



EUSALP EU STRATEGY FOR THE ALPINE REGION

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AG4 DISCUSSION PAPER

ON SECONDARY NETWORKS IN THE ALPINE REGION



EUROREGION
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Tirol Südtirol Trentino
Tirolo Alto Adige Trentino



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The project is co-financed by the European Regional Development Fund.

EDITORIAL INFORMATION

Title: Discussion Paper on Secondary Networks

Version: Final 19.12.2018

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INTRODUCTION

EUSALP Action Plan {COM(2015) 366 final} in its Action 4 (“To promote inter-modality and interoperability in passenger and freight transport”), after recognising the significance of the trans-European transport network (TEN-T) and the core network corridors for the Alpine region, also points to the vital importance of regional and local transport links, which in the following are referred to as “secondary network”:

“Within the trans-European Network for Transport (TEN-T), the Alpine Region has a special place, due to its challenging geographical structures, its ecological systems and its transit function, leading towards a sensitive balance between ecological, economic and social parameters. Within the core Alpine Region, local transport plays a major role in maintaining a balanced demographic development of the area. Local communities are keen, as it clearly appeared from the public consultation, that regional and local railways and public transport in general, are upgraded and modernised. Connections between valleys or across passes are often insufficiently coordinated to allow for a systematic use of public transport. In order to improve this situation, better coordination intervention at a sufficiently large scale is necessary. Given that remote areas in the Alps are often closer to the border than to the regional or national capitals, the transnational dimension is very important. Cross-border projects on sustainable mobility have proven to be positive for the diffusion of innovative solutions, including e-bikes where appropriate.”

This is supported by a table enclosed in this chapter of the EUSALP Action Plan, where in the sense of AG4, as defined below, most of the examples of possible projects apply at least partly or indirectly to the “secondary network”, i.e.:

- Removal of infrastructure bottlenecks and bridging missing links, which would allow the improvement of inter-modality and interoperability, to the benefit of shifting traffic from road to rail.
- Development of access routes towards the cross-border projects.
- Coordination of local and regional transport planning at macro-regional level, which will allow for increasing the efficiency of existing networks and the share of population using less impacting transport means.
- Upgrading of local railways such as Turin – Aosta, Nice – Ventimiglia – Cuneo – Turin, Munich – Lindau – Bregenz – Zurich, Ulm – Friedrichshafen – Lindau,

Trieste – Ljubljana, Brescia – Edolo, Durance Valley, Milano – Tirano, Dolomiti valleys of Trentino.¹

- *Building on existing cooperation projects for reducing the impact of transalpine traffic and upgrading them at a macro-regional scale.*

Derived from the corresponding specifications in EUSALP Action Plan, the present initiative is based on the following definition of the “secondary network”, in contrast to the “primary” and “tertiary networks”:

While the overall transport infrastructure network is considered to be one coherent multi-modal entity, consisting of links and nodes of all modes of transport, it is, with view to its dominant functionalities, subdivided into a “primary”, a “secondary” and a “tertiary network”, which are equally multimodal and span the entire EUSALP macro-region. In the following, the plural “secondary network” is only used when distinguishing between the networks of the individual EUSALP regions.

Primary Network

The “primary” transport infrastructure network is characterised by its functionality connecting large urban and/or logistic nodes at European level, such as big cities, ports or intermodal terminals. Therefore, it carries a relevant portion of long distance transport or traffic, of course overlaid by regional or local traffic flows, in particular in nodal areas or densely populated regions. Formally, it mainly corresponds with the TEN-T core network, which is based on the same long distance transport functionality as described. However, it should also include links of the TEN-T comprehensive network that carry a relevant share of long-distance transport and, therefore, could or will be part of the future TEN-T core network. Among others, this applies in particular to Switzerland, where only the north-south corridor is part of the TEN-T core network, while even the main east-west oriented links, functionally corresponding to the core network, are part of the comprehensive network.

¹ Actually, some of these examples concern links of the TEN-T core network (Trieste – Ljubljana) or of the comprehensive network with core function (Munich – Lindau – Bregenz – Zürich).



TEN-T core network corridors relevant to the EUSALP Macro Region (Source: Veneto Region)

Another example stems from four Austrian regions, i.e. Carinthia, Salzburg, Styria and Upper Austria, which together pursue the goal to promote Tauern and Pyhrn-Schober axes, currently parts of the TEN-T comprehensive network, to become parts of the future TEN-T core network, in order to close a core network gap between the Western Balkans and Central Europe. Upgrading the Tauern railway line – mainly for fast passenger transport and light freight transport – and the Pyhrn-Schober railway line – mainly for heavy freight transport – in the TEN-T core network would be essential for an effective shift of international road transport to rail.

With view to this complexity, the more general name “primary network” is preferred to the specific terminus “TEN-T core network” in the context of this paper.

Secondary Network

Contrary to that, the **“secondary” transport network comprises all transport infrastructure that mainly serves intra-regional or even local transport, both of passenger and freight or that connects the territories of the Alpine regions to the primary network.** Functionally, the secondary network carries the lion share of transport and is crucial for social and economic life in the regions. Within and between them, they connect towns and villages in the flat country, in valleys and on mountains with each other. Figuratively, they are the veins that reach even remote

parts of the regions and transmit accessibility from the central areas and the interfaces with primary networks to the peripheries. On rail, this applies to regional and local railways, as well as to trams, which are the backbone of local public transport.

Tertiary Network

The “tertiary” network covers all transport infrastructure that is dedicated to purely local, small-scale accessibility, connecting individual objects, such as small urban or rural residential lanes connecting a limited number of houses, shops, farms etc. It serves almost exclusively these very local riparian residential or economic use.

While the primary network is in the focus of TEN-T and member state policies, with potential access to the corresponding funds, and tertiary network in the competence of municipalities, the secondary network, due to its functionality, is a key issue for the macro-regional level of EUSALP Action 4.

Whereas this definition applies to transport infrastructure, one has to take into account that, at operational level, regional or even local traffic may take place even in the primary network, which in this sense would include also secondary network functionalities. This applies to both private and public transport. For this reason, regional and local public transport services, also those provided in sections of the “primary” network, are considered in the framework of the “secondary” network, in this paper.

The secondary network, which is much denser than the primary network, contributes both to strengthening the efficiency of the primary network, promoting its wider utilization, and plays an active and practical part in the development and innovation that involves the multiple aspects of mobility in general. The paramount importance of secondary networks in all regions shows in the fact that, due to its density, it is longer by a factor of up to ten and even more, depending on the respective spatial structure, and total road and public traffic performance values clearly prevail, compared with the primary network.

In principle, all modes of transport exist in the EUSALP macro-region, including non-motorised forms as walking and cycling. Although there are also inland waterways (Rhine, Danube and Po river sections), the dominant modes are road and rail – or private and public transport, and their intermodal linkages, such as railway stations,



park&ride provisions, airports, bus terminals, rail-road terminals, sea and inland ports, which may belong to TEN-T core or comprehensive networks.

While at the level of the primary network, rail and road links and nodes are generally almost congruent, this is, by far, not the case in the secondary network. Even the most remote villages have a road connection, whereas apart from TEN-T, railways exist only exceptionally, mainly in suburban areas, in major valleys or where significant industry or mining developed in the 19th century. Secondary railway links are mostly “radial” connections from peripheral places to the respective centres, whereas most “tangential” connections, if ever, exist on road only.

