Bosnia and Herzegovina: the road to Europe
Transport Sector Review - Main Report

Transport Unit, Sustainable Development Department
Europe and Central Asia Region

May 2010

Document of the World Bank
CURRENCY EQUIVALENTS

Exchange rates as of December 31, 2009

Currency unit – Convertible marks
US$1 = 1.35840 BAM

Currency unit – euro
US$1 = € 0.694

WEIGHTS AND MEASURES

Metric system

FISCAL YEAR

January 1-December 31
### ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AADT</td>
<td>Average Annual Daily Traffic</td>
</tr>
<tr>
<td>BAD</td>
<td>Brčko Administrative District</td>
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<tr>
<td>BAM</td>
<td>Bosnia and Herzegovina currency</td>
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<tr>
<td>BHZJK</td>
<td>Bosnia and Herzegovina State Railway Company</td>
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<tr>
<td>BH</td>
<td>Bosnia and Herzegovina</td>
</tr>
<tr>
<td>BHTMAP</td>
<td>Bosnia and Herzegovina Transport Master Plan</td>
</tr>
<tr>
<td>BRIC</td>
<td>Bosnia and Herzegovina Road Infrastructure Company</td>
</tr>
<tr>
<td>CARDS</td>
<td>Community Assistance for Reconstruction, Development and Stabilization</td>
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<tr>
<td>CPS</td>
<td>Country Partnership Strategy</td>
</tr>
<tr>
<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
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<tr>
<td>ECA</td>
<td>Europe and Central Asia, an administrative region of the World Bank</td>
</tr>
<tr>
<td>ECMT</td>
<td>European Conference of Ministers of Transport (Part of OECD)</td>
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<tr>
<td>ECSSD</td>
<td>Europe and Central Asia Sustainable Development Department, in the World Bank’s Europe and Central Asia region</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>EIB</td>
<td>European Investment Bank</td>
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<tr>
<td>EIRR</td>
<td>Economic Internal Rate of Return</td>
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<td>ESC</td>
<td>Environmental Steering Committee</td>
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<td>EU</td>
<td>European Union</td>
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<tr>
<td>FASRB</td>
<td>Framework Agreement on the Sava River Basin</td>
</tr>
<tr>
<td>FBHRD</td>
<td>Federation of Bosnia and Herzegovina Road Directorate</td>
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<tr>
<td>FBM</td>
<td>Federation of Bosnia and Herzegovina</td>
</tr>
<tr>
<td>FBHMTC</td>
<td>Federation of Bosnia and Herzegovina Ministry of Transport &amp; Communications</td>
</tr>
<tr>
<td>FDI</td>
<td>Foreign Direct Investment</td>
</tr>
<tr>
<td>FYROM</td>
<td>FYR Macedonia</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GRAS</td>
<td>Sarajevo Public Transport Company</td>
</tr>
<tr>
<td>HDM-4</td>
<td>Highway Development and Management Model</td>
</tr>
<tr>
<td>IBRD</td>
<td>International Bank for Reconstruction and Development, the World Bank Group</td>
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<td>IDA</td>
<td>International Development Agency, the World Bank Group</td>
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<td>IFC</td>
<td>International Finance Corporation</td>
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<td>IFI</td>
<td>International Financial Institutions</td>
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<td>IRI</td>
<td>International Roughness Index</td>
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<td>ISPS</td>
<td>International Ship Facility and Port Facility Security Code</td>
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<td>ISRBC</td>
<td>International Sava River Basin Commission</td>
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<tr>
<td>IWT</td>
<td>Inland Waterways Transport</td>
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<tr>
<td>LRT</td>
<td>Light Rail Transit</td>
</tr>
<tr>
<td>MAP</td>
<td>Multi Annual Plan</td>
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<tr>
<td>MOCT</td>
<td>Ministry of Communications and Transport</td>
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<tr>
<td>NAIADES</td>
<td>Navigation and Inland Waterway Action and Development in Europe</td>
</tr>
<tr>
<td>NMT</td>
<td>Non Motorized Transport</td>
</tr>
<tr>
<td>OECD</td>
<td>Organization of Economic Co-operation and Development</td>
</tr>
<tr>
<td>PEIR</td>
<td>Public Expenditure and Institutional Review</td>
</tr>
<tr>
<td>PPP</td>
<td>Public Private Partnership</td>
</tr>
<tr>
<td>PRSP</td>
<td>Poverty Reduction Strategy Paper</td>
</tr>
<tr>
<td>RMSP</td>
<td>Road Management and Safety Project</td>
</tr>
<tr>
<td>RS</td>
<td>Republika Srpska</td>
</tr>
<tr>
<td>RSCAD</td>
<td>Republika Srpska Civil Aviation Directorate</td>
</tr>
<tr>
<td>RSMTC</td>
<td>Republika Srpska Ministry of Transport &amp; Communications</td>
</tr>
<tr>
<td>RSR</td>
<td>Republika Srpska Roads Company</td>
</tr>
<tr>
<td>SAA</td>
<td>Stabilization and Association Agreement</td>
</tr>
<tr>
<td>SEE</td>
<td>South East Europe</td>
</tr>
<tr>
<td>SEETO</td>
<td>South East Europe Transport Observatory</td>
</tr>
<tr>
<td>SOLAS</td>
<td>International Convention for the Safety of Life at Sea</td>
</tr>
<tr>
<td>TEN-T</td>
<td>Trans-European Network-Transport</td>
</tr>
<tr>
<td>TER</td>
<td>Trans-European Railway</td>
</tr>
<tr>
<td>UIC</td>
<td>International Union of Railways</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>VAT</td>
<td>Value Added Tax</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
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<tr>
<td>ZFBH</td>
<td>Federation of Bosnia and Herzegovina Railway Company</td>
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<tr>
<td>ZRS</td>
<td>Republika Srpska Railway Company</td>
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</table>
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EXECUTIVE SUMMARY

Bosnia and Herzegovina (BH) has overcome significant political and administrative challenges since the end of the hostilities in 1995. The war disrupted transport services, contributed to the large scale destruction of the transport infrastructure, and fragmented institutional responsibilities. Post-war reconstruction efforts have made tangible contributions to recovering the physical infrastructure, and strengthening the institutional framework. However, as detailed in this report and the accompanying sub-sector annexes, significant challenges remain in a number of areas, not least the need to realize the administrative and transaction cost savings that would result from reducing organizational atomization in the sector.

The overall objective should be the development of a transport system, and an institutional framework, that facilitates rather than constrains, economic development in BH. A strong transport system contributes to economic growth by reducing the economic distance\(^1\) to markets, by expanding opportunities for trade, by improving the competitiveness of national locations for production and distribution, and by facilitating mobility for a country’s citizens, while minimizing the social and environmental costs of the transport sector. Such a strategy will determine the priorities across all modes, determined by clear technical, economic and financial considerations. It will also enable the coordinated sequencing of interventions within the available funding constraints, and define necessary changes in legislation, regulation, organizations, and financing to implement the plans for the development of the sector, in a manner consistent with the development needs of BH as a whole.

However, the objective remains distant in BH at this time. There have been two attempts to define a national transport strategy at the state level. The first attempt was the preparation of the Transport Master Plan for Bosnia & Herzegovina (BiHTMAP) in 2001. This study was the first comprehensive attempt to define priorities across all the modes, and in the sector more generally, in a consistent manner. Unfortunately, the final master plan was approved, but never officially adopted, reflecting a lack of agreement between key stakeholders. A second attempt was initiated in 2006 by the state Ministry of Communications and Transport (MOCT), collaborating with the two line entity ministries [the Federation Ministry of Transport and Communications (FBHMTG) and the Republika Srpska Ministry of Transport and Communications (RSMTC)]. However, a lack of consensus on, *inter alia*; which level (state or entity) was responsible for the

---

\(^1\) This measure reflects all the necessary and unnecessary transportation and clearance expenditures. Thus, a reduction in economic distance can be realized not only from improved physical infrastructure, where justified by economic criteria—a necessary condition for economic development—but also from improvements in the institutional framework (harmonized and simplified policies and regulations which offer significant unrealized gains in some of the countries at present), better cost recovery and improved maintenance, simplified transit procedures, improved provision of information, and the reduction of unofficial payments or corruption, across the whole region. World Bank (2004).
development of a strategy and the main policy objectives for the strategy, meant that this attempt also floundered.

So a number of different strategies have been produced at the entity level, but these, almost with exception, have been limited along one or more dimensions. These documents generally amount to statements of broad policy objectives, followed by lists of prospective projects along particular corridors, routes, or for particular modes. What is generally lacking is any strategic attempt to identify future investment needs based on a robust assessment of current and future demand over an appropriate timeframe. Equally, there is usually no assessment of the synergistic impact of projects across the sector more generally, or more seriously, any prioritization of the proposed investment projects that is reflective of the fiscal resources available, from different potential sources, public and private, internal and external. The result has been a patchwork of initiatives and projects, sometimes complementary, sometimes contradictory.

What would be the main pillars of a transport sector strategy and policy for BH?

I. **Strengthening the Institutional Framework**

*Streamlining the legal framework*

Further work is undoubtedly required to harmonize the legal framework internally and align it with the requirements of the *acquis communautaire*. This applies not only to the majority of the secondary legislation, but also some of the primary legislation. In line with European policy, the main focus of attention in terms of road transport legislation will have to be on market access and social legislation. The specific requirements in each sub-sector are detailed in the relevant Annexes to this report.

The legal framework of the sector also needs clarification. In nearly every sub-sector, an explicit clarification of responsibilities would be timely, particularly concerning the development of the strategic road network, the SEETO Core network, or the Pan-European network and other cross-entity issues. There needs to be a clear mandate for the institutions at the state level, with no ambiguities between different laws at different levels.

*Streamlining the organizational structure*

The current organizational structure of the sector would also benefit from improvement. As one example, in a country the size of BH, having five distinct bodies endowed with managerial responsibilities in the road sector is plainly illogical from a technical perspective. A critical comment that is equally applicable in the other sub-sectors. A reduction in the number of organizations and a concentration of responsibilities for the different layers of the road network would reduce the current atomization of resources, improve the quality and consistency of interventions, and improve efficiency.
Revising the functional classification of the road network

The current classification of the road network needs to be revised. The current road network classification is based on an administrative classification and a rather complex set of administrative layers. A functional road classification should become part of a new state Law on Roads, and would provide a better basis for the allocation and use of resources within the sector.

II. Improving the sustainability of the sector

Improving management in the road sector

An up-to-date road inventory that covers all the classes of roads should be commissioned. The inventories should include details on the surface type, condition, drainage structures and usage (volume and type of traffic) on individual roads.

An asset management system should be maintained and updated. Essential data such as traffic counts should be collected continuously, and entered into the road database. Pavement condition should be monitored on a rolling basis, as should the functional importance of different roads in the network e.g., populations served, villages accessing road etc. to facilitate network wide maintenance prioritization and planning. This is a prerequisite for the professional management of the assets.

Good management practices also require improved accountability. This is not just in terms of accounting for money received and showing how it has been spent. It includes the whole process of being accountable to the road users and stakeholders. This is ideally achieved in a best practice agency through:

- Strong financial management systems and auditing processes;
- Assessing needs of road users through user satisfaction surveys;
- Measuring the improvement in the condition of the road network;
- Assessing performance of the agency against predetermined performance criteria; and
- Preparing annual reports of the agency to include results of all the above elements.

Placing greater emphasis on maintenance

The government ought to make the maintenance of the existing assets a major priority. At present, road maintenance can already be fully supported from existing funding sources if all the road-related revenues were to be redirected to the sector. The first and foremost goal regarding the magistral and regional road network is to ensure an

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2 The need for a reclassification of the road network is even more important, as the latest reclassification was done in 1987, and since the Dayton Peace Agreement there have been important shifts in traffic flows, with some magistral roads losing their importance, and conversely, some regional roads gaining considerably in terms of traffic. A reclassification would require a new set of criteria to be defined and agreed upon.
adequate level of routine, winter, and periodic road maintenance. All maintenance should be supported via domestic funding sources to ensure sustainability. This policy is already successfully implemented by both entities for routine and winter maintenance.

**New approaches/methods to maintenance should be piloted to improve efficiency and quality.** Output and performance-based maintenance contracts for routine and winter maintenance were due to be started in 2008 under the World Bank financed Road Infrastructure and Safety Project, but unfortunately despite the potential benefits as realized in other countries in the region, there has been little progress in the introduction of these techniques, even on a pilot basis, at this time.

