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The Regional Balkans Infrastructure Study (REBIS) Update

ENHANCING REGIONAL CONNECTIVITY
Identifying Impediments and Priority Remedies

Main Report

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Abbreviations and Acronyms

AADT	Annual Average Daily Traffic
AEO	Authorized Economic Operator
BCP	Border Crossing Point
BiH	Bosnia and Herzegovina
C/BC	Customs and border crossings
CEF	Connecting Europe Facility
CEFTA	Central European Free Trade Agreement
DG	Directorate General
EC	European Commission
EEA	European Economic Area
ERTMS	European Rail Traffic Management System
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GIS	Geographic Information System
HGV	Heavy Goods Vehicle
IATA	International Air Transport Association
IM	Inter/multimodal transport
IMF	International Monetary Fund
IPA	Instrument for Pre-Accession Assistance
IRU	International Road Transport Union
IT	Information technology
IWW	Inland Waterways
LNG	Liquefied Natural Gas
MAP	Multi Annual Plan
M/IWW	Maritime and/or Inland Waterways
NC	National Coordinators
NCTS	New Computerized Transit System
OECD	Organization for Economic Cooperation and Development
REBIS	Regional Balkans Infrastructure Study
RO-RO	Roll-on/Roll-off Passenger
RP	Regional Participants
SC	Steering Committee
SEE	South East Europe
SEETO	South East Europe Transport Observatory
SQL	Structured Query Language
TEN-T	Trans-European Transport Network
TEU	Twenty-foot Equivalent Unit
TTF	Trade and Transport Facilitation
TTFSE	Transport Facilitation Projects in South East Europe
WB	World Bank
WBIF	Western Balkans Investment Framework

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Executive Summary

1. In an effort to further develop the South East Europe Transport Observatory (SEETO) Comprehensive Network, integrate it in the European Union's (EU) Trans-European Transport Network (TEN-T) and strengthen underlying transport planning systems, an Update of the Regional Balkans Infrastructure Study (REBIS) was prepared.[1] The motivation for the Update was the fact that, since the completion of REBIS in 2003, there had been no review or update of the study's projections and recommendations that would in turn enable an informed assessment and updating of the regional priorities for investment in the SEETO Comprehensive Network.

2. The main objective of the REBIS Update was to develop a Priority Action Plan for enhancing the efficiency of the SEETO Comprehensive Network. The Action Plan identifies priority physical investments as well as non-physical improvements including regulatory, institutional and managerial changes required to reduce impediments to the efficient performance of the Network. The Action Plan should be followed by a series of prefeasibility and feasibility studies (beyond the scope of the Update) for the identified interventions. The studies would be used to identify economically viable interventions for inclusion in the SEETO Multi Annual Plan (MAP) along with other eligible priority projects.

3. The World Bank carried out this Update with a grant awarded by the Western Balkans Investment Framework (WBIF). The Beneficiary of this Update is the SEETO Steering Committee with representatives from Albania, Bosnia and Herzegovina (BiH), the former Yugoslav Republic of Macedonia, Montenegro, Serbia, and Kosovo*. The Update also benefits Croatia, which was a member of SEETO at the inception of the study and prior to joining the EU on July 1, 2013.

4. The scope of work included (i) an assessment of the 2010/2011 traffic projections from the 2003 REBIS against actual traffic counts to better inform the Update, (ii) development of transport demand models for the different transport modes, (iii) assessment of the 2012 traffic flows against the current capacity of the road, rail, inland waterways ports and airports of the Comprehensive Network , (iv) development of 2030 traffic projections for all modes, (v) assessment of future traffic flows against existing and planned network capacities, (vi) identification of non-physical and physical impediments on the Network, and (vii) development of a priority action plan for network improvements.

[1] The 2003 REBIS study was funded by the EU Commission and focused on the development of a multi-modal Core Transport Network for the Balkan region, similar to the Trans-European Networks of the European Union.

*This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Assessment of the 2003 REBIS Traffic Projections

5. The 2003 REBIS model is based on a well-documented relationship between economic variables and future traffic for road, rail, inland waterway and air transport. A review of the traffic projections of the 2003 REBIS model against reported traffic counts showed significant variations which were not consistent across the network or at the national level. (The results of the comparison are presented in Annex IX). While overestimation of traffic could generally be attributed to the economic and financial European crisis that started in 2007, traffic projections for 32 percent of the Comprehensive Network were underestimated by over 100 percent. Possible reasons for the underestimation (such as the use of one rate of traffic growth only for a regional participant, not accounting for local traffic, and the relationships between traffic growth and economic growth) were taken into account in the development of the model for the REBIS Update.

Impediments to the Efficient Use of the SEETO Comprehensive Network

6. The report identifies key non-physical and physical transport and trade logistics barriers within the SEETO Comprehensive Network. These impediments contribute to the increase in transport costs and to the reduction in the reliability of supply chains raising the cost of doing business and ultimately diverting potential investment and jobs from the region. Most of the Regional Participants are small open economies which depend, or will need to depend, to varying degrees, on trade for sustainable economic growth. Enhancing the efficiency of the Comprehensive Network, particularly the main export corridors, will help attract foreign direct investment (FDI), a key "push" factor for exports in the region. The key impediments are discussed below:

Non-Physical Impediments

7. Addressing non-physical impediments is critical for enhancing connectivity in Southeast Europe and for better integrating SEETO Regional Participants into the EU. Not only does the alleviation of non-physical obstacles require significantly lower financial resources than the construction of costly infrastructure, it yields high economic returns. Moreover, the economic development benefits expected from investments in costly transport infrastructure will not be fully realized if non-physical impediments, including regulatory and procedural constraints at borders and along the corridors, are not removed. Improving the quality of the road or railway network to reduce travel time within a Regional Participant only to spend the saved time at the border is highly inefficient and would greatly reduce, if not negate, the benefits of the improved infrastructure. Table ES1 (below) of the Priority Action Plan presents the proposed interventions for addressing non-physical barriers together with an order of magnitude of the cost for each intervention. Tables 18 and 19 show the economic benefits and the benefit-cost ratio respectively for each measure.

8. While there have been significant improvements in the past decade in eliminating non-physical bottlenecks impeding trade and transport in the region, the study found that unpredictability of border-crossing times remains an issue. The main cause of this problem does not appear to be that of inefficient or non-transparent customs procedures, but rather weak inter-agency coordination among border authorities. If the operational environment in the region would reach the average EU levels, the order of magnitude of possible savings is about 1 per cent of the region's GDP or about €900 million a year.

9. Overseeing the implementation of the measures that eliminate the non-physical impediments would be best coordinated by both the SEETO and Central European Free Trade Agreement (CEFTA) authorities with strong technical support from the European Commission. Success in their implementation will require high level government support that extends well beyond transport authorities.

Physical Impediments

10. In order to define the priorities for infrastructure investment in the SEETO Comprehensive Network, two broad types of analyses were carried out. The first was a *capacity analysis* in which the capacity of the SEETO Comprehensive Network was assessed against existing traffic flows and projected 2030 traffic flows to identify current and future bottlenecks in the network based on purely engineering considerations. Interventions were then proposed to address the identified capacity constraints. The second analysis was a *preliminary level economic efficiency analysis* of the proposed interventions that was utilized to develop the priority action plan. Two economic growth scenarios were considered in estimating traffic projections.

11. (a) The *capacity analysis* shows that about 60 percent (about 4,000 km) of the Comprehensive Road Network is in no need of any immediate intervention and another 23 percent (1,500 km) only requires rehabilitation. About 16 percent (1,100 km) of the network may require some intervention for upgrading or widening at present. Depending on the economic growth scenario, between 25 and 30 percent of the network (1,700 km - 2,100 km) may require some upgrading or widening intervention before 2030.

12. The capacity analysis also shows that about 63 percent of the Comprehensive Railway Network (about 2,900 km out of 4,600 km) is in no need of any immediate intervention to increase capacity. However, based on the poor infrastructure condition and maintenance backlog, a large proportion of the 2,900 km that do not need immediate intervention to increase capacity, will require maintenance/rehabilitation. About 19 percent (900 km) may require interventions for upgrading at present. Depending on the economic growth scenario, between 25 and 33 percent of the network (1,200 km - 1,500 km) may require some upgrading intervention before 2030. Lower cost interventions such as the implementation of modern signaling and managing the heterogeneity of trains should be considered before a decision is made to invest in costly infrastructure.

13. It was determined that the existing air services for passengers and freight within the SEETO airports are adequate to meet the demand and that no financially viable additional services could be envisaged in the short- and medium-terms. However the terminal capacity in many of the airports in the region has either exceeded capacity (Zagreb and Podgorica) or is reaching its physical limit (Sarajevo, Tirana and Tivat). Belgrade could further reinforce its role as a gateway to the SEETO region leveraging its connections to the other airports in the region.

14. The capacity of all maritime container ports in the region is sufficient to handle the current freight flows, with the exception of the ports of Split and Durres where capacity is only marginally sufficient. Passenger terminal capacities for the ports of Vlore, Dubrovnik, Ploce, Pula, Zadar, Split and Durres will not be able to cope with future (2030) passenger traffic and expansions should be considered.

15. The capacity analysis of the inland waterway ports indicates that the ports of Serbia (Belgrade, Novi Sad and Samac) may require expansion and that the ports on the Sava River are not being fully utilized due to the lack of dredging and river rehabilitation.

16. (b) A *preliminary-level economic efficiency analysis* was carried out to develop a priority action plan consisting of the key interventions and measures to alleviate bottlenecks and enhance regional connectivity. The preliminary-level economic analysis is based on rough costs and benefits and is intended to provide a general sense of the viability of proposed efficiency-enhancing investments and measures. It is intended to identify interventions for which prefeasibility and feasibility studies should be prioritized.

17. In determining the priorities using the preliminary-level efficiency analysis, interventions were divided into three categories: (i) High Priority, (ii) Medium Priority and (iii) Low Priority. High priority investments were those which had a high positive Net Present Value and were very likely to prove viable following the completion of a feasibility study. High Priority investments were divided into two sub-categories: Immediate High Priority projects that are needed to address current constraints and bottlenecks; and Future High Priority projects that are not an immediate priority but that will need to be implemented before 2030. Future High Priority Projects are expected to have positive economic returns when implemented at the optimal time. ***The Priority Action Plan includes the immediate high priorities—i.e. investments that are required to address current bottlenecks and that are expected to have high positive economic rates of return.***

18. Since the economic efficiency analysis is based on crude costs and benefits, interventions that may have a marginal negative rate of return were considered a medium priority and should be subject to further analysis. Finally, projects/interventions that have large negative rates of return were classified as low priority and in principle should not be considered further.

19. It is also important to note that the economic benefits were based on time and vehicle operating cost savings only and did not take into account safety or environmental considerations. In addition, the wider development impacts of large transport projects such as agglomeration, potential increase in competition due to better transport, and tax impacts resulting from changes in product and labor markets were not taken into account. This may warrant the consideration of certain projects which are not included in the high priority list.

20. While SEETO's prioritization criteria for inclusion in SEETO's MAP reflect, *inter alia*, project readiness, the number of countries involved in the project, prioritization in this exercise is predicated on economic efficiency only using the Net Present Value criterion. If there are projects which prove to have a high economic return but are for some reason not reflected in SEETO's MAP, it would be worth understanding the reason for the exclusion from the MAP and what would be necessary to include them.

High Priorities

21. The high priorities that were included in the Priority Action Plan covered both non-physical as well as physical interventions. The physical interventions included both asset preservation as well as upgrading/new construction.

(i) ***Non-Physical Interventions.*** Given the relatively low cost of these interventions and their substantial benefits, all non-physical impediments are considered a top priority.

(ii) ***Physical Interventions.*** Given the large rehabilitation and maintenance needs for the Comprehensive Network, and the importance of addressing them to preserve the value of expensive infrastructure assets, the proposed physical interventions included both (a) asset preservation and (b) upgrading and new construction.

(a) Asset preservation. The estimates covered roads and railways for both regular maintenance (routine and winter) and rehabilitation (see Table ES-2.1). The details of the estimation are provided in Section 6 of the report.

(b) Investment in High Priority Physical Infrastructure. The investment cost in high priority roads to address existing bottlenecks was estimated at €2,640 million. The preliminary-level economic efficiency analysis did not support any further infrastructure investment in the railways beyond rehabilitation and maintenance. Expansions in ports and airports with capacity constraints were considered medium priority. No preliminary-level economic efficiency analysis was carried out for interventions in these areas as the type and cost of interventions vary significantly from one port/airport to another.

The Priority Action Plan

22. Based on the analyses carried out in this study, an action plan was developed for addressing the most important priorities for enhancing connectivity in the region. These cover both physical interventions as well as soft measures. Physical interventions include both asset preservation and new investment. As discussed above, the candidates for

upgrading/widening identified in the plan above should be subject to prefeasibility/feasibility studies before proceeding further. The total cost of the proposed interventions from 2016-2020 is about €8,140 million, an average annual cost of €1,630 million. Tables ES1-3 below present the Priority Acton Plan.

Priority Action Plan for Improving Regional Connectivity

Table ES- 1. Interventions for Addressing Non-physical Impediments (Total cost in million Euro up to 2020)

Intervention/Action	Type	ALB	BiH	MKD	KOS	MNE	SRB	Total*
Strengthening the CEFTA Committee on Trade Facilitation; with SEETO participation	C/BC	0.3	0.3	0.3	0.3	0.3	1	**2.5**
Collecting and monitoring comparable data on process times at Border Crossing Points	C/BC	1	1	1	0	1	2	**6**
Implementing the NCTS Transit Convention	C/BC	1	4	4	1	4	8	**22**
Improving Customs IT systems	C/BC	3	1	3	1	2	6	**16**
Implementing efficient risk management, post control audit & simplified procedures	C/BC	8	8	4	2	7	16	**45**
Supporting Single Window procedures	C/BC	4	4	2	2	2	8	**22**
Establishing AEO status procedures and providing capacity building	C/BC	2	2	1	1	2	4	**12**
Enabling better use of inter-modal transport	IM	2	2	2	1	2	6	**15**
Strengthening the administrative capacity in Road Transport & Safety Agencies	Road	8	6	10	4	8	20	**56**
Facilitating admission to road haulage market & profession	Road	4	4	2	1	4	8	**23**
Implementing legislation regarding dangerous goods	Road	1	1	1	1	1	3	**8**
Strengthening the administrative capacity in Rail Safety & Regulatory Agencies	Rail	3	4	4	1	4	6	**22**
Separating operations from infrastructure management	Rail	1	4	1	1		8	**15**
Opening up the rail market to competition	Rail	1	4	4	0.5	2	12	**23.5**
Strengthening administrative and technical capacity of Maritime Administrations	M/IWW	6	2			2	4	**14**
Developing Sava and Danube waterways and related IT systems	IWW		2				4	**6**
Strengthening the administrative capacity of Civil Aviation Authorities	Air	3	3	1	2	1	10	**20**
Total*		**48**	**52**	**40**	**19**	**42**	**126**	**327**

Legend:

Air transport	Air	Customs and border crossing	C/BC
Inter/multimodal transport	IM	Road transport	Road
Rail transport	Rail	Maritime and/or Inland Waterways	M/IWW

** Totals may not add up due to rounding.*

Source: Costs for each measure/country based on Consultants' estimates; measures largely follow those in the EC reports: (i) Enlargement Strategy and Main Challenges 2014-15, October 2014, available at: http://ec.europa.eu/enlargement/pdf/key_documents/2014/20141008-strategy-paper_en.pdf; and (ii) Country-Specific Strategy and Progress reports, 2014, available at: http://ec.europa.eu/enlargement/countries/strategy-and-progress-report/index_en.htm.

Table ES-2. 1. Interventions for Addressing Physical Impediments
Asset Preservation for the Comprehensive SEETO Network (cost in million Euros)

	Regular maintenance (routine and winter)	Rehabilitation (including backlog)	Total Annual Cost
Roads	55	340	395
Rail	60	580	640
Total	**115**	**920**	**1,035**

Source: Consultants/World Bank estimates

Table ES-2. 2. Interventions for Addressing Physical Impediments*,
Physical Upgrades/New Construction (total cost in million Euros)

Country	SEETO CODE	From	To	Length (km)	Intervention Type	No of Lanes	Total Costs (Euros million)
Route 2a							
BIH	R2a.04	Banja Luka	Jajce	77	Upgrade	2	211
BIH	R2a.05	Jajce	Donji Vakuf	34	Upgrade	2	104
Route 2b							
ALB	R2b.13	Lezhe	Milot	13	Upgrade/widening	2	108
ALB	R2b.14	Milot	Mamurras	14	Upgrade/widening	2	116
ALB	R2b.15	Mamurras	Fushe Kruje	14	Upgrade/widening	2	116
ALB	R2b.16	Fushe Kruje	Vlore	13	Widening	2	83
Route 3							
BIH	R3.01	Sarajevo	Pale	21	Upgrade	2	171
Route 4							
SRB	R4.15	Prijepolje	Dobrakovo	36	Upgrade	2	37
MNE	R4.17	Bijelo Polje	Mojkovac	23	Upgrade/widening	2	102
M NE	R4.18	Mojkovac	Kolasin	21	Upgrade/widening	2	130
Route 5							
SRB	R5.08	Kraljevo	Beranovac	6	Widening	2	40
Route 6							
KOS	R6.07	Mitrovice/a	Pristina	35	Upgrade	2	133
KOS	R6.09	Lipljan	Gerlice/Donja Grlica	23	Widening	2	191
Route 7							
KOS	R7.11	Pristina	Luz(h)ane	17	Upgrade	2	37
Corridor Vc							
BIH	Vc.07	Doboj	Karuse	8	Widening	2	27
BIH	Vc.09	Maglaj	Zenica	58	Widening	2	239
BIH	Vc.11	Lasva	Visoko	35	Widening	2	218
BIH	Vc.16	Blazuj	Tarcin	19	Widening	2	106
BIH	Vc.17	Tarcin	Konjic	24	Widening	2	111
BIH	Vc.18	Konjic	Jablanica	22	Widening	2	132
Corridor X							
SRB	X.11.1	Dobanovci	Novi Beograd	15	Widening	4	108
SRB	X.11.2	Novi Beograd	Belgrade	7	Widening	4	50
SRB	X.11.3	Belgrade	Bubanj Potok	10	Widening	4	72
					Total cost:		**2,642**

* High priority sections for Croatia are not included in this table, but are included in Table 15 in Section 6.
** The baseline for the analysis was 2012 so a few sections in the table are under construction.
Source: Consultants/World Bank estimates

Table ES- 3. Priority Action Plan Summary
(Cost in million Euros)

	(2016 –2020)	**Average Annual**
1. Non-physical interventions	327	65
2. Asset Preservation (maintenance and rehabilitation)		
2.1 Roads	1,975	395
2.2 Rail	3,200	640
Subtotal Asset Preservation	5,175	1,035
3. Physical Upgrades/New Construction (Roads)	2,642	528
Total	**8,144**	**1,628**

Source: Consultants/World Bank estimates

Moving Forward

23. Moving forward, there are four areas worthy of attention.

(i) Prefeasibility and feasibility studies for High Priority projects prepared to International Financial Institution (IFI) standards; and SEETO to develop a pipeline of projects ready for implementation for each Regional Participant.

