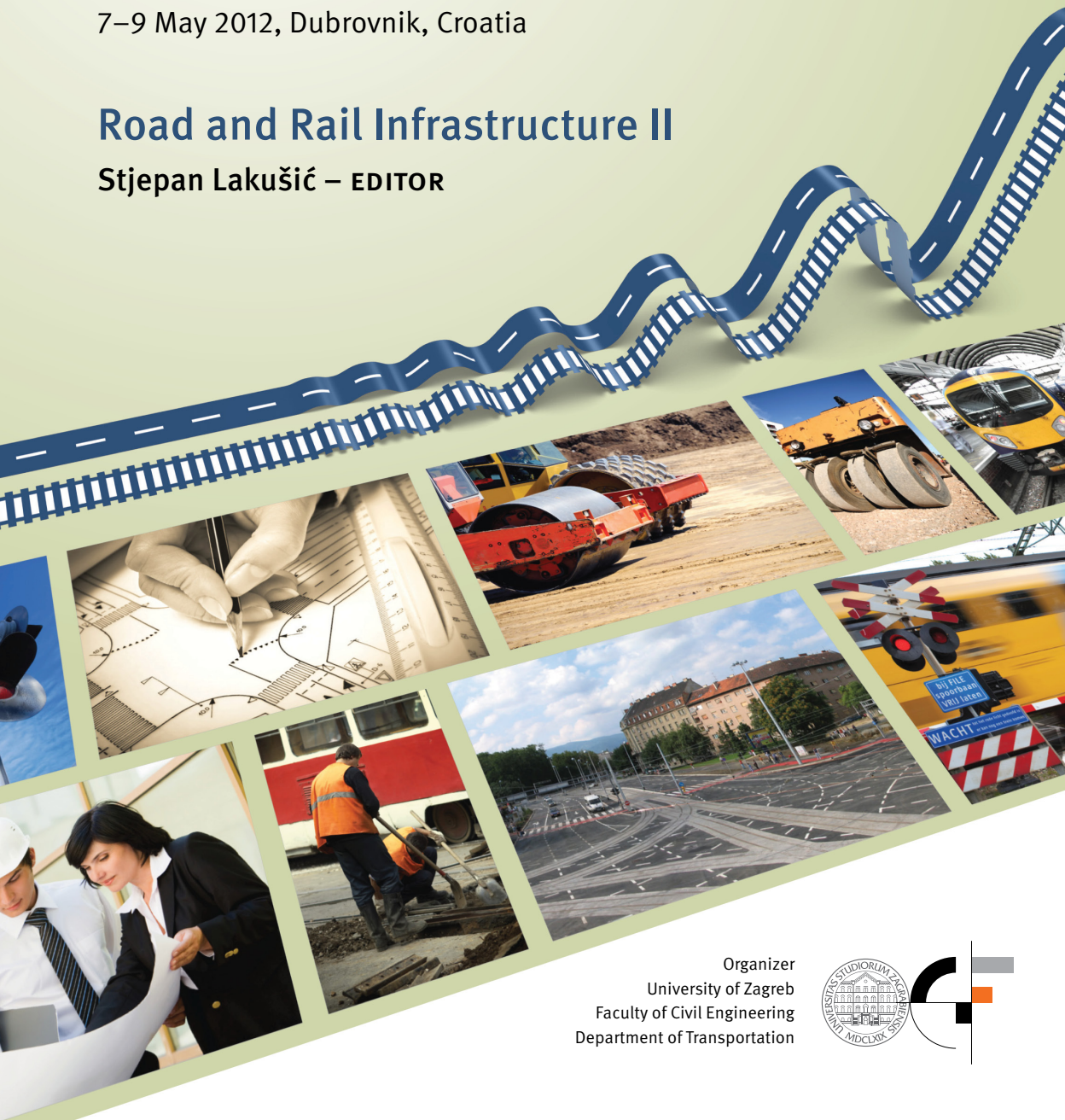
CETRA 2012

2nd International Conference on Road and Rail Infrastructure
7–9 May 2012, Dubrovnik, Croatia

Road and Rail Infrastructure II

Stjepan Lakušić – EDITOR



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STRATEGIC TRANSPORT INFRASTRUCTURE IN SOUTH EAST EUROPE: PLANNING EXPERIENCE AND PERSPECTIVES IN THE CONTEXT OF THE EUROPEAN TRANSPORT POLICY