*Improve cost recovery in the road sector*

The level of diesel fuel duty and vehicle registration fees, particularly for larger, heavier commercial vehicles, do not, currently cover the social costs of use, including the damage caused by the vehicle to the road itself. Since heavy goods vehicles cause significantly greater damage to the road pavement than other vehicle types, a recommendation to increase road user charges for these vehicles would seem justified. However, a clear study would need to be undertaken prior to such a move to ensure that this does not compromise the competitive position of Bosnia and Herzegovina as a potential transit country for traffic.

**Based on the current financing scheme, no funds are available for network enhancement on any of the road network.** A higher fuel road tax is required to support network enhancements via domestic funding. The study identifies a number of potential options and recommends the introduction of an increase to BAM 0.35 per liter with the breakdown of BAM 0.10 per liter for motorways, BAM 0.16 for magistral and regional roads, and BAM 0.09 for local roads.

*Improve the operational and financial performance of the railways*

**In the short term:**

- *Establish accounting to support profit centers.* A critical step to implementing profit centers is to develop accounting information and analytical tools that provide information on a profit center basis;

- *Measure performance and provide incentives to staff.* The railway’s Board of Directors should set goals for railway management, which in turn should set corresponding goals for staff that reflect the policy goals for the railway. These goals should include a combination of financial, safety, environmental and service quality/quantity measures.

- *Institute marketing and service design.* The FBH railways would benefit significantly from efforts to increase traffic. With marketing and service design, the railway seeks information about actual and potential customers to provide services that better meet the customers’ needs;
• **Improve governance.** In FBH, national governments are the owners of railway stock and exercise supervisory control through boards of directors. This role should be used to encourage railway management to take up the strategy issues, discussed above, which are within the railway’s control: commercial management, boosting productivity, and integrating railway services;

**In the medium-term**

• **Scrap excess rolling stock.** Each railway should review and identify the non-functional rolling stock that could be cleared from its inventory and scrapped;

• **Implement staff reduction plan.** The two railways should implement the staff reduction plan in the medium term to improve the financial and operating performance of the railways;

• **Reduce unprofitable lines.** The procedures for closing unprofitable lines and services, where service specific subsidy is not forthcoming, should be started to close the line/service;

• **Privatize non-core activities.** The railways should shed all non-core activities and focus on their core activities.

• **Close unviable stations.** A similar process should be followed for all unviable stations on the network; and

• **Formalize the line of business separation for freight and passenger services.** Commercial railways organize themselves in lines of business or profit centers, which focus on groups of customers external to the railway\(^3\) whose traffic has shared characteristics which cause it to benefit from being managed together. At a minimum, the railways should separate freight and passenger lines of business.

**III. CONTRIBUTING TO BROAD BASED ECONOMIC GROWTH**

**Developing the road network**

**The motorway/expressway program is the highest priority.** The development of motorways/expressways crossing the country is a national priority agreed to by all parties, and the authorities have begun to implement and open key sections on Corridor Vc, and the Banja Luka-Gradiska links. A clear and transparent sequencing, both transverse and horizontal, of the construction of any further sections of motorway, based

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\(^3\) The profit center must have external customers. If the customers are all internal to the railways (e.g., the locomotive department), it is a cost center, not a profit center.
on a robust assessment of the financial, economic, technical, social and environmental considerations, is essential.

However, **a program to develop the road infrastructure cannot focus primarily on motorways.** The strategic economic assessment undertaken in this study has indentified the twenty-five projects (presented in the next table), which are assessed to be the most beneficial in economic terms, and the most necessary, over the next twenty years. The essential next step involves starting the necessary preparatory work, where this is lacking, and the pre-feasibility and feasibility studies, together with the requisite environmental and social studies, and the detailed designs.

**Priority road projects in the 2020 “Intermediate” Scenario based on economic performance**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Improvement</th>
<th>Name</th>
<th>NPV (mill BAM)</th>
<th>EIRR</th>
<th>B/C Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corridor Vc</td>
<td>4L Motorway</td>
<td>Sava-Doboj</td>
<td>175.0</td>
<td>17.0</td>
<td>1.55</td>
</tr>
<tr>
<td>Corridor Vc</td>
<td>4L Motorway</td>
<td>Doboj-Zenica</td>
<td>280.1</td>
<td>15.9</td>
<td>1.43</td>
</tr>
<tr>
<td>Corridor Vc</td>
<td>4L Motorway</td>
<td>Zenica-Kakanj</td>
<td>112.7</td>
<td>17.0</td>
<td>1.55</td>
</tr>
<tr>
<td>M-14</td>
<td>2L Main</td>
<td>Bihac-Bos. Krupa</td>
<td>38.1</td>
<td>24.4</td>
<td>2.40</td>
</tr>
<tr>
<td>M-15</td>
<td>2L Main</td>
<td>Kijuk-Sanski Most</td>
<td>4.3</td>
<td>17.3</td>
<td>1.39</td>
</tr>
<tr>
<td>M-18</td>
<td>2L Main</td>
<td>Tinovo-Dobro Polje</td>
<td>0.8</td>
<td>13.3</td>
<td>1.11</td>
</tr>
<tr>
<td>M-18</td>
<td>2L Main</td>
<td>Sarajevo-Tuzla</td>
<td>257.3</td>
<td>26.0</td>
<td>2.75</td>
</tr>
<tr>
<td>M-4</td>
<td>4L Xway/2L Main</td>
<td>Doboj-Tuzla</td>
<td>328.1</td>
<td>33.4</td>
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<td>M-4.2</td>
<td>2L Main</td>
<td>Srbiljani-V. Kladusa</td>
<td>64.6</td>
<td>52.1</td>
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<td>New</td>
<td>4L Expressway</td>
<td>Lashva-D. Vakuj</td>
<td>2120.4</td>
<td>60.9</td>
<td>11.14</td>
</tr>
<tr>
<td>M-6/15</td>
<td>2L Main</td>
<td>Mostar-Posuje</td>
<td>199.6</td>
<td>54.9</td>
<td>7.41</td>
</tr>
<tr>
<td>M-5</td>
<td>2L Main</td>
<td>Renovica-Mesici</td>
<td>12.2</td>
<td>14.4</td>
<td>1.24</td>
</tr>
<tr>
<td>New</td>
<td>4L Motorway</td>
<td>Banja-Laka-Doboj</td>
<td>368.9</td>
<td>11.1</td>
<td>1.58</td>
</tr>
<tr>
<td>M-1.8</td>
<td>2L Main</td>
<td>Lepnica-Blazevak</td>
<td>40.4</td>
<td>39.2</td>
<td>4.52</td>
</tr>
<tr>
<td>M-14.1</td>
<td>2L Main</td>
<td>Loncari-Bijeljina</td>
<td>268.4</td>
<td>75.0</td>
<td>11.10</td>
</tr>
<tr>
<td>M-14/19</td>
<td>2L Main</td>
<td>Bijeljina-Zaomik</td>
<td>134.6</td>
<td>37.8</td>
<td>4.69</td>
</tr>
<tr>
<td>M-16</td>
<td>2L Main</td>
<td>Karanovac-C.Rijeka</td>
<td>24.0</td>
<td>15.7</td>
<td>1.38</td>
</tr>
<tr>
<td>M-18</td>
<td>2L Main</td>
<td>Racica-Bijeljina-Tuzla</td>
<td>73.6</td>
<td>26.8</td>
<td>2.61</td>
</tr>
<tr>
<td>M-20/5</td>
<td>2L Main</td>
<td>Gornzde-Visegrad</td>
<td>17.3</td>
<td>15.8</td>
<td>1.33</td>
</tr>
<tr>
<td>M-4/16</td>
<td>2L Main</td>
<td>Prijedor-Karanovac</td>
<td>148.3</td>
<td>34.8</td>
<td>4.15</td>
</tr>
<tr>
<td>M-5</td>
<td>2L Main</td>
<td>Sarajevo-Pale</td>
<td>16.3</td>
<td>23.1</td>
<td>2.27</td>
</tr>
<tr>
<td>M-6</td>
<td>2L Main</td>
<td>Stolac-Ljabinje</td>
<td>4.2</td>
<td>15.6</td>
<td>1.34</td>
</tr>
<tr>
<td>R-405</td>
<td>2L Regional</td>
<td>Bronzani-Sanski Most</td>
<td>14.9</td>
<td>19.9</td>
<td>1.82</td>
</tr>
<tr>
<td>R-413</td>
<td>2L Regional</td>
<td>Knezevo-Turbe</td>
<td>0.9</td>
<td>12.5</td>
<td>1.05</td>
</tr>
<tr>
<td>R-474</td>
<td>2L Regional</td>
<td>Srbac-Ukrina</td>
<td>6.6</td>
<td>16.7</td>
<td>1.46</td>
</tr>
</tbody>
</table>

**Enhanced private sector participation would bring real benefits**

The scale of the investment required means that the involvement of the private sector will be necessary. Involvement of the private sector in financing and constructing infrastructure and providing transport services could bring benefits such as the reduction in user costs, more rapid completions, additional choices offered to users, avoidance of monopolies, and more efficient ways of payment (performance-based contracts). The private sector may also foster the adoption of cost-recovery principles via greater commercialization of infrastructure and better management.
Make targeted investments in the railway sector

Priority should be given to improving the quality of service rather than raising line speeds. The proposed investments (summarized in the following table) prioritize projects to rehabilitate track on the key lines to meet the 22.5 ton axle load, as required by the TER standards, improving signaling, and upgrading line speeds to 120 km per hr.

Recommended railway investments 2010-2030

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost (BAM Mill)</th>
<th>Period</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completing rehabilitation of southern section of Corridor Vc between Sarajevo and Gabela (Croatian border)</td>
<td>76.2</td>
<td>Short - Medium term.</td>
<td>The line is completely electrified and connects to the line Metković - Ploče in Croatia. The rehabilitation of the section Čelebić – Mostar – Čaplina – Croatian border is part of the EIB-EBRD plan. The section Bradina – Konjic, part of this proposal, has a very complex set of tunnels and turns over a 25 km distance.</td>
</tr>
<tr>
<td>Completing rehabilitation of northern section of Corridor Vc between Samac and Sarajevo. Total length covered by the project is 235 km.</td>
<td>245.6</td>
<td>Medium – Long term.</td>
<td>The medium term requirements to implement the project includes completing the feasibility and technical studies and determining the further funding needs on the basis of the available EBRD- EIB loans. The project focuses the sections not covered prior by EBRD-EIB or other investments.</td>
</tr>
<tr>
<td>Completing Rehabilitation of Sections Novi Grad – Doboj and Doboj – Tuzla (Line parallel to Corridor X). Total length covered by the project is 190 km: 125 km (section 1) + 65 km (section 2).</td>
<td>198.6</td>
<td>Medium – Long term.</td>
<td>The medium term requirements to implement the project includes completing the feasibility and technical studies and determine further funding arrangements on the basis of the available EBRD-EIB loans. The project focuses the sections not covered by the EBRD-EIB investment.</td>
</tr>
<tr>
<td>Rehabilitation and electrification of the railway line Brcko – Tuzla. Total length covered by the project is 75 km.</td>
<td>78.4</td>
<td>Long term.</td>
<td>With the expected growth of river transport via Brcko port. Improved railway interconnectivity linking the port with the BiH railway network and Corridor Vc will create opportunities for intermodal transport linking river and railway.</td>
</tr>
</tbody>
</table>


Necessary improvements to the inland waterways

The potential of the IWT sector in BH is significant given reasonable investments in the waterway and the ports. The key intervention is the rehabilitation of the Sava river itself, to Class Va status between Belgrade and Brčko, and Class IV status between Brčko and Sisak. The cost of this intervention has been provisionally estimated to total BAM 137.3 million (US$101.8 million) for the entire stretch. This estimate includes: (i) dredging the navigation channel; (ii) strengthening river banks; (iii) constructing groynes; (iv) smoothing river bends to improve the radius of the curve; (v) increasing the height of the three bridges; and (vi) removal of sunken vessels, mines and unexploded ordnance. It should be noted that these estimates have been made without the detailed designs. The economic cost of phase I for BH is estimated at BAM 19.1 million, including demining costs.
IV. Mitigating the social costs of transport

Improving road safety performance

The following actions are recommended to ensure sufficient capacity for a results focus for road safety:

- Establish a new BH Road Safety Coordination Council—a high-level coordination body under the state MoCT to act as the coordinating body on road safety interventions in BH;
- Adopt a long-term goal for effective road safety management to enable the production and implementation of effective road safety strategy and programs;
- Establish a lead agency for road safety at state and entity levels on a “first amongst equals” basis. The overarching function of the lead agency is the creation of a consistent and harmonized results framework for the delivery of the national road safety strategy;
- Establish small but appropriately resourced road safety offices at state and entity levels within the lead agencies with sections covering road safety strategy, policy and action programs, road safety statistics, road safety economics and road safety promotion. The offices would identify and work on the preparation of a harmonized road safety strategy and entity action plans and commence capacity building initiatives and create the results focus;
- Prepare a harmonized national road safety strategy with supporting state and entity action plans;
- Specify the responsibilities of the key government stakeholders—transport, roads authorities, police, health and education—for road safety, ensuring that regulatory and compliance functions are separated according to good European practice; and
- Upgrade road safety capacity across all departments and urban administrations to improve understanding of the road safety problem, crash injury problems and cost-effective, evidence-based strategies and countermeasures.