(ii) Developing a financial plan that includes national, EU as well as private resources for implementing the priority actions.

(iii) Measuring and benchmarking corridor performance systematically and on a regular basis. SEETO is well placed to oversee the development and implementation of a measurement methodology. This can be carried out as part of the extension of the TEN-T Core Network Corridors into the Western Balkans. This would also help monitor the implementation of measures to address physical as well as non-physical impediments.

(iv) Estimation of wider development impacts of large transport projects. Using vehicle operating cost savings and time savings as the measure of economic benefits misses potential development benefits resulting from agglomeration, relocation of employment and residences, and labor impacts as discussed above. This could ultimately lead to suboptimal project selection.

Enhancing Regional Connectivity
Identifying Impediments and Priority Remedies

1. Introduction

1. In an effort to further develop the South East Europe Transport Observatory (SEETO) Comprehensive Network, integrate it in the European Union's (EU) Trans-European Transport (TEN-T) Network and strengthen the underlying transport planning systems, a grant was awarded by the Western Balkans Infrastructure Framework (WBIF) for the update of the Regional Balkans Infrastructure Study (REBIS).[2] The motivation for the Update was the fact that since the completion of REBIS in 2003, there had been no review or update of the study's projections and recommendations that would in turn enable an informed assessment and updating of the regional priorities for investment in the SEETO Comprehensive Network.

2. The Beneficiary of this Update is the SEETO Steering Committee with representatives from Albania, Bosnia and Herzegovina (BiH), the former Yugoslav Republic of Macedonia, Montenegro, Serbia, and Kosovo*. The Update also benefits Croatia, which was a member of SEETO at the inception of the study prior to joining the EU on July 1, 2013.

3. The main objective of the REBIS update was to develop a Priority Action Plan for enhancing the efficiency of the SEETO Comprehensive Network. The Action Plan identifies priority physical investments as well as non-physical improvements including regulatory, institutional and managerial changes required to reduce impediments to the efficient performance of the Network. The Action Plan should be followed by a series of prefeasibility and feasibility studies (beyond the scope of the update) for the identified interventions. The studies would be used to identify economically viable interventions for inclusion in the SEETO Multi Annual Plan (MAP) along with other eligible priority projects.

4. The scope of work included (i) an assessment of the 2010/2011 traffic projections from the 2003 REBIS against actual traffic counts to better inform the Update, (ii) development of transport demand models for the different transport modes, (iii) assessment of the 2012 traffic flows against the current capacity of the road, rail, inland waterways ports and airports of the Comprehensive Network , (iv) development of 2030 traffic projections for all modes, (v) assessment of future traffic flows against existing and

[2] The 2003 REBIS study - funded by the EU Commission focused on the development of a multi-modal Core Transport Network for the Balkan region, similar to the Trans-European Networks of the European Union.
*This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

planned network capacities, (vi) identification of non-physical and physical impediments on the transport network, and (vii) development of a priority action for network improvements.

5. The focus of the final report is the assessment of the 2030 traffic projections under low/moderate and moderate/high economic growth scenarios against the capacity of the network under the "do-nothing scenario" (the 2012 network) and the "full SEETO scenario" (network based on the 2015 MAP) and on the development of the Priority Action Plan.

6. The report is organized as follows: Section 2 presents a brief assessment of the 2003 REBIS traffic projections against reported counts. Section 3 presents key non-physical impediments to transport and trade facilitation, as well as the costs and benefits associated with their alleviation. Section 4 presents the 2030 traffic projections for both the low/moderate and moderate/high economic growth scenarios. Section 5 presents the results of the capacity assessment of the existing/planned networks to handle the projected traffic. It identifies physical bottlenecks and proposes interventions for their alleviation. Section 6 presents the methodology used in the preliminary economic efficiency analysis for assessing the proposed physical interventions and the results, while Section 7 presents the priority action plan. Section 8 provides some concluding comments. Annexes I – X provide detailed assumptions and model results.

2. Assessment of the 2003 REBIS Traffic Projections

7. The 2003 REBIS model is based on a well-documented relationship between economic variables and future traffic for road, rail, inland waterway and air transport. A review of the traffic projections of the 2003 REBIS model against reported traffic counts showed significant variations which were not consistent across the network or at the national level. (The results of the comparison are presented in Annex IX). While overestimation of traffic could generally be attributed to the economic and financial European crisis that started in 2007, traffic projections for 32 percent of the Comprehensive Network were underestimated by over 100 percent. Possible reasons for the underestimation (such as the use of one rate of traffic growth only for a regional participant, not accounting for local traffic, and the relationships between traffic growth and economic growth) were taken into account in the development of the model for the REBIS Update.

3. Non-physical Impediments to Transport and Trade

3.1 Overview

8. This section identifies key non-physical transport and trade logistics impediments within the SEETO Comprehensive Network. These impediments contribute to the increase in transport costs and to the reduction in the reliability of supply chains raising the cost of doing business and ultimately diverting potential investment and jobs from the region.

9. Addressing non-physical impediments is critical for enhancing connectivity in Southeast Europe and for better integrating SEETO Regional Participants into the European Union (EU). Not only does the alleviation of non-physical obstacles require significantly lower financial resources than the construction of costly infrastructure, it yields high economic returns. Moreover, the economic development benefits expected from investments in costly transport infrastructure will not be fully realized if non-physical impediments including regulatory and procedural constraints at borders and along the corridors are not removed.

10. Table 1 presents the status of customs and transport policy preparation of SEETO Regional Participants for EU accession through convergence with the EU *acquis communautaire* (the *acquis*). The findings are in line with those proposed in studies/reports provided by the Central European Free Trade Agreement (CEFTA), Organization for Economic Cooperation and Development (OECD) and SEETO.

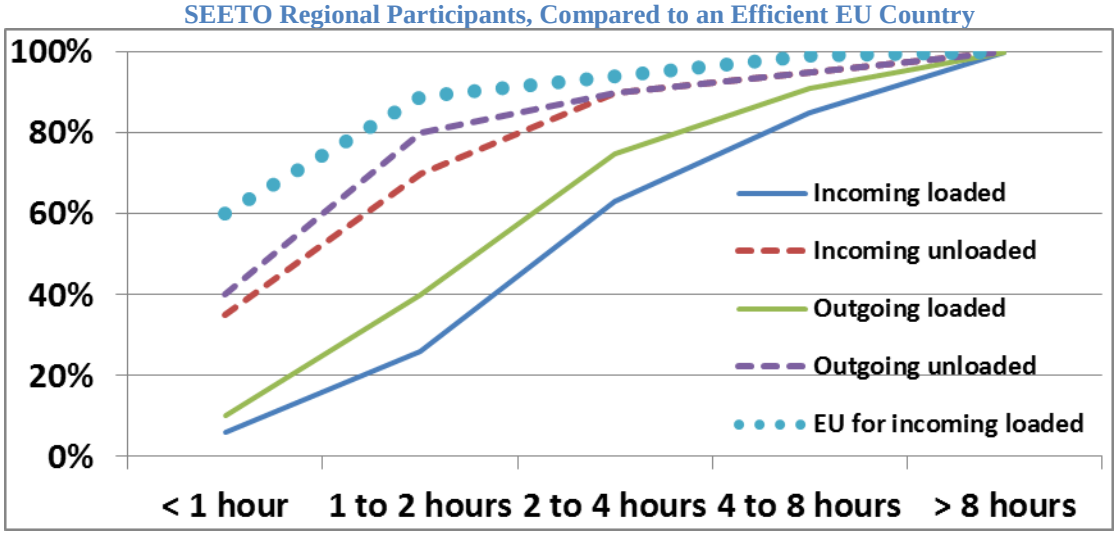
Table 1. Status of Customs and Transport Policy Preparation for EU Accession in SEETO Regional Participants as Assessed by the EC October 2014 Progress Reports

Country	Customs issue preparation	Transport policy preparation
Albania	moderately advanced	at an early stage
BiH	positive	little progress
Kosovo	limited progress	little progress
The former Yugoslav Republic of Macedonia	at an advanced stage	moderately advanced
Montenegro	moderately advanced	moderately advanced
Serbia	some progress; on track	moderately advanced

Source: EC. (2014) Enlargement Strategy and Main Challenges 2014-15, Progress reports October 2014. Available from: http://ec.europa.eu/enlargement/countries/strategy-and-progress-report/index_en.htm

11. A comparison of border crossing waiting times for SEETO Regional Participants and for EU countries shows that significant improvements could be made. Figure 1 shows that while about 60 percent of EU bound loaded trucks cross the border in less than an hour, the corresponding figure for SEETO Regional Participants is only 10 percent. The costs and benefits associated with the non-physical impediments are discussed in Section 6.

Figure 1. Estimate of Cumulative Frequency of Border Crossing Times of Road Freight Vehicles in SEETO Regional Participants, Compared to an Efficient EU Country



Source: Consultant's estimate based on available border crossing information for SEETO Regional Participants, and for EU based on FRONTEX, IRU and data from Sweden and Finland.

3.2 Key Measures to Alleviate Non-physical Impediments in Customs and Transport Policy

12. The key areas of intervention necessary to alleviate non-physical impediments in customs and transport policy and facilitate trade and passenger movements within, as well as in and out, of the region are:

- Administrative and institutional capacity development in regulatory and implementing agencies,
- Adoption and implementation of interoperable information technology (IT) systems in trade and transport,
- Inter-agency cooperation both in trade and transport operations,
- Safety regulation and enforcement in all transport modes, especially in road transport,
- Access to markets for transport services, especially in rail transport,
- Risk management systems and simplified customs procedures in customs; and
- Adoption of inter-connected IT systems in customs, such as the New Computerized Transport System (NCTS) in transit operations.

13. Table 2 summarizes by mode and country the key proposed actions/measures that would alleviate non-physical impediments and enhance regional integration in the short to medium term. The overall analysis of non-physical bottlenecks identified about 70 country-specific "soft" measures in customs and border crossing issues and transport policy for the Western Balkans that need to be addressed. Given that many of these constraints are common to SEETO Regional Participants, regional bodies such as SEETO (and its expected successor, the Transport Community Treaty) and CEFTA can, and ought to, play a leading role in alleviating them. The successful implementation of these measures not

only requires interagency cooperation within a country but also strong collaboration across countries in a number of sectors.

14. Addressing non-physical impediments would substantially improve the safety and quality of transport operations for passengers and goods, and permanently reduce costs and improve the predictability of transport and logistics. Such improvements are necessary to enable the region to more deeply engage in international trade and also utilize its potential to attract foreign direct investment, the level of which remains low.

Table 2. Summary of Key Short to Medium Term Development Needs in View of Non-physical Bottlenecks in Customs and Transport by Mode/Type and Country (2014)

Theme/Measure	Type	ALB	BiH	MKD	KOS	MNE	SRB
Strengthening the CEFTA Committee on Trade Facilitation; with SEETO participation	C/BC	X	X	X	X	X	X
Collecting and monitoring comparable data on process times at Border Crossing Points (e.g. WCO's Time Release Study)	C/BC	X	X	X	X	X	X
Implementing the NCTS Transit Convention	C/BC	X	X	X	X	X	X
Improving Customs IT systems	C/BC	X	X	X	X	X	X
Implementing efficient risk management, post control audit & simplified procedures	C/BC	X	X	X	X	X	X
Supporting Single Window procedures	C/BC	X	X	X	X	X	X
Establishing AEO status procedures and providing capacity building	C/BC	X	X		X	X	X
Enabling better use of inter-modal transport	IM	X	X	X	X		X
Strengthening the administrative capacity in Road Transport & Safety Agencies	Road	X	X	X	X	X	X
Facilitating admission to road haulage market & profession	Road	X	X	X	X	X	
Implementing legislation regarding dangerous goods	Road	X	X	X	X	X	X
Strengthening the administrative capacity in Rail Safety & Regulatory Agencies	Rail	X	X	X	X	X	X
Separating operations from infrastructure management	Rail	X	X	X	X	X	X
Opening up the rail market to competition	Rail		X	X			X
Strengthening administrative and technical capacity of Maritime Administrations	M/IWW	X	X	X	X	X	X
Developing the Sava and Danube waterways and related IT systems	IWW		X				X
Strengthening the administrative capacity of Civil Aviation Authorities	Air	X	X	X	X	X	X

Legend:

Air transport	Air	Customs and border crossing	C/BC
Inter/multimodal transport	IM	Road transport	Road
Rail transport	Rail	Maritime and/or Inland Waterways	M/IWW

Source: EC. (2014) Enlargement Strategy and Main Challenges 2014-15, Progress reports October 2014. Available from: http://ec.europa.eu/enlargement/countries/strategy-and-progress-report/index_en.htm

4. Traffic Projections for 2030

4.1 Methodological Approach

15. Two scenarios were considered for traffic projections on the SEETO Comprehensive Network based on projections of key economic and demographic variables (GDP, population and employment). The two scenarios represent two alternative economic growth options: low/moderate and moderate/high.

16. GDP projections for 2014, 2015 and 2019 were based on the IMF's 2014 World Economic Outlook.[3] Projections from 2020 to 2030 were developed taking into account the economic conditions of the region and the growth prospects given the stage of economic development of the different Regional Participants. The projected economic growth rates within a Regional Participant varied to reflect higher growth rates in some zones due to an expected higher intensity of economic activities. Zones with economic growth rates higher than average for the Regional Participant included large cities, ports and industrial areas.

17. Population projections were obtained from the World Bank's population datasets.[4] Employment growth rates were estimated based on accepted empirical relationships between economic growth and employment growth (employment intensity). Details on growth rates used and their calculation are presented in Annex I.

18. Traffic growth rates were applied to the traffic counts received from the SEETO Secretariat, which had been collected from the Regional Participants. The results presented below are for the low/moderate and the moderate/high economic growth scenarios for each transport mode.

19. With regards to the road and rail networks, for each of the two economic growth scenarios, two network scenarios are considered: the "do-nothing scenario" (existing network) and the "Full SEETO scenario". The "do-nothing scenario" is based on the 2012 network and so does not reflect ongoing projects. The "Full SEETO" scenario is based on the SEETO Comprehensive MAP 2014 and 2015 which present a set of infrastructure developments and network upgrades expected to be initiated by year 2020.

[3] IMF. (2014) *World Economic Outlook: Legacies, Clouds, Uncertainties*. Available from: http://www.imf.org/external/pubs/ft/weo/2014/02/
[4] The World Bank. (2013) *Population Estimates and Projections.* Available from: http://datatopics.worldbank.org/hnp/popestimates

4.2 Modelling Results for 2030 – Low/Moderate Economic Growth

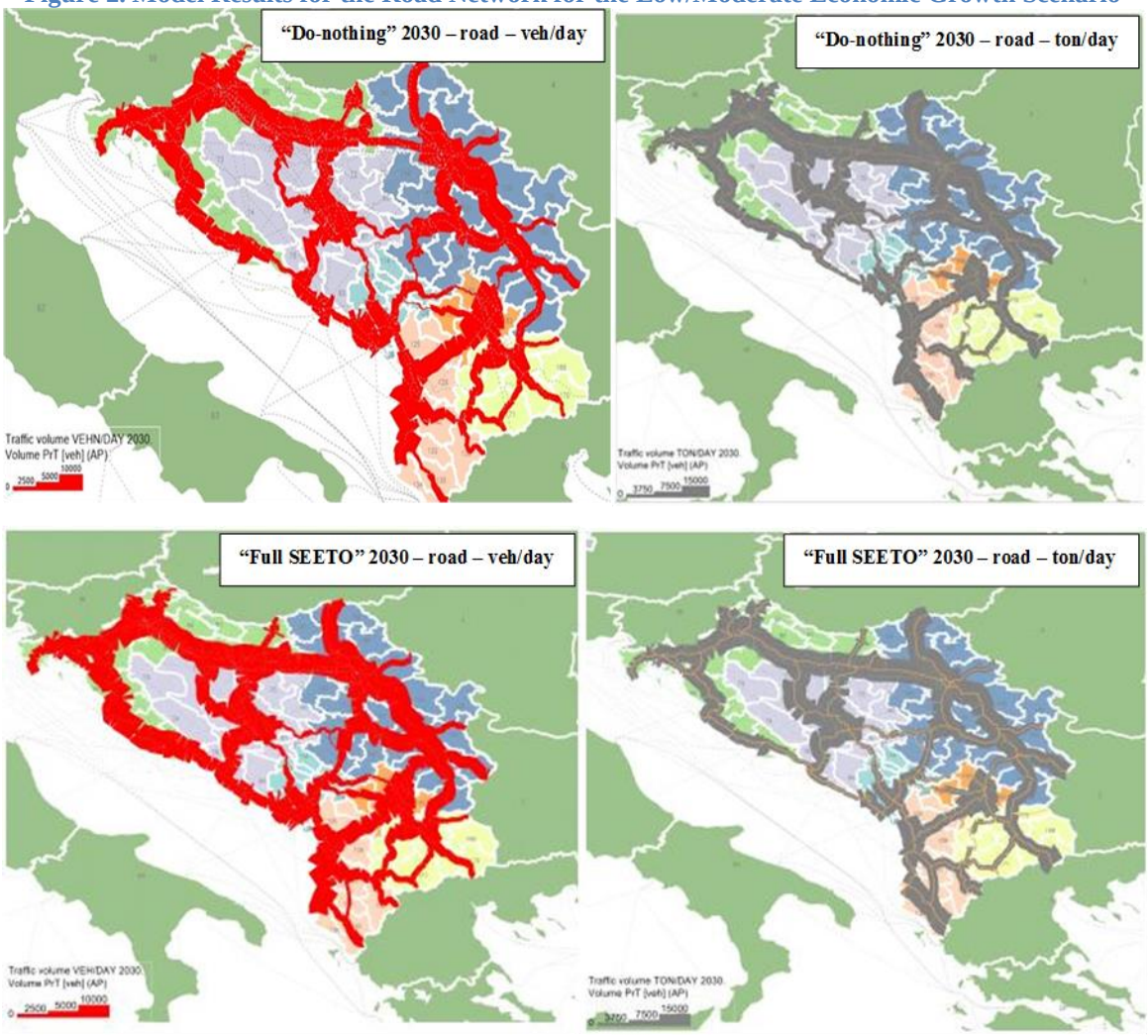
4.2.1 Road Network

20. Traffic volumes were assigned to the different routes along the Comprehensive Network based on the 2030 projections for trip productions and attractions for each zone.[5] Figure 2 shows the 2030 traffic projections on the SEETO Comprehensive Road Network under the low/moderate economic growth scenario, for both the "do-nothing" and "full SEETO" scenario. Complete road traffic projections for 2030 for the "do-nothing" scenario and the "full SEETO" scenario are presented in Annexes II and III respectively.