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Abstract

South East Europe (SEE) is a region of high importance for the European Union (EU). Especially concerning Transport, this importance accrues from the fact that this region is a part of the European continent, but at the same time it is a discontinuity zone of the Trans-European Transport Networks (TEN-T).
The European Transport Strategy for the non-EU regions has been expressed in the '90s through the Pan-European Corridors (PECs) and Areas (PETRAs) concept, but moreover, in this particular region it was more intensively expressed after 2001, with the definition of the SEE Strategic Network and of the SEE Core Transport Network, in view of the EU enlargements, which would cause the incorporation of entire PECs or parts of them into the TEN-T. Then, the European Commission (EC) initiated the revision of the PECs' concept, proposing five Priority Axes, and among them the South Eastern Axis that covers the SEE region, the Caucasus, Turkey, Middle East and Egypt.
In this aspect, taking into consideration the development already made on the networks of the acceding countries, a new orientation for extension of the transport networks for a wider Europe has been initiated. Especially for the development of the South Eastern Axis, with the aim to boost the development of transport infrastructures in the SEE region, the PECs' structures, Transport Ministries and the SEE Transport Observatory (SEETO) are engaged in the SEE Transport Axis Cooperation (SEETAC), a project funded by the SEE Trans-National Programme.
In this paper, an overview of the general framework and the followed methodologies for priority project definition and promotion is presented, together with intermediate results of the analysis of the existing situation carried out within the SEETAC project. Perspectives for development and priority projects are presented based on these results, other studies and the TEN–T framework, which is currently under revision.

Keywords: Infrastructure Projects, European Transport Strategy

1 Introduction

This paper presents the implementation of the European Transport Strategy in the SEE and especially in the so called 'Western Balkans'. The Western Balkans (WB), regardless of the different stage of integration of the various countries, is considered as a region of special and high importance for the EU, being a part of the European continent with clear EU orientation. Therefore, the extension of the major trans-European axes to these neighbouring countries is essential.
The first aim of the paper is to present the general transport strategy for infrastructure development for the non-EU regions, with special emphasis on the strategic networks in SEE. More-

over, this paper focuses on the perspectives in the context of the current European Transport Policy, the revised framework for transport infrastructure planning after the EU enlargements of 2004 and 2007 and the most recent proposal for the revision of the TEN–T Guidelines in 2011.
Furthermore, this paper aims to present the followed methodologies for priority project definition and promotion after more than ten years of planning experience in the framework of the European Transport Strategy, together with the results of the analysis of the existing and future situation in the SEE region carried out within the SEETAC project and other relevant studies.
The methodology to approach the aim of the paper consists of: a) the presentation of the PECs in the region and the SEE Strategic and Core Networks; b) the presentation of the revised framework for transport infrastructure planning in neighbouring countries/regions after the EU enlargement; c) the presentation of results of the analysis of the existing situation concerning the supply and the demand in the SEE region (carried out within the SEETAC project); and d) the formulation of comments and conclusions, for the strategic transport infrastructure planning and the project priorities definition in the SEE region.

2 Corridors in the region – SEE Strategic and Core Networks

In the '90s, especially after the Maastricht Treaty, the EC carried out extensive planning exercises to define and promote the TEN-T for the Member States and the neighbouring countries. Even before the TEN-T guidelines definition in 1996, it was recognized that there is a need for further planning in SEE, in order to involve the non-EU regions. In this aspect, at the Pan-European Transport Conferences of Crete (1994) and Helsinki (1997), the Pan-European Corridors (PECs) and Areas (PETRAs) for the non-EU European territories were defined.
The "grid" of PECs in the SEE region consists of PECs IV (North-Southeast), V (West-East), VII (the Danube Inland Waterway), VIII (West-East), IX (North-East) and X (Northwest-Southeast). Additionally, three out of the four PETRAs are sited in SEE: the Adriatic – Ionian Seas, the Mediterranean Basin and the Black Sea Basin. For the documentation and prioritisation of projects, as well as for the examination of the development potential of the transport sector in general and especially PECs' infrastructure, various regional planning exercises, strategic studies and inventories were elaborated.
More specifically, one of the extensive planning exercises, in order to define the TEN-T for the Member States and the accession countries, was the Transport Infrastructure Needs Assessment (TINA). Based on the PECs, TINA contributed to the coordination of the infrastructure investment plans of the eleven (then) acceding countries with those of the EU member states, in view of the extension of the TEN-T to the enlarged EU. There was obviously a gap on the European map and rationally it was then recognized, that there was also need for further planning to involve the five (then) countries of the WB participating in the Stabilisation and Association Process.
In these terms, the European Transport Policy was further enhanced, on the basis of the already established PECs, with the SEE Strategic Network definition in 2001 [1]. Two strategic studies, similar to TINA, were elaborated immediately after: the Transport Infrastructure Regional Study (TIRS) [2] and the Regional Balkans Infrastructure Study (REBIS) [3], and the SEE Core Transport Network was defined (nowadays called 'SEE Comprehensive Network', in order to avoid misunderstanding with the term 'Core' used in the current TEN-T revision process), as well as lists of priority projects.