The following actions are recommended to ease the funding constraints currently impeding efforts to address the road safety problem:

- Establish sustainable sources and mechanisms for annual funding for road safety results by e.g., earmarking resources from general taxation, creating a road safety fund from user fees and insurance levies;
- Earmark 10 percent of all new road project funding for safety purposes beyond those projects;
- Earmark ten percent of mandatory third party insurance for road safety budgets;
- Develop long term funding proposals and associated prioritization and financial management systems with clear road safety funding streams in government budgets;
- Start to develop a rational framework for allocating resources e.g., by estimating the costs and benefits of countermeasures and the value of preventing death and serious injury; and
• Implement cost-sharing arrangements between the entities for emergency trauma care.
1. INTRODUCTION

The background to the report

1.1. Bosnia and Herzegovina (BH) has overcome significant political and administrative challenges since the end of the hostilities in 1995. The war disrupted transport services, contributed to the large scale destruction of the transport infrastructure, and fragmented institutional responsibilities. Post-war reconstruction efforts have made tangible contributions to recovering the physical infrastructure and strengthening the institutional framework. However, significant challenges remain in a number of areas, not least the development of a transport network and an effective institutional framework, to facilitate rather than constrain economic development in BH, a transport network that, while minimizing the associated social and environmental costs, ensures that the country is fully integrated into the regional and European markets.

1.2. There is recognition of the importance of a comprehensive strategy for developing the transport sector in BH. The Medium-Term Development Strategy (MTDS) of BH asserts that the transport sector should contribute to the achievement of three goals: (i) it should create conditions for sustainable and balanced economic development; (ii) it should contribute to a reduction in poverty; and (iii) it should accelerate integration into the European Union (EU). The Protocol on Land Transport, contained in the Stabilization and Association Agreement (SAA), signed in June 2008, requires cooperation with the European Union in the following broad areas: (i) The development of transport infrastructure in a coordinated manner; (ii) market access, on a reciprocal basis, in the field of road transport; (iii) harmonization of legal and administrative supporting measures, including commercial, taxation, social and technical measures; and (iv) a transport system, which meets social and environmental as well as commercial needs.

1.3. Despite this recognition, there remains no comprehensive strategy for the development of the sector. There have been a number of regional plans, the most recent being the REBIS study, which was developed with support from the European Union. However, this study was primarily concerned with the definition of a "core" transport network in the South East Europe region with the objective of improving regional integration. While undoubtedly worthwhile, the original plan, and the subsequent Multi-Annual Investment Plans prepared by the South East Europe Transport Observatory (SEETO), were prepared at an aggregate level with a clear focus to define the "core network" for each mode, and the resulting investment priorities, independent of the potential synergies between them, and broadly unreflective of competing national considerations and priorities.

1.4. There have been two attempts to define a national transport strategy at the state level. The first attempt was the preparation of the Transport Master Plan for Bosnia &

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4 COWI (2003) Regional Balkans Infrastructure Study (REBIS), supported by the European Union CARDS Program.
Herzegovina (BiHTMAP) in 2001. This study was the first comprehensive attempt to define priorities across all the modes, and in the sector more generally, in a consistent manner. Unfortunately, the final master plan was approved, but never officially adopted, reflecting a lack of agreement between key stakeholders. A second attempt was initiated in 2006 by the state Ministry of Communications and Transport (MOCT), collaborating with the two line entity ministries [the Federation Ministry of Transport and Communications (FBHMTC) and the Republika Srpska Ministry of Transport and Communications (RSMTC)]. However, a lack of consensus on, *inter alia*; which level (state or entity) was responsible for the development of a strategy and the main policy objectives for the strategy, meant that this attempt also floundered.

1.5. **A number of different strategies have been produced at the entity level, but these, almost without exception, have been limited along one or more dimensions.** These documents generally amount to statements of broad policy objectives, followed by lists of prospective projects along particular corridors, routes, or for particular modes. What is generally lacking is any strategic attempt to identify future investment needs based on a robust assessment of current and future demand over an appropriate timeframe. Equally, there is usually no assessment of the synergistic impact of projects across the sector more generally, or more seriously, any prioritization of the proposed investment projects that is reflective of the fiscal resources available, from different potential sources—public and private, internal and external. The result has been a patchwork of initiatives and projects, sometimes complementary, sometimes contradictory.

1.6. **But improved economic development will require a safe, clean, affordable, and sustainable transport system, integrated both with the region and the rest of Europe.** A strong transport system contributes to economic growth by reducing the economic distance\(^5\) to markets, by expanding opportunities for trade, by improving the competitiveness of national locations for production and distribution, and by facilitating mobility for a country’s citizens, while minimizing the social and environmental costs of the transport sector. Such a strategy will determine the priorities across all modes, determined by clear technical, economic and financial considerations. It will also enable the coordinated sequencing of interventions within the available funding constraints, and define necessary changes in legislation, regulations, organizations, and financing to implement the plans for the development of the sector, in a manner consistent with the development needs of BH as a whole.

### The objective of the report

1.7. **This Transport Sector Review is intended to be a contribution to the dialogue over the development of a National Transport Strategy and Action Plan for BH.** It is not intended to be prescriptive or act as a substitute for a nationally developed transport strategy,\(^5\)

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\(^5\) This measure reflects all the necessary and unnecessary transportation and clearance expenditures. Thus, a reduction in economic distance can be realized not only from improved physical infrastructure, where justified by economic criteria—a necessary condition for economic development—but also from improvements in the institutional framework (harmonized and simplified policies and regulations which offer significant unrealized gains in some of the countries at present), better cost recovery and improved maintenance, simplified transit procedures, improved provision of information, and the reduction of unofficial payments or corruption, across the whole region. World Bank (2004).
but it is intended in its review of the main modes, to highlight deficiencies and indicate priorities for a prospective national transport strategy and action plan, for further consideration by key stakeholders in BH. The main report synthesizes the contents, conclusions, and recommendations of a series of detailed sector reports covering the road, railway, urban transport, and inland waterway sectors, which are provided as Annexes to this main report. The intention is to provide a review of the current status of the transport sector in BH, identify the main sectoral challenges, both in institutional and physical terms, and outline a strategy and prospective Action Plan.

The intended audience of the report

1.8. The primary audience of this work is intended to be national and international stakeholders interested in the development of Bosnia and Herzegovina. The primary audience of the work is the diverse national and international stakeholders in the transport sector in Bosnia and Herzegovina, including government officials, decision makers, business people, operators, and most importantly, the users and beneficiaries of the system. In addition, the report is considered to be of potential value to multilateral and bilateral donor organizations, and other international organizations with an interest in this important subject, to focus discussions over investment priorities over the short to medium term.

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6 In turn, these annexes draw on recent work by Pacific Consultants International (PCI) and Safrege, funded by the Japanese and French Governments respectively, and other work commissioned, or undertaken, by the World Bank.
2. THE INSTITUTIONAL FRAMEWORK FOR THE SECTOR

The European context

2.1 The institutional framework for the transport sector in the Western Balkans is defined by the European Union. BH passed a major milestone to membership in the EU with the signing of the Stabilization and Association Agreement (SAA) in June 2008. But in order to meet the requirements for accession, candidate countries are required to align domestic laws, rules and procedures to the body of community legislation in such a way that ensures that relevant EU law is fully reflected within the domestic legal framework. The relevant community legislation is contained in the acquis communautaire, which is constantly evolving as it reflects the contents, principles and objectives of the Treaties on which it is based. The acquis summarizes the requirements in a number of chapters, including transport, each of which contains all relevant Directives, Regulations and Decisions, together with all principles of law and interpretations of the European Court of Justice, and all relevant Declarations and Resolutions of the Council of Ministers for that particular area. Candidate countries must bring their institutions, management capacity and administrative and judicial systems up to EU standards, both at national and regional level, as a prerequisite for membership in the European Union.

The regional context

2.2 There have also been several initiatives aimed at accelerating regional integration in South East Europe. The South East Europe Transport Observatory (SEETO) is a regional transport organization established by the Memorandum of Understanding for the development of the Core Regional Transport Network (MoU) signed June 11, 2004 by the Governments of Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia (FYROM), Montenegro and Serbia and the United Nations Mission in Kosovo and the European Commission. The aim of SEETO is to promote cooperation on the development of the main and ancillary infrastructure on the multimodal South East Europe Core Regional Transport Network and to promote and enhance local capacity for the implementation of investment programs, management and data collection and analysis on the Core Regional Transport Network. An addendum to the MoU was signed in December 2007 to enhance regional cooperation in the South East European Railway Transport Area, and, more particularly, on improving rail market access, opening the national market, facilitating border crossings and ensuring a high level of technical interoperability between signatories.

2.3 More recently, the EU has launched negotiations on a Western Balkan Transport Community Treaty. An initiative was launched in March 5, 2008 to accelerate

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7 The transportation chapter in the acquis also includes all international transportation agreements to which the EU is a party, including the European Conference of Ministers of Transport (ECMT) acquis.

8 The Addendum can be found at:
EU pre-accession preparations with Western Balkan countries, including a proposed Western Balkan Transport Community Treaty. The proposed Transport Treaty aims to work towards an integrated market for road, rail, inland waterways, and maritime transport in the West Balkans region—the region includes Albania, Bosnia and Herzegovina, FYROM, Montenegro, Serbia, and Kosovo—and to align the relevant legislation in the Western Balkans with EU legislation. It is also expected to help accelerate the integration of transport systems and to harmonize rules on safety, environmental protection and services, as well as facilitating the expansion of the trans-European transport network. The European Commission opened negotiations on the Transport Treaty on June 24 2008.

The national context

2.4 The institutional framework for the transport sector is a legacy of the Dayton Peace Accords. Under the Dayton Peace Accords, the responsibilities for air transport and the regulation of transport between the two entities [the Federation of Bosnia and Herzegovina (FBH) and the Republika Srpska (RS)] were assigned to the state level, whereas the responsibility for infrastructure was given to the respective entities. The problem this legacy has created is clearly illustrated in the road sector, where there are three Laws on Public Roads, one in each entity and one in Brčko Administrative District (BAD), and a further draft under preparation at the state level. The result is both different arrangements for the management of different levels of the road network within each domain, and confusion over institutional responsibilities regarding the development of the strategic road network, the SEETOC Core network, and the Pan-European network. The same problems are manifest in the other sub-sectors to a greater or lesser extent.

2.5 The 2003 Law on Ministries established the MOCT at the state level. This initiative was an attempt to address the inherent problems and additional transaction costs resulting from this cumbersome institutional framework. This law endowed the new body with responsibilities in respect of international coordination, international agreements and international transport links. However, so far, there has been little subsequent success in defining the primary legislation to provide an appropriate basis for this mandate, and a draft state Law on Roads has been under preparation, awaiting agreement amongst stakeholders, for a number of years. There remains a lack of agreement on which level is responsible for defining national strategies and priorities, and possibly not surprisingly, a lack of agreement on what the actual strategy should be, or the priorities are, at a national level.