21. Not surprisingly, the highest traffic projections for 2030 are on the sections along the main corridors in South East Europe (Corridors V, VIII and X). Annex IIIa presents a list of the road network sections with the highest traffic 2030 projections and largest annual traffic growth rates under the low/moderate economic growth scenario. The highest traffic projections for 2030 are found on Corridor X in proximity to significant urban areas. For example, the projected number of vehicles per day near Belgrade in 2030 is between 55,000 to 145,000, and Sections. The equivalent figures near Zagreb are 50,000 to 66,000. For the rest of Corridor X, the 2030 projections varied significantly across sections with the lowest volumes between Orlovaca and Bubanj Potok) in Serbia (about 4,500 vehicles/day) and Gradsko to Udovo in the former Yugoslav Republic of Macedonia (about 4,800 vehicles/day). The average projected traffic for Corridor X is around 23,500 vehicles/day for 2030.

[5] Detailed description of the model development is in the Second REBIS report entitled *"Transport Demand Model and SEETO Comprehensive Network Main Corridors/Routes/Links and Capacities "*

Figure 2. Model Results for the Road Network for the Low/Moderate Economic Growth Scenario



Source: VISUM model output

22. Significant variations in traffic are also found along Corridor VIII with highest projected traffic level near Tirana and the port of Durres reaching about 34,000 vehicles/day and the lowest traffic projections between Rugince and Deve Bair in the Former Yugoslav Republic of Macedonia (approximately 2,700 vehicles/day). The average projected traffic flows for Corridor VIII is about 10,000 vehicles/day.

23. Other road sections with high traffic projections for 2030 are on Corridor Vb between Ivanja Reka and Kraljevecki Novaki, and between Jastrebarsko and Lucko in Croatia (traffic between 40,000 and 45,000 vehicles/day), the section from Pristina to Lipljan and to Sllatine/Slatina in Kosovo (projected traffic between 38,000 and 42,000 vehicles/day).

24. A careful comparison of the flows in Figure 2 shows significant increases in the projected number of vehicles per day for 2030 on Corridor X around Slavonski Brod which is the intersection of two of the three major corridors in the region: Corridor X and Corridor Vc[6]. Traffic is projected to increase on that section of Corridor X from around 17,000 in 2012 level to around 31,000 vehicle per day in 2030. The number of trucks is expected to increase by about 20 percent during that period. Annex IV presents a comparison of the 2030 traffic projections for the "do-nothing" and "full SEETO" networks under the low/moderate growth scenario.

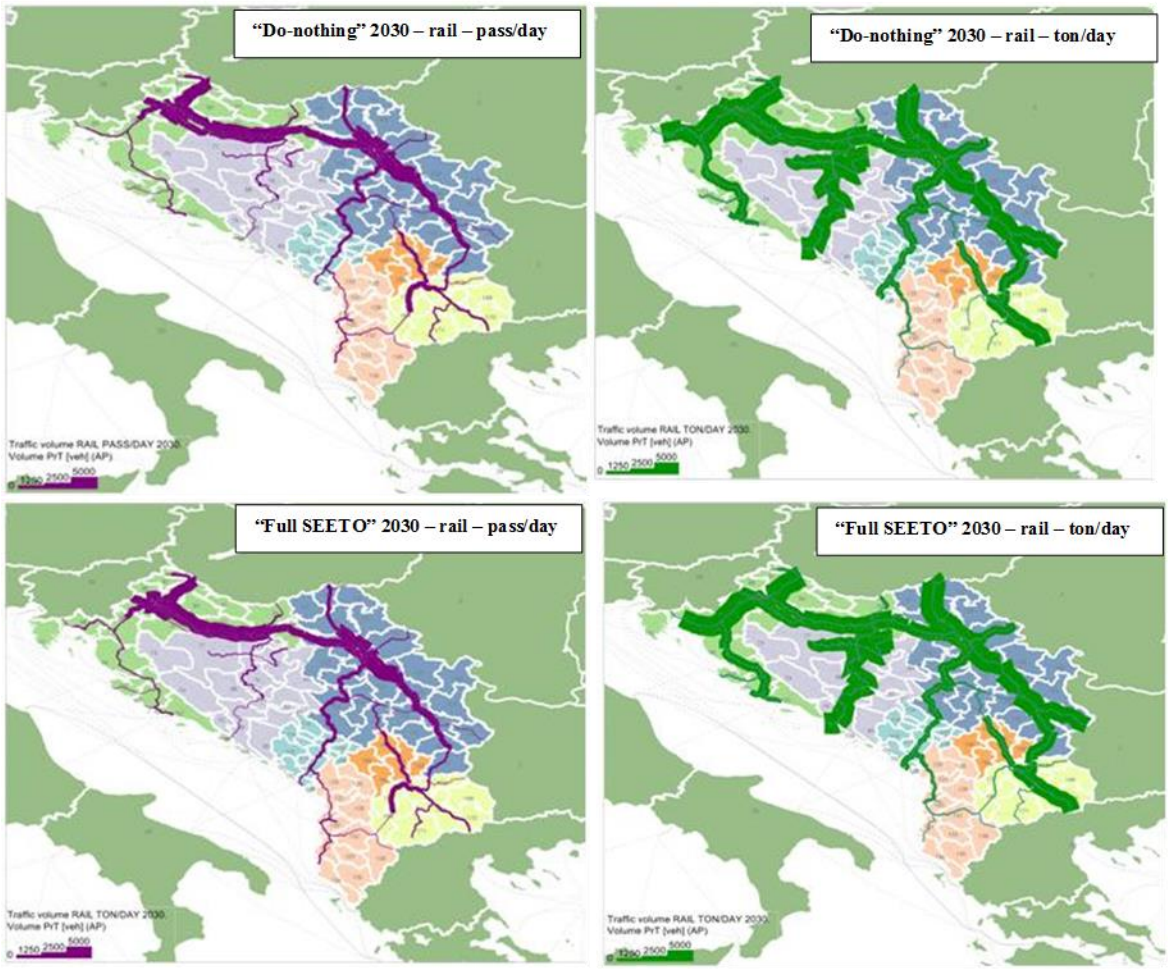
4.2.2 Rail Network

25. Similar to the road network, two scenarios were considered for the rail network: the "do-nothing" scenario and the "full SEETO" scenario, which includes projects identified by the SEETO MAP 2014 and 2015.

26. Figure 3 presents the 2030 traffic forecasts for the SEETO Comprehensive rail network for the "do-nothing" scenario as well as for the "full-SEETO" scenario under low/moderate growth rates assumption. Figure 3 shows that there are only minor differences between the two scenarios. This is to be expected given that, unlike the road network, there are not a lot of practical route alternatives for rail shipments between two points within the region. Annex IV presents the detailed comparisons between the two scenarios. Similar to roads, the highest traffic projections for rail are on Corridor X. Rail cargo projections for 2030 on sections close to Zagreb and Belgrade are the highest at about 12,000 – 14,000 tons per day. Rail traffic on Corridor X in fYR Macedonia is projected to reach 5,500 – 7,500 tons per day by 2030. For Bosnia and Herzegovina the 2030 projections are 6,000 – 8,000 tons per day between Doboj and the port of Ploce in Croatia; and around 8,000 on Route 9 between Banja Luka, Doboj, Tuzla and Brcko. The 2030 rail projections for Albania (for Corridor VIII) are quite low and are expected to reach 700 tons per day on the section from Durres to Rrogozhine if it were upgraded. Traffic on Route 4 in Montenegro connecting the port of Bar to Belgrade in Serbia is projected to reach around 4,000 – 4,500 tons per day in the northern section between Podgorica and Bijelo Polje close to the border with Serbia. The sections close to Bar port are projected to carry about 1,500 tons per day in 2030.

[6] Corridor X runs between Salzburg in Austria and Thessaloniki in Greece and passes through Austria, Slovenia, Croatia, Serbia and fYR Macedonia. Corridor Vc starts in Hungary, goes through Croatia and Bosnia and Herzegovina and ends in the Port of Ploce in Croatia, which serves as the primary port for Bosnia and Herzegovina.

Figure 3. Model Results for the Rail Network for the Low/Moderate Economic Growth Scenario



Source: VISUM model output

4.2.3 Maritime and Inland Waterway (IWW) Transport

27. For the low/moderate economic growth scenario, Figures 4-6 present 2030 traffic projections for both passenger and freight for IWW and sea ports. The port of Rijeka in Croatia is expected to handle the largest cargo throughput projected at 11.3 million tons per year in 2030 (from 9.4 million tons in 2012), followed by port of Duress in Albania at 4.8 million tons per year. The ports of Split and Ploce are each projected to handle around 3-3.5 million tons per year. The ports of Croatia are projected to have the largest number of passengers in 2030, with the ports of Split, Zadar and Dubrovnik expected to handle 5.5, 3.1 and 2.2 million passengers respectively.

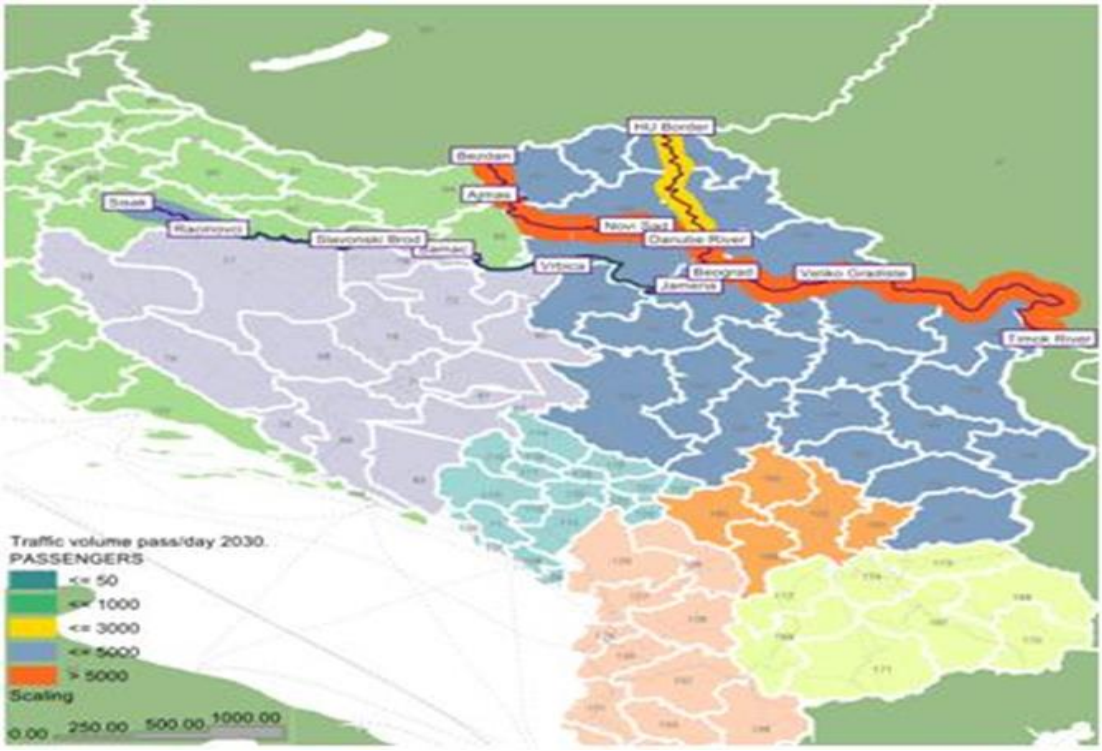
28. For the IWW, throughput for the port of Novi Sad on the Danube River in Serbia is projected to increase from around 1.1 million tons in 2012 to 1.4 million tons in 2030, the highest throughput for the regional inland waterways. The port of Vukovar on the Danube River in Croatia is expected to handle the second large throughput (750,000 tons in 2030). Brcko port on the Sava River, Bosnia and Herzegovina's only international port is

projected to handle about 100,000 tons in 2030. The detailed forecasted volumes are presented in Annex II.

Figure 4. Number of Passengers and Tons per year (2030) for Seaports for the Low/Moderate Economic Growth Scenario

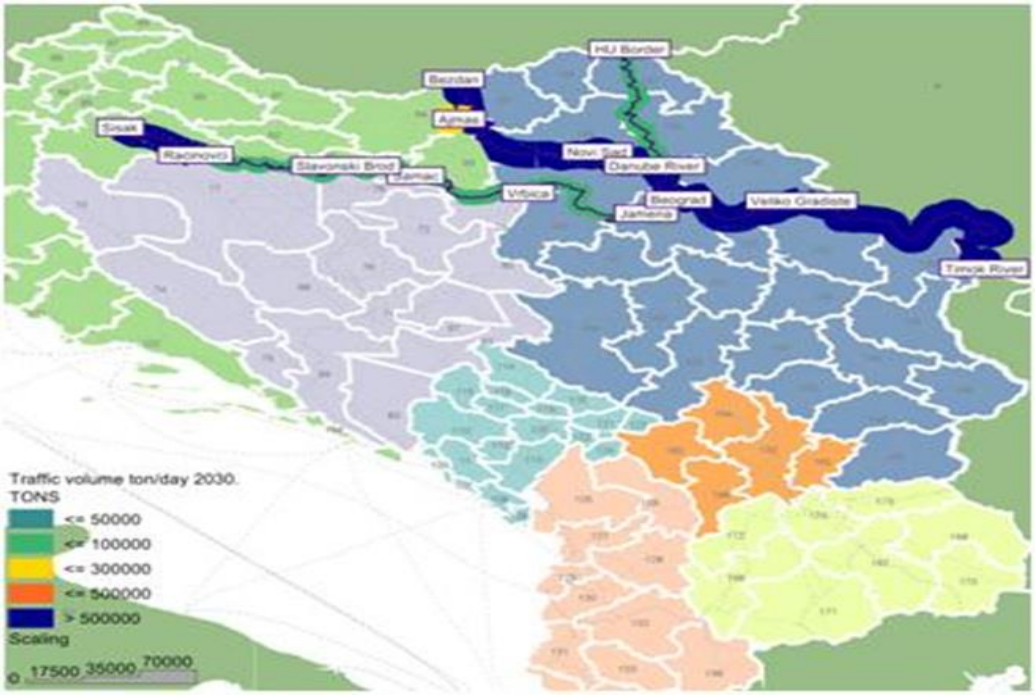
Source: Consultant's estimates

Figure 5. 2030 – IWW – Pass/Day for the Low/Moderate Economic Growth Scenario



Source: VISUM model output

Figure 6. 2030 – IWW – Ton/Day for the Low/Moderate Economic Growth Scenario

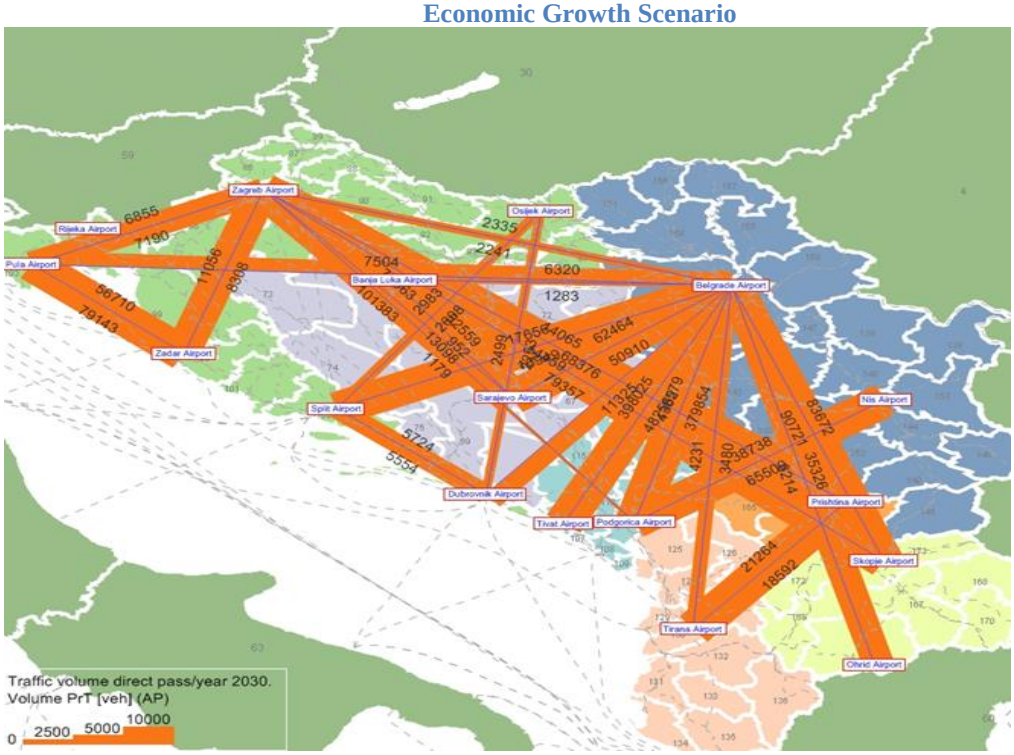


Source: VISUM model output

4.2.4 Air Transport

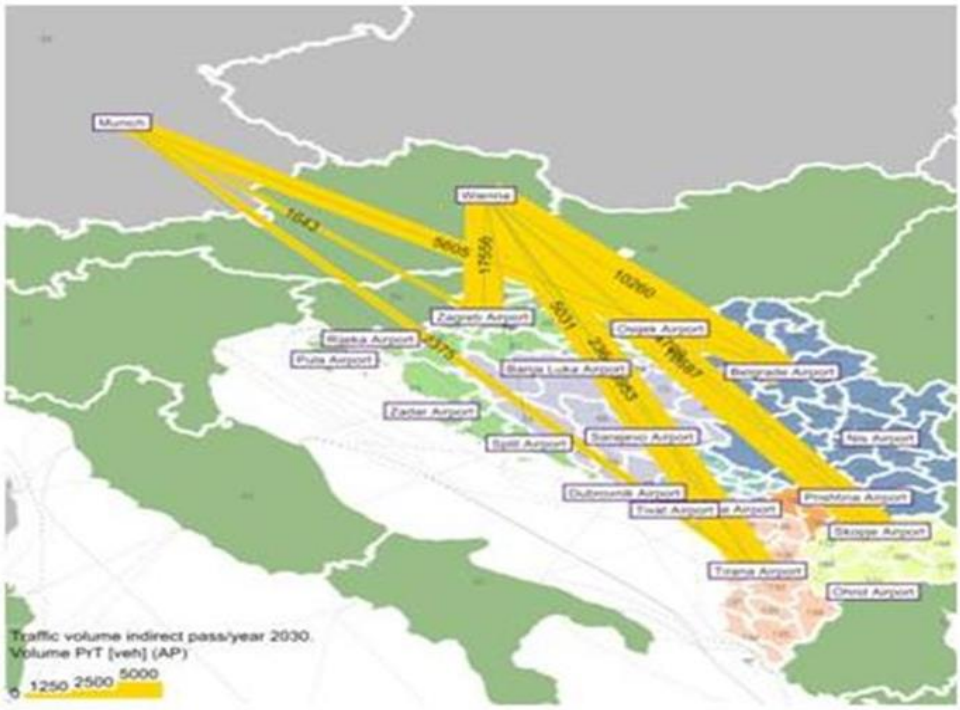
29. Figures 7-8 present air traffic projections for 2030 for passengers using direct flights and for those using connecting flights for the low/moderate growth scenario. Vienna and Munich airports, the two main airport hubs, outside the SEETO region, were considered. The newly introduced direct flight connections between Tirana and Belgrade, and Zagreb and Belgrade were taken into account. Belgrade airport is expected to continue to handle the largest number of passengers in the region projected to reach 4.3 million in 2013.Tirana and Zagreb airports are expected to reach about 3 million passengers each, in 2013. Pristina airport is projected to have around 2.8 million passengers in 2030. Podgorica, Skopje and Sarajevo are projected to handle 1.9, 1.6 and 0.9 million passengers in 2030. The detailed 2030 air transport forecasts are presented in Annex II.