This infrastructural imbalance between road and rail, which has in origins in ages before the invention of railways but has proliferated in the age of cars and trucks, is due to lower infrastructure and operation costs of road as well as its higher flexibility. On the other hand, it is this ubiquity of road infrastructure, which induces spatial structures that are fully dependent on road transport and contributes to the modal imbalance, causing correspondingly high greenhouse gas and polluting emissions and accident rates, while at the same time, in particular railways have been disregarded.

In many cases, particularly on rail, there are gaps between the secondary networks of neighbouring regions, mainly if separated by mountains, which may create accessibility deficiencies in valleys that are open for traffic only towards their mouths. Where such road connections between two adjacent regions do exist, insufficient bus services may be observed.

As already stated above, in the field of infrastructure, due attention must be given to all kinds of nodes and modal interfaces. In the field of operation, it may be necessary to better integrate the various kinds and levels of public transport networks (long-distance and regional railways, trams, buses, etc.) and to extend them into very remote or peripheral areas by more flexible demand-driven offers. In some well justified cases, it may make sense, even economically, to close network gaps of the infrastructure, if relevant improvements as regards accessibility, emissions or public transport use may be expected. In this context, in particular in Alpine regions, considering, beyond traditional infrastructure measures concerning road and rail, also innovative teleferic or cable car solutions, may be a reasonable option.

Finally, one should not neglect another aspect of the interdependencies between primary, secondary and sometimes even tertiary networks, in particular on roads:

Traffic tends to follow the least expensive way, taking into account both travel times, costs and “soft factors” such as comfort. In the positive way, this phenomenon may be used to establish incentives for modal shift. On the other hand, if for instance traffic on higher level roads is charged with tolls whereas the use of lower level roads is free, or if there are relevant (high quality) shortcuts in the lower level network or in the case of congestion, there is the tendency that traffic flows divert, at least partially. In such cases, appropriate avoidance measures are needed, to maintain traffic fluidity and protect the population living along the respective lower level roads.

Against this general background, this in-depth study is initiated within the remit of EUSALP Action 4, with the objective to investigate the state of secondary transport networks and of the requirements needed for their improvement, in acknowledgment of the interdependence, multiplicity and multi-modal structure of these connections.

In line with the overall objective of AG4, which is to promote intermodality and interoperability in passenger and freight transport, this requires a comprehensive view of sustainability, in environmental as well as in socio-economic terms, and of the relevance of existing services and their development, as well as innovative approaches to mobility itself. It appears necessary, therefore, to consider all relevant transport modes within the secondary network that are vital to EUSALP and essential to confirm or outline prospects of overall development.

Thus, the framework of secondary networks embraces a variety of aspects to be considered from infrastructural, as well as operational points of view, concerning the transport of both passengers and freight. This topic is also dealt with in several parts of the EUSALP AG 4 Mobility Work Plan 2017-19. Great emphasis is laid on the objectives of removing traffic bottlenecks, establishing connections where missing, incrementing combined forms of transportation, differentiating between long-distance journeys on rail and other sustainable modalities and short-range inter-regional journeys to promote modal shift from road to rail in both passenger and freight transport. Of high relevance is the optimisation of the connection of regional secondary networks with national and international, i.e. primary networks, to address an ever-increasing demand for transport and to ensure the attractiveness of an efficient use of the various sustainable transport modes.

The attention on secondary networks and modal shift requires a knowledge of the policies and objectives for transport and mobility development that are shared within the EU framework. It is also important to recall how the European Commission has recently completed its own agenda on the theme of “Europe on the Move – for a

safe, clean and connected mobility”. Starting in May 2017, this has given rise to a series of legislative proposals (a mobility package) for implementation and constitutes an agenda for a socially equitable transition towards sustainable mobility.

The present document, therefore, is the first step of an in-depth study of the topic of secondary networks as defined above. It is proposed to stimulate the debate on future mobility, both within the EUSALP macro-region and among private and institutional stakeholders, which shall be continued by initiatives and activities within the incoming AG4 Work Plan 2019 – 21.

An open comparative approach and close cooperation of stakeholders are needed to identify mobility modalities, including new ones, which can bring value to a specific territory, while acknowledging its correlation and connectedness with wider and more competitive environments. With the economic, social and environmental needs of the EUSALP regions and the objectives of Action 4 in mind, one can conclude, extracting two main thematic areas to be investigated in the context with the secondary network:

Thematic area 1:

The impacts of the secondary network on accessibility and possible measures to maintain and improve it, with view to economy and society.

Thematic area 2:

The impacts of the secondary network on environment and climate, including possible measures for improvement, in particular by modal shift.

Upon invitation, a number of EUSALP AG4 members have supplied written contributions to several aspects of these main topics, extracts from which have been summarised and commented in the following chapters 1 and 2, to be also used as a basis of the present document. The originals as received can be seen in the Annexes 1 and 2, in line with the above defined thematic areas.

Intermodality and interoperability of secondary networks appear to be of primary importance in order to promote modal shift. This requires the various stakeholders to re-appraise their approaches on intermodality, transportation flow management, protection of the territory, and the function of nodes, including ports and combined transport terminals.

The second element of importance is the relationship between a secondary network and accessibility in terms of management, maintenance, safety, socio-economic sustainability and a sustainable transportation system.

Such improvements may be infrastructural, but regulatory, organisational or operational measures should be given preference, as they are generally less expensive, faster to implement and, if unsuccessful, easier to adapt or to abolish.

This paper should be a first instrument to networking as well as to building up a synthesis to achieve more targeted policies for mobility and transport, giving practicality to the objectives of the EUSALP macro-region, by adequately tackling the development and integration challenges that the current situation demands.

The introduction of the Annex of this document comprises surveys of the existing transport infrastructure networks of EUSALP member regions, namely of Slovenia and the Autonomous Region of Trento, which have delivered such general overviews.

1. THEMATIC AREA

The impacts of the secondary network on accessibility and possible measures to maintain and improve it, with view to economy and society

1.1. General Overview

The very and fundamental justification of the existence and further development of the secondary network, including private and public transport, consists in providing the needed accessibility to all parts and municipalities of each region (mutually and from its centres or from the primary network or across regional borders) and, including tertiary network elements, of every building and house. An efficient secondary network is therefore a key precondition for mobility as well as economic and social life. On the other hand, mainly caused by the traffic flows, it affects territory, environment, climate and health. In order to enhance sustainability, these negative impacts can and must be reduced by accompanying measures or – better – by shifting traffic to ecologically more compatible modes.

Accessibility improvements, including of the more peripheral and less populated areas, need specific considerations and solutions, in order to prevent depopulation of mountain areas and to favour the preservation of balanced environmental conditions. Sustainability and its multiple forms and opportunities are important aspects to be addressed, in this context. This implies more articulated solutions to be developed. In addition to switching road traffic to railways, at least on medium- and long-distance routes, a more efficient public transportation service must be promoted, together with a more widespread practice of car- and vehicle-sharing, car-pooling, on-demand public transport and the use of electrically powered vehicles.