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11 The relevant laws in the Federation of Bosnia & Herzegovina (FBH) and in the Republic Srpska (RS) are, respectively, the Law of Roads, (currently in the process of being revised), (Official Gazette of the Federation of Bosnia & Herzegovina, No. 6/02), and the Law on Public Roads (Official Gazette of the Republic of Srpska, No. 3/04).
12 Brčko Administrative District was established by the Dayton Peace Accords as the territories of the two entities overlapped in Brčko District, and agreement on the inter-entity line was not forthcoming. Brčko Administrative District was formed under the arbitration process, established by the DPA. The District is self-governing under the Brčko Administrative District Council, under the supervision of an international supervisor appointed by the Office of the High Representative (and the EU Special Representative). With the recent addenda to the DPA, Brčko Administrative District now enjoys the same status as the other two entities.
The organizational structure of the sector

The road sector

2.6 The complexity of the legal framework is mirrored, or even surpassed, by the complexity of the organizational structure within the road sector. Currently—without considering the tertiary, or local road, level—there are 18 distinct bodies that are assigned responsibilities in the road sector in BH: (i) The MOCT; (ii) The entity line ministries; (iii) the Federation Road Directorate, responsible for the management of the primary road network, excluding motorways and expressways; (iv) the RS Road Company, responsible for main and regional roads, excluding motorways; (v) the two entity motorway/highway companies; (vi) the ten cantons, and four Cantonal Road Directorates, responsible for regional roads in the respective cantons within FBH; and (vii) BAD Council, responsible for the roads within the district.

The state level

2.7 The MOCT of Bosnia and Herzegovina was established in 2003, based on the state Law on Ministries. The 2003 Law on Ministries established the MOCT and assigned to it responsibility for: (i) international and inter-entity transport links; (ii) the drafting of contracts, agreements and other acts that fall within the sphere of international and inter-entity transport; (iii) relations with international organizations whose functioning fall within international and inter-entity transport; (iv) the drafting and development of strategic planning documents that fall within international and inter-entity communications, transport, infrastructure and information technologies; and (v) issues of control for unimpeded transport in international transport, civil aviation and air-traffic control.

2.8 While the state ministry has played an important role in the preparation and planning of the development of the infrastructure on Corridor Vc, it has no formal mandate in relation to the planning and development of the strategic network, or in areas of necessary coordination between the entities and BAD such as: (i) consistency in the classification of roads; (ii) consistency in the technical standards for design, maintenance, construction and supervision, road safety; (iii) the charging of heavy goods vehicles for infrastructure use (in line with EU Directive 1999/62); and (iv) the environmental classification and charging of heavy goods vehicles for environmental purposes.

The Federation of Bosnia and Herzegovina

2.9 Under the 2005 Law on Ministries of FBH, the Ministry of Transport and Communications of FBH (FBHMTC) is responsible for the administration of road transport and public roads. FBHMTC fulfills the role of the administrator of the road network, responsible for policy, for the relevant legal and regulatory framework, and ensuring the provision of appropriate levels of funding to ensure the maintenance and development of the federal primary and secondary road network. However, responsibilities for the latter are shared with the ten cantons in the Federation.

2.10 One difference between the management of the road network in the two entities is the three levels of government in the FBH compared to two in RS. At the first tier, the
management functions for the magistral roads are entrusted to the Federation of Bosnia and Herzegovina Road Directorate (FBHRD),\textsuperscript{13} while the management functions for the motorways are entrusted to the Federation of Bosnia and Herzegovina Highway Directorate (FBHHD).\textsuperscript{14} FBHRD is thus responsible for the planning, management, maintenance and upgrading of the magistral road network. Road maintenance and construction is contracted out to the private sector through competitive bidding. At the second-tier, regional roads are managed by the road directorates in the respective cantons. At the third-tier, local roads are managed by the municipalities, working under the umbrella of the respective cantons. This three-tier system reflects the federal structure, but it is non-optimal for the management of a road network covering a relatively small geographical area. It atomizes the limited competences, inhibits the use of professional management, raises transaction costs, and reduces efficiency of expenditures. There have been recent discussions aimed at streamlining the management of the main and regional network, which would appear sensible.

2.11 **FBHRD undertakes little multi-year planning of work projects, and there is no up-to-date Asset Management System.** As in the RS, FBHRD also undertakes little multi-year planning of its maintenance requirements. An inventory of the technical characteristics of the road network, the condition of the road network, and the level of traffic was undertaken in 2004, and an Asset Management System was also established in the FBHRD at considerable cost under the World Bank Road Management and Safety Project. This was used to produce a network analysis prioritizing interventions on an objective basis for all the road sections on the network. This plan led directly to the current European Investment Bank-European Bank for Reconstruction and Development-World Bank intervention. Despite this, the necessary annual data collection to maintain this database and update the strategic plan has not been carried out.

**The Republika Srpska**

2.12 **The 2002 Law on Ministries of RS established the Ministry of Transport and Communications of RS (RSMTC) as the owner and administrator of the road network.** Since under the Dayton Peace Accords, infrastructure was accorded to the entities, and BAD, these bodies ”own” the public good, and the relevant entity ministries (and BAD Council) fulfill the administration role: they are responsible for policy, the relevant legal and regulatory framework, and ensuring the provision of appropriate levels of funding to ensure the maintenance and development of the respective network.

\[\textsuperscript{13}\] The Road Directorate of the Federation of Bosnia and Herzegovina was registered in the Cantonal Court in Sarajevo on October 28, 2002 on the basis of the Law on Roads of Federation of Bosnia and Herzegovina (“Official Gazette of Federation of Bosnia and Herzegovina”, No. 6/02) under which the Road Directorate of FBH is authorized to manage the main road infrastructure. The Road Directorate of FBH harmonized its form of organization, title, company and activities with the Law on Public Companies (“Official Gazette of FBH”, No. 8/05) and it operates today under the title “Public Company Road Directorate of Federation of Bosnia and Herzegovina, limited liability company, Sarajevo.”

\[\textsuperscript{14}\] The Highway Directorate of the Federation of Bosnia and Herzegovina was established in July 2006 and currently employs 47 staff.
2.13 The role of the manager of the main and regional network is exercised by the Public Company Republika Srpska Roads (RSR). The management of the main and regional network, excluding motorways and expressways, in the RS is assigned to the RSR, established under the 2004 RS Law on Public Roads. The development of motorways and expressways, so far restricted to Banja Luka to Gradiska, is the responsibility of the motorway company of the RS, established under the same law. RSR is the organization responsible for planning activities to be undertaken, then supervising the implementation, and monitoring the outputs. Given the formal delineation of responsibilities, RSR should, in theory, operate entirely independently from RSMTC. (The issue of the management of the local road network is discussed in more detail in Annex 2).

2.14 RSR rightly focuses on the management and planning roles rather than on physical implementation itself. The actual work on the main and regional network is carried out by private contractors under public procurement (following a one-year pre-qualification period). Input-based contracts for maintenance are stratified geographically within 13 areas, each of which contains some 250-350 kilometers of roads. The contracts last for 3 years. RSR undertakes little multi-year planning of its maintenance requirements. An inventory of the technical characteristics of the road network, the condition of the road network, and the level of traffic was undertaken in 2004, and an Asset Management System was established in RSR under the World Bank supported Road Management and Safety Project (RMSP).

2.15 From a purely technical perspective, the failure to establish the Bosnia and Herzegovina Road Infrastructure Company (BRIC) was a missed opportunity. The Dayton Peace Accords\textsuperscript{15} required a public road corporation to be established to ensure the smooth operation of transport across the entities, to manage the national road network, and reduce transaction costs. However, while the Bosnia and Herzegovina Road Infrastructure Company (BRIC) was formally established, it never became fully operational. This represents a significant missed opportunity, as one national road directorate responsible for the management and maintenance of all primary and secondary roads, would be a far more efficient solution for Bosnia and Herzegovina. This would reduce transaction costs, improve governance and management, and allow the concentration of scarce resources.

The classification of roads

2.16 The road system in BH is currently classified according to three categories: magistral (primary) roads; regional (secondary) roads; and local (tertiary) roads. The current classification of roads is an administrative or jurisdictional typology, rather than one based on function. The first law to introduce a typology for the different categories of roads was the “Law of National and Autonomous Roads” (1929-1932), which established the administrative partition of public roads; in this way, public and autonomous roads were distinguished first, which were then further subdivided into domain and municipal roads of the 1st and 2nd order, and municipal roads of 1st and 2nd order. This system remained in place until 1945, when public roads were classified into categories I-III, which become categories I-IV in 1953. The current administrative typology of magistral, regional, local and

unclassified roads dates to the Law of Public Roads. But an administrative typology overlooks core evolving elements, such as the introduction of motorways or expressways and the changing function of different roads over time.

The railway sector

2.17 The sector now includes two vertically integrated railway companies, and a state level coordinating body: Zeljeznice Federacije Bosne i Hercegovine (ZFBH), Zeljeznice Republike Srpske (ZRS), and Bosne i Hercegovine i Bosanskohercegovačke Zeljeznicke Javne Korporacije (BHZJK), the state-level coordinating body. The latter was established in 1998 to act as a coordinating and regulating body for railway transport between the two entities. Its objectives and responsibilities are regulated in the BHZJK Agreement, prepared by the commission established under Annex 9 of the Dayton Peace Accords, but include the purpose of the corporation to establish institutionalized cooperation among the entities and provide whatever decisions are necessary to allow smooth, safe and regular inter-entity and international railway traffic.

2.18 BHZJK has never been fully established. The organizational structure of BHZJK was defined in Article 4 of the Agreement. But to date, only limited progress has been made in the realization of the Agreement and the organizational structure therefore reflects the intention rather than the reality. Specific responsibilities of BHZJK are defined to include (i) allocating train-paths for inter-entity and international traffic; (ii) harmonizing signaling, safety and telecommunications systems throughout BH; (iii) harmonizing and determining infrastructure access charges; (iv) selecting rehabilitation priorities; and (v) allocating and managing funds received from international donors. However, in practice, the activities of the Public Railway Corporation remain limited, as it is dependent for both resources and the agreement of the two railways to undertake any function, as BHZJK owns no assets and is financed entirely by funds provided by the entity railways (sixty (60) percent from ZFBH, and forty (40) percent from ZRS.

2.19 The primary function of BHZJK is to act as a conduit for international financial assistance (Article 3.5) and as the counterpart to the respective international institutions. This coordination is organized via the Project Implementation Unit (PIU) of the Corporation. The Agreement stipulates in Article 3.7 that the Corporation could also act by specific mandate as common agent and in its own right for all matters which could contribute to the development of the railway sector. However, the functions described in Article 3.5 to 3.7 are subject to the approval of the entities or the railway companies and such a mandate has not been approved. BHZJK is also frequently mentioned as the body for the management of the railway infrastructure, but there has been little substantive movement in this direction.

2.20 ZFBH is the railway operator in the Federation of Bosnia and Herzegovina. This company was established by the 2001 Law on Railways of the Federation of Bosnia and Herzegovina. The law legalizes railway transport in the Federation, establishes ZFBH and regulates relations between ZFBH and BHZJK. Article 3 stipulates that ZFBH is the only manager of railway infrastructure in the Federation as well as the railway operator of FBH. The objective of ZFBH is defined as the provision of internal and international railway transport, maintenance, modernization and building of railway infrastructure and activities of restoration of railway transport. The same law foresees the opening of the infrastructure, allowing approved operators access to the railway infrastructure provided that these operators
accept designated railway routes and pay adequate infrastructure fees, and it also establishes the principle of separated accounts for infrastructure and operations (Article 13).

2.21 **ZRS is the railway company in the Republika Srpska.** The Law on Railways RS establishes the undertaking for railway transport “Republic of Srpska Railways” (Zeljeznice Republike Srpske—ZRS) as a joint stock company with eighty (80) percent of the shares owned by the Republic of Srpska. According to the law, ZRS is both the infrastructure manager and the transport operator. Even more explicitly, ZRS is recognized as the only infrastructure manager in the Republic of Srpska, with all resources to be provided from the budget of the Republic of Srpska (Article 6). More explicitly, the law declares that ZRS is responsible for the following (Article 1):

- The conditions and technical elements of construction, reconstruction and maintenance of railroads, railway facilities, devices and equipment included, as well as their control;
- The conditions, which are to be met by railway vehicles, devices and equipment included, as well as their control;
- The conditions for performing railway transport and organization of the transport of passengers and goods; and
- The conditions, which are to be met by railway workers who are directly involved in performing railway transport; overall working hours and special safety measures, traffic safety and order of the railway, surveillance of the safe organizing of railway traffic, as well as certain issues of industrial and city railway and cable railway.

2.22 **The law also foresees the opening of the infrastructure to private operators.** Article 5 foresees access by private operators to the network via the issuing of operators’ certificates that will regulate activities and rules on the use of railway infrastructure, activities performed by the Ministry of Traffic and Communications of the Republic of Srpska, and guarantees free access to the railway network without discrimination (Article 9).