3 Enlargement and revised framework for transport infrastructure planning in EU neighbouring countries and regions

In view of the EU enlargements, which would lead to the incorporation of entire PECs or parts of them into the TEN-T, the EC initiated the revision of the PECs' concept. The 14 Priority Projects (PP) defined in 1996 became 30 in 2004, for the enlarged EU. Sections of the PP 6 (Railway axis Lyon - Trieste - Divača/ Koper - Divača - Ljubljana - Budapest - Ukrainian border), PP 7 (Motorway axis Igoumenitsa/ Patras - Athens - Sofia - Budapest), PP 18 (Waterway axis Rhine/ Meuse - Main - Danube) and PP 22 (Railway axis Athens - Sofia - Budapest - Wien - Praha - Nürnberg/ Dresden) coincide with the Railway PEC V, Road PEC IV, Inland Waterway PEC VII and Railway PEC IV respectively.

At Pan-European level, the EC [4] proposed five 'Priority Axes' (Sea Motorways, Northern Axis, Central Axis, South Eastern Axis and South Western Axis), which would contribute to the promotion of international exchanges, trade and traffic between the EU and its neighbours, with additional branches (with lower traffic volumes) for regional cooperation enhancement and integration in the long term. The 'South-Eastern Axis' in the SEE region is actually the network of the existing PECs; although some parts of them are excluded (Branches B of PEC V and D of PEC X, plus PECs IV and IX, which are now parts of the TEN-T). This Axis was actually the inspiration of the SEETAC establishment.

Cooperation in the transport field and the extension of the Acquis Communautaire to the new EU member states, the candidate and the potential candidate countries of the SEE region is more advanced than for the other partner countries of the EU that are included in the European Neighbourhood Policy. Therefore, the EC suggests that cooperation in the WB should focus on the SEE Core Network development and encourages the countries to speed up alignment of their national legislation with the Acquis Communautaire on transport and relevant thematic areas, in order to fully benefit from the accession framework. The EC and the countries of the region are for years now negotiating a Treaty for the establishment of a Transport Community in SEE, targeting at the establishment of an integrated market for infrastructure and land, inland waterways and maritime transport and of course the adjustment of the relevant legislation in this region. However, due to political reasons the Treaty has not yet been signed.

In the Member States the TEN-T Programme consists of projects (defined as studies or works), whose ultimate purpose is to ensure the cohesion, interconnection and interoperability of the TEN-T as well as the access to it. The Priority Projects and other horizontal priorities, as a whole, are established to concentrate on Pan-European integration and development and aim to establish and develop the key links and interconnections needed to eliminate existing bottlenecks to mobility, fill in missing sections and complete the main routes, especially their cross-border sections, overcome natural barriers and improve interoperability on major routes.

In late 2011, the EC adopted a proposal to transform the existing patchwork of European roads, railways, airports and canals into a unified TEN-T and, among others, to promote projects of mutual interest, including extensions to the neighbouring countries and regions [5]. A dual layer TEN-T is proposed: the 'Comprehensive' and the 'Core'. Especially the second is envisaged to improve connections between different modes of transport and provide adequate connections to neighbouring countries, ensuring geographical coverage.

More specifically, the projects of mutual interest aim to connect the TEN-T with the networks of third countries (covered by the Enlargement Policy, the European Neighbourhood Policy, the European Economic Area and the European Free Trade Association) and seek to connect the Core TEN-T at border crossing points, ensure the connection between the Core TEN-T and the networks of the third countries (like the SEE Core Network), complete the transport infrastructure in third countries which serve as links between parts of the Core TEN-T and implement traffic management systems in those countries. Such projects shall enhance the capacity and utility of networks located in the SEE countries.