The package of mobility measures presented by the European Commission under “Europe on the move – an agenda for a socially equitable transition towards clean, competitive and interconnected mobility for all” is a groundwork for reflection and action. The necessary measures to ensure the reduction of vehicle emissions to levels within European parameters, better road safety conditions and reduced traffic congestion, should involve the “polluter-pays” and “user-pays” principles, making use of digitalisation and network effects, to engage institutions as well as enterprises. It is equally important to involve the public, granting access to the process of

transformation, to take advantage of the benefits of the modernisation, with awareness and confidence.

As regards the infrastructural network, both of the road and the railway systems, improvements and maintenance have to be planned and prioritised by optimising costs, while taking into account mobility needs. An on-going monitoring activity is useful, to proceed with ordinary and extraordinary interventions, with the targets:

- promoting road safety,
- facilitating service accessibility and sustainability and
- contributing to the reduction of adverse impacts.

As regards the revolutionary impact of the new technologies that are redrawing and modifying all kinds of activities and systems, considerations are needed of their overall effects on accessibility and environment, as well as on the availability of the necessary resources.

Not covering this thematic area entirely and exhaustively, the following aspects have been particularly highlighted in the contributions delivered by AG4 members:

- Sustainable and economically efficient accessibility, in particular of peripheral or weak demand areas;
- Management capacity and maintenance of the network;
- Cross border links.

Furthermore and apart from these specific aspects, Austrian regions, in particular Styria, have reported of their common efforts to promote Tauern and Pyhrn axes, which are currently parts of the TEN-T comprehensive network, to be adopted for the future TEN-T core network, with the option to form a new core network corridor that would connect Germany and Czech Republic with the Western Balkans, Greece, Bulgaria and Turkey.

1.2. Sustainable and efficient accessibility, in particular of peripheral or weak demand areas; new forms of transport

Weak-demand areas are characterised by low population density, usually in the periphery of a region, often at levels below-average of economic development and therefore at risk of depopulation. Demand is weak, because it is low in absolute

terms and geographically rarefied because extremely dispersal. The Alpine range shows a compendium of these situations.

Improving accessibility may be key, in particular for remote areas, to support their economic development. In general, this would ease everyday life of commuters, by enabling them to commute on a daily instead of a weekly base, and contribute to keep them resident. In the best case, it may even contribute to attract economic life to remote areas. Only in extreme cases, the adverse effect may occur, which means that thorough investigations are needed in each case before making decisions.

Given the low demand in scarcely populated areas and the high costs of traditional forms of public transport, its operation at acceptable economic efficiency is impossible – a problem that is aggravated today by spending review policies. Therefore, investments in remote areas are predominantly made in road infrastructure. Consequently, for residents of remote areas, private cars are the backbone of mobility. Cars are steadily available, but, on the other hand, people are dependent on their cars. Given the low density of the population, traffic is not dense there, either, and consequently, environmental and climate impacts are relatively low, as well. Thus, the main problem emerges from the exclusion of persons that do not dispose of or are not able to drive a car of their own, such as children, elderly or handicapped people, or those who simply cannot afford it.

Mobility services within weak-demand areas should therefore aim at responding to the needs in terms of economic sustainability as well as social equity. The key words are integration, inclusion, sharing, flexibility and innovation. The aim of analyses of the so-called “weak-demand” areas is to explore, as an alternative, the feasibility of innovative mobility services, which are socially, environmentally and economically sustainable, but would better respond to the needs of the population than conventional public transport services.

Hence, the goal of sustainability in transport must comprise private and public transport of passengers and freight on all modes. Moreover, mobility is moving increasingly towards using rather than owning. Transport planners need to consider alternative offers and to adapt the services to the conditions of territories, cities, peripheral areas. In this respect, public transport operation needs to be reinvented, to include all forms of mobility, especially shared ones, and improve the interconnection between all modes, to make for an attractive offer and to increase flexibility in order to reach all citizens. Innovative and flexible business models are required to accelerate the implementation of on-demand, low-emission mobility.

New technologies have the chance to make transport more efficient, sustainable and interconnected. The rise of mobile apps certainly support the uptake of on-demand transport and other new forms of mobility and spur the integration of modes, for example in travel planners. Also, the evolution of automated driving technologies can bring new opportunities in linking sparsely populated areas to the main transport corridors.

A discussion on sustainable transport must also consider the development of low-emission vehicles to replace conventionally-fuelled transport. These efforts and the subsidies in electro-mobility reflect this current trend. Sufficient availability of charging stations is crucial for the successful market uptake of e-mobility in individual and public transport including car sharing systems. The Interreg Alpine Space project “e-MOTICON”² addresses this challenge with the goal to offer a transnational strategy for harmonising e-mobility deployment and interoperability of charging stations. The development of self-driving vehicles would offer services comparable to traditional local public transport, but at lower operating costs.

Sustainability in transport deals with the public and private programmes and challenges of development in the next years. A wider use of the public transport, research on and diffusion of electric mobility, car sharing, carpooling, and interaction with new technologies require to think of mobility in a completely new way. Transport planners need to consider alternative offers and to adapt the nowadays services to the conditions of territories, cities, peripheral areas. One of the key question is how shared, customised, on-demand services can be combined and integrated into the overall public transport offer, to facilitate door-to-door mobility, also to the least populated areas. Moreover, not only residents should be addressed, but also tourists. Hence intermodality in the EUSALP Region also means linking tourist facilities such as cableways to public transport.

One of the future key questions is how shared, customised, on-demand services can be combined and integrated into the overall public transport offer, to facilitate door-to-door mobility, also to the least populated areas. Moreover, not only residents should be addressed, but also tourists. Hence intermodality in the EUSALP Region also means linking tourist facilities such as cableways to public transport.

Service operators and authorities, carriers and means of transport alike, should embrace a vision of “mobility as a service” and propose an attractive offer to their

² <http://www.alpine-space.eu/projects/e-moticon/en/home>



users: Rather than potentiating conventional public transport services – defined by rigidly set transit routing and scheduling, even if the number of passengers is very small – a demand-responsive transport scheme should be considered. This means flexible, call-based services that operate vehicles according to real needs and may vary transit routes depending on demand of everyday users. Carpooling, collective taxis, on-call buses and car sharing are all part of the family of demand-responsive transport services.

These services require IT application platforms to structure the offer according to a variable demand and to provide timely responses to users (possibly in real-time) who request a journey by entering pick-up and drop-off location and stating when they wish to travel. Hypothetical scenarios offering solutions more likely to be adopted are:

- Carpooling among the population, making use of a favourable social context, where mutual acquaintance is a feature of small communities (fellow inhabitants of the same locality, workers from the same district, interest groups practising the same activity, etc..
- Setting up an on-demand transport booking service using a fleet of small vehicles (such as nine-seater passenger vans), to integrate or extend an existing extra-urban regular service outside of scheduled hours.
- The possibility of replacing the entire regular extra-urban public service (except on school bus routes) with such an on-call service, setting up consolidation points for the extra-urban service to be explored after an initial activation phase of the on-call service in which on-demand vehicles complement the regular service.

These so-called demand-responsive transport (DRT) systems can vary significantly, depending on the specific target to which they are directed. Their geographic flexibility, for instance, can be measured in relation to whether the service is organised:

- with set routes and pre-booked stops, usually operating in association with a fixed schedule;
- with set routes and deviations possible only if pre-booked, usually according to a fixed schedule;
- without set routes but with fixed stops which must be pre-booked, usually within a flexible scheduling;
- without set routes or stops (door-to-door), usually within a flexible schedule.