**Urban transport**

2.23 **The management of urban transport issues is the preserve of the respective canton/municipality.** The institutional structures in FBH are more complex than those in RS. In FBH, substantial urban transport responsibilities are assigned to the 10 cantons (which do not exist in RS) with the 74 municipalities also retaining some responsibilities, for example road maintenance. In RS, most of the urban transport responsibility lies with the 63 municipalities. There is also wide variation in capacity among the municipalities and cantons in BH. While a few large municipalities have the resources to hire competent staff, most do not. In turn, there is a skills gap in knowledge and professionalism to run a modern urban transport system with the essential elements of transport and land use planning and traffic management, with public transport policy and regulation lacking in many instances. In both entities, matters are further complicated by the designation of official cities, including Sarajevo, East Sarajevo, Banja Luka and Mostar. While Banja Luka and Mostar city boundaries coincide with the municipality boundaries, Sarajevo and East Sarajevo consist of several municipalities, creating an additional layer of institutional mire.
Inland waterways

2.24 The institutional framework for the IWT in BH is no less complex than any other sector in BH. The Dayton Peace Accords, and particularly Annex 9, imply that international and inter-entity water infrastructure, as well as traffic on that infrastructure, are the responsibility of the state Ministry of Communications and Transport (MOCT). However, until the passage of a state level Law on Inland Water Transport, this is a mandate without a clear legal basis. By contrast, all intra-entity river traffic, as well as all aspects of waterway management and operations, are the responsibility of the respective entity ministries of transport, and Brčko Administrative District, for a short section of the river, which are collectively responsible for the transport infrastructure within their respective domains. IWT is at present regulated in accordance with the Law on Internal Navigation of the Republic of Srpska\(^{16}\) and the FBH Law on Internal and Maritime Navigation of the Federation of Bosnia and Herzegovina\(^{17}\). No legislation exists at the level of the state, since the draft Maritime and Inland Waterway Law of 2005 has yet to be adopted. This framework engenders a number of potential conflicts with duplication of responsibilities, and confusion as to who is ultimately in charge. These conflicts are summarized in Table 1.

Table 1. Inland waterway sector potential state-entity conflicts of responsibility

<table>
<thead>
<tr>
<th>Issue</th>
<th>entity</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sava river traffic</td>
<td>- In principle, entities are responsible, and vessels and crews navigating the river need to meet the technical specifications and certificates issued by entities.  &lt;br&gt; - For inter-entity traffic, entities have no authority under strict interpretation of Dayton Peace Accords. It is unclear what happens if entities insist on vessels having entity technical certificates and crews getting entity certificates and licenses. Further complexity would arise if entities have different standards.</td>
<td>- Given the international status of the Sava river, and the authority granted to MOCT, it should be responsible. Permits, technical specifications and licenses are international, and so MOCT-issued and defined.  &lt;br&gt; - MOCT has responsibility under the Dayton Peace Accords. However, it is unclear whether this extends to imposing technical specifications or issuing certificates and licenses for entity traffic and whether these would differ from those issued to international traffic.</td>
</tr>
<tr>
<td>Sava river bank exploitation and dredging</td>
<td>- The entity laws on inland waterways (more specifically the RS law) assign this to be entity responsibility.</td>
<td>- MOCT has the obligation to “recommend” bank exploitation actions to the entities, but what are the implications if entities do not comply? Dredging is part of ensuring the navigability of the river, and thus falls under MOCT responsibility.</td>
</tr>
<tr>
<td>Sava river maintenance and new infrastructure investments</td>
<td>- Maintenance is an entity responsibility; and entities can develop their infrastructure, including receiving funds to implement projects of international importance. Thus, in theory the entities should implement MOCT projects.</td>
<td>- The Sava River Framework Agreement mandates MOCT to undertake infrastructure development decisions and maintenance obligations. But it is not clear whether they should do this themselves, or delegate responsibility to the entities</td>
</tr>
</tbody>
</table>

Source: PCI (2007).

2.25 Navigation on the Sava river is subject to several international and regional treaties and regulations, particularly the Framework Agreement on the Sava River

\(^{17}\) Official Gazette of FBH, Dec. 28, 2005, no.73 year XII.
Basin (FASRB). In addition to certain global treaties such as the Ramsar Convention, UNECE treaties and the *acquis communautaire*, there are specific instruments regulating navigation on the Sava river and its tributaries, particularly the FASRB and related protocols. The FASRB was signed by the riparian countries (Republic of Slovenia, Republic of Croatia, Bosnia and Herzegovina and the former Federal Republic of Yugoslavia) in Kranjska Gora (Slovenia) in December 2002, after successful completion of negotiations run under the “umbrella” of the Stability Pact for Southeastern Europe. The Agreement entered into force on December 29, 2004. Its objectives are: (i) establishing the international navigation regime on the Sava river and its navigable tributaries; (ii) establishing sustainable water management; and (iii) undertaking measures for prevention or restriction of danger, as well as elimination of the hazardous impacts of floods, ice, draught and accidents involving substances having negative impacts to waters. To achieve the first objective above, the parties committed themselves to special cooperation with the Danube Commission.
3. PERFORMANCE OF THE SECTOR

The supply of transport

The road network

3.1 The BH road network totals approximately 22,615 kilometers. This comprises 3,800 km of magistral roads, of which 2,037 km fall within the FBH and 1,763 km within the RS; 4,815 km of regional roads, of which 2,658 km fall within the FBH and 2,157 km within the RS; and 14,000 km of local roads, of which 5,520 km fall within the FBH and 8,780 km fall in the RS. About forty-seven (47) percent of the total road network is paved, compared to sixty-four (64) percent in Montenegro and FYR Macedonia, and eighty-five (85) percent and eighty-seven (87) percent in Croatia and the Slovak Republic, respectively. However ninety-eight (98) percent of the magistral road network are paved (see Table 2 below).

<table>
<thead>
<tr>
<th>Table 2. Length and characteristics of the road network in Bosnia and Herzegovina (2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBH</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Magistral % asphalted</td>
</tr>
<tr>
<td>Regional % asphalted</td>
</tr>
<tr>
<td>Local % asphalted</td>
</tr>
<tr>
<td>Total % asphalted</td>
</tr>
</tbody>
</table>

Sources: FBH Statistical Office and RS Institute of Statistics and Study Estimates.

3.2 BH is also traversed by Corridor Vc, part of the Pan-European network, and a total of 470 km on the SEETO core road network:

- Route 1: From the Croatian border (near Ploce) to Neum (BH), and then back to the Croatian border (near Dubrovnik);
- Route 2A: From the Croatian border (in the direction of Okucani) to Banja Luka (BH) to Laska (BH);
- Route 2B: From Sarajevo (BH) to the Montenegrin border (in the direction of Podgorica); and
- Route 3: From Sarajevo (BH) to the Serbian border (in the direction of Uzice).
3.3 **The density of the entire BH road network is broadly comparable with its immediate neighbors.** In terms of both road density per head of population and per square km, BH compares reasonably well with regional neighbors, but with marked variation between the entities. However such comparisons need to be treated with caution, given the different physical characteristics of the countries concerned.

<table>
<thead>
<tr>
<th></th>
<th>(Km/1000 sq km)</th>
<th>(Km/1000 People)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BH</td>
<td>442</td>
<td>5.9</td>
</tr>
<tr>
<td>Federation of BH</td>
<td>373</td>
<td>4.2</td>
</tr>
<tr>
<td>Republika Srpska</td>
<td>516</td>
<td>8.8</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>175</td>
<td>2.5</td>
</tr>
<tr>
<td>Croatia</td>
<td>519</td>
<td>6.6</td>
</tr>
<tr>
<td>Hungary</td>
<td>2,040</td>
<td>18.9</td>
</tr>
<tr>
<td>Romania</td>
<td>335</td>
<td>3.7</td>
</tr>
<tr>
<td>Serbia</td>
<td>439</td>
<td>5.2</td>
</tr>
<tr>
<td>Slovenia</td>
<td>1,904</td>
<td>19.3</td>
</tr>
</tbody>
</table>

Sources: EC, Statistical Pocketbook 2009; WB.

3.4 **About half of the road network in BH is in good condition, with the remaining half in either fair or poor condition.** While this condition data for magistral and regional roads is relatively dated, based on a comprehensive inventory undertaken in 2004, at that time it compared well with regional neighbors (See Figure 1). In Serbia, a recent policy note reported that while thirty percent (30%) of the magistral and regional road network was in good condition, seventeen (17) percent in fair condition, fifty-three percent (53%) was in poor or very poor condition. The comparative figures for Croatia have been reported as thirty-two (32) percent of the network in good condition, forty six (46) percent in fair condition, and twenty two (22) percent, poor or very poor condition. Although the findings for local roads reflect a simple visual survey of a small sample of local roads in ten selected municipalities (in RS: Trebinje, Rogatica, Samac, Kotor Varos and Novi Grad; in FBH: Grude, Vitez, Srebrenik, Sanski Most and Cazin). The modest size of the sample, the approach used, and the results of earlier more comprehensive surveys suggest that the latter findings should be viewed with caution.

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18 For the main and regional network, Good: IRI<3, Fair: IRI 3-4.5 and Poor IRI>4.5; for the local road network, Good refers to roads substantially free of defects, Fair to roads needing rehabilitation and Poor to roads needing reconstruction.

19 BCEOM (2005), Bosnia and Herzegovina Road Management and Safety Project: Roads, Bridges and Tunnels Database.

20 World Bank (2008b) Improving the management and financing of the road sector in Serbia, Policy Note for the Government of Serbia.

21 World Bank (2008c) Improving the Management of Secondary and Tertiary Roads in the South East Europe Countries.
3.5 The relatively poor condition of the network has been attributed to: (i) the extended period of neglect of the road network or maintenance over the period of hostilities and afterwards; (ii) insufficient funds for routine and scheduled periodic maintenance; (iii) a continued lack of enforcement of axle-load limits, contributing to the premature decline of even those pavements where money was being spent; and (iv) the significant increase in traffic volumes, reported as two to three times higher than the pre-war period, and close to major cities more than five (5) percent annually prior to the crisis.

3.6 The respective entity road authorities undertake no medium-term planning for maintenance. Under Article 18 of the 2004 RS Law on Public Roads, the RSR is charged with producing a mid-term program for the management and maintenance of the magistral road network for adoption by the government. Article 11 of the 2002 Law on Roads in Federation endows the FBHRD with the same responsibility. However, in practice, the programs of work projects are defined and undertaken on a yearly basis, based on the availability of funds, with little forward assessment of needs, priorities, or multi-year work programs.

3.7 The exceptions to this statement were the mid-term plans produced by the RSR and the FBHRD in 2004/2005. The production of these two plans was possible due to the inventory and asset management system established under the World Bank financed RMS. A system was established in both the FBHRD and the RSR, and a strategic analysis undertaken to determine and rank the highest priorities for rehabilitation and reconstruction on the network. The results of this exercise led directly to the World Bank, via the subsequent Road Infrastructure and Safety Project, and the EBRD and the EIB, to collectively commit to US$215 million of investment to clear the maintenance backlog and return much of the primary network to good condition—projects which are being implemented at this time.

3.8 Unfortunately, the impact of these expenditures is unknown, as there has been little or no collection of required data on road condition, traffic levels, or improvements since that time. Despite the considerable investment made, neither an updated strategic

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22 However, nearly one-third of the regional road network was excluded due to its poor condition, so only approximately 2,400 regional road kilometers are included in the database. In addition, the nearly 14,000 km of local roads are neither mapped nor entered into the inventory, or the database.
analysis to determine the mid-term plans, nor the database itself has been updated subsequently, allowing the functionality of the system to decline. Overlooking the cost to the taxpayers of Bosnia and Herzegovina who will have to repay the loan, the professional management of the road network is difficult without a functioning road asset management system.

**Upgrading the magistral road network**

3.9 Each entity has plans to upgrade significant portions of the magistral (primary) road network to better serve the growing demand for road transport. The RS is discussing urban bypasses/ring roads for major urban centers i.e., Banja Luka, Prijedor, Doboj, Modrica, Bijeljina, Rogetica and Trebinje. RS is also looking for some new alignment of some portion of the magistral (primary) road network (e.g., M16, Karanovac-Crna Rijeka; M5, Praca-Mesici; M8, Foca-Pljevlja; M18, Brod na Drini-Scepan Polje) and for the widening of other sections (e.g., M1.8, Lepnica-Blazevak; M14.1, Loncari-Brčko-Bijeljina; M18, Raca-Bijeljina-Tuzla; M5, Pale-Praca; M18, Trnovo-Dobro Polje; M20, Tjentiste-Gacko; and, M6, Stolac-Ljubinje). The Federation plans to enhance the characteristics of some sections of road or to build new alignments (e.g., M 5, Lashva-Donji Vakuf new alignment; M 5, Renovica-Mesici, new alignment; M 4.2, Velika Kladusa-Srbljani, rehabilitation; M 15, Sanski Most-Kljuc, rehabilitation; M 6.1, Mostar South bypass new alignment; M 14, Bihac-Bosanska Krupa, rehabilitation. In addition, both entities have a program for bridge and tunnel rehabilitation—seventeen (17) percent of the existing bridges and eleven (11) percent of the tunnels present serious safety issues.