4 SEETAC interim results for the existing situation

4.1 SEETAC content

The SEETAC project main technical activities concern: a) the establishment of a detailed and harmonised database for the existing and future situation of the SEE transport infrastructure and b) the development of a transport model for the simulation and assessment of the existing situation and the examination of development scenarios (demography, economy, trade, new projects implementation) for the future (target year 2030) and their impact on transport operations and the environment.
The reference network (Figure 1) consists of the strategic infrastructure (TEN-T, PECs and SEE Core Network – consisted of PECs and important routes in the WB), as well as some other sections useful for modelling purposes, and concerns roads, railway lines, inland waterways and their interconnection points with the ports and airports in the region.

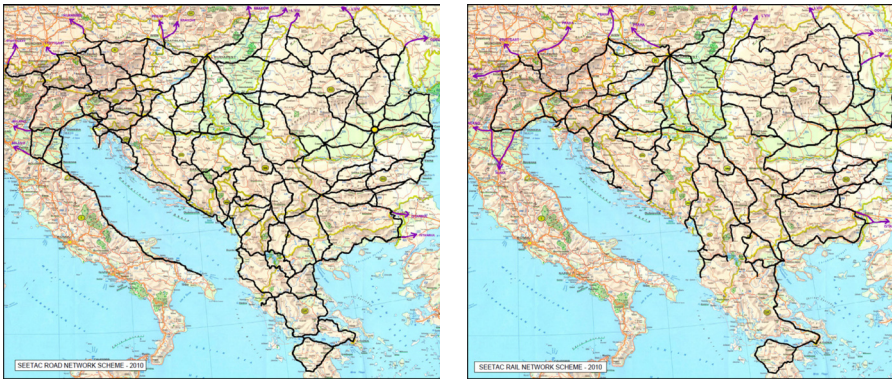

Figure 1 SEETAC study Road (left) and Railway (right) Networks [6]

The simulated road network consists of 373 links with total length of 23.920km and the railway network of 301 links with length of 19.085km in total.
For these networks a very detailed survey was performed in order to collect data for the physical (geometrical) and operational characteristics of each one of the networks' links and nodes. This survey allowed the establishment of the SEETAC study network database and the construction of the SEETAC transport model with appropriate geo-reference and assignment of the appropriate attributes to its components.
Through the transport model it is possible to have various functions for the assessment of the network, e.g. the identification of main trips generators and attractors, saturated links and nodes, corridors and nodes of national (but mostly regional/international) importance.
Furthermore, the model shall test the impact of the priority projects implementation on the traffic assignment on the network under study, for the target year of the traffic forecast, year 2030.
For the examination of the future situation of the infrastructure (supply), a data collection is under elaboration concerning projects under implementation or underway for implementation (secured financing), as well as on projects included in the national transport plans and which are also part of the TEN-T and SEETO planning.

4.2 Results of the inventory on existing situation of Roads and Railways

A very detailed database has been established up today [6], which refers to the existing situation of the transport network (geometrical/ physical and operational characteristics) of the various transport modes, based on the information provided to the EC (DG Mobility and Transport) by the EU Member States and to the SEETO by the WB countries, for TENtec and SEETIS systems, respectively.
The total length of PECs in the region under study is 9.594km of roads and 10.530km of railway lines. From the initial processing of this database and per PEC, it emerges that the infrastructures on the main PECs running through the region are more or less developed: 53,1% of the roads are with 2 or more lanes per direction, 51,4% of the PECs (existing) railway lines are with double tracks and 83,7% of the PECs railway lines are electrified.
Regarding the road network, the length of motorways and expressways (2 or more lanes per direction) on PEC X represents 72,3% of its total length and on PEC V represent 60,8% of its total length (Figure 2).

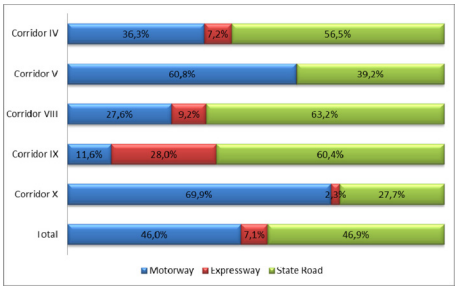

Figure 2 Typology of PECs Roads in SEE (% of the total length).