On-call types of services can also target:

- some specific points such as hospitals, public buildings, markets, industrial zones or tourist attractions;
- some specific passenger categories with special needs, such as disabled people, the elderly, the young, workers, etc., or a generic population;
- some specific days and/or hours such as night-time services, services outside regular service hours, market days or specific public services, etc..

From a technological point of view, ideal solutions for efficiently implementing solutions as outlined above are from the very start based on the concepts of service integration, flexibility, inter-operability and optimally serving users' needs. A simple intervention that could be done without altering current conditions, would be the creation of an IT platform on the web (e.g. with an app) enabling users to access all transportation information available through a single procedure.

The choice of new services calls for a participation process involving all stakeholders in the territory, from local bodies to transportation companies, private service providers, carriers with their own fleets who undertake transport services on behalf of their customers/associates and demand-side stakeholders. Such new services will presumably require public subsidies. Depending on the type of organisation involved, local bodies will have to make provisions for their financial sustainability. In legal terms, today's sharing mobility ranges between public transport, taxi services, and hired vehicle services with or without a driver. The innovative scenario in which a private vehicle with or without a driver is shared and involves a concomitant monetary transaction should be investigated more thoroughly in all its legal aspects, prior to possible experimentation.

1.3. Management capacity and maintenance of the network

The secondary road network connects all territories to an inter-regional motorway system, or to air or rail transport networks. Even excluding local urban traffic flows, it generally accounts for more than 90 per cent of the total road traffic load in any territory. It is estimated that the secondary road network

- carries a light-vehicle traffic volume (measured in vehicles per km of road) that reaches a rate similar to traffic recorded on the main road network;
- sees heavy vehicles using the secondary road network accounting for up to 50 per cent of the traffic volume recorded on the main road network.

The mere extent of the secondary road network and the large traffic flows confirm the strategic importance of this network in the connectivity of all regions. A specific feature of the secondary network is that almost the entire private light-vehicle and public bus traffic represent commuting, personal settlements such as shopping or educational short distance trips. This implies that most of the private road users are accustomed to local trips and are thus ready to face, for instance, adverse weather conditions, also in winter, while they also require a permanently high level of safety and greater transit time reliability. In this context, maintenance of the existing infrastructure generally prevails the construction of new one.

In most of the EUSALP regions there are abundant rainfall and/or difficult winter conditions, so that deterioration evolves rapidly, both in the substructures and in the surface of roads. Maintenance programmes must therefore be flexible enough, to be carried out when needed.

Against this background, ordinary and extraordinary maintenance work must be planned well in advance, to prevent the deterioration of road surfaces and their relative structures, and to ensure the safest possible roads for users.

However, in contrast to most of the main road network, no road charges are levied in the secondary road network. Thus, in many regions, the continuous preventive type of maintenance suffers from an increasing scarcity of financial and human resources for this type of activity. Therefore, in some cases, a transition from a “preventive” to an “accident-based”, or “malfunction-responsive” type of maintenance can be observed, with increased delays in road repair.

Another important element for the management of a network of roads, including secondary, is real-time information on actual conditions to be provided to users. Running such services can be quite demanding, because of the difficulty of gathering this type of information and because of the rapidity with which possible problems may emerge.

With reference to environmental issues, the importance of noise protection must be emphasized, also on secondary roads. Thus, for this type of roads as well, acoustic mitigation interventions must be foreseen., e.g.by 'sound-absorbing' asphalt or 'acoustic' barriers.

1.4. Cross-border links

While the primary network (TEN-T core network including parts of the comprehensive network and the core network corridors) by their methodological definition carry international and/or interregional traffic flows, the secondary network is more focussed on intra-regional or local traffic. In many cases the secondary network is linked across borders, even across mountain passes, but rather on road than on rail. However, even where infrastructural connections exist, public transport is missing or, at least, insufficient.

There are concrete proposals and initiatives to close some of these border crossing gaps, in a few cases by new infrastructure, in some other cases by new public transport links.

1.5. Contribution of EUSALP AG4 Members to Thematic Area 1

The complete papers as delivered by EUSALP AG4 Members can be found in the Annex.

	Sustainable and efficient accessibility, in particular of peripheral or weak demand areas; new forms of transport	Management capacity and maintenance of the network	Cross-border links
Aosta Valley	Different systems of on-demand services in low demand areas; lack of funding for infrastructure, maintenance and services, due to unbalanced commercial costs-benefits		
Bolzano	Integrated services at regular intervals; subsidies for e-cars and car sharing,	Enhancing efficiency of maintenance, to keep a higher safety level	

	improving charging infrastructure		
Friuli Venezia Giulia			Friuli Venezia Giulia is claiming that non-harmonised national regulations affecting cross-border public transport (all modes). Yet, the FVG region is linked to Austria (Villach) and Slovenia (Ljubljana) through direct railway services, also co-funded by EU projects – CONNECT2CE and CROSSMOBY respectively.
Liguria	5 public transport operators, with rail as a backbone; providing different systems of on-demand services in low demand areas (peripheries)		
Piedmont	Different systems of on-demand services in low demand areas		
Slovenia	Comparing traffic volumes and growth with other Alpine regions; providing infrastructure for alternative fuels; pointing to vicious circle of dispersed settlements and high use of private cars.	Significant reduction of accidents due to focusing on safety; eliminating weakness of railway network.	Intending to improve cross-border public transport for efficient mobility of passengers and goods, in particular along corridors; free cross-border mobility for daily commuters.
Styria	High potential demand for public transport in low density areas due		Intending to close gaps of cross-border railway or public



	to tourism; special offers for tourists to avoid closing regional railway lines.		transport links to Slovenia and Hungary, to enhance cohesion.
Switzerland	Pilot use of autonomous buses in 6 urban areas, on-demand services, shared mobility already in use.		
Trentino	Studying rapid bus transit (RBT) in dedicated bus lanes, public road transport and light transportation for commuters (cycling, e-cars, shared mobility).	Maintaining and improving tunnels and bridges.	
Tyrol	Investigating corridors for a direct rail link to Ausserfern district.		



2. THEMATIC AREA

The impacts of the secondary network on environment and climate, including possible measures for improvement, in particular by modal shift and traffic management.

2.1. General overview

Whatever the purpose for implementing transport infrastructure is, impacts on the environment are inevitable. Apart from the construction phase, the infrastructure itself implies land consumption and soil sealing, furthermore there is an impairment of the landscape, especially in mountainous areas.

The main impacts, however, emerge from traffic flowing on the infrastructure, affecting environment and climate: polluting, greenhouse gas and noise emissions. They correspond with traffic volumes, the share of heavy goods vehicles, average speeds and specific local conditions such as gradients. Whereas road traffic is a source of all these emissions, those due to rail traffic is largely restricted to noise. Most of these emissions, as well as accidents, affect health and endanger lives.

Traffic volumes depend on the potential traffic demand, the available infrastructure of all modes (network shapes, design speeds and capacities), the general legal framework and generalised costs (resulting from infrastructure charges, fuel costs, transport times and possible transshipments), against competing modes of transport. They are however independent of externalities, which are charged to society, presently or in future, but not by users. With view to the necessary trade-off between society, economy and environment, management of traffic flows is becoming increasingly challenging, while heavy goods traffic on the Alpine crossing corridors increase. Considering the amount of vehicles, the importance of the secondary connections for the local economy is evident.