Figure 7. 2030 – Airports – Direct Passengers per year for the Low/Moderate Economic Growth Scenario



Source: VISUM model output

Figure 8. 2030 – Airports – Indirect Passengers per year for the Low/Moderate Economic Growth Scenario



Source: VISUM model output

4.3 Modelling Results for 2030–Moderate/High Economic Growth

30. For the moderate/high economic growth scenario, the same modelling approach was used as for the low/moderate economic scenario. The detailed results for all transport modes are presented in Annexes II and III.

31. Comparing the 2030 traffic forecasts for the low/moderate and moderate/high scenario for the road network (expressed in total number of vehicles/day), the moderate/high forecasts are on average approximately 12 percent higher. Freight traffic (both expressed in tons/day and number of trucks/day), is about 15 percent higher in the moderate/high growth scenario than in the low/moderate growth scenario.

32. As for railway network projections, passenger traffic (number of passengers) is found to be approximately 13 percent higher and freight traffic (tons) 11 percent higher in the moderate/high growth scenario than in the low/moderate scenario.

33. Regarding maritime and IWW transport, the forecasted traffic, both passenger and freight, for the low/moderate scenario are calculated to be 20 percent lower than for the moderate/high scenario. Finally, the air traffic forecasts for 2030 are found to be approximately 17 percent higher in the moderate/high growth scenario, compared to the low/moderate scenario.

5. Capacity Assessment: The Identification of Physical Bottlenecks

34. This section of the report assesses the capacity of the existing SEETO Comprehensive Network (defined as the "do-nothing" network scenario) to handle the existing traffic as well as the 2030 projected traffic. It also assesses the capacity of the Full SEETO Comprehensive Network (which is based on the MAP 2014 and 2015) to handle the 2030 projected traffic. The objectives of this exercise are to identify, based on technical capacity constraints, whether an intervention is required to alleviate a bottleneck and if so what type of intervention; and when it would be required. The proposed interventions need to be subject to pre-feasibility and feasibility analyses involving sound economic cost-benefit criteria to determine their viability before a decision is made regarding their implementation.

5.1 Road Network

35. Road capacity was defined for the different roads on the SEETO Comprehensive Network based on road type, design speed, terrain and other operating factors (see Annex V). Existing traffic and 2030 traffic projections were then assessed against the capacity of the networks to identify bottlenecks where interventions need to be considered. This was carried out for both the low/moderate and moderate/high economic growth scenarios.

36. Four broad categories of interventions were considered:

(i) Road sections that require no immediate upgrading

This is based on the 2012 SEETO Comprehensive network and does not take into account ongoing projects. There are a few complete corridors/highways that fall into that category:

- Route 9 - Croatia – all sections [Vukovar-Vinkovci-Zupanja]
- Corridor Xa - Croatia – all sections [Zagreb/Donji Macelj – Jankomir]
- Corridor Xb - Serbia – all sections [Horgos-Subotica-Novi Sad-Batajnica-Dobanovci]

In addition, there are many sections within each corridor/route which also fall into this category.

(ii) Road sections that are candidates for immediate rehabilitation to preserve capacity

These are road sections where existing road and pavement conditions require rehabilitation; otherwise, they will operate at a reduced capacity.

(iii) Road sections that are candidates for immediate upgrading to increase capacity

The interventions in this category include upgrading to sustain optimum existing lane capacity, widening from 2 lanes to 4 lanes and widening from 4 lanes to 6 lanes.

(iv) Road sections that are candidates for future upgrading to increase capacity before 2030

These are specific sections where the current road conditions may require future upgrading/widening to increase capacity to meet the 2030 traffic projections. It is therefore recommended that these specific sections be subject to further studies in due course, to identify the appropriate type of intervention, which will be likely to take place before 2030.

37. For the low/moderate economic growth scenario, Figure 9 provides the locations of identified current and future bottlenecks in the road network and Table 3 provides a summary of the interventions proposed for addressing them. Similarly, for the moderate/high economic growth scenario, Figure 10 provides the locations of identified current and future bottlenecks in the road network and Table 4 provides a summary of the interventions proposed for addressing them. The proposed interventions are based on technical capacity considerations but need to be subject to an economic analysis to determine their viability. All identified interventions for the different road sections are presented in Annex VI.

Figure 9. Identified Current and Future Bottlenecks on the Existing SEETO Comprehensive Road Network for the Low/Moderate Economic Growth Scenario

Source: Consultant's estimates based on SEETO data (2012) and model output (forecasts)

Figure 10. Identified Current and Future Bottlenecks on the Existing SEETO Comprehensive Road Network for the Moderate/High Economic Growth Scenario

Source: Consultant's estimates based on SEETO data (2012) and model output (forecasts)

Table 3. Summary Table for Potential Interventions in the Road Sector for the Low/Moderate Economic Growth Scenario

		No immediate rehabilitation or upgrading required	Immediate rehabilitation may be required	Immediate upgrading may be required			Upgrading may be required by 2030	
	Total length (km)			Measures to optimize capacity	Widening from 2 lanes to 4 lanes	Widening from 4 lanes to 6 lanes	Requiring upgrading by 2030	Requiring widening by 2030
Route 1	713	569	92	52.5	0	0	30	155.5
Route 10	183	138	45	0	0	0	0	85
Route 2a	239	91	37	111	0	0	148	49
Route 2b	395	108	124	150	13	0	0	141
Route 2c	125	125	0	0	0	0	23	0
Route 3	185	0	149	36	0	0	21	0
Route 4	601	350	119	110	22	0	75	331
Route 5	211	120	0	85.9	5.5	0	0	85.9
Route 6a	259	12	189	35	23	0	75	12
Route 6b	205	80	125	0	0	0	0	0
Route 7	314	196	101	17	0	0	58	20
Route 8	78	0	78	0	0	0	0	0
Route 9	43	43	0	0	0	0	0	0
Corridor Vb	274	274	0	0	0	0	0	0
Corridor Vc	541	111	135	43	225	0	181	0
Corridor VIII	657	426	154	77	0	0	97	0
Corridor X	1030	921	43	22	0	44	0	30
Corridor Xa	63	63	0	0	0	0	0	0
Corridor Xb	185	185	0	0	0	0	0	0
Corridor Xc	110	110	0	0	0	0	91	0
Corridor Xd	117	42	75	0	0	0	0	0
SUMMARY	**6528**	**3964**	**1466**	**739.4**	**288.5**	**44**	**799**	**909.4**
SUMMARY (%)*		**60.7%**	**22.5%**	**11.3**	**4.4%**	**0.7%**	**12.2%**	**13.9%**

Source: Consultant's estimates based on SEETO data (2012) and model output (forecasts)

** The sum exceeds 100% because some road sections require immediate as well as future interventions. For example a section may require rehabilitation now and upgrading in the future.*

38. The capacity analysis for the road network shows that about 60 percent of the Comprehensive Network (about 4,000 km) is in no need of immediate interventions and another 23 percent (1,500 km) only requires rehabilitation. About 16 percent of the network (1,100 km) may require some intervention for upgrading or widening at present. Depending on the economic growth scenario, between 25 and 30 percent of the network (1,700 km - 2,100 km) may require some upgrading or widening intervention before 2030. As

mentioned earlier, the economic viability of the different interventions needs to be examined before a decision is made on whether to implement the intervention or not.

Table 4. Summary Table for Potential Interventions in the Road Sector for the Moderate/High Economic Growth Scenario

	Total length (km)	No immediate rehabilitation or upgrading required	Immediate rehabilitation may be required	Immediate upgrading may be required			Upgrading may be required by 2030	
				Measures to optimize capacity	Widening from 2 lanes to 4 lanes	Widening from 4 lanes to 6 lanes	Requiring upgrading by 2030	Requiring widening by 2030
Route 1	713	569	92	52.5	0	0	0	185.5
Route 10	183	138	45	0	0	0	0	85
Route 2a	239	91	37	111	0	0	77	120
Route 2b	395	108	124	150	13	0	0	141
Route 2c	125	125	0	0	0	0	23	71
Route 3	185	0	149	36	0	0	0	21
Route 4	601	350	119	110	22	0	85	346
Route 5	211	120	0	85.9	5.5	0	54.0	85.9
Route 6a	259	12	189	35	23	0	75	12
Route 6b	205	80	125	0	0	0	0	0
Route 7	314	196	101	17	0	0	58	20
Route 8	78	0	78	0	0	0	0	0
Route 9	43	43	0	0	0	0	0	0
Corridor Vb	274	274	0	0	0	0	0	73
Corridor VC	541	111	135	43	225	0	181	0
Corridor VIII	657	426	154	77	0	0	97	0
Corridor X	1030	921	43	22	0	44	54	100
Corridor Xa	63	63	0	0	0	0	0	0
Corridor Xb	185	185	0	0	0	0	0	0
Corridor Xc	110	110	0	0	0	0	91	0
Corridor Xd	117	42	75	0	0	0	0	0
SUMMARY	**6528**	**3964**	**1466**	**739.4**	**288.5**	**44**	**795**	**1260.4**
SUMMARY (%)*		**60.7%**	**22.5%**	**11.3**	**4.4%**	**0.7%**	**12.2%**	**19.3%**

Source: Consultant's estimates based on SEETO data (2012) and model output (forecasts)

** The sum exceeds 100% because some road sections require immediate as well as future interventions. For example a section may require rehabilitation now and upgrading in the future.*

5.2 Rail Network

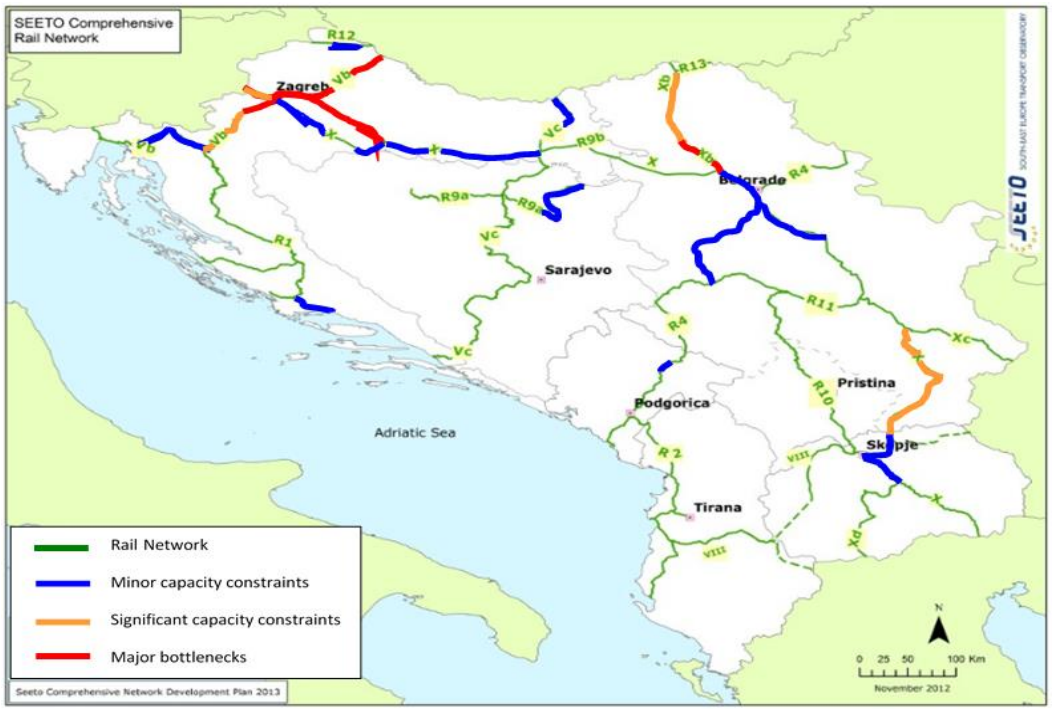
39. The capacity of the SEETO Comprehensive Railway networks (the "do-nothing" and the "Full-SEETO" networks) was assessed against the 2012 railway traffic and 2030 traffic projections to identify bottlenecks where interventions need to be considered. This was carried out for both the low/moderate and moderate/high economic growth scenarios.

Based on the current average speeds and temporary speed restrictions on the Comprehensive Network, it is clear that the infrastructure condition needs significant improvement. However, the capacity analysis carried out in this update is to determine whether the railway infrastructure, if in reasonable condition, could handle the existing and projected traffic flows or not. Four broad categories of constraints and corresponding interventions were considered:

i. Rail sections with **no capacity constraints** related to infrastructure. These rail sections refer to links with less than 40 percent utilization, thus no improvements are needed.
ii. Rail sections with **minor capacity constraints.** Minor capacity constraints in infrastructure that can be improved with minor improvements. These are assumed to be the links with average utilization 40-65 percent.
iii. Rail sections with **significant capacity constraints.** Significant capacity constraints in infrastructure that need major upgrading. These are links with utilization of 65-80 percent.
iv. Rail sections with **major capacity constraints.** Major capacity constraints in infrastructure that would require based on engineering technical capacity standards construction of new line: links with utilization above 80 percent.

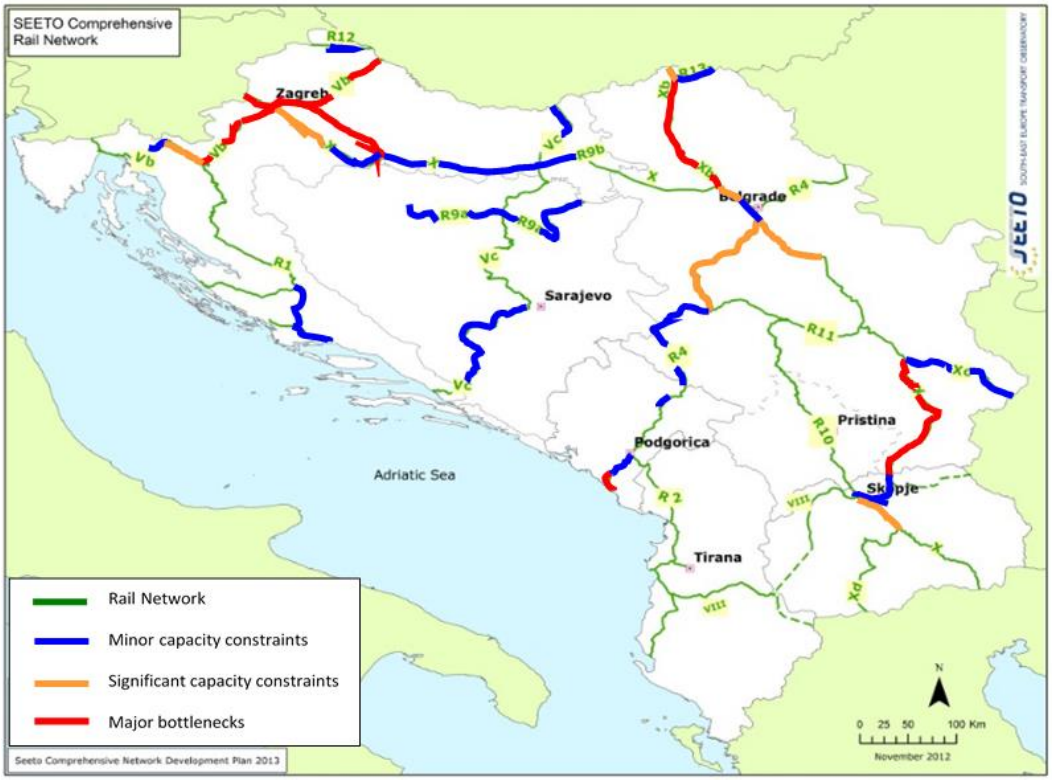
40. Possible interventions for increasing capacity include: (i) double tracking; (ii) adding auxiliary tracks at crossing stations; (iii) managing network effects; (iv) managing track structure and speed limits; (v) managing train heterogeneity; and (vi) implementing modern signaling. More specifically, for rail sections with minor capacity constraints, minor works are proposed; for rail sections with significant capacity constraints, upgrading measures to optimize capacity and/or major rehabilitation are proposed; for rail sections with major bottlenecks, the construction of additional track/new line is proposed. It should also be noted that less costly interventions than the construction of new lines (such as the implementation of modern signaling and managing train heterogeneity) should be considered first and can typically lead to significant increases in capacity. The closure of railway lines is not considered in this study, because such a decision should be based on a careful line by line and network economic efficiency analysis. The proposed interventions for addressing the capacity bottlenecks are presented in Annex VII.

Figure 11. Identified *Current* Bottlenecks on the SEETO Comprehensive Rail Network for the Low/Moderate Economic Growth Scenario



Source: Consultant's estimates based on SEETO data (2012) and model output (forecasts)

Figure 12. Identified *Future* Bottlenecks on the Existing SEETO Comprehensive Rail Network for the Low/Moderate Economic Growth Scenario



Source: Consultant's estimates based on SEETO data (2012) and model output (forecasts)

41. For the low/moderate economic growth scenario, Figures 11-12 present the maps of the SEETO Comprehensive Railway Network displaying current and future capacity constraints respectively and Table 5 provides a summary of the interventions proposed for further analysis on the rail network. For the moderate/high economic growth scenario, Figure 13 presents the map of the SEETO Comprehensive Railway Network showing future capacity constraints and Table 6 provides a summary of the interventions proposed for further analysis on the rail network. Annex VIIa presents a breakdown of the railway infrastructure by type of intervention proposed for consideration. The economic viability of the identified interventions would need to be assessed before a decision on implementation is made.

