip**	**round-trip (7 days)**	**round-trip (1 month)**
Destination HU 1 – Destination SK 1	1,00 EUR	2,00 EUR	6,00 EUR	18,00 EUR
Destination HU 1 – Destination SK 2	2,00 EUR	3,00 EUR	10,00 EUR	30,00 EUR
Destination HU 2 – Destination SK 2	2,50 EUR	5,00 EUR	16,00 EUR	54,00 EUR
Destination HU 3 – Destination SK 2	6,00 EUR	10,00 EUR	-	-

The contract defines the incentive fares and also the classes of reduced fare based on the international standard SCIC-NRT.

The contract is defined a really sophisticated system concerning the allocation of the revenue, which is based on mileage in the two border regions:

Distribution of ticket revenue between the two railway operators:

Destination HU 1			*Destination SK 1 - Destination HU 1*						*Destination SK 2 - Destination HU 1*						*Destination SK 2 - Destination HU 2*						*Destination SK 2 - Destination HU 3*	
			1 occasion		*7 days*		*1 month*		*1 occasion*		*7 days*		*1 month*		*1 occasion*		*7 days*		*1 month*		*1 occassion*	
Distance			*ZSSK*	*GYSEV*	*ZSSK*	*GYSEV*	*ZSSK*	*GYSEV*	*ZSSK*	*GYSEV*	*ZSSK*	*GYSEV*	*ZSSK*	*GYSEV*	*ZSSK*	*GYSEV*	*ZSSK*	*GYSEV*	*ZSSK*	*GYSEV*	*ZSSK*	*GYSEV*
			4 km	*4 km*	*4 km*	*4 km*	*4 km*	*4 km*	*15 km*	*4 km*	*15 km*	*4 km*	*15 m*	*4 km*	*15 km*	*17 km*	*15 km*	*17 km*	*15 km*	*17 km*	*15 km*	*56 km*
one way	full price	price	1,50 €						2,00 €						3,00 €						8,00 €	
		shares																				
	youth	price	1,00 €						2,00 €						2,50 €						6,00 €	
		shares																				
	children, dogs, bicycle	price	1,00 €						1,50 €						2,00 €						4,00 €	
		shares																				
round trip	full price	price	2,00 €		8,00 €		22,00 €		4,00 €		12,00 €		38,00 €		6,00 €		24,00 €		78,00 €		14,00 €	
		shares																				
	youth	price	2,00 €		6,00 €		18,00 €		3,00 €		10,00 €		30,00 €		5,00 €		16,00 €		54,00 €		10,00 €	
		shares																				
	children, dogs, bicycle	price	1,00 €		4,00 €		11,00 €		2,00 €		6,00 €		16,00 €		3,00 €		12,00 €		39,00 €		8,00 €	
		shares																				

Validity of the contract: 10.12.2017 – 08.12.2018. (Timetables 2018.)
Signatories: legal representatives of the two railway companies (GYSEV and ZSSK).
List of Annexes

- Annex 1 – Specimen of tickets

Annex 2 – Distribution of revenue