Undesired impacts on the environment can be coped directly with by specific measures, such as the construction of noise protecting walls, green-bridges, tunnels, etc. or by an appropriate traffic management, in particular by shifting traffic flows to modes that are ecologically more sustainable. Full internalisation of external costs could be a key measure for modal shift, to achieve a higher degree of sustainability in the field of transport (and others). The best way to reduce undesired effects would

however be avoiding traffic as far as possible by new, innovative forms of economy, e.g. by measures like tele-working or creation of jobs close to where people live. Internalisation of external costs would certainly contribute to this goal.

2.2. Protection of territory, environment and climate

Thus, the “protection of the territory”, or “of territories”, should be construed according to a wider vision, including the various factors playing a role in the evaluation of the requirements and objectives needed to define efficient secondary networks. Given that the transport system constitutes a fundamental and indispensable factor in the organisation of communities, three interdependent elements immediately come to the fore:

- the relationship with the environment,
- the relationship between transport and economics
- and with the social context as a whole.

Considering the harmful impact of transportation on the environment, the 2011 White Paper, which deals with all modes of transport, includes a strict schedule for the reduction of emissions with targeted objectives and clear guidelines (2020/2030/2050). Among other objectives, the intention is to provide guidance for evolving industrial sectors. The progressive goal of zero-emission transport can only be achieved through the active participation of the business world and of society as a whole, through concrete actions and a new culture of mobility. Among the main objectives, there is:

- the commitment to transfer freight from road to rail for journeys of 300 km or more,
- the completion of the TEN-T core network before 2030,
- the full application of the “user pays” and the “polluter pays” principles,
- the halving of traditionally fuelled vehicles in urban transportation by 2030 and their complete elimination by 2050,
- the cutting of road accidents by half,
- the enhancement of information and
- the use of innovative technologies in transport.

Clearly, these objectives, and others correlated to them, require specific attention to the impact of the infrastructural aspects of transport supply side and its related services on economic relationships. The involvement of economic entities, which

remains equally indispensable, will be in response to and induced by a partially different assessment of sustainability.

The social context of mobility encompasses aspects inherent to climate, energy and the application of new technologies and should provide guidance for quality in development. EUSALP may be able to contribute to the implementation of the territorial transformation objectives in the above-defined sense, both through the transfer of knowledge concerning the various characteristic contexts and through the sharing of a good-practice culture.

More in-depth considerations show, that in the sense of sustainability, it is not sufficient to reduce air pollution and noise due to transport, but more basically, the overall target should be a sustainable type of economic development, aiming at a form of 'welfare' that supports growth, employment and social inclusiveness at regional level.

2.3. Traffic management and modal shift

Against this background, multimodality and modal shift are one of the key strategies to reduce polluting and greenhouse gas emissions of traffic for transport, also in the secondary network, in particular in the Alpine Region. Measures to achieve a higher share of rail are manifold, covering a harmonised infrastructure charging policy, preferably internalising the external costs of detrimental emissions, but as a precondition, providing sufficient capacities of the railway network and the existence of attractive logistic hubs, i.e. ports and terminals, in all regions. However, at the level of the secondary network, there are severe physical restrictions: While passengers may use regional or local railways or other public transport means branching off the main ("primary") routes, this may not be possible for freight, due to missing transshipment areas outside central areas of a region. Bridging the "last mile" is therefore a challenge to be tackled within a regional focus.

As an optimisation in this context, different forms of "combined transport" have evolved. This means that goods are collected within the region of origin and distributed within the region of destination on road, while the long-distance share of the transport is carried out by trains. The transshipments between the two modes is carried out in appropriately equipped multimodal terminals.

European policies and legislation on transport and mobility have, for a long time, underscored the necessity of shifting traffic from road to rail as a priority, while promoting a plurality of transport modes and improving integration between long-distance and local system modalities.

As regards tolls and tariffs, the Eurovignette Directive (COM(2017)275), currently under revision, the studies on “Toll Plus” carried out by the Suivi de Zurich and the in-depth analysis on regional transport in the frame of a Toll Plus system³, carried out by the iMONITRAF! network, are of highest relevance. These studies also demonstrate the complexity of treating regional transport in toll systems, especially when respecting the EU principle of non-discrimination. In order to counteract the negative effects on the regional economy and to reduce diverted traffic of Alpine crossing HGV, effective measures at regional and national levels could be discussed, taking into account a different application of tolls in the EUSALP area such as existing regional exemptions.

If, so far, attention has been focused on the development of the TEN-T network and of its core corridors, it is also necessary to ask how such an approach can be made to tally with regional transport policy and how the requirements of both can be treated coherently, on an equal basis. To this end, it is relevant that the European programming rules regarding project financing after 2020 are currently being revised and that these may be of interest also for secondary transport infrastructure, as the new rules are expected to provide access to significant resources.

Multimodality and modal shift in secondary networks encompass a strategic vision for the promotion of all transport modes, including intermodal hubs, which may or may not be aligned with the European core network corridors. This includes the need to assess how traffic flows on roads and how modal interchange capacity, especially regarding freight, can be improved. Attention must be given to improve logistics, last-mile connectivity, the competitiveness of multimodality and a widespread use of the new technologies.

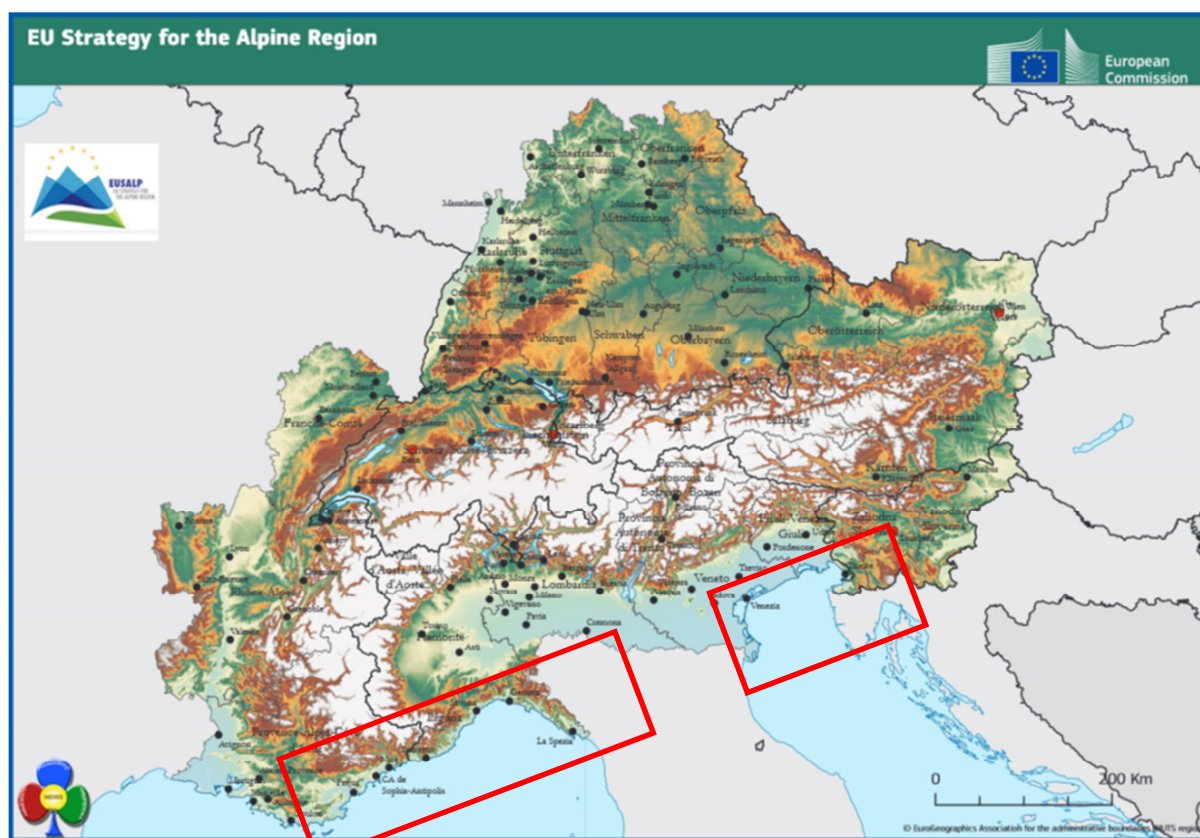
Apart from the generally intended and pursued modal shift, also an unintended shift of routing may be observed, mainly as a consequence of unbalanced road charges, not only between corridors, but also within a corridor, from primary to secondary