Table 5. Summary Table for Potential Interventions in the Rail Sector for the Low/Moderate Economic Growth Scenario

				Immediate upgrading may be required		Upgrading may be required by 2030		
	Total length (km)	No immediate minor works or upgrading required	Immediate minor works may be required (Minor capacity constraints)	Measures to optimize capacity (significant capacity constraints)	Requiring construction of additional track/new line (Major bottlenecks)	Requiring minor works by 2030 (minor capacity constraints)	Requiring upgrading by 2030 (significant capacity constraints)	Requiring construction of additional track/new line by 2030 (major bottlenecks)
Route 1	**428**	383	45	0	0	105	0	0
Route 10	**117**	117	0	0	0	0	0	0
Route 11	**138**	138	0	0	0	0	0	0
Route 12	**51**	12	39	0	0	39	0	0
Route 13	**28**	28	0	0	0	28	0	0
Route 2	**144**	144	0	0	0	0	0	0
Route 4	**529**	321	187	21	0	181	132	19
Route 9a	**218**	146	72	0	0	218	0	0
Route 9b	**18**	18	0	0	0	0	0	0
Corridor Vb	**325**	19	124	103	79	88	36	171
Corridor Vc	**553**	553	0	0	0	201	0	0
Corridor VIII	**593**	382	0	0	211	0	0	211
Corridor X	**1077**	376	400	169	132	218	207	253
Corridor Xb	**145**	0	2	106	37	0	2	143
Corridor Xc	**104**	104	0	0	0	104	0	0
Corridor Xd	**146**	146	0	0	0	0	0	0
SUMMARY	**4614**	**2887**	**869**	**399**	**459**	**1182**	**377**	**797**
SUMMARY (%)*		**62.6%****	**18.8%**	**8.7%**	**9.9%**	**25.2%**	**8.2%**	**17.3%**

Source: Consultant's estimates based on SEETO data (2012) and model output (forecasts)

** The sum exceeds 100% because some road sections require immediate as well as future interventions. For example a section may require minor works now and upgrading in the future.*

*** Based on the poor infrastructure condition and maintenance backlog, a large proportion of the 2,900 km that do not need immediate intervention to increase capacity, will require maintenance/rehabilitation.*

Figure 13. Identified *Future* Bottlenecks on the SEETO Comprehensive Rail Network for the Moderate/High Economic Growth Scenario

Source: Consultant's estimates based on SEETO data (2012) and model output (forecasts)

42. The capacity analysis for the SEETO Comprehensive railway network shows that about 63 percent of the Comprehensive Network (about 2,900 km out of 4,600 km) is in no need of any immediate intervention to increase capacity. However this figure needs to be interpreted with caution. As mentioned above, the capacity analysis is used to determine whether the designed railway infrastructure could handle the existing and projected traffic flows or not. But based on the poor infrastructure condition and maintenance backlog, a large proportion of the 2,900 km that do not need immediate intervention to increase capacity, will require maintenance/rehabilitation. About 19 percent (900 km) may require interventions for upgrading at present. Depending on the economic growth scenario, between 25 and 33 percent of the network (1,200 km - 1,500 km) may require some upgrading intervention before 2030. The economic viability of the different interventions needs to be established before a decision is made to move ahead with implementation.

Table 6. Summary Table for Potential Interventions in the Rail Sector for the Moderate/High Economic Growth Scenario

	Total length (km)	No immediate rehabilitation or upgrading required	Immediate rehabilitation may be required (Minor capacity constraints)	Immediate upgrading may be required		Upgrading may be required by 2030		
				Measures to optimize capacity (significant capacity constraints)	Requiring construction of additional track/new line (Major bottlenecks)	Requiring rehabilitation by 2030 (minor capacity constraints)	Requiring upgrading by 2030 (significant capacity constraints)	Requiring construction of additional track/new line by 2030 (major bottlenecks)
Route 1	**428**	383	45	0	0	267	45	0
Route 10	**117**	117	0	0	0	0	0	0
Route 11	**138**	138	0	0	0	0	0	0
Route 12	**51**	12	39	0	0	39	0	0
Route 13	**28**	28	0	0	0	28	0	0
Route 2	**144**	144	0	0	0	0	0	0
Route 4	**529**	321	187	21	0	239	38	151
Route 9a	**218**	146	72	0	0	124	94	0
Route 9b	**18**	18	0	0	0	0	0	0
Corridor Vb	**325**	19	124	103	79	0	124	171
Corridor Vc	**553**	553	0	0	0	278	32	0
Corridor VIII	**593**	382	0	0	211	32	0	211
Corridor X	**1077**	376	400	169	132	289	220	303
Corridor Xb	**145**	0	2	106	37	0	2	143
Corridor Xc	**104**	104	0	0	0	104	0	0
Corridor Xd	**146**	146	0	0	0	0	0	0
SUMMARY	**4614**	**2887**	**869**	**399**	**459**	**1400**	**555**	**979**
SUMMARY (%)*		**62.6%**	**18.8%**	**8.67%**	**9.9%**	**30.3%**	**12.0%**	**21.2%**

Source: Consultant's estimates based on SEETO data (2012) and model output (forecasts)

** The sum exceeds 100% because some road sections require immediate as well as future interventions. For example a section may require minor works now and upgrading in the future.*

*** Based on the poor infrastructure condition and maintenance backlog, a large proportion of the 2,900 km that do not need immediate intervention to increase capacity, will require maintenance/rehabilitation.*

5.3 Airports

43. Based on the analysis undertaken using current traffic data (IATA 2013) and the model forecasts for 2030 for both low/moderate and moderate/high economic growth scenarios, it was determined that the existing air services for passengers and freight within the SEETO airports are adequate to meet the demand and that no financially viable additional services could be envisaged in the short- and medium-terms.

However the situation is different when considering terminal capacity in many of the airports in the region. Table 7 shows that passenger traffic in Zagreb and Podgorica airports has exceeded terminal capacity. Split and Tirana airports are also close to reaching terminal capacity. Tables 7 and 8 present a list of airports that are expected to face capacity constraints by 2030 for the low/moderate and moderate/high economic growth scenarios

respectively. The tables also show the interventions proposed for consideration to enhance capacity. Figures 14 and 15 highlight the airports that have or are expected to have capacity constraints by 2030.

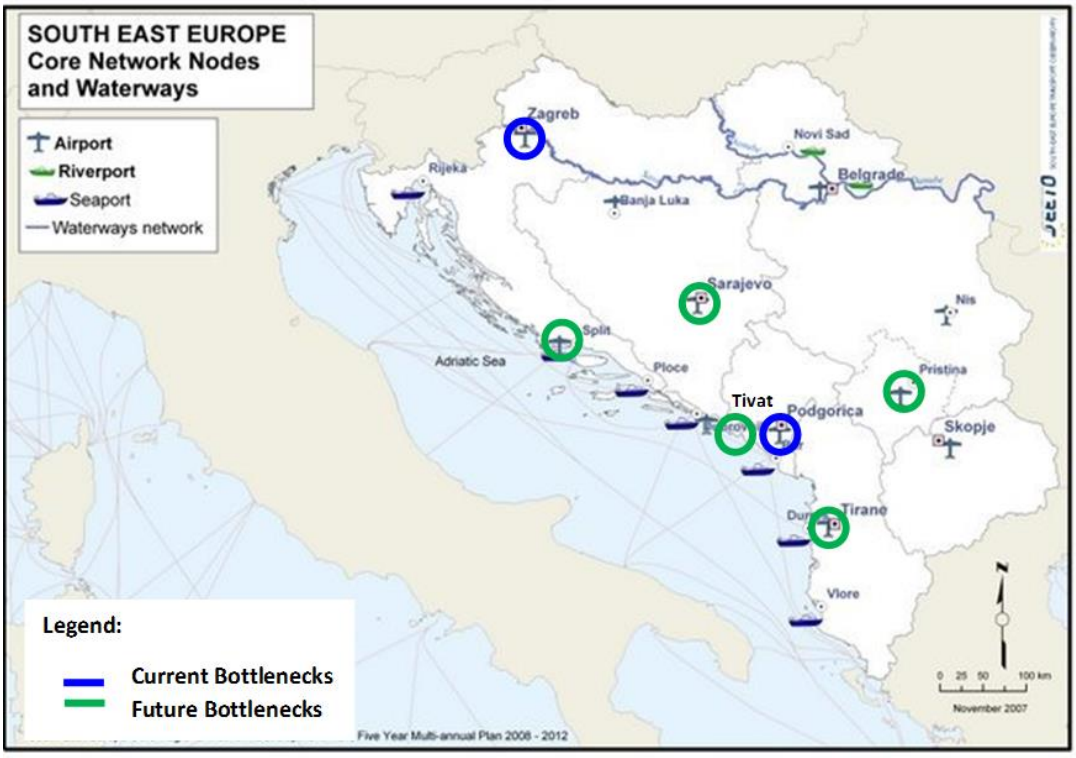
44. Most of the indirect traffic between the SEETO airports and Europe currently connects through European hubs. Zagreb and Belgrade could further reinforce their role as gateways to the region leveraging their connections to the other regional airports. As a result, more services from Zagreb and Belgrade to the other regional airports could be foreseen and there is potential for these airports to develop as gateways to Europe and the rest of the world from/to the South East Europe.

Table 7. Airports Capacity Constraints and Interventions for the Low/Moderate Economic Growth Scenario

Country	Airport	Annual Traffic vs Annual Declared Capacity (2012)	Annual Traffic Vs Annual Declared Capacity (2030)	Bottlenecks detected	Proposed Intervention
ALB	Tirana	93%	163%	Current traffic close to declared capacity and future traffic will exceed declared capacity	Expansion of the airport (terminal building)
ALB	Tirana			Current runway length (2735m) is short for the largest code E aircraft	Future extension of the runway
BiH	Sarajevo	73%	109%	Future traffic will exceed declared capacity	Expansion of the airport (terminal building)
CRO	Split	95%	119%	Current traffic close to declared capacity and future traffic exceeds declared capacity	Expansion of the airport (terminal building)
CRO	Zagreb	117%	146%	Current and future traffic exceed declared capacity	Expansion of the airport (terminal building)
KOS	Pristina	30%	56%	Current runway length (2501m) is too short for most of code E aircraft	Future extension of the runway
MNE	Tivat	73%	125%	Current traffic close to declared capacity and future traffic will exceed declared capacity	Expansion of the airport (SEETO MAP 2014 Priority Projects: Construction of new terminal building and apron rehabilitation on Tivat Airport)
MNE	Podgorica	111%	191%	Future traffic will exceed declared capacity	Expansion of the airport (terminal building)

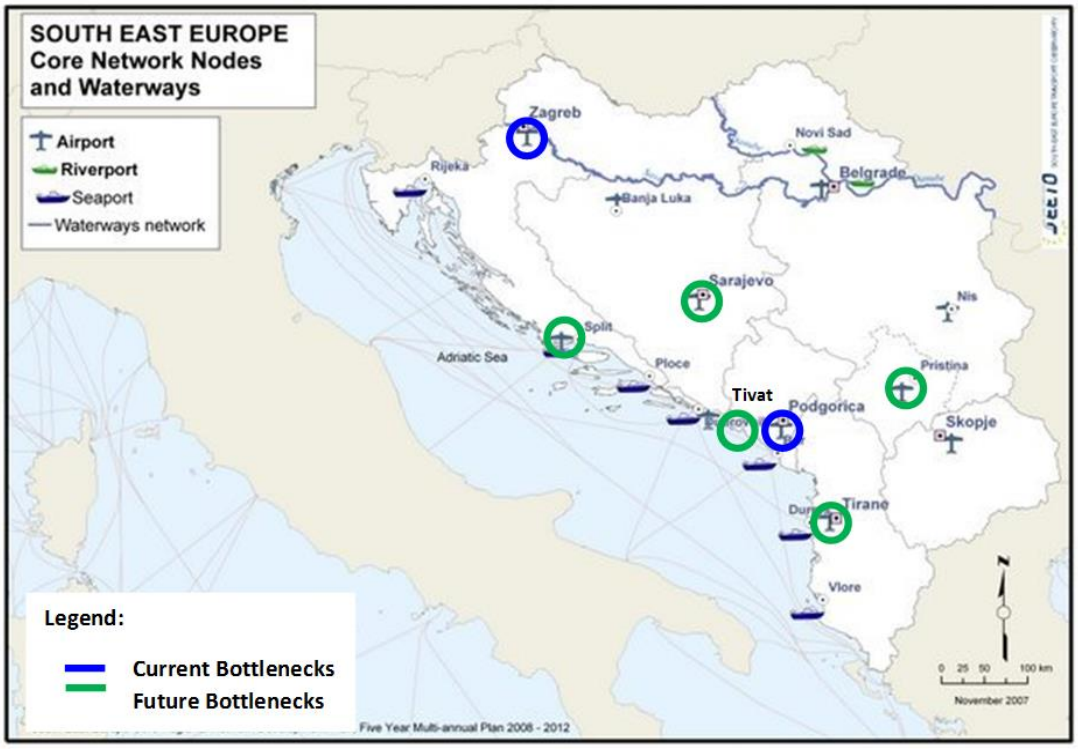
Source: SEETO (2012), Consultant/World Bank estimates (2030 forecasts)

Figure 14. Current and Future Bottlenecks for the Airports for the Low/Moderate Economic Growth Scenario



Source: Consultant/World Bank estimates and SEETO data (2012)

Figure 15. Current and Future Bottlenecks for the Airports the Moderate/High Economic Growth Scenario



Source: Consultant/World Bank estimates and SEETO data (2012)

Table 8. Airports Capacity Constraints and Interventions for the Moderate/High Economic Growth Scenario

Country	Airport	Annual Traffic vs Annual Declared Capacity (2012)	Annual Traffic Vs Annual Declared Capacity (2030)	Bottlenecks detected	Proposed Intervention
ALB	Tirana	93%	216%	Current traffic very close to declared capacity and future traffic will exceed declared capacity Current runway length (2735m) is short for the largest code E aircraft	Expansion of the airport (terminal building) Future extension of the runway
BiH	Sarajevo	73%	135%	Future traffic will exceed declared capacity	Expansion of the airport (terminal building)
CRO	Dubrovnik	74%	103%	Future traffic will reach declared capacity	
CRO	Split	95%	132%	Current traffic very close to declared capacity and future traffic exceeds declared capacity	Expansion of the airport (terminal building)
SRB	Belgrade	67%	100%	Future traffic will reach declared capacity	
CRO	Zagreb	117%	163%	Current and future traffic exceed declared capacity	Expansion of the airport (terminal building)
KOS	Pristina	30%	75%	Current runway length (2501m) is too short for most of code E aircraft	Future extension of the runway
MNE	Tivat	73%	165%	Future traffic will exceed declared capacity	Expansion of the airport (SEETO MAP 2014 Priority Projects: Construction of new terminal building and apron rehabilitation on Tivat Airport)
MNE	Podgorica	111%	251%	Current and future exceed declared capacity	Expansion of the airport (terminal building)

Source: SEETO (2012), Consultant/World Bank estimates (2030 forecasts)

5.4 Maritime and Inland Waterways Ports

45. Below is an overview of the main ports in the SEETO region.

Maritime Container Terminals

46. Among the maritime ports in the region, five have container terminals: Rijeka, Ploce and Split in Croatia, Durres in Albania and Bar in Montenegro. The port of Zadar in Croatia allows for container transport in one pier using a ramp for Roll on – Roll off (Ro-

Ro) vessels. The total capacity of all the container terminals in the region is estimated at around 900,000 TEU/year.[7]

47. Rijeka port is currently upgrading its container terminal facilities. The new terminal will handle approximately 600,000 TEU/year (up from the current capacity of 385,000 TEU). Minor container flows are also handled in the Croatian port of Split.[8] Container volumes are served in the port of Durres (100,000 TEUs), as well as in the port of Bar (50,000 TEUs).

48. Once the expansions are completed, the total capacity of the container terminals in the region will be sufficient to handle the 2030 forecasts. At the individual port level, however, insufficient capacity exists in the ports of Split and Durres.

Maritime General Cargo Terminals

49. All ports in the region can handle general cargo, except the port of Dubrovnik which is a passenger-only port. Rijeka port can handle 2,000,000 tons/year, Ploce can handle 600,000 tons/year. Ploce's capacity will increase when the bulk terminal will be relocated to new bulk cargo installation. Split can handle 500,000 tons/year operating at maximum capacity but with yard side restrictions. Durres handles 1,000,000 tons/year (maximum capacity of the existing facilities 1,500,000 tons/year; further expansion is limited by inadequate space) and Pula can handle 400,000 tons/year limited by yard side restrictions.

50. In total the ports in the area can handle approximately 5,000,000 tons/year of general cargo.

Maritime Bulk Cargo Terminals

51. Almost all ports in the region (except Dubrovnik, Vlore and Pula) can handle bulk cargo. Rijeka port can handle 1,400,000 tons/year, Sibenik port can handle 1,400,000 tons/year (further expansion is restricted by yard-side capacity), Split port can handle 1,300,000 tons/year (further expansion restricted also by seaside capacity), Zadar port can handle 600,000 tons/year (further expansion restricted by seaside capacity) and Bar and Durres ports can handle about 400,000 each (further expansion restricted by seaside capacity). Ploce port (current capacity of bulk cargo is 400,000 tons/year) is constructing a new bulk terminal with an estimated capacity of 6,200,000 tons/year. Once construction is completed, the total annual capacity of the bulk terminals in the region will exceed 11,500,000 tons/year.

Maritime Liquid Cargo Terminals

52. The ports that can handle liquid cargo are: Rijeka (24,000,000 tons/year), Zadar (1,600,000 tons/year), Ploce (1,200,000 tons/year), Bar (1,400,000 tons/year) and Vlore

[7] Twenty foot equivalent unit of containers.
[8] A mobile 104 ton crane is used to handle containers.

(300,000 tons/year). In total, the ports in the region can collectively handle 27,000,000 tons/year of liquid cargo.

Maritime Port Capacities against 2030 Projections

53. Tables 9 and 10 present assessments of the 2030 projected passenger and cargo traffic against the maritime port capacities under the low/moderate and moderate/high growth scenarios. Detailed results are presented in Annex VIII. Figure 16 shows ports with insufficient capacity, where interventions need to be considered. According to the capacity assessment, all of the maritime container ports in the region have can handle the current freight flows, with the exception of the ports of Split and Pula where capacity is marginally sufficient. However, against the 2030 traffic projections (and taking into account the planned port expansion projects) the capacities of the ports of Split and Pula (Croatia) and Durres (Albania) are inadequate to cope with the expected future freight flows.