Regarding the railway network (Figure 3), the length of double tracks on PEC IV represent 64,7% of its total length, on PEC V represent 52,6% of its total length and on PEC VIII 50,7% of its total (constructed) length.

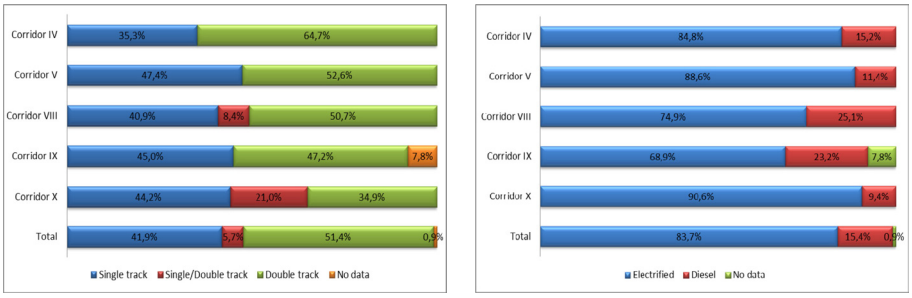

Figure 3 Typology of PECs Railway Lines in SEE (% of the total length)

Furthermore, through the transport model (after trips assignment on the network and the calibration to the observed traffic), traffic and capacity analyses have been performed, through the assessment of the flows over capacity ratios for each road and railway links of the network. The results of these analyses are depicted in Figures 4 and 5, respectively for the road and the railway links.
It can be observed that the biggest share of transport flows is concentrated on the PECs running through the region: On the road network on PECs IV, V and X (and less on PECs VIII and IX), and on the railway network on PECs IV, V and X. Saturation problems appear only at road

sections around important cities of the region (Salzburg – Innsbruck, Milan, Bucharest and Sofia) and on railway lines on the Austrian network, in Slovakia (Bratislava – Gyor), southwest of Ljubljana on PEC V, and on PEC IV, mainly between Plovdiv and Haskovo in Bulgaria.

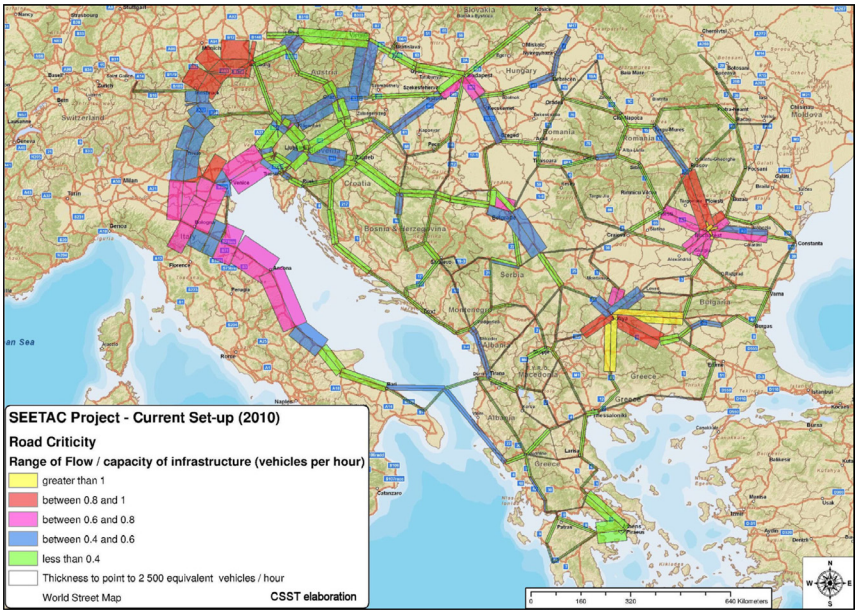

Figure 4 Volume over Capacity ratio on SEETAC study Road Network [7]