³ In depth analysis to further develop the iMONITRAF! proposal: Regional transport in the frame of a Toll Plus System, December 2017
(<http://www.imonitraf.org/DesktopModules/ViewDocument.aspx?DocumentID=jKpY7HVsQ9g=>)

roads. At local level, also shortcuts may induce such undesirable shift to secondary roads, which has proven an onerous and unacceptable burden for the affected areas.

2.4. Seaports and inland terminals

Seaports

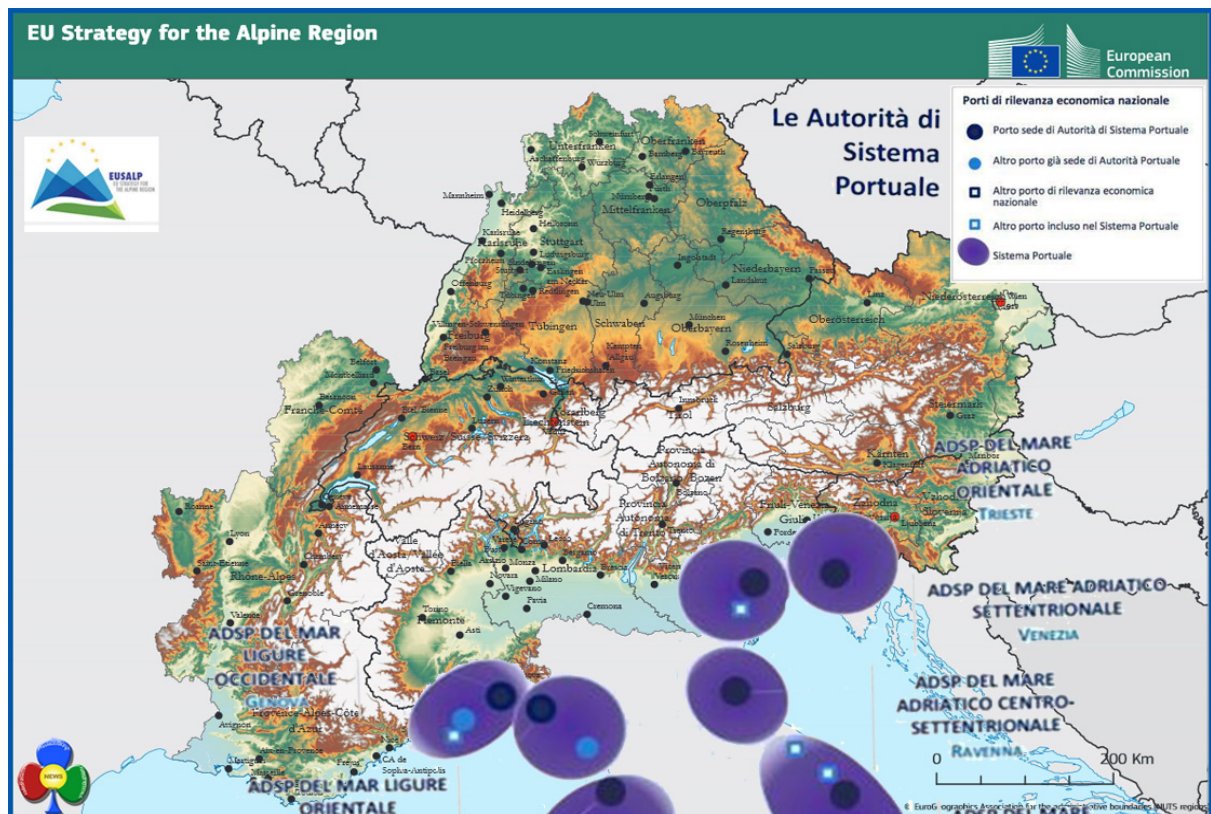


The seafront of EUSALP macro-region

In line with EUSALP Action Plan and the terms of reference for AG4 and considering the fact that each mode of transport has its peculiarity, the role of seaports is crucial to promote multimodality and interoperability in passenger and freight transport”, also in the context with the secondary network, in full synergy with the core networks.

Relevant ports in the EUSALP Macro Region are in the south of France (Nice and Marseille), in the north of Italy (Savona, Genova, La Spezia, Venezia and Trieste), and in Slovenia (Koper). The north of Italy is characterized by a system of “Port Authorities” as shown below. They are connected with a system of “inland terminals” or “logistic platforms” located in the north of Italy and in other parts of the EUSALP macro-region, as shown by the following images. Thus, the north of Italy can be seen as a single big system for the mobility of freight.

Only with a strong integration of ports and combined transport terminals in the core and the comprehensive TEN-T, as stipulated also by the EU Regulation 1315/2013, one of the most essential objectives of EUSALP can be achieved, i.e. “to ensure accessibility and connections to all the inhabitants of the Alpine region”, both for passengers and freight. The infrastructural system must be modernised in line with the European documents (White Paper for Transport, TEN-T and CEF Regulations), by strengthening both the European corridors and the secondary network, in order to adequately connect the territories, including “weak” ones. New ways of managing the port system and its connections with the territory, also by developing integrated plans, completing the dry port infrastructure as well as railways and roads accessing ports, may take advantage of current and future “European Funds for Strategic Investments”.



Seaports in northern Italy

It is evident that the ports in the European Union generate important effects on supply chains, economy and employment. According to EU forecasts, a 50% increase of the goods managed in the ports of the EU may be expected, which will cause economic growth and create a large number of new jobs. The development of the core ports should be part of a connectivity strategy that shall include also the strengthening of the secondary networks.