54. The container terminals in Rijeka and Ploce ports will contribute to the modernization of containerization in the region and (given the good rail connections that both ports offer) will allow for ship-rail transport chains from Adriatic Sea to Central and North-West European destinations.

55. The extension plan of the port of Split includes projects in St. Nikolas pier and Resnik-Divulje passenger terminal. These projects will allow Split to retain its key/hub role in passenger transport and stimulate the growth of tourism activities, which support economic growth of the wide port region and nearby islands.

56. With regards to passenger traffic, passenger terminal capacities for the ports of Vlore, Dubrovnik, Ploce, Pula and Zadar will not be able to cope with future (2030) passenger traffic under the low/moderate growth rate scenario. At the same time, based on the moderate/high scenario forecasts for 2030, the ports of Durres and Split will also have passenger capacity constraints (marginally sufficient capacity).

Table 9. Capacity Assessment for the Maritime Ports (low/moderate economic growth scenario)

Country	Port	Passengers/ year 2012	Passengers/ year 2030	Assessment of port passenger capacity (2030)	Tonnes/ year 2012	Tonnes/ year 2030	Assessment of port freight capacity (2030)
ALB	Durres	798,524	926,288	Sufficient	3,516,446	4,782,367	Insufficient
ALB	Vlore	190,015	220,417	Insufficient	164,620	223,883	Sufficient
CRO	Dubrovnik	1,194,298	2,159,291	Insufficient	150	180	Sufficient
CRO	Ploce	189,745	247,427	Insufficient	2,582,109	3,098,531	Sufficient
CRO	Pula	50,000	65,200	Insufficient	568,000	681,600	Insufficient
CRO	Rijeka	178,956	233,359	Sufficient	9,390,380	11,268,456	Sufficient
CRO	Sibenik	297,000	387,288	Sufficient	410,000	492,000	Sufficient
CRO	Split	4,253,135	5,546,088	Sufficient	2,825,192	3,390,230	Insufficient
CRO	Zadar	2,390,229	3,116,859	Insufficient	252,582	303,098	Sufficient
MON	Bar	60,000	69,600	Sufficient	1,640,000	2,230,400	Sufficient

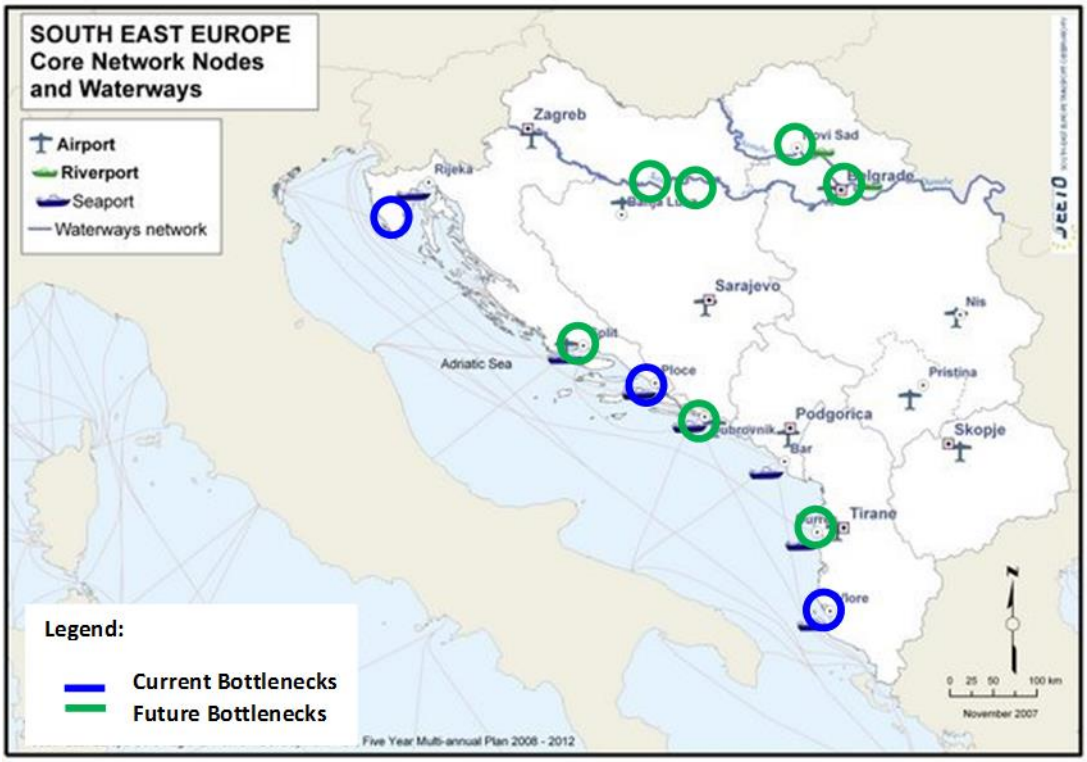
Source: SEETO (2012), Consultant's estimates (2030 forecasts)

Table 10. Capacity Assessment for the Maritime Ports (moderate/high economic growth scenario)

Country	Port	Passengers/ year 2012	Passengers/ year 2030	Assessment of port passenger capacity (2030)	Tonnes/ year 2012	Tonnes/ year 2030	Assessment of port freight capacity (2030)
ALB	Durres	798,524	1,157,860	Marginally sufficient	3,516,446	5,977,958	Insufficient
ALB	Vlore	190,015	275,522	Insufficient	164,620	279,854	Sufficient
CRO	Dubrovnik	1,194,298	2,699,113	Insufficient	150	225	Sufficient
CRO	Ploce	189,745	309,284	Insufficient	2,582,109	3,873,164	Sufficient
CRO	Pula	50,000	81,500	Insufficient	568,000	852,000	Insufficient
CRO	Rijeka	178,956	291,698	Sufficient	9,390,380	14,085,570	Sufficient
CRO	Sibenik	297,000	484,110	Sufficient	410,000	615,000	Sufficient
CRO	Split	4,253,135	6,932,610	Marginally sufficient	2,825,192	4,237,788	Insufficient
CRO	Zadar	2,390,229	3,896,073	Insufficient	252,582	378,873	Sufficient
MON	Bar	60,000	87,000	Sufficient	1,640,000	2,788,000	Sufficient

Source: SEETO (2012), Consultant's estimates (2030 forecasts)

Figure 16. Current and Future Bottlenecks for the Maritime and IWW ports on the SEETO Comprehensive Network for the Low/Moderate and Moderate/High Economic Growth Scenarios



Source: Consultant's estimates (2030 forecasts) and SEETO data (2012)

Inland Waterways (IWW) Terminals

57. The inland waterways terminals are smaller in size than the maritime terminals of the region. Three (out of eight) terminals can handle container traffic. These terminals are Vukovar (Croatia), and Belgrade and Novi Sad (Serbia). The total capacity of all the container terminals in the region is estimated at around 25,000 TEU/year.

58. General and bulk cargo represents the main commodities transshipped to the IWW ports. All of these ports offer options for handling general cargo and bulk cargo commodities. Capacities range from 60,000 to 1,500,000 tons/year (Belgrade and Vukovar ports handle the largest quantities of cargo). Terminals can be categorized according to their location in two clusters: The first cluster contains the ports of Belgrade, Sisak, Brcko, Samac, Vukovar, and Novi Sad, which have well designed installations although of small scale. A common characteristic of these terminals is that they are surrounded by urban areas.

59. The second cluster consists of the ports of Slavonski Brod and Osijek, which are located in rural areas where there is a potential for easy expansion.

IWW Port Capacities against 2030 Projections

60. The assessment of IWW port capacities against the 2030 projections was carried out by assigning each river segment to one or more IWW ports that are located in the specific segment. The outcomes indicate that the IWW terminals of Serbia have insufficient capacity, while most of the IWW terminals of the other countries in the region can handle the forecasted freight traffic. However, the lack of sustainable dredging in Sava River precludes the utilization of the Sava River ports to their full potential.

61. While the port of Belgrade is strategically positioned as a transshipment hub at the intersection of the Danube and Sava Rivers, the port's location in an urban area is an obstacle to further development which argues for the gradual relocation of the port and the further development of other river ports as envisioned in the Spatial Plan of the Republic of Serbia for the period 2010 – 2020. The expansion of other IWW ports in Serbia, as well as in Bosnia and Herzegovina and Croatia is physically feasible and would need to be subject to economic viability tests.

62. Tables 11 and 12 present the results of the passenger and freight capacity assessment of the IWW ports under both economic growth scenarios and Annex VIII provides additional details.

Table 11. Capacity Assessment for the IWW Ports – Passenger Traffic

River	Port	Passengers/ year 2012	Passengers/ year 2030	Assessment of port capacity	Passengers/year 2030	Assessment of port capacity
			Low/Moderate Scenario		Moderate/High Scenario	
Sava	Brcko	200	541	Sufficient	676	Sufficient
Sava	Samac					
Drava	Osijek	1,475	3,312	Sufficient	4,140	Sufficient
Sava	Sisak				0	
Sava	Sl. Brod				0	
Sava	Vukovar		3 new terminals	Sufficient	3 new terminals	Sufficient
Danube	Belgrade	61,037	238,044	Insufficient	297,555	Insufficient
Danube	Novi Sad	11,800	46,018	Insufficient	57,522	Insufficient

Source: SEETO (2012), Consultant's estimates (2030 forecasts)

Table 12. Capacity Assessment for the IWW Ports – Freight Traffic

River	Port	Tonnes/ year 2012	Tonnes/ year 2030	Assessment of port capacity	Tonnes/year 2030	Assessment of port capacity
			Low/Moderate Scenario		Moderate/High Scenario	
Sava	Brcko	71,273	98,780	Sufficient	123,476	Sufficient
Sava	Samac	54,000	74,841	Insufficient	93,551	Insufficient
Drava	Osijek	257,937	357,486	Sufficient	446,858	Sufficient
Sava	Sisak	42,361	58,710	Sufficient	73,388	Sufficient
Sava	Sl. Brod	168,028	232,878	Insufficient	291,097	Insufficient
Sava	Vukovar	541,764	750,855	Sufficient	938,569	Sufficient
Danube	Belgrade	332,485	407,625	Sufficient	509,532	Sufficient
Danube	Novi Sad	1,100,000	1,348,596	Insufficient	1,685,745	Insufficient

Source: SEETO (2012), Consultant's estimates (2030 forecasts)

6. Preliminary Economic Efficiency Analysis

63. A preliminary-level economic efficiency analysis was carried out to develop a priority action plan consisting of the key interventions and measures to alleviate bottlenecks and enhance regional connectivity. The preliminary-level economic analysis is based on rough costs and benefits and is intended to provide a general sense of the viability of proposed efficiency-enhancing investments and measures. The analysis covers both non-physical as well as physical interventions. For physical upgrading or new construction, the analysis is intended to identify interventions for which prefeasibility and feasibility studies should be prioritized.

6.1 Physical Impediments

64. Enhancing the physical connectivity of the SEETO Comprehensive Network in an economically sustainable manner, requires two types of interventions: (i) asset preservation to safeguard the valuable and costly investments in the Network, and (ii) economically-justified investments in upgrading or new construction to address physical bottlenecks.

Asset Preservation

65. The economic rates of return to investment in asset preservation are typically high, often in the double digits. This, coupled with international evidence that a euro not spent on maintenance will result in multiple euros in additional vehicle operating costs provides a sound basis for setting asset preservation of the Comprehensive Network as a high priority.

66. The annual asset preservation cost for the Network includes three elements:

1. Regular maintenance (which includes routine and winter maintenance).
2. “Planned” rehabilitation/renewal of a proportion of the network.
3. Backlog rehabilitation/renewal of a proportion of the network.

67. The estimation was based on the following data:

<u>Roads</u>
Comprehensive Road Network: 6528 km
Annual unit cost of regular maintenance: €10,000 per km.
Unit cost of rehabilitation: €300,000 per km.
Percent of network undergoing regular rehabilitation annually: 12.5%
Percent of network rehabilitation to address backlog: 5%

Based on this data:
Annual cost of regular road maintenance: €55 million
Annual cost of road rehabilitation (regular and backlog): €340 million
Total annual cost of road rehabilitation and maintenance: €395 million

Railways
Annual unit cost of regular maintenance: €15,000 per km.
Unit cost of renewal: €1,000,000 per km.
Percent of network undergoing regular renewal annually: 2.5%
Percent of network rehabilitation to address backlog: 10%

Based on this data:
Annual cost of regular railway maintenance: €60 million
Annual cost of railway renewal (regular and backlog): €580 million
Total annual cost of railway renewal and maintenance: €640 million

Upgrading and New Construction

68. The capacity of the SEETO Comprehensive Network was assessed against existing and 2030 traffic flows to identify current and future bottlenecks in the network based on purely engineering considerations. Interventions were then proposed to address the identified bottlenecks. In order to develop a priority action plan consisting of the key interventions and measures to reduce bottlenecks and enhance regional connectivity, a preliminary-level economic efficiency analysis based on rough costs and benefits was carried out. Below is a brief description of how the costs and benefits were estimated.

69. It is necessary to make a distinction at this point between the prioritization criteria that SEETO uses in the preparation of the MAPs and the criterion used in this exercise for prioritization. While SEETO's prioritization criteria for inclusion in the MAP reflect, *inter alia*, project readiness, and the number of countries involved in the project, prioritization in this exercise is predicated on economic efficiency only using the Net Present Value criterion. If there are projects which prove to have a high economic return but are for some reason not reflected in SEETO's MAP, it would be worth understanding why they are not in the MAP and what would be needed to include them.

The Costs

Capital Cost of Road and Rail Interventions

70. The cost estimation for each SEETO road and railway network intervention was based on a unit cost (euro/km) for each of the various categories of road and rail interventions. These unit costs are averages for a large number of projects in each of the different countries. Tables 13 and 14 present the unit costs for each SEETO Regional Participant for roads and railways respectively. These costs are rough averages and should be more accurately identified through prefeasibility and feasibility studies.

Table 13. Unit Costs for Road Projects (motorways)

Country	Unit costs (Euros/km) 2013					
	Rehabilitation	Minor upgrade (no major structures)	Minor Upgrade (with major structures)	Major Upgrade (no major structures)	Major Upgrade (with major structures)	Widening
ALB	300,000	1,000,000	1,900,000	3,500,000	4,200,000	6,400,000
BIH	300,000	1,000,000	1,900,000	3,300,000	4,200,000	6,240,000
MKD	330,000	1,100,000	2,000,000	3,600,000	4,300,000	6,480,000
CRO	390,000	1,300,000	2,400,000	4,100,000	5,400,000	7,760,000
KOS	300,000	1,000,000	1,900,000	3,500,000	4,200,000	6,400,000
MNE	360,000	1,200,000	1,400,000	3,000,000	3,800,000	7,200,000
SRB	360,000	1,200,000	2,100,000	3,500,000	4,600,000	7,200,000

Source: Unit Costs: Consultant's estimates based on available references[9]

Table 14. Unit Costs for Railway Projects

	Unit costs (Euros/km) 2013					
Country	Minor interventions	Minor rehabilitation (no major structures)	Minor rehabilitation (with major structures)	Major rehabilitation (no major structures)	Major rehabilitation (with major structures)	Construction of second line
ALB	390,000	1,300,000	2,100,000	4,000,000	4,600,000	6,000,000
BIH	420,000	1,400,000	2,700,000	4,200,000	4,500,000	5,900,000
MKD	480,000	1,600,000	2,500,000	4,400,000	5,100,000	5,900,000
CRO	600,000	2,000,000	3,600,000	4,800,000	6,000,000	6,500,000
KOS	390,000	1,300,000	2,000,000	4,000,000	4,000,000	6,000,000
MNE	510,000	1,700,000	2,800,000	4,700,000	5,400,000	6,200,000
SRB	510,000	1,700,000	2,900,000	4,300,000	5,400,000	6,100,000

[9] Monitoring Road Works Contracts and Unit Costs for Enhanced Governance in Europe and Central Asia, The World Bank, 2011
SEETO MAP 2014-2018
Feasibility Study and Environmental Assessment for Two Main Road Axes in Kosovo, Draft Final Feasibility Report , COWI, 2006
Technical Assistance to the Ministry of Transport and Communications and the Fund for National and Regional Roads in Elaborating a Road Investment Plan, Macedonia, HYDROPLAN consortium for the European Agency for Reconstruction, 2007
WBIF projects:
TA2-MNE-TRA-03 & TA3-MON-TRA-01: Improvement of the Scepan Polje-Pluzine Main Road (Feasibility Study),2011
WBIF-TA-BIH-06: Improvement of the Foca-Hum Main Road, 2011
WBIF-TA-BiH-08: Updated Feasibility Study for BiH's Motorway in Corridor Vc, Section: Pocitelj-Croatian Border, 2010
WB1-BIH-TRA-01: Corridor Vc Coordination, 2013
International Construction Costs: A Change of Pace, International Construction Cost report, EC Harris Research 2013

Source: Unit Costs: Consultant's estimates based on available references[10]

Maintenance Costs

71. For this preliminary-level efficiency analysis, the maintenance cost was assumed to be 2.5 percent of the construction cost for the whole life period of road projects. For rail interventions, maintenance cost was taken as 10,000 €/km.

Economic Cost of Capital

72. An economic cost of capital of 9 percent was used to discount real costs and benefits.

The Benefits

73. The benefits of the proposed interventions on the SEETO Comprehensive Network that were considered in this analysis are the standard benefits of a transport project: time savings and vehicle operating cost savings. Other benefits such as the reduction in accidents, environmental impacts have not been considered in the current calculation. In addition, the wider development impacts of large transport projects such as agglomeration, potential increase in competition due to better transport, and tax impacts resulting from changes in product and labor markets were not taken into account.[11] Time savings were estimated on the basis of the transport demand model used to project future traffic.

74. The value of time for car passengers was estimated at 3.3 €/hour for car passengers, and a car occupancy rate of 2.25 passengers per car was used. The value of time for a driver on the road network was estimated at 10.40 € per hour. The value of time for passengers using the railways was 3 €/hour for passengers and 2.13 €/ton-hour for freight railway traffic.

75. Residual values were taken as 10 percent of the cost of a "minor upgrade", 15 percent of a "major upgrade" and 25 percent of road widening interventions; whereas for rail projects, the residual value was taken as 30 percent of construction costs. The economic lives of road and rail infrastructure investments were taken as 30 years and 50 years respectively.