**Developing a motorway network**

3.10 The RS is committed to building 400 kilometers of motorway and expressway. The core element of this program is the Banja Luka to Gradiska motorway, a four-lane, thirty-four (34) kilometer, median separated and access-controlled facility that is scheduled to be completed in 2009. RS authorities are also trying to develop the Banja Luka-Doboj motorway along a similar design (the state is suggesting to build an upgraded route first, with bypasses and the possible upgrading to a dual carriageway in the longer term). RS is also trying to involve the private sector in the development of its road network, as evidenced by its recent discussions with an Austrian contractor, but earlier experience elsewhere with sole-source, negotiated, contracts of this type are not promising. Generally open, competitive bidding has been found to lead to better value for public money, and reduces the risk that governance will be compromised. Construction of the first section is expected to begin in 2010, starting with the 72 km Banja Luka to Doboj motorway. The overall agreement is to construct more than 400 kms of motorways along four axes: (i) Novi Grad-Prijedor-Banja Luka-Doboj-Bijeljina-Serbian border (including the Banja Luka-Doboj link mentioned previously); (ii) Gradiska-Banja Luka-Kupres, (iii) Croatian border-Modrica-Doboj-(Corridor Vc); and (iv) boundary of FBH-Pale-Ustipraca-Visegrad-Serbian border.

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24 Project documentation has been prepared for Banja Luka to Doboj and for 46 km of Corridor Vc, from Doboj to Vukosarije. For the remaining three sections, project documentation is expected to be completed by early 2010.
3.11 Efforts within FBH focus on Corridor Vc. To that end, considerable effort has been expended to complete pre-feasibility, and feasibility studies, environmental reviews, alignment comparisons and preliminary/final designs of Corridor Vc. Corridor Vc is the “spine” of the SEETO core road network in BH and represents the North-South motorway link crossing the country. The corridor extends over roughly 336 kilometers mainly within the Federation. Nine sections are identified, with designation of sections based on logical geographic, design and hinterland conditions.\textsuperscript{25} The average construction cost is BAM 24.0 million (US$32.6 million) per kilometer, with some sections displaying unit costs amounting to nearly BAM 40 million (US$53.9 million). For some sections, especially for the section south of Sarajevo, savings could be made without compromising the capacity of the infrastructure by using expressway characteristics instead of the motorway characteristics that are discussed at present.\textsuperscript{26} At present, about 30 km north of Sarajevo have been completed, toll booths established, and opened to traffic.

Table 4. Current status of Corridor Vc (September 2009)

<table>
<thead>
<tr>
<th></th>
<th>Length (km)</th>
<th>Preliminary design completed (Yes/No)</th>
<th>Final design completed (Yes/No)</th>
<th>Scheduled construction (dates)</th>
<th>Construction started (Yes/No)</th>
<th>Length constructed (km)</th>
<th>Cost (BAM mill)</th>
<th>Financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sava river-Doboj</td>
<td>62.7</td>
<td>Yes</td>
<td>Underway (deadline Jan. 2010)</td>
<td>2010-12</td>
<td>No</td>
<td>-</td>
<td>810.7</td>
<td>EIB/Strabag</td>
</tr>
<tr>
<td>Doboj-Zenica</td>
<td>58.4</td>
<td>Yes</td>
<td>No</td>
<td>2013-17</td>
<td>No</td>
<td>-</td>
<td>1,476.7</td>
<td>Unknown</td>
</tr>
<tr>
<td>Zenica-Kakanj</td>
<td>23.7</td>
<td>Yes</td>
<td>Yes</td>
<td>2009-11</td>
<td>No</td>
<td>-</td>
<td>454</td>
<td>EBRD/EIB/Kuwait fund</td>
</tr>
<tr>
<td>Kakanj-Josanica</td>
<td>37.0</td>
<td>Yes</td>
<td>Yes</td>
<td>2001-09</td>
<td>Yes</td>
<td>28</td>
<td>300</td>
<td>Budget</td>
</tr>
<tr>
<td>Josanica-Vlakovo (Sarajevo bypass)</td>
<td>8.5</td>
<td>Yes</td>
<td>Yes</td>
<td>2008-12</td>
<td>Yes</td>
<td>0</td>
<td>200</td>
<td>EBRD/EIB/OPEC</td>
</tr>
<tr>
<td>Vlakovo-Tarcin</td>
<td>18.9</td>
<td>Yes</td>
<td>Underway (deadline Dec 2009)</td>
<td>2010-12</td>
<td>No</td>
<td>-</td>
<td>387</td>
<td>EBRD/EIB</td>
</tr>
<tr>
<td>Tarčin-Mostar</td>
<td>69.5</td>
<td>Yes</td>
<td>No</td>
<td>2014-17</td>
<td>No</td>
<td>-</td>
<td>2,272.8</td>
<td>Unknown</td>
</tr>
<tr>
<td>Mostar-South border</td>
<td>57.5</td>
<td>Yes</td>
<td>Underway (deadline May 2010)</td>
<td>2010-12</td>
<td>No</td>
<td>-</td>
<td>915.9</td>
<td>For one part EBRD EIB</td>
</tr>
</tbody>
</table>

\textsuperscript{25} The nine sections are: (i) Svilaj-Karuse, length of 59.9 kilometers; (ii) Karuse-Donja Gracanica, length of 61.0 kilometers; (iii) Donja Gracanica-Kakanj, length of 23.9 kilometers; (iv) Kakanj-Vlakovo, length of 45.4 kilometers; (v) Vlakovo-Tarcin, length of 19.7 kilometers; (vi) Tarcin-Konjic; length of 21.2 kilometers; (vii) Konjic-Jablanica; length of 14.5 kilometers; (viii) Jablanica-Mostar North, length of 32.3 kilometers; and (ix) Mostar North-Republic of Croatia, length of 58.2 kilometers.

\textsuperscript{26} The standard cross-section that both the Federation and RS are contemplating consists of dual lane carriageways with four-meter separation, 3.75 meter lane width, complete grade-separation and other facilities. Those characteristics are slightly higher than the ones commonly used in most of Europe.
Note: Costs exclude VAT, and not all sub-sections of each section are fully financed.
Source: state Ministry of Communications and Transport.

The railway network

3.12 The railway network in BH extends for some 1,017 km. It is based on a standard gauge (1,435 mm) and ninety-two (92) percent of the network is single track. After considerable rehabilitation efforts, more than eighty-five (85) percent of the network is now classified as D4 in terms of UIC load categories, allowing maximum loads of 22.5 tons per axle, or 8.0 tons per linear meter. Around seventy-six (76) percent of the network is electrified with a mono-phase 25kV, 50Hz AC system. The only non-electrified part of the railway network is located in the north-eastern part of the country, around Tuzla, but it is important in traffic terms. All lines are single-track, except one section of 87 kilometers of Corridor Vc between Zenica and Doboj.

| Table 5. Network size and length of electrified line for ZFBH and ZRS (2008) |
|---------------------------------|---------|---------|---------|
| Length of track (km)           | ZFBH   | ZRS     | Total   |
| Electrified lines (%)          | 73      | 79      | 76      |
| Double track lines (%)         | 27      | 21      | 24      |
| Traffic units/track-km         | 1,592,346 | 959,923 | 1,333,399 |

Sources: ZFBH, ZRS, Federation Statistics Office.

3.13 The railway network comprises two main strategic lines, which are also the main railway lines for cargo (see Figure 2). The two include: (i) The North-South Bos.Samac-Doboj-Zenica-Sarajevo-Mostar-Capljina line located on Corridor Vc (which connects Budapest in Hungary to Ploce in Croatia); and (ii) the West-East Dobrjlin-Bos.Novi-Banja Luka-Doboj-Tuzla-Zvornik line which is the railway line parallel to Corridor X. The rehabilitation of the core railway network, in particular Pan European Corridor Vc and the east-west line parallel to Corridor X (and marked in blue in Figure 2) are deemed to be critical first steps. In 2005, the EBRD approved euro 70 million (US$102 million) for a program of track renewal on key sections of both corridors, together with rehabilitation of the station signaling system and purchase of track machinery.

3.14 The density of the railway network in BH is one of the lowest in the region. The density of the railway network in BH in terms of km of track per square km is one of the lowest in the region, with just over 1,000 km of track in a land area of 51,000 square kilometers (see Figure 3). This contrasts poorly with nearly all the comparator countries, with a lower density measure than any other country in the region, excepting Albania. However such comparisons need to be interpreted with caution, given the different topographies of the countries involved.
3.15 Despite the rehabilitation efforts, the overall condition of the railway network in BH remains poor, with operational weaknesses markedly reducing line capacity. Despite extensive rehabilitation on many sections, overall operational speeds remain low, due to the existence of temporary speed restrictions, the condition of some tunnels (notably Tunnel Ivan south of Sarajevo where there is a speed restriction of 40 km/hr), poor track alignment (due to topography and gradient) and condition, and the number and functioning of crossings. Train operating speeds are limited to a range between 30-70 km per hour on around eighty (80) of the railway lines on Corridor Vc. In addition, there are limitations in ballast on curves, weak sleepers, and inadequate fastenings. Another significant problem is the length of the crossing sidings in stations (with a usable length of 570 meters) leading to restrictions on train length (550 meters) and train weight (1,500 tons).

Proposed investments on the network

3.16 Priority should be given to improving the quality of service rather than raising line speeds. The proposed investments (summarized in Table 6) aim to rehabilitate track on the key lines to meet the 22.5 ton axle load, as required by the TER standards, improving signaling, and upgrading line speeds to 120 km per hr. A recent study\(^\text{27}\) noted that if this rehabilitation were implemented and current bottlenecks were addressed, then together with other necessary operational improvements (crossings, signaling, and operational practices), the capacity of the railway network would be sufficient to meet projected demand until 2030. Placing the emphasis on increasing the capacity of the key lines of the current network, primarily on Corridor Vc, and the quality of service for existing customers, before ambitious and potentially unviable projects to introduce higher line speeds, or high speed passenger services, or electrifying lines, seems very sensible.

\(^{27}\) DB International, Vienna Consult and viadonau (2008).
Table 6. Recommended railway investments 2010-2030

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost (BAM Mill)</th>
<th>Period</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completing rehabilitation of southern section of Corridor Vc between</td>
<td>76.2</td>
<td>Short - Medium term.</td>
<td>The line is completely electrified and connects to the line Metković - Ploče in Croatia. The rehabilitation of the section Celebic – Mostar – Čapljina – Croatian border is part of the EIB-EBRD plan. The section Bradina – Konjic, part of this proposal, has a very complex set of tunnels and turns over a 25 km distance.</td>
</tr>
<tr>
<td>Sarajevo and Gabela (Croatian border). Total length covered by the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>project is 73 km (100 km of the 173 km long line is covered by the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EBRD-EIB loan).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completing rehabilitation of northern section of Corridor Vc between</td>
<td>245.6</td>
<td>Medium – Long term.</td>
<td>The medium term requirements to implement the project includes completing the feasibility and technical studies and determining the further funding needs on the basis of the available EBRD-EIB loans. The project focuses the sections not covered prior by EBRD-EIB or other investments.</td>
</tr>
<tr>
<td>Samac and Sarajevo. Total length covered by the project is 235 km.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completing Rehabilitation of Sections Novi Grad – Doboj and Doboj –</td>
<td>198.6</td>
<td>Medium – Long term.</td>
<td>The medium term requirements to implement the project includes completing the feasibility and technical studies and determine further funding arrangements on the basis of the available EBRD-EIB loans. The project focuses the sections not covered by the EBRD-EIB investment.</td>
</tr>
<tr>
<td>Tuzla (Line parallel to Corridor X). Total length covered by the project</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>is 190 km; 125 km (section 1) + 65 km (section 2).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehabilitation and electrification of the railway line Brcko – Tuzla.</td>
<td>78.4</td>
<td>Long term.</td>
<td>With the expected growth of river transport via Brcko port, Improved railway interconnectivity linking the port with the BiH railway network and Corridor Vc will create opportunities for intermodal transport linking river and railway.</td>
</tr>
<tr>
<td>Total length covered by the project is 75 km.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Urban Transport

Sarajevo

3.17 Passenger transport in Sarajevo is dominated by GRAS, a limited liability company fully owned by Sarajevo Canton. Private sector operations constitute a very small proportion of services and these are limited to buses. GRAS operates a full complement of public transport modes including trams, trolley buses, buses and minibuses. In 2008, the public transport modal share was forty-one (41.4) percent tram, thirty three (32.8) percent bus, seventeen (17) percent trolley, and nine (8.7) percent minibus, and these shares have not changed significantly over the last four years. Total daily passenger transport reached 348,630 in 2008, up from 334,411 in 2004. GRAS employs approximately 2,000 persons for the purposes of operating and maintaining the passenger transport system. Internal reorganization reforms are underway, though progress is slow. The bus and minibus services are at the forefront of these initiatives. In 2008, GRAS carried a total of 127 million passengers along 102 lines extending to 1,008 line kilometers. Prior to the war, GRAS carried about 250 million passengers.