Inland terminals

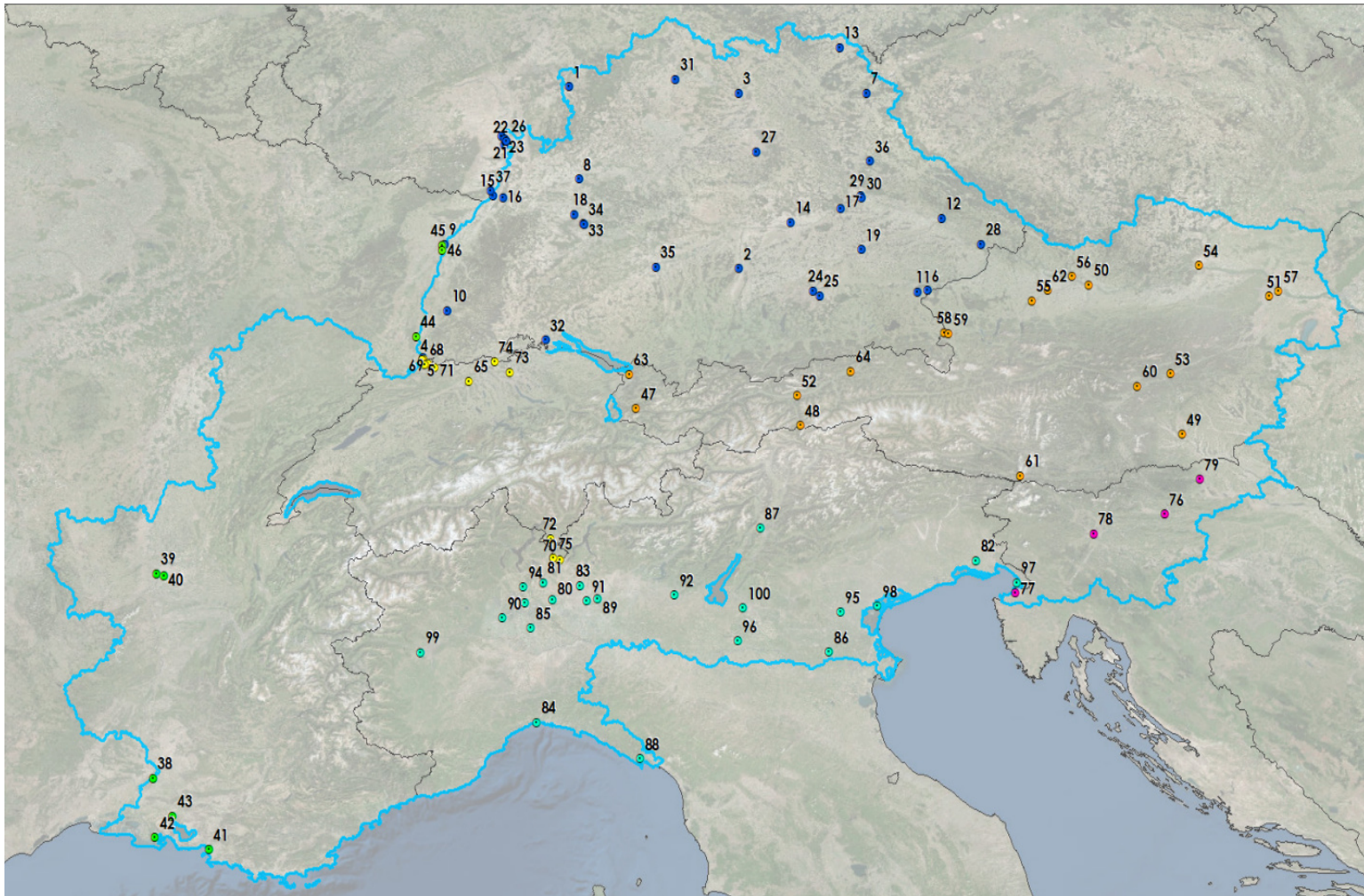
Intermodal terminals or “interports” are the infrastructural nodes for the transshipment of loading units from one transport mode to another, mostly road and rail, as well as their storage, which is sometimes accompanied by ancillary services, such as repair of containers, etc. They are characterised by the transport modes that they connect and the way transshipment between the modes is done. Some of the inland terminals act as “dry ports”, which means that they correspond functionally with certain seaports.

The EUSALP macro-region includes 100 main intermodal terminals as listed below: 18 in Austria, 9 in France, 37 in Germany, 21 in Italy, 4 in Slovenia and 11 in Switzerland. Two main types can be identified: the maritime and the continental ones. The former, related to the presence of important international ports (e.g., Trieste, Venice, Genova), have been described in 2.4. The latter, which are the most numerous, include terrestrial transport modes (road and rail). Finally, some intermodal centres located along the main rivers are also present, e.g. Weil (Rhine), Enns-Hafen (Danube) may also serve barges or boats, in combination with road and rail.

The proximity of the terminal to the main transport infrastructures, such motorways, highways, railways, inland waterways and sea highways determines its accessibility, which, on turn, affects the functionality, i.e. the origin and destination of the goods and the frequency of the services. For the attractiveness of terminals for combined transport, the facilities and services for a competitive transshipment are crucial. The typical process performed includes the cargo check, the export treatment of the container, the processing of the consignment by the agency of the operator, the temporary storage, the loading onto the freight wagon and the composition of the train. Basically, two kinds of services are provided, one related to the basic handling of the loading units, the other one to supplementary services regarding security, customs, container maintenance, container repair, container cleaning, dangerous goods, reefer, trucking, etc.

As regards the transshipment road – rail, several methods can be distinguished, i.e. “accompanied” and “unaccompanied” combined transport, depending whether the tractor units of the trucks do or do not accompany the load units. Unaccompanied combined transport includes several systems for the transshipment of non-cranable or crunable trailers, containers and swap bodies.

These aspects influence two main indicators of the competitiveness of intermodal terminals, i.e. operational costs and times, which can contribute in explaining the total volume of goods handled in a terminal. In the EUSALP macro-region, volumes may be very different.