The Results

76. Based on outcomes of the preliminary-level economic efficiency analysis, interventions were divided into three categories: (i) High Priority, (ii) Medium Priority and (iii) Low Priority. In determining the priorities using the preliminary-level efficiency analysis, interventions were divided into three categories: (i) High Priority, (ii) Medium

[10] WBIF projects:
WBIF-TA-SER-15: Modernisation of the railway line Trupale (Nis - Presevo - border of the Former Yugoslav Republic of Macedonia, 2010
WBIF-TA-ALB-06: Albanian Railway Network: Infrastructure and Signalling Improvement Project, 2010

[11] The methodology for estimating wider economic benefits has been applied to the Crossrail project in London (Crossrail Ltd, 2005; Colin Buchanan and Partners Limited, 2007) and the HS2 high-speed rail project (HS2 Ltd, 2011), among others.

Priority and (iii) Low Priority. High priority investments were those which had a high positive Net Present Value and were very likely to prove viable following the completion of a feasibility study. High Priority investments were divided into two sub-categories: Immediate High Priority projects that are needed to address current constraints and bottlenecks; and Future High Priority-projects that are not an immediate priority but that will need to be implemented before 2030. Future High Priority Projects are expected to have positive economic returns when implemented at the optimal time.

77. Based on the preliminary-level economic efficiency analysis, capacity expansions on the SEETO Railway Comprehensive Network did not prove to be economically viable suggesting the need to focus on railway rehabilitation.

78. Expansions in ports and airports with capacity constraints were considered medium priority. No preliminary-level economic efficiency analysis was carried out for interventions in these areas as the type and cost of interventions vary significantly from one port/airport to another.

79. Since the economic efficiency analysis is based on crude costs and benefits, interventions that may have a marginal negative rate of return were considered a medium priority and should be subject to further analysis. Finally, projects/interventions that have large negative rates of return were classified as low priority and in principle should not be considered further.

80. Table 15 below shows the priority categories for the interventions considered for addressing the constraints.

Table 15. Prioritization of Physical Interventions on the SEETO Comprehensive Network

ROUTE 1

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
CRO	R1.06.03	Slano	Dubrovnik	30	Future upgrade	2	72	Low
CRO	R1.07.01	Dubrovnik	Cibasa	8	Future widening	2	62	Medium
MNE	R1.09	Igalo	Kamenari	18	Upgrade	2	155	Low
CRO	R1.09.01	Zadar (port)	Zadar Port	19	Future widening	4	147	Low
CRO	R1.09.02	Sibenik	Sibenik	11	Future widening	2	85	Low
CRO	R1.09.03	Dugopolje	Split (port)	14	Future widening	4	109	Low
MNE	R1.10	Kamenari	Raskrnica E65	32	Future widening	2	227	Low
MNE	R1.10.2	Raskrnica E65	Budva	19.5	Future widening	2	168	Low
MNE	R1.11	Budva	Petrovac	15	Future widening	2	129	Low
MNE	R1.12	Petrovac	Misici	10	Future widening	2	72	Low
MNE	R1.13	Misici	Bar	9	Future widening	2	65	High-F

ROUTE 2A

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
BIH	R2a.03	Klasnice	Banja Luka	16	Future widening	4	100	High-F
BIH	R2a.04	Banja Luka	Jajce	77	Upgrade/ widening	2	211	High
BIH	R2a.05	Jajce	Donji Vakuf	34	Upgrade	2	104	High
BIH	R2a.06	Donji Vakuf	Travnik	37	Future upgrade	2	51	High-F
BIH	R2a.07	Travnik	Lasva	33	Future widening	2	157	High-F

ROUTE 2B

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
BIH	R2b.03	Brod na Drini/Foca	Hum	21	Upgrade	2	40	Low
MNE	R2b.05	Pluzine	Sipacno	46	Upgrade	2	64	Medium
MNE	R2b.07	Niksic	Danilovgrad	29	Future widening	2	209	Low
MNE	R2b.08	Danilovgrad	Podgorica	20	Future widening	2	144	Low
MNE	R2b.09	Podgorica	Tuzi	9	Future widening	2	65	High-F
ALB	R2b.12	Shkoder	Lezhe	42	Future widening	2	349	Low
ALB	R2b.13	Lezhe	Milot	13	Upgrade/ widening	2	108	High
ALB	R2b.14	Milot	Mamurras	14	Upgrade/ widening	2	116	High
ALB	R2b.15	Mamurras	Fushe Kruje	14	Upgrade/ widening	2	116	High
ALB	R2b.16	Fushe Kruje	Vore	13	Widening	2	83	High

ROUTE 2C

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
Alb	R2c.1	Fier	Tepelene	71	Future widening 2-4	2	454	Low
ALB	R2c.2	Tepelene	Gjirokaster	23	Upgrade	2	44	Medium

ROUTE 3

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
BIH	R3.01	Sarajevo	Pale	21	Upgrade	2	171	High
BIH	R3.05	Medjedja	Visegrad	15	Upgrade	2	29	Medium

ROUTE 4

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
SRB	R4.03	Pancevo	Belgrade	16	Future upgrade	4	390	High F
SRB	R4.04	Belgrade	Belgrade (Cukarica)	3	Future upgrade	2	7	High-F
SRB	R4.05	Belgrade (Cukarica)	Orlovaca	14	Future upgrade	2	34	High-F
SRB	R4.06	Orlovaca	Lazarevac	44	Future widening	2	317	Low
SRB	R4.07	Lazarevac	Ljig	25	Future widening	2	180	Low
SRB	R4.08	Ljig	Rudnik	26	Future widening	2	110	High-F
SRB	R4.09	Rudnik	Gornji Milanovac	12	Future widening	2	94	Low
SRB	R4.11	Cacak	Pozega	41	Future widening	2	221	High-F
SRB	R4.12	Pozega	Uzice	22	Widening	2	158	Low
SRB	R4.13	Uzice	Nova Varos	66	Upgrade	2	117	Low
SRB	R4.14	Nova Varos	Prijepolje	25	Future widening	2	145	Low
SRB	R4.15	Prijepolje	Dobrakovo	36	Upgrade	2	36	High
MNE	R4.16	Dobrakovo	Bijelo Polje	22	Future Upgrade	2	31	Medium
MNE	R4.17	Bijelo Polje	Mojkovac	23	Upgrade/ widening	2	102	High
MNE	R4.18	Mojkovac	Kolasin	21	Upgrade/ widening	2	130	High
MNE	R4.19	Kolasin	Mioska	17	Future widening	2	122	Medium
MNE	R4.20	Mioska	Bioce	40	Future widening	2	236	High-F
MNE	R4.21	Bioce	Podgorica	13	Future widening	2	83	High-F
MNE	R4.22	Podgorica	Virpazar	30	Future widening	2	173	High-F
MNE	R4.23	Virpazar	Sotonici	2	Future widening	2	14	High-F
MNE	R4.24	Sotonici	Misici	12	Future widening	2	86	Low

ROUTE 5

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
SRB	R5.07	Cacak	Kraljevo	31	Future widening	2	283	Low
SRB	R5.08	Kraljevo	Beranovac	6	Immediate widening	2	40	High
SRB	R5.08.01	Beranovac	Krusevac	55	Future widening	2	511	Low

ROUTE 6

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
KOS*	R6.07	Mitrovice/Mitrovica	Pristina	35	Upgrade	2	133	High
KOS	R6.08	Pristina	Lipljan	12	Future widening	4	77	High-F
KOS	R6.09	Lipljan	Gerlice/Donja Grlica	23	Widening	2	191	High
KOS	R6.10	Gerlice/Donja Grlica	Kacanik	17	Future Upgrade	2	71	Medium

ROUTE 7

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
KOS	R7.08	Suhareke/Suva Reka	Carraleve/ Crnoljevo	20	Future widening	4	128	High-F
KOS	R7.09	Carraleve/ Crnoljevo	Lipljan	25	Future upgrade	2	48	High-F
KOS	R7.11	Pristina	Luzhane/ Luzane	17	Upgrade	2	37	High
KOS	R7.12	Luzhane/ Luzane	Merdare	16	Future upgrade	2	35	Medium

ROUTE 10

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
CRO	R10.05.01	Sveti Kuzam	Bakar	5	Future widening	2	39	Low
CRO	R10.05.02	Bakar	Smrika	8	Future widening	2	62	Low
CRO	R10.06.01	Smrika	Senj	45	Future widening	2	310	Low
CRO	R10.07.01	Senj	Zuta Lokva	27	Future widening	2	210	Low

CORRIDOR Vb

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
CRO	Vb.06.01	Bosiljevo 2	Bosiljevo 1	4	Future widening	4	19	High-F
CRO	Vb.06.02	Bosiljevo 1	Novi Grad	13	Future widening	4	60	High-F
CRO	Vb.07	Novi Grad	Karlovac	11	Future widening	4	51	High-F
CRO	Vb.08.01	Karlovac	Jastrebarsko	18	Future widening	4	179	High-F
CRO	Vb.08.02	Jastrebarsko	Lucko	23	Future widening	4	122	High-F
CRO	Vb.09.01	Ivanja Reka	Kraljevacki Novaki	4	Future widening	4	9	High-F

CORRIDOR Vc

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
CRO	Vc.03.01	V. Kopanica	Slavonski Samac	13	Future upgrade	2	31	High-F
BIH	Vc.04	Bosanski Samac	Modrica	21	Future upgrade	2	43	High-F
CRO	Vc.04.01	Metkovic HR/BH bord.	Opuzen	12	Future upgrade	2	26	Low
BIH	Vc.05	Modrica	Seslije	28	Upgrade	2	95	Low
BIH	Vc.06	Seslije	Doboj	15	Upgrade	2	49	Medium
BIH	Vc.07	Doboj	Karuse	8	Widening	2	27	High
BIH	Vc.08	Karuse	Maglaj	21	Future upgrade	2	38	High-F
BIH	Vc.09	Maglaj	Zenica	58	Widening	2	239	High
BIH	Vc.10	Zenica	Lasva	8	Future upgrade	2	14	High-F
BIH	Vc.11	Lasva	Visoko	35	Widening	2	218	High
BIH	Vc.14	Semizovac	Sarajevo	8	Widening	2	65	Low
BIH	Vc.16	Blazuj	Tarcin	19	Widening	2	106	High
BIH	Vc.17	Tarcin	Konjic	24	Widening	2	111	High
BIH	Vc.18	Konjic	Jablanica	22	Widening	2	132	High
BIH	Vc.19	Jablanica	Mostar bypass 1	51	Widening	2	225	Low
BIH	Vc.20	Mostar bypass 1	Mostar bypass 2	20	Future upgrade	2	35	High-F
BIH	Vc.21	Mostar bypass 2	Zitomislic	10	Future upgrade	2	18	High-F
BIH	Vc.22	Zitomislic	Capljina	16	Future upgrade	2	31	High-F
BIH	Vc.23	Capljina	Doljani	9	Future upgrade	2	15	High-F

CORRIDOR VIII

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
ALB	VIII.3.2	Elbasan	Librazhd	25	Future upgrade	2	48	High-F
ALB	VIII.3.4	Tirana	Elbasan	32	Future upgrade	2	64	High-F
ALB	VIII.4.1	Perrenjas	Pogradec	13	Future upgrade	2	77	High-F
MKD	VIII.5.02	Kafasan	Struga	13	Upgrade	2	48	Low
MKD	VIII.5.04	Pesocani	Botun	16	Upgrade	2	28	Low
MKD	VIII.5.06/07	Kicevo	Gostivar	48	Upgrade	2	86	Low

CORRIDOR X

	SEETO CODE	FROM	TO	Length km	Intervention Type	No of Lanes	Costs (million €)	Priority
CRO	X.02.01	Jankomir	Lucko	5	Widening	4	31	High
CRO	X.03.01	Lucko	Zagreb - Buzin	7	Widening	4	47	High
CRO	X.03.02	Zagreb – Buzin	Zagreb - Kosnica	8	Future widening	4	54	High-F
CRO	X.03.03	Zagreb – Kosnica	Ivanja Reka	5	Future widening	4	39	High-F
SRB	X.11.1	Dobanovci	Novi Beograd	15	Widening	4	108	High
SRB	X.11.2	Novi Beograd	Belgrade	7	Widening	4	50	High
SRB	X.11.3	Belgrade	Bubanj Potok	10	Widening	4	72	High
MKD	X.31	Demir Kapija	Udovo	22	Future widening	2	40	Low
SRB	Xc.2	Niska Banja	Bela Palanka	32	Future	2	138	Low
SRB	Xc.3	Bela Palanka	Pirot	28	Future upgrade	2	124	Low
SRB	Xc.4	Pirot	Dimitrovgrad	24	Future upgrade	2	69	Low

Source: World Bank's/Consultant's estimates.

Legend:

High: Interventions needed to address current constraints and bottlenecks and that are expected to have high economic returns.

High-F: Interventions that are not an immediate priority but that will need to be implemented before 2030 and that are expected to have positive economic returns when implemented at the optimal time.

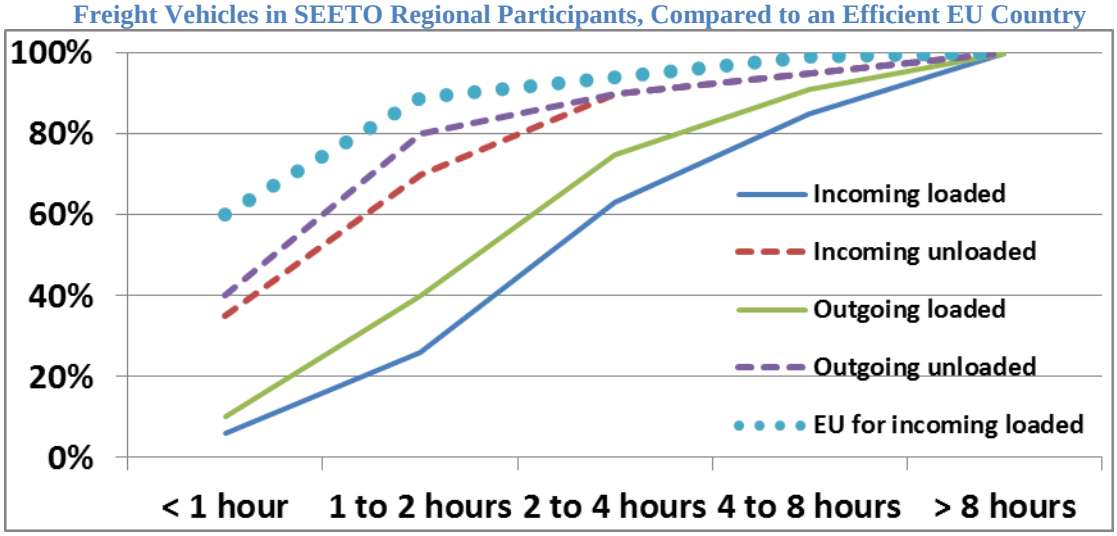
Medium: Interventions that have marginal negative rates of return.

Low: Interventions that are expected to have large negative rates of return and in principle should not be considered further.

6.2 Non-physical Impediments

81. Figure 1, reproduced below, is used in estimating the cost of non-physical impediments to trade and transport facilitation and regional integration by assessing the waiting times at the borders. It provides the estimated cumulative frequency of border crossing times of road freight vehicles in SEETO Regional Participants, relative to an efficient EU country.

Figure 1 (reproduced): Estimate of Cumulative Frequency of Border Crossing Times of Road Freight Vehicles in SEETO Regional Participants, Compared to an Efficient EU Country



Source: Consultant's estimate based on available border crossing information for SEETO Regional Participants, and for EU based on FRONTEX, IRU and data from Sweden and Finland.

82. According to data from SEETO Regional Participants and FRONTEX,[12] over 3 million trucks crossed a border either within the region or an external border to the EU in 2012/13. This is the net figure of truck movements. As each crossing typically involves separate inspections on both sides, about 6 million controls are performed annually on international traffic to, from and within the SEETO Regional Participants.

83. There are four main types of cost resulting from truck waiting and processing times at a border. These are (i) inventory carrying costs related to cargo; (ii) vehicle costs for both tied capital and idle running; (iii) driver costs; and (iv) other costs, including the additional capacity (trucks) needed for traffic as a whole.

84. Using the estimated waiting time distribution for SEETO Regional Participants, trucks spend collectively over 26 million hours at border crossing points (BCPs). Table 16 provides the cost of waiting and processing at the border using an estimated average value

[12] The European Council established the European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union (Frontex) in 2004 to improve procedures and working methods within the European Union. Frontex promotes, coordinates and develops European border management in line with the EU fundamental rights charter applying the concept of Integrated Border Management.

of cargo of € 100,000 per truck, and an average value of a second-hand truck and trailer of € 150,000. The sum of inventory carrying costs, vehicle costs and driver costs attributed to border crossings in a SEETO Regional Participant is more than 5 times the cost in an efficient EU country.

Table 16. Estimated Logistics Costs Related to Border Crossing per type of cost (in million €)

M € or trucks/drivers per annum	SEETO Regional Participant estimated current	Estimate of an efficient EU country	Difference SEETO Regional Participant and an. efficient EU country
(i) Inventory carrying costs (With cargo)	52	5	47
(ii) Vehicle costs (including empty backhauls; excluding idle running)	48	7	41
(iii) Driver cost (average 7 € /h)	181	46	135
Total in M €	**262**	**57**	**205**
(iv) No. of trucks and drivers required due to waiting times at border crossing points	*3,007*	*758*	*2,249*

Source: Consultant's estimates of waiting times based on available border crossing information for SEETO Regional Participants incl.: SEETO. (2012) Report on Border Crossing Facilitation, FRONTEX (2012) Western Balkans Risk Assessment Reports 2012-2014 and interviews with authorities and logistics industry representatives in spring/summer 2014. Typical operational costs of road haulage and average value of cargo (100,000 €/ loaded truck).

85. Unpredictable waiting/processing times also have a significant negative multiplier effect on the supply chain, both upstream and downstream. Uncertainty makes inventory planning more difficult and leads businesses to hold higher levels of inventory than necessary if the supply chains were predicable. The increase in inventories is not reflected in this estimate in Table 16 (€52 million) which only considers the inventory holding cost of cargo at the border. Truck idling is another cost not included the table. A truck consumes 2-3 liters of fuel per hour in idle running, which is equivalent to € 2-3 per hour. If a truck idles only 12 minutes each hour of the total 26 million hours spent at the border, this would add another €13 million per annum to total vehicle costs for the region. The differences per annum for cost types (i) and (ii) between the average for the SEETO Regional Participants and an efficient EU country are €47 million and €41 million, respectively.

86. Driver salaries in international traffic vary a lot, as does the way they are paid. The remuneration for a trip may be partly or wholly a lump-sum payment, where additional waiting time does not raise the income of an individual driver. Unnecessary waiting time does, however, mean that more drivers are needed to perform the same duties. For an average cost of a driver of 7 €/hour, 26 million hours is equivalent to almost 3,000 trucks/drivers spending a whole year at the borders in the region. For a well-functioning EU country with a similar traffic flow, the corresponding figure would be 6.5 million hours, equivalent to 760 trucks or drivers per year. In other words, the current procedures require over 2,200 trucks/drivers more to provide the same transport service that would be provided under efficient BCP operations.