3.18 Following the war, some considerable investments were made to re-invigorate GRAS but no major modernization efforts have been undertaken since 1996. Therefore while demand approaches pre-war levels, the supply is not following the same pace. In fact, the fleet size in 2008 was lower than in 2005, as older vehicles were removed from circulation. Average commercial operating speeds have improved somewhat over the same period, with the exception of trams, where it has declined slightly. The bus network brings passengers to the tram network, and covers mostly flat, low hilly parts, while the mini-buses
are used for the very steep parts of Sarajevo. The tram mode is the only one of its operations that was noted as returning a profit for the year. GRAS is economically constrained to carry out much needed overhauls of its public transport fleet and infrastructure. The quality of service has suffered in part due to an aging fleet and infrastructure, outdated depots and workshops and the inability to extend services to the rapidly expanding metropolitan areas.

3.19 **Sarajevo Canton has invested heavily on improving the street system.** Sarajevo Canton is responsible for 460 km of roads, of which 74 km are regional roads and 16 km are magistral roads. Seven companies are responsible for road maintenance, of which two are public and five are private. Cantonal revenue for road work is financed from the fuel tax, advertising along roads, vehicle registration fees, and funds from the Federation Directorate of Roads. In spite of heavy investments in the road system, developing a satisfactory road network in Sarajevo represents a considerable challenge due to the severe topographic constraints of being surrounded by hilly terrain. The major east-west “spine” (Zmaja od Bosne) serving as a vital east-west road link, is heavily used and in need of relief.

3.20 **Trams are a special mode of public transport in Sarajevo.** The tram line network is the spine of the GRAS route structure, with 6 lines and 45.4 km. It forms a semi-continuous loop around the central district and penetrates some areas in the suburbs and the old town. A distinct advantage lies in the fact that considerable portions of the tram line network lie along a segregated central meridian alignment; and it is only in the old town that trams travel as part of mixed traffic. Despite its importance, little has been done to enhance this vital component of the urban transport portfolio. The tram system is heavily used all day and is especially crowded during rush hours. This system, running down the central road spine of the city (Zmaja od Bosne) could be considered the core public transit system element. Overall the system is aging, with the average vehicle fleet age at 29 years. Tram commercial operating speed is 14.6 km per hour, which is understandable in a mixed traffic non-segregated environment.

3.21 **Any desire to increase tram commercial speeds should be taken in the context of weighing proposals for introducing Light Rail Transit (LRT) systems.** An LRT system with newer vehicles would be able to operate at much higher speeds on segregated lines. The relocation of the main train station on the west side of the city, where the main intercity line runs, would require the construction of 700 meters of track and is part of GRAS’ long-term investment plan. This would avoid the spur into the city with no turn around. The idea would then be to have the LRT trains ferry passengers into town; but an important issue is how these investments could be financed, at a time when cantonal budget funds have been reduced. In 2005, 5 km of light track were modernized, and an additional 14 km (two-track) are under consideration by the cantonal government, at a cost of an estimated BAM 2.9 (US$2.2) million per km.

3.22 **Bus and trolley bus services combined accommodate even more passengers than the tram system.** These two modes systems are more extensive, serving both central and outlying portions of the metropolitan area. The bus complement has also benefited in the past

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28 The tram rail gauge is 1.435 meters which is the same as the railway.
few years from a donation of 130 buses from Japan. There is a need to modernize the bus and trolley bus fleet. In 1998 GRAS bought 80 buses with Japanese grant funds, but these are in need of an overhaul or replacement. GRAS plans to acquire 50 new buses, of which 14 buses have already been delivered, and 10 more expected by the end of 2009, financed from cantonal budget funds. Trolley buses are in poor condition—according to GRAS fifty (50) percent are in very poor condition—and an international tender was issued in September 2009 for the acquisition of 17 second-hand, two-segment vehicles.

3.23 **Taxis are currently limited to one per 700 persons residing in Sarajevo, but this regulation is not enforced.** There are several taxi companies and individual owners; and taxis are metered. In 2004, a decision was made at the cantonal level that there should be one taxi for every 700 persons in Sarajevo, although whether there was any empirical evidence to support the decision is unknown. However, in 2006 the FBH law on road transport recommended the ratio to be one for every 500 persons, and the cantonal decision will need to be amended to reflect the FBH law in the coming months. As of 2009, there are 1,470 licensed taxis in Sarajevo Canton, which is one for every 287 persons. As of September 1, 2009, there are new regulations for the registration of taxi vehicles, with new license plates from September 28, 2009. As a result of these changes, taxi drivers will have to change license plates and the number of taxis in Sarajevo is expected to decline.

3.24 **There are approximately 130 signalized intersections in the city.** But the system is outmoded as the signals are capable of only one timing plan and consequently cannot adequately be timed to different travel patterns during the course of a day or day of the week. In addition, there is no central control of the system to enable real time modifications in settings or facilitate accident interventions. Instead, there are two centralized traffic signal systems, but these are not integrated at present and there are no immediate plans to do so given the high costs—the cost of a proposed system upgrade has been estimated in the range of BAM 20 million (US$14.8 million). In addition, the placement of signal heads is generally inadequate, especially along wider streets. A centralized traffic signal system along with speed and red light cameras is being proposed.

**Banja Luka**

3.25 **Banja Luka is the administrative capital and largest city in the Republika Srpska (RS).** The corporate boundaries extend well beyond the current limits of urbanization and into some of the surrounding villages. The city was thrust in the post-war transition from a simple municipal town into being the capital of the RS. Existing spatial planning from the pre-war years has thus proved largely inadequate in light of the city’s new role. Motorization is increasing rapidly in Banja Luka. There were 16,000 registered vehicles in 1995, but since then there has been a marked increase to 45,328 passenger vehicles and 51,937 registered vehicles in 2008. Ongoing intensification of demographic and economic patterns within the metropolitan area is likely to continue. In the face of these challenges, urban transport issues, while not so pressing at the moment, take on an added meaning in planning for the future.

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29 This implies a maximum fleet of 600 taxis based on an assumed Sarajevo population of 420,000.

30 Amount unsubstantiated at this stage.
Urban transport matters within Banja Luka are managed by the city administration’s Department of Public Works and Housing. The Department has five staff working on urban public transport issues, and is also responsible for traffic management including the traffic signal system, road signing and marking.

3.26 A linear development pattern has emerged as a result of the physiological constraints posed by surrounding mountains and the Vrbas river. The city has evolved in a north-south direction along the western bank of the Vrbas river causing a north-south bias for traffic flow. Rapid post-war expansion has resulted in unplanned growth along the eastern bank of the river causing increase in demand for East-West connections. There are few bridges available for these cross-river connections thus adding to the capacity constraint problems. The available bridges are concentrated in the traditional center of the city causing undesirable effects of congestion and environmental degradation.

3.27 In Banja Luka, urban and suburban public transport is provided by bus services. There are a number of private public transport companies operating on 23 lines in the urban center and 30 lines in the suburban area. The public sector operator was privatized in 2000. There is a lack of an organized body in charge of reinforcing fares and ensuring the integration of operations to improve efficiency of the public transport system. The city has an integrated fare system. The city collects all fares (which are sold off-vehicle) and distributes the proceeds to the providers of service according to vehicle kilometers of service provided. The system is self financing with four companies—and four associated partners—paying the city for the privilege of providing services on selected routes.

3.28 Passenger transport satisfaction surveys have indicated a relatively high level of satisfaction with passenger transport services. However, one source has argued that this positive assessment might be due to improvements over a very poor base case. It is also likely that service to outlying areas of the city is deficient as the system is highly focused on the north-south main corridor of the city. As a result many of the western and eastern areas remain without adequate public transport service. Concern has also been indicated that the present arrangement is not sustainable as the bus fleets are aging, with the average bus being 15 years old.

3.29 Banja Luka has 40 signalized intersections, but these are not centrally synchronized. With the exception of 9 intersections with newer traffic signal installations, the traffic signal installations can provide only one timing plan. The city plans to signalize 15 additional intersections and to add central control. An international call for bids for project design documentation for the centralized management system, including a center for traffic management, is ongoing, with the bid period having closed at the end September 2009. This is a priority project for the city and will be financed through loans from commercial banks. The estimated budget for this is in the range of BAM 4.8 million (US$3.6 million). The city had planned approximately 10 traffic circles, of which one has been built and three traffic circle designs have been finalized.

3.30 The city has installed parking meters and is planning to add more. Presently parking is being handled by a section within the administrative service of the city. The city is
exploring the possibility of creating a company dedicated to parking, but has yet to make a decision. The law on public/private partnerships, which was adopted in 2009, will facilitate private participation in a range of activities. The city is currently in the early phases of discussions with the private sector under which the city would provide land, with the private sector constructing and operating the facility. There have been issues over land acquisition that have delayed this project. However, there are 100 new spaces in the city center. Overall, there is a parking shortage and parking violations are apparent, but parking has not yet reached a tipping point.

3.31 The city has undertaken a major road program in recent years. There were only 75km of sealed roads in the city during 2002, but an additional 150km have been asphalted since then.\(^3\) The city is responsible for 314km of local roads and 1,070 km of non-categorized roads—it has completed work on local roads and fifty (50) percent of non-classified roads. This program needs to continue as there are new settlements, some of them illegal, which require sealed roads. The peri-urban road network is not meeting the requirements of the traffic load, and the city has prepared project documentation for 26 km of local roads to be reconstructed to become urban streets. Project preparation has been prepared, and land expropriation has been estimated to cost BAM 9.7 million (US$7.3 million) and an additional BAM 29.3 million (US$21.8 million) will be required, which is likely to be financed by loans. There is also a need for a bypass road on the west side of the city to accommodate a major north-south traffic movement. Although the bypass is the first best solution, the city is also exploring the possibility of building a BAM 1.9 million (US$1.5 million) traffic circle instead, in order to increase safety and reduce congestion at a lower cost.

Inland waterways

3.32 In pre-war times, navigation on the Sava river was possible during most periods of the year, except during the summer period (low river flow times). Navigation on the river was possible almost 250 days a year. In times of low river flows (particularly during July-August), limits were introduced for navigation. Limits for navigation speed were also introduced when there was fog, except if vessels were equipped with radar, and during severe ice and wind conditions. Navigability was Class IV from the confluence of the Sava and Danube rivers up to Brčko port (rmk 221/225); Class III from Brčko port to Slavonski Brod (rmk 365); and Class II up to Rugvica (rmk 653). Class II implies that the river was navigable for ships with tonnage of up to 650 tons, Class III for ships up to 1,000 tons, and Class IV for ships up to 1,500 tons with draft of 2.5 meters. The classification reflects the European Agreement on Main Inland Waterways of International Importance.\(^3\)

3.33 The current navigation conditions along the Sava river are difficult. Morphological characteristics of the Sava riverbed are unstable, having a negative impact on navigation conditions such as the shallow depth of the navigation channel, sharp curves due

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\(^3\) A significant portion of this road upgrading was financed under the World Bank financed Urban Infrastructure Project.