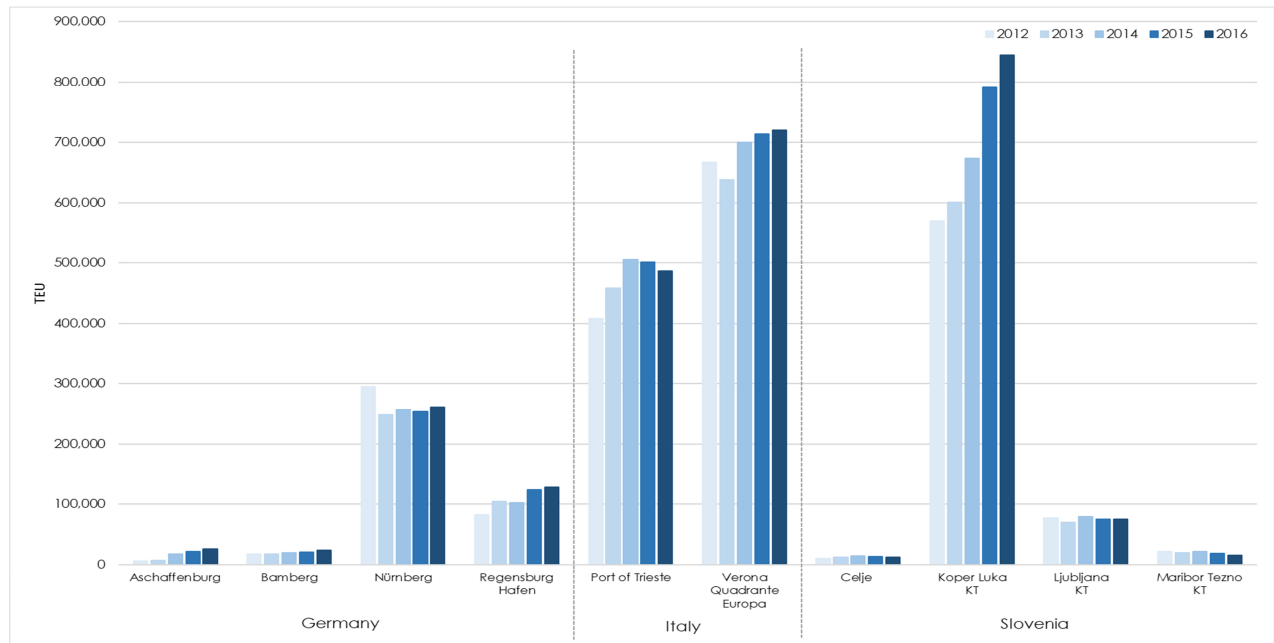


Intermodal terminals in the Alpine macro-region (map)

1	Aschaffenburg (DE)	26	MCT Mannheimer Container Terminal (DE)	51	Güterzentrum Wien Süd (AT)	76	Celje (SI)
2	Augsburg-Oberhausen (DE)	27	Nürnberg (DE)	52	Hall i. T. CCT (AT)	77	Koper Luka KT (SI)
3	Bamberg (DE)	28	Passau (DE)	53	Kapfenberg CCT (AT)	78	Ljubljana KT (SI)
4	Basel - Weil am Rhein (DUSS) (DE)	29	Regensburg Hafen (DE)	54	Krems a.d. Donau CCT (AT)	79	Maribor Tezno KT (SI)
5	Basel - Weil am	30	Regensburg Ost (DE)	55	Lambach (AT)	80	Arluno (IT)

	Rhein (Rheinhafen) (DE)					
6	Burghausen (DE)	31	Schweinfurt (DE)	56	Linz Stadthafen CCT (AT)	81 Busto Arsizio-Gallarate (IT)
7	Cargo Center Bayern (Wiesau) (DE)	32	Singen (DE)	57	Port of Vienna (AT)	82 Cervignano (IT)
8	Container-Terminal Hafen Heilbronn (DE)	33	Stuttgart Container Terminal SCT (DE)	58	Salzburg CTS (AT)	83 Desio (IT)
9	Euro Terminal Kehl (DE)	34	Stuttgart Hafen (DE)	59	Salzburg Hbf- ROLA (AT)	84 Genova VTE - Port (IT)
10	Freiburg (DE)	35	Ulm (DE)	60	St. Michael CCT (AT)	85 Intermodal terminal of Mortara (IT)
11	Gendorf (DE)	36	Wackersdorf (DE)	61	Villach Süd CCT (AT)	86 Intermodal terminal of Rovigo (IT)
12	Hafen Deggendorf (DE)	37	Wörth (DE)	62	Wels Vbf. CCT (AT)	87 Intermodal terminal of Trento (IT)
13	Holf (DE)	38	Avignon (FR)	63	Wolfurt CCT (AT)	88 La Spezia Container Terminal (IT)
14	Ingolstadt (DE)	39	Lyon Terminal SA (FR)	64	Wörgl CCT (AT)	89 Melzo (IT)
15	Karlsruhe (Contargo) (DE)	40	Lyon Terminal Venissieux (FR)	65	Aarau (CH)	90 MGDV Vercelli (IT)
16	Karlsruhe (DUSS) (DE)	41	Marseille (FR)	66	Basel – Kleinhüningen (CH)	91 Milan CT-terminals (IT)
17	Kelheim Hafen (DE)	42	Marseille Port and Marseille FOS (FR)	67	Basel – Swissterminal (CH)	92 Nord-Est Terminal S.P.A. (IT)
18	Kornwestheim (DE)	43	Miramas (FR)	68	Basel Wolf (CH)	93 Novara CIM (IT)
19	Landshut (DE)	44	Ottmarsheim (FR)	69	Birsfelden (CH)	94 Oleggio Terminal (IT)
20	Ludwigshafen (Contargo) (DE)	45	Strasbourg Terminal Conteneurs Nord (FR)	70	Chiasso (CH)	95 Padua Interport Terminal (IT)
21	Ludwigshafen KTL (DE)	46	Strasbourg Terminal Conteneurs Sud (FR)	71	Frenkendorf (CH)	96 Port of Mantua – Valdaro (IT)
22	Mannheim Container-Terminal Contargo (DE)	47	Bludenz CCT (AT)	72	Lugano Veduggio (CH)	97 Port of Trieste (IT)
23	Mannheim-Handelshafen (DE)	48	Brennersee (RoLa) (AT)	73	Niederglatt (CH)	98 Port of Venice (IT)
24	München CDM (DE)	49	CCG Cargo Center Graz (AT)	74	Rekingen (CH)	99 S.I.TO Interport of Torino Orbassano (IT)
25	München-Riem (DE)	50	Enns Hafen CCT (AT)	75	Stabio (CH)	100 Verona Quadrante Europa (IT)

Intermodal terminals in the Alpine macro-region (table)



CT volumes for selected intermodal terminals in the EUSALP macro-region

2.5. Contribution of EUSALP AG4 Members to Thematic Area 2

The complete papers as delivered by EUSALP AG4 Members can be found in the Annex.

	Protection of territory, environment and climate	Traffic management and modal shift	Seaports and inland terminals
Aosta Valley	Demanding a more balanced distribution of traffic flows		
Bolzano	Trying to solve noise and air pollution problems	Commitment for combined transport subsidies; revision of A22 concession, to include external costs and to harmonise corridor tolls	Macro-regional view to seaports and hinterland terminals
Carinthia			Suggesting fostering cooperation of seaports and hinterland terminals; has delivered map and technical details of F�rnitz terminal
Friuli Venezia Giulia			Claiming for a better coordination of stakeholders north and south of the Alps, with focus on intermodality
Liguria			Pointing to the role of Ligurian seaports, the potentials of sea cargo flows from Far East through Suez Canal and the competition of land transport

Slovenia	Adequate protection against noise and environmental impacts existing along motorways, not along secondary and urban roads	Describing existing and planned infrastructure and the existing toll system; objectives to improve accessibility, mobility, supply for economy, road safety and to reduce energy consumption, costs and environmental impacts; emphasising infrastructure quality as a basis for homogeneous regional development	Paying attention to extending Koper, the most important seaport for Slovenia and Central and Southeast Europe, concern also for airports
Styria	Pointing to high density and polluting traffic in and around Graz and dense road traffic in highest touristic and worth protecting areas Enns valley (NATURA 2000) and Salzkammergut, which should be shifted to more sustainable modes.		Mentioning the ongoing extension of Cargo Centre Graz, to connect regional enterprises with TEN-T core network
Ticino		Exploiting main axes for innovative, sustainable mobility, to enhance polycentric development	
Trentino		Explaining governance of trunk and regional transport infrastructure; promoting better integration of modes,	Intending to attract, by specific incentives, intermodal transport through Roncafort terminal

		modal shift, reducing congestion and enhancing public transport	
Tyrol		Restricting heavy goods vehicles to motorways, to protect local population	