Interventions to Address the Non-physical Impediments

87. A number of interventions have been identified to address the non-physical impediments at the border. Many of these measures relate to customs and border crossing activities (C/BC), or involve strengthening the administrative capacity of the competent authorities in transport and trade.

The Costs

88. The total cost, up to 2020, for the measures proposed to alleviate non-physical impediments to trade and transport were estimated at € 300-350 million in the SEETO Regional Participants, as shown in Table 17. On an annual basis, the total cost for the proposed measures is about € 60-70 million in years 2016-2020.

Table 17. Estimated Cost of Alleviating the Non-physical Impediments (up to year 2020 -million €)

Intervention/Action	Type	ALB	BiH	MKD	KOS	MNE	SRB	Total*
Strengthening the CEFTA Committee on Trade Facilitation; with SEETO participation	C/BC	0.3	0.3	0.3	0.3	0.3	1	**2.5**
Collecting and monitoring comparable data on process times at Border Crossing Points	C/BC	1	1	1	0	1	2	**6**
Implementing the NCTS Transit Convention	C/BC	1	4	4	1	4	8	**22**
Improving Customs IT systems	C/BC	3	1	3	1	2	6	**16**
Implementing efficient risk management, post control audit & simplified procedures	C/BC	8	8	4	2	7	16	**45**
Supporting Single Window procedures	C/BC	4	4	2	2	2	8	**22**
Establishing AEO status procedures and providing capacity building	C/BC	2	2	1	1	2	4	**12**
Enabling better use of inter-modal transport	IM	2	2	2	1	2	6	**15**
Strengthening the administrative capacity in Road Transport & Safety Agencies	Road	8	6	10	4	8	20	**56**
Facilitating admission to road haulage market & profession	Road	4	4	2	1	4	8	**23**
Implementing legislation regarding dangerous goods	Road	1	1	1	1	1	3	**8**
Strengthening the administrative capacity in Rail Safety & Regulatory Agencies	Rail	3	4	4	1	4	6	**22**
Separating operations from infrastructure management	Rail	1	4	1	1		8	**15**
Opening up the rail market to competition	Rail	1	4	4	0.5	2	12	**23.5**
Strengthening administrative and technical capacity of Maritime Administrations	M/IWW	6	2			2	4	**14**
Developing Sava and Danube waterways and related IT systems	IWW		2				4	**6**
Strengthening the administrative capacity of Civil Aviation Authorities	Air	3	3	1	2	1	10	**20**
Total*		**48**	**52**	**40**	**19**	**42**	**126**	**327**

Legend:

Air transport	Air	Customs and border crossing	C/BC
Inter/multimodal transport	IM	Road transport	Road
Rail transport	Rail	Maritime and/or Inland Waterways	M/IWW

** Totals may not add up due to rounding.*

Source: Costs for each measure/country based on Consultants' estimates; measures largely follow those in the EC reports: (i) Enlargement Strategy and Main Challenges 2014-15, October 2014, available at: http://ec.europa.eu/enlargement/pdf/key_documents/2014/20141008-strategy-paper_en.pdf; and (ii) Country-Specific

Strategy and Progress reports, 2014, available at: http://ec.europa.eu/enlargement/countries/strategy-and-progress-report/index_en.htm

The Benefits

89. Table 18 presents the estimated gross benefits from addressing the non-physical impediments. The total cumulative benefits up to year 2020 are estimated at € 800-900 million corresponding to approximately € 160-180 million per year (2016-2020).

Table 18. Estimated Cumulative Benefits of Alleviating Non-physical Impediment (up to year 2020--million €)

Intervention/Action	Type	ALB	BiH	MKD	KOS	MNE	SRB
Strengthening the CEFTA Committee on Trade Facilitation; with SEETO participation	C/BC	1	1	1	0.4	1	2
Collecting and monitoring comparable data on process times at Border Crossing Points	C/BC	1	1	1	0.4	1	2
Implementing the NCTS Transit Convention	C/BC	4	12	8	2	12	24
Improving Customs IT systems	C/BC	8	3	8	2	6	14
Implementing efficient risk management, post control audit & simplified procedures	C/BC	32	32	26	12	28	54
Supporting Single Window procedures	C/BC	8	8	7	5	7	16
Establishing AEO status procedures and providing capacity building	C/BC	6	6	4	1	4	12
Enabling better use of inter-modal transport	IM	4	4	4	2	4	12
Strengthening the administrative capacity in Road Transport & Safety Agencies	Road	16	10	14	8	14	32
Facilitating admission to road haulage market & profession	Road	12	12	14	4	12	28
Implementing legislation regarding dangerous goods	Road	4	2	2	2	3	8
Strengthening the administrative capacity in Rail Safety & Regulatory Agencies	Rail	4	6	6	2	6	12
Separating operations from infrastructure management	Rail	8	12	8	2		28
Opening up the rail market to competition	Rail	4	8	8	1	4	36
Strengthening administrative and technical capacity of Maritime Administrations	M/IWW	8	3			3	7
Developing Sava and Danube waterways and related IT systems	IWW		4				8
Strengthening the administrative capacity of Civil Aviation Authorities	Air	8	8	4	4	3	30
ESTIMATED TOTAL BENEFITS		**128**	**132**	**115**	**48**	**116**	**325**

Legend:

Air transport	Air	Customs and border crossing	C/BC
Inter/multimodal transport	IM	Road transport	Road
Rail transport	Rail	Maritime and/or Inland Waterways	M/IWW

Source: Measures/actions based on EC. (2014) Enlargement Strategy and Main Challenges 2014-15, Progress reports October 2014. Available from: http://ec.europa.eu/enlargement/countries/strategy-and-progress-report/index_en.htm, the benefits for each measure/action per country based on Consultant's estimates, if these are implemented comprehensively

The Results

90. Based on the costs and benefits in Tables 17 and 18 above, indicative economic efficiency criteria were estimated by dividing the cumulative economic benefits by the cumulative economic costs. Table 19 presents the summary results for each measure for each Regional Participant as well as an aggregate for each Regional Participant. The analysis shows high estimates of benefit/cost ratios for the interventions reaching as much as 8.0 in the case of more efficient management of railway infrastructure. Implementing efficient risk management practices is expected to yield the most benefits measured in absolute terms (€) for each of the Regional Participants.

Table 19. Estimated Benefit/Cost Ratios for Implementing the Interventions/Actions for Addressing Non-physical Impediments

Intervention/Action	Type	ALB	BiH	MKD	KOS	MNE	SRB
Strengthening the CEFTA Committee on Trade Facilitation; with SEETO participation	C/BC	2.5	2.5	3.3	4.0	3.3	2.0
Collecting and monitoring comparable data on process times at Border Crossing Points	C/BC	1.3	1.3	1.3	1.0	1.7	1.0
Implementing the NCTS Transit Convention	C/BC	4.0	3.0	2.0	2.0	3.0	3.0
Improving Customs IT systems	C/BC	2.7	3.0	2.7	2.0	3.0	2.3
Implementing efficient risk management, post control audit & simplified procedures	C/BC	4.0	4.0	6.5	6.0	4.0	3.4
Supporting Single Window procedures	C/BC	2.0	2.0	3.5	2.5	3.5	2.0
Establishing AEO status procedures and providing capacity building	C/BC	3.0	3.0	4.0	1.0	2.0	3.0
Enabling better use of inter-modal transport	IM	2.0	2.0	2.0	2.0	2.0	2.0
Strengthening the administrative capacity in Road Transport & Safety Agencies	Road	2.0	1.7	1.4	2.0	1.8	1.6
Facilitating admission to road haulage market & profession	Road	3.0	3.0	7.0	4.0	3.0	3.5
Implementing legislation regarding dangerous goods	Road	4.0	2.0	2.0	4.0	3.0	2.7
Strengthening the administrative capacity in Rail Safety & Regulatory Agencies	Rail	1.3	1.5	1.5	2.0	1.5	2.0
Separating operations from infrastructure management	Rail	8.0	3.0	8.0	2.0		3.5
Opening up the rail market to competition	Rail	4.0	2.0	2.0	2.0	2.0	3.0
Strengthening administrative and technical capacity of Maritime Administrations	M/IWW	1.3	1.5			1.5	1.8
Developing Sava and Danube waterways and related IT systems	IWW		2.0				2.0
Strengthening the administrative capacity of Civil Aviation Authorities	Air	2.7	2.7	4.0	2.0	3.0	3.0
Benefit/Cost ratio for Regional Participant		**2.7**	**2.5**	**2.9**	**2.6**	**2.5**	**2.6**

Legend:

Air transport	Air	Customs and border crossing	C/BC
Inter/multimodal transport	IM	Road transport	Road
Rail transport	Rail	Maritime and/or Inland Waterways	M/IWW

Source: Calculation based on estimated values presented in Table 17 and 18.

7. Priority Action Plan

91. Based on the analyses carried out in this study, an action plan was developed for addressing the most important priorities for enhancing connectivity in the region. These cover both physical interventions as well as soft measures. Physical interventions include both asset preservation and new investment. As discussed above, the candidates for upgrading/widening identified in the plan above should be subject to prefeasibility/feasibility studies before proceeding further. The total cost of the proposed interventions from 2016-2020 is about €8,140 million, an average annual cost of €1,630 million. Tables ES1-3 below present the Priority Acton Plan.

Priority Action Plan for Improving Regional Connectivity

Table 20. Interventions for Addressing Non-physical Impediments (Total cost in million Europ up to 2020)

Intervention/Action	Type	ALB	BiH	MKD	KOS	MNE	SRB	Total*
Strengthening the CEFTA Committee on Trade Facilitation; with SEETO participation	C/BC	0.3	0.3	0.3	0.3	0.3	1	**2.5**
Collecting and monitoring comparable data on process times at Border Crossing Points	C/BC	1	1	1	0	1	2	**6**
Implementing the NCTS Transit Convention	C/BC	1	4	4	1	4	8	**22**
Improving Customs IT systems	C/BC	3	1	3	1	2	6	**16**
Implementing efficient risk management, post control audit & simplified procedures	C/BC	8	8	4	2	7	16	**45**
Supporting Single Window procedures	C/BC	4	4	2	2	2	8	**22**
Establishing AEO status procedures and providing capacity building	C/BC	2	2	1	1	2	4	**12**
Enabling better use of inter-modal transport	IM	2	2	2	1	2	6	**15**
Strengthening the administrative capacity in Road Transport & Safety Agencies	Road	8	6	10	4	8	20	**56**
Facilitating admission to road haulage market & profession	Road	4	4	2	1	4	8	**23**
Implementing legislation regarding dangerous goods	Road	1	1	1	1	1	3	**8**
Strengthening the administrative capacity in Rail Safety & Regulatory Agencies	Rail	3	4	4	1	4	6	**22**
Separating operations from infrastructure management	Rail	1	4	1	1		8	**15**
Opening up the rail market to competition	Rail	1	4	4	0.5	2	12	**23.5**
Strengthening administrative and technical capacity of Maritime Administrations	M/IWW	6	2			2	4	**14**
Developing Sava & Danube waterways & related IT systems	IWW		2				4	**6**
Strengthening the administrative capacity of Civil Aviation Authorities	Air	3	3	1	2	1	10	**20**
Total*		**48**	**52**	**40**	**19**	**42**	**126**	**327**

Legend:

Air transport	Air	Customs and border crossing	C/BC
Inter/multimodal transport	IM	Road transport	Road
Rail transport	Rail	Maritime and/or Inland Waterways	M/IWW

** Totals may not add up due to rounding.*

Source: Costs for each measure/country based on Consultants' estimates; measures largely follow those in the EC reports: (i) Enlargement Strategy and Main Challenges 2014-15, October 2014, available at: http://ec.europa.eu/enlargement/pdf/key_documents/2014/20141008-strategy-paper_en.pdf; and (ii) Country-Specific Strategy and Progress reports, 2014, available at: http://ec.europa.eu/enlargement/countries/strategy-and-progress-report/index_en.htm.

Table 21. Interventions for Addressing Physical Impediments
Asset Preservation for the Comprehensive SEETO Network (cost in million Euros)

	Regular Maintenance (routine and winter)	Rehabilitation (including backlog)	Total Annual Cost
Roads	55	340	395
Rail	60	580	640
Total	**115**	**920**	**1,035**

Source: Consultants/World Bank estimates

Table 22. Interventions for Addressing Physical Impediments*,**
Physical Upgrades/New Construction (total cost in million Euros)

Country	SEETO CODE	From	To	Length (km)	Intervention Type	No of Lanes	Total Costs (Euros million)
Route 2a							
BIH	R2a.04	Banja Luka	Jajce	77	Upgrade	2	211
BIH	R2a.05	Jajce	Donji Vakuf	34	Upgrade	2	104
Route 2b							
ALB	R2b.13	Lezhe	Milot	13	Upgrade/widening	2	108
ALB	R2b.14	Milot	Mamurras	14	Upgrade/widening	2	116
ALB	R2b.15	Mamurras	Fushe Kruje	14	Upgrade/widening	2	116
ALB	R2b.16	Fushe Kruje	Vlore	13	Widening	2	83
Route 3							
BIH	R3.01	Sarajevo	Pale	21	Upgrade	2	171
Route 4							
SRB	R4.15	Prijepolje	Dobrakovo	36	Upgrade	2	37
MNE	R4.17	Bijelo Polje	Mojkovac	23	Upgrade/widening	2	102
M NE	R4.18	Mojkovac	Kolasin	21	Upgrade/widening	2	130
Route 5							
SRB	R5.08	Kraljevo	Beranovac	6	Widening	2	40
Route 6							
KOS	R6.07	Mitrovice/a	Pristina	35	Upgrade	2	133
KOS	R6.09	Lipljan	Gerlice/Donja Grlica	23	Widening	2	191
Route 7							
KOS	R7.11	Pristina	Luz(h)ane	17	Upgrade	2	37
Corridor Vc							
BIH	Vc.07	Doboj	Karuse	8	Widening	2	27
BIH	Vc.09	Maglaj	Zenica	58	Widening	2	239
BIH	Vc.11	Lasva	Visoko	35	Widening	2	218
BIH	Vc.16	Blazuj	Tarcin	19	Widening	2	106
BIH	Vc.17	Tarcin	Konjic	24	Widening	2	111
BIH	Vc.18	Konjic	Jablanica	22	Widening	2	132
Corridor X							
SRB	X.11.1	Dobanovci	Novi Beograd	15	Widening	4	108
SRB	X.11.2	Novi Beograd	Belgrade	7	Widening	4	50
SRB	X.11.3	Belgrade	Bubanj Potok	10	Widening	4	72
					Total cost:		**2,642**

* High priority sections for Croatia are not included here, but are included in Table 15 in Section 6.
** The baseline for the analysis was 2012 so a few sections in the table are under construction.
Source: Consultants/World Bank estimates

8. Concluding Comments

92. Impediments to the efficient utilization of the Comprehensive SEETO Network and the integration of the Regional Participants into the European Union can be categorized into two broad categories: physical and non-physical.

93. There is a strong argument for prioritizing the measures to address non-physical impediments. In addition to the high economic rates of return of interventions to reduce these impediments, they enhance the economic benefits of the investment in physical infrastructure. Improving the quality of SEETO Comprehensive network to reduce travel time within a Regional Participant only to spend the saved time at the border is highly inefficient. This would greatly reduce, if not negate, the benefits of the improved infrastructure.

94. While there have been significant improvements in the past decade in eliminating non-physical bottlenecks impeding trade and transport in the region, long and unpredictable border-crossing times remain an issue in the region. This applies to both passengers and freight. If the operational environment in the region would reach the average EU levels, the order of magnitude of possible savings is about 1 per cent of the region's GDP or about €900 million a year. About 80 percent of these potential savings would stem from reduced inventory carrying and other indirect logistics costs due to more predictable operations.

95. If such savings would materialize, they would directly benefit manufacturing, trading and agricultural firms, and improve their competitiveness. A more predictable operational environment for logistics is also essential for attracting FDI into the region. Eventually, the consumers in the region would also benefit as the savings would also help manage the price level especially of imported goods.

96. The main cause of border crossing delays does not appear to be that of inefficient or non-transparent customs procedures, but rather weak inter-agency coordination among border authorities. In most of the Regional Participants, customs declarations are submitted electronically to a high degree (especially in the Former Yugoslav Republic of Macedonia) and customs authorities are also adopting more modern customs systems for trade and transit along models from the EU. At present, there is no systematic measurement of waiting times at the different borders between Regional Participants. Having a system in place for monitoring the performance of entire corridors and routes along the SEETO Comprehensive Network is essential to reducing border waiting times and increasing corridor efficiency. Monitoring performance would allow for benchmarking and setting concrete targets for improvement.

97. Overseeing the implementation of the measures to eliminate non-physical impediments would be best coordinated by both the SEETO and Central European Free Trade Agreement (CEFTA) authorities with strong technical support from the European

Commission. Success in their implementation will require high level government support that extends well beyond transport authorities.

98. As the majority of international trade in the Regional Participants and Croatia is with the EU (notably with Germany, Italy, Austria, Croatia, and Hungary), the importance of aligning to EU practices has also been recognized. Realignment with EU *acquis* is expected to gain further momentum with EU membership preparations that have started with Serbia in spring 2014 and Albania that was confirmed as a candidate in June 2014.

99. The low average wages in the region – both in manufacturing and in services together with the close proximity to the EU market provide an opportunity to attract more manufacturing activities in the region. Proximity and low wages are not enough, however, if the predictability of supply chains remains low due to the lack of reliability and transparency of border crossing procedures.

100. It is also worth mentioning that many of the potential investments identified in this study could be eligible for EU grant financing either full or partial through the IPA or the CEF.

101. Moving forward, it is recommended that SEETO focus on four activities.

(i) Prefeasibility and feasibility studies for High Priority projects prepared to International Financial Institution (IFI) standards; and SEETO to develop a pipeline of projects ready for implementation for each Regional Participant.

(ii) Developing a financial plan that includes national, EU as well as private resources for implementing the priority actions.

(iii) Measuring and benchmarking corridor performance systematically and on a regular basis. SEETO is well placed to oversee the development and implementation of a measurement methodology. This can be carried out as part of the extension of the TEN-T Core Network Corridors into the Western Balkans. This would also help monitor the implementation of measures to address physical as well as non-physical impediments.

(iv) Estimation of the wider development impacts of large transport projects. Using vehicle operating cost savings and time savings as the measure of economic benefits misses potential development benefits resulting from agglomeration, relocation of employment and residences, and tax and labor impacts as discussed above. This could ultimately lead to suboptimal project selection.