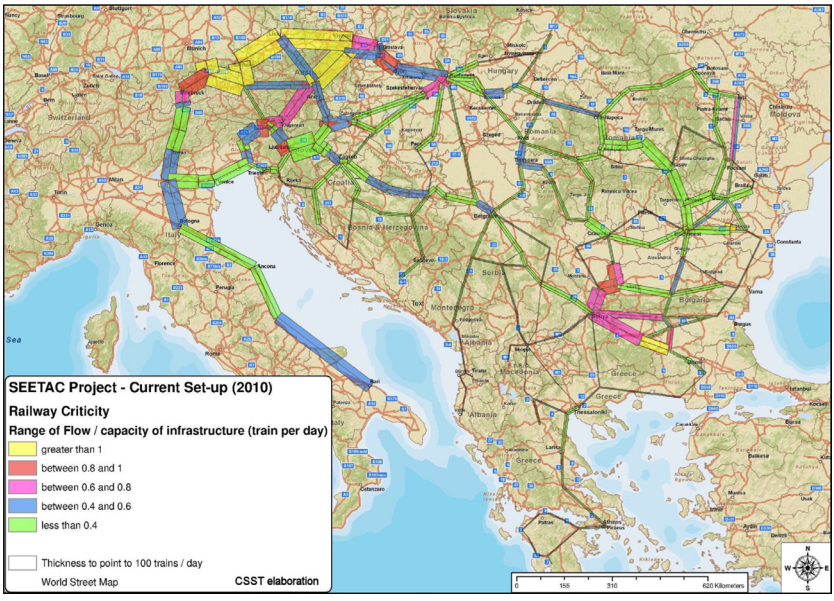

Figure 5 Volume over Capacity ratio on SEETAC study Railway network [7]

4.3 Future transport demand in SEE

Concerning the future demand, the scenarios development within SEETAC are under formulation, so there aren't any results for the time being. However, there are other studies with reference to this region, the EUN STAT [8] and the TEN-CONNECT [9].
The first one concerned the freight traffic flows forecast between the EU and the neighbouring countries and regarding the SEE region it concluded that in the future (target year of the forecast 2020) the freight traffic flows will be concentrated on the road corridors between Turkey – Bulgaria – Western Balkans – Germany/ Northern Italy and Bulgaria – Romania – Russia and on the railway corridor between Bulgaria – Romania – Ukraine and Russia.
The second forecast, not only dedicated to freight, concluded that on the SEE road network the PECs with the biggest flows are PEC X (Main Axis from Austria to Belgrade and Nis and Branch C to Sofia) and PEC IV from Sofia to Istanbul. The same applies for rail passenger traffic and to some extend for rail freight traffic, where PEC IV is more loaded on its parts in Romania and its eastern part in Bulgaria near the border with Turkey, and also on PEC IX south of Bucharest.

5 Transport project prioritisation in SEE

5.1 Prioritisation in previous strategic exercises

Projects are placed among national, regional and international (Pan-European) policies, and therefore in a 'pool' of projects, out of which, usually through Multi-Criteria Analyses (MCA), it results the prioritization of implementation of the most urgent projects.
Therefore, the strategic planning at Pan-European level, dealt with the definition of the most urgent and with international impact projects. According to the TEN-T first guidelines (1996), the processing for the formulation of project proposals for financing focused in three terms: 'projects of common interest', 'bottlenecks' and 'missing links'.
Earlier (1993-1994), for the wider European Network, the Economic Commission for Europe of the United Nations (UNECE) and the European Council of Ministers for Transport (ECMT) worked on the methodology for defining common criteria for the identifying bottlenecks and missing links. On the definition of the term 'bottleneck' worked later the studies TEN-NAxis [10] and TEN-CONNECT assigned by the EC, whilst in the mean time the HCM and the UIC guidelines were respectively the basic tools for road and railway infrastructure capacity assessment.
In the very beginning the priorities had been set for some of the PECs by their structures and for the TEN-T through their initial definition (14 priority projects), and later on for the SEE by the general guidelines of the EC strategic guidelines of 2001.
On the basis of these EC guidelines, each of the strategic exercises elaborated for the transport infrastructure development in SEE included methodologies for prioritising the projects with major importance for the region.
Especially for the wider SEE region (WB, Romania and Bulgaria), the TIRS was based on the ECMT methodology and developed a weighted MCA to assess the potential projects, according to two main groups of criteria, i.e. the socioeconomic return on investment and the functionality and coherency of the network.
On the same direction, the REBIS developed a weighted MCA with six major criteria categories, but for a more limited network (SEE Core Network): economic appraisal, financial viability environmental effects, functionality and coherency of the network, readiness of the authority to implement a project and speed of implementation.
For the same network, SEETO consultants [11] in 2006 defined the criteria for prioritising projects when preparing the Multi-Annual Plans for the realisation of the SEE Core Network (defined through the REBIS). It categorised the criteria to five groups concerning regional interest, economic and development impact, financial sustainability, environmental and social impact and technical standards.

These MCA methodologies are apparently valuable in the process of the SEE transport network development. However, there are criteria which are more or less linked to the political component of a project, i.e. the national priorities but also the overall EU transport strategy (PECs). In other words, between the projects of the TIRS network, it was obvious that the projects on the PECs in the region would be prioritised. Firstly because they belong to PECs, secondly because they are already prioritised by the national governments (as parts of the PECs and thus as easier to secure funds) and finally because the demand in the region is concentrated on these PECs. So it was obvious that they meet the criteria of functionality and coherence of the network, the regional importance and the importance for international transport.

5.2 Project prioritisation in SEETAC

During the elaboration of the SEETAC, it was initially planned to prioritise projects following a detailed MCA, similar to those applied in the aforementioned exercises. A detailed methodology was presented to the project partnership and the EC, but it was decided that no other priorities than those already defined by the SEETO and the EC should be defined.
Therefore, the prioritisation that would emerge from this project should be to define priorities between priorities, i.e. to define the most urgent and mature projects for realisation, which should meet the several criteria (planning, financial and technical) adjusted to the recommendations of EC proposal for the new TEN-T Guidelines: a) belong to the EU proposed Core or Comprehensive TEN-T or the SEE Comprehensive Network, b) provide link between these networks, mainly at border crossing points, c) ensure connection between the Core TEN-T and the transport networks of third countries, d) facilitate maritime transport by providing links to main ports, e) serve the majority of international transport flows, f) ensure and promote interoperability and multimodality, g) ensure financial and economic sustainability, h) minimise investment, maintenance and operational costs and environmental impact.
The TEN-T Regulation is under adoption (co-decision procedure), and the countries of the SEETAC partnership should, through their unified exercise, contribute to the finalisation of the new TEN-T Guidelines. The assessment of the network in the present and future situation contributes to the redefinition of the critical routes on the SEE transport network and the investment needs for development. The results of this assessment will be presented in a dedicated Ministerial Meeting of the SEETAC partnership and an Infrastructure Forum in May 2012 in Athens, with the presence of the EU instruments, the International Financial Institutions and various relevant stakeholders from the Europe and the SEE region.

6 Conclusions and perspectives for the SEE Transport Network

From the topological consideration of the Pan-European Networks according to Bunge (1962) and according to the networks attributes that Dupuy (1985) and Chesnais (1982) later defined, it emerges that it is a network characterised by anisotropy, but has high density (networks length per surface unit that they serve), multiplicity and high connectivity capacity of nodes in Western Europe, in contrast to their regional development in SEE. Additionally in the Western Europe we can observe homogeneous and exclusive sub-systems (high speed railway networks TGV/LGV, aviation networks, conventional railway networks and closed motorways' networks), which are adequately interconnected, with elements of interoperability and intermodality [12].
On the contrary, on the SEE network, there is high heterogeneity, which, combined with the physical barriers, the political instability and the various institutional or technical barriers at borders, creates a complex area for transport. In this area there should be developed multimodal and efficient transport systems.

Obviously, the SEE transport infrastructure needs further development for the connectivity and accessibility of the countries in the region, apart from the general aim to serve the needs for economic, social and territorial cohesion.
The transport networks in SEE, defined through the various planning exercises briefly described in this paper, are not arbitrary. They are pre-existing, historical networks, a priori strategic for the countries concerned, which have been adequately developed in the past, but due to economic reasons have been neglected and did not manage to follow the development achieved in the EU countries, so they lag behind the EU standards.
Therefore, despite the scarcity of funds, the development of these infrastructures is one-way road. The discussion in the process of the new TEN-T regulation definition includes firstly the inclusion of the SEE strategic network in the Comprehensive TEN-T (which in extension would mean inclusion of parts of it in the Core TEN-T upon accession of a country in the EU, i.e. Croatia in 2013) and secondly, the provision of the possibility of financing the development of this network through the new financial mechanisms (Connecting Europe Facility and IPA II) for the TEN-T implementation in the framework of EU 2020 Strategy.
Therefore, the challenge for the countries in the region and the cooperation frameworks is to align the priority projects with the projects implemented or underway in the EU neighbouring countries, in order to secure the anticipated transnational impact of the projects, the consecutiveness of the networks and therefore to maximise the added value for the EU.

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