\(^3\) European Agreement on Main Inland Waterways of International Importance (AGN), Geneva, January 19, 1996.
to meanders, and resultant low speeds. In addition, the Sava river has a strongly fluctuating discharge resulting in wide variation in water levels and depths during the year. Heavy sedimentation in certain areas together with a lack of maintenance of the river bed has led to a reduction in the width and depth of the fairway (navigable channel). The result is that conditions for navigation along the Sava river can be difficult for much of the year. The unfavorable conditions arise from: (i) limited draft during periods of low water, reducing the number of navigable days to less than 200 in some places, and less further upstream; (ii) limited width and depth of fairway; (iii) sharp river curves/bends limiting the length and width of vessels and convoys; (iv) limited height under bridges at high water; (v) no river information system for vessels; and (vi) the existence of sunken vessels and unexploded ordnance. In addition, until recently, the channel was not even been marked. A further rather worrying development, regarding concerns about the impact of climate change, is the discovery of a significant drop in the Sava river water levels in the period 1990-1999 compared to 1975-1984.33

3.34 Several efforts and investments have been undertaken to improve the navigability on the Sava river. Reconstruction work on 170 km of the navigation channel on critical parts of the river has been already completed. More recently BH invested BAM 297,000 (US$220,000) and finished the bathymetric survey and planning for the Sava river between rkm 165 and rkm 207. Croatia, in cooperation with ISRBC, also invested BAM 297,000 (US$220,000) to conduct the bathymetric survey and a pre-feasibility study for the section of the Sava river between rkm 207 and rkm 586.34 The study recommends the upgrade of the river channel to Class IV on the section from Brčko port to Sisak.

Brčko port

3.35 Brčko port is located on rkm 221/225, and encompasses a total of 14 hectares of land at the south bank of Sava river. Waterside cargo handling is executed at the 180 m long quay, of which 76 m is a pile-founded vertical quay wall and the remainder of the berth is constructed as a revetment quay.35 With these berthing facilities the port can accommodate two Class IV barges at a time, one at the vertical and another at the revetment quay; both quays are accessible to the two rail-mounted jib cranes. Geo-morphologic conditions of the soil in the vicinity of the quay, and the lack of a fender system at the vertical quay make berthing at this site difficult. Brčko port owns and operates two 45 year old rail mounted Ganz jib cranes. The cranes were renovated in 2001, including an upgrade of the electrical system, with a payload capacity36 of 5 tons at a 30 m reach over the quay, with an average capacity of the cranes at about 100 tons per hour.


35 For further details on Brčko port, PPIAF funded Reforming the Management of the Port of Brčko: Towards Improving Port Efficiency and Operational Performance, Final Report, produced by Maritime & Transport Business Solutions (MTBS), July 28, 2009.

36 Payload capacity is the net capacity per grab.
3.36 **Brčko port has significant storage space available.** The port offers 11,000 m$^2$ of warehouse storage space and 16,000 m$^2$ for open storage. Recently the warehouses were renovated. Most of the available warehouse storage space is leased to companies located within the port’s vicinity (Agrana and Agro group). The paved open storage space is divided into two sites: west and east of the cranes. The customs terminal is located in the port area; at the customs terminal, heavy duty vehicles are cleared, coming from and going to Croatia via the bridge northwest of the port. The customs terminal has a total surface of 17,000 m$^2$ of which 5,500 m$^2$ of open-air customs warehouse space called type “A” warehouses. The customs terminal provides space for processing about 50 heavy duty vehicles simultaneously.

3.37 **The port has two railway tracks on the quay at its disposal, which are connected to the national railway system.** Presently the BAD Council is in the process of exploring financing options for developing new railway connections for the port. The objective of the railway tracks relocation is to reroute cargo transport away from urban area. The relocation of the railway connection offers Brčko port an opportunity to optimize the efficiency of train logistics within the port boundaries by investing in a connection between the railway tracks of operating shores 1 and 2. Internal roads in the port are of good quality. The main road stretches from the main gate at the western entrance to the port, closer to the city center, all the way through the port to its eastern gate.

**Šamac port**

3.38 **Šamac port privatization was completed in 2006.** Headed by Balkan Steel, the new port owner is established as a shareholder association with 100 percent private capital. The prime contractual obligations of the new owners are to start and further expand the port operations in accordance with the previously designed three-phase development strategy. The existing facilities are not operational, and the cranes, the warehouse, the storage facilities, and the railway connection need to be repaired. Nevertheless, the new port owner managed to use the port marginally through sporadic loading and unloading activities, using mobile equipment and benefiting from moments of high water levels to berth, achieving traffic volumes of 17,000 tons in 2006, rising to 60,000 tons in 2007, and consisting fully of imports, predominantly rolled steel sheets destined for the Balkan Steel plant near Derventa. Prior to the international crisis which has hit the steel sector particularly hard, Balkan Steel had stated that it was moving towards committed throughput of 500,000 tons, plus amenities for an additional 500,000 tons for third-party throughput.

3.39 **Šamac port was originally designed to handle 1 million tons per year, with plans for expansion before the war.** The maximum capacity of one million tons was never achieved. The port was usable approximately 220 days a year due to draft restrictions, primarily for bulk cargo, in particular steel and semi-finished products. The major clients of Šamac port prior to its closure were Energoinvest and the steel plant of Zenica. However, due to its good hinterland connections both by road and rail, industrial clients in the wider hinterland of what is now the Federation of Bosnia and Herzegovina and the RS use the port. For example, companies in Prijedor and Modriča also shipped goods through Šamac port.

37 The official name is “Joint Stock Company Cargo Transport Center Luka Šamac.”
The port has a 304 m long and 40 m wide vertical quay placed on reinforced concrete pillars, and two movable port cranes with a capacity of 5 to 6 tons over a 34m span mounted on rail tracks and capable of serving vessels moored next to each other.

3.40 The new owners of Šamac port have started an ambitious investment plan for its rehabilitation. In order to have proper port operations, immediate rehabilitation efforts are necessary to preserve and restore some Šamac port assets, and perform safe and efficient operations. The new owners of the port have formulated an ambitious short-term investment plan amounting to about BAM 20.1 million (US$15.6 million) to rehabilitate Šamac port in a period of 3 to 5 years, and transform it into an efficient and multi-functional cargo transit point. The planned investments are aimed at infrastructure improvements, installation of modern cargo handling equipment, and establishment of storage facilities. The main objectives of the planned investments are to rehabilitate the port to meet the transport demands of Balkan Steel as well as to provide port services to other potential costumers (open access port). The planned investment exceeds the minimum investment obligations in the privatization contract. Investment commitment associated with the privatization agreement could allow the eventual handling of one million tons per year.

Bosanski Brod

3.41 The port of Bosanski Brod is located on the Sava river (rmk 368) and only handles liquid bulk from the nearby oil refinery. Vessels are handled from a pontoon. The site consists only of an improvised barge terminal which needs to be rehabilitated in order to be enabled for waterside handling of liquid cargoes at the adjacent refinery. The refinery was sold in mid-2007 to the Russian company NefteGazInKor,” part of the state owned Zarubezhneft. The refinery is located on the bank of the Sava river. This offers potential for the refinery to use the inland waterway to import products (crude oil) and export final product (derivatives) to Sava and Danube riparian countries. On average, the refinery used to handle between 300,000 and 400,000 tons per year of crude oil, which were delivered to the refining facilities by tank trucks and tank cars and, to a lesser extent, by inland vessels crossing the Sava river from Slavonski Brod in Croatia. In 2008, the new owner repaired and put the oil refinery, with a capacity of 1.2 million tons a year, into operation.

The demand for transport

Road transport

3.42 The road network in Bosnia has seen over a twenty-five (25) percent increase in the number of vehicles compared to the pre-conflict period in 1990. It has also seen a more than doubling of freight and a fifty (50) percent increase in passenger traffic since 1996. More recently, passenger transport by road has increased by twenty-two (22) percent in RS over the period 2004-2007 and by fifteen (15) percent in FBH over the period 2004-2008 in terms of passenger km. Meanwhile, freight traffic in ton kilometers has also increased markedly: up 195 percent in the RS over the period 2004-2007 and by 155 percent over the period 2004-2008 in the FBH. This significant increase in traffic has been accommodated on the pre-war network which, with the notable exception of the 37 km of

38 Republic of Srpska, Municipality of Šamac, / Balkan Steel: “Development Plan until the year 2010.”
motorway in the Federation and the Banja Luka-Gradiska motorway, has not changed fundamentally from the pre-war network.

3.43 **The number of registered vehicles in BH has grown markedly since 2004, but less than one would expect.** Figure 4 displays nominal GDP in million the number of registered vehicles over the period 2004-2008. The latter increased eighteen (18) percent over the period, but growth in real GDP was twenty nine (29) percent over the same period. Passenger cars comprise over eighty (80) percent of the total number of registered vehicles.

**Figure 4. Number of registered vehicles in BH (2004-2008)**

![Graph showing number of registered vehicles vs. GDP](image)

3.44 **BH is likely to continue experiencing rapid growth in vehicle registrations over the medium term.** Table 7 presents a summary of the number of vehicle registrations in BH over the 2005-2008 period indicating that despite some volatility, the annual average rate of growth in BH has been just over four (4) percent over this period. BH, together with Serbia, Montenegro and FYR Macedonia, fall into the “middle lower” range of national income economies. With some 188 passenger vehicles per thousand inhabitants in 2008, vehicle ownership remains limited compared to the EU-27 average of 464 per 1,000 persons in 2007, although higher than in Romania, Former Yugoslav Republic of Macedonia (FYROM), and Turkey. Although, the rate of vehicle ownership is just over half the rate of real GDP growth, which is a surprising finding. The normal relationship between the two is reflected in an income elasticity of around 1.2, which suggests that for every ten (10) percent increase in GDP, vehicle ownership would be expected to increase by twelve (12) percent. Understanding this lag would require further empirical investigation, but it may reflect the 1999 law prohibiting the importation of vehicles that are more than seven years old.

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39 Vehicle registration data is drawn from the Bosnia and Herzegovina Statistical Yearbooks, while GDP data in US$ at constant prices is drawn from the IMF’s World Economic Outlook database/EIU Country Reports.

40 Statistical Offices of RS and FBH.

41 Population statistics are unreliable since no census has taken place within BH since 1991. According to the Federation Agency of Statistics, the population of FBH was estimated at 2,327,195 in mid-2008, excluding 521,577 refugees living abroad. Meanwhile, the Republika Srpska Institute of Statistics estimated the population in the RS at 1.4 million, while the Agency for Statistics of Bosnia and Herzegovina estimated the population in Brčko District at 75,648 in 2008. There were 239,307 registered passenger vehicles in RS and 447,631 in FBH in 2008, and 26,158 in Brčko Administrative District.

42 Over the period 2004-2008, the rate of vehicle ownership increased eighteen (18) percent, real GDP increased by twenty-nine (29) percent.
Table 7. Total vehicle registration in BH (2005-08)

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS</td>
<td>238,339</td>
<td>252,095</td>
<td>245,970</td>
<td>276,885</td>
</tr>
<tr>
<td>% change</td>
<td>4.7</td>
<td>5.8</td>
<td>-2.4</td>
<td>12.6</td>
</tr>
<tr>
<td>FBH</td>
<td>450,281</td>
<td>465,322</td>
<td>482,765</td>
<td>519,690</td>
</tr>
<tr>
<td>% change</td>
<td>0.9</td>
<td>3.3</td>
<td>3.7</td>
<td>7.6</td>
</tr>
<tr>
<td>BH (excl Brčko)</td>
<td>688,620</td>
<td>717,417</td>
<td>728,735</td>
<td>796,575</td>
</tr>
<tr>
<td>% change</td>
<td>2.2</td>
<td>4.2</td>
<td>1.6</td>
<td>9.3</td>
</tr>
</tbody>
</table>

Sources: FBH Statistical Office and RS Institute of Statistics.

Future growth of the road network

3.45 A strategic four-stage transport model was developed to forecast transport demand on both a base and an enhanced network over a defined time period. The model developed, which was an enhancement of an earlier model, has a traditional four-stage structure. A zone structure was defined, comprising forty-one zones covering BH, and a further thirteen external zones. The existing road and rail network, including physical characteristics, capacity, and condition, was defined for modeling purposes. The base traffic (for year 2005) was defined, and subsequently calibrated by actual traffic data on the network. The forecasts were prepared for two future horizons of 2010 and 2020.

3.46 Forecasts of road transport demand prepared for this study suggest a marked increase in road traffic. Some 343,600 inter-zonal vehicle trips are projected to occur on a typical day in 2020 (Table 8). This number of inter-zonal vehicle trips increased from 198,000 trips in 2005 to 243,000 trips in 2010. This is equivalent to growth approaching two hundred (200) percent over the next 15 years. Some ninety (90) percent of the projected vehicle trips in 2020 are by passenger cars, one (1) percent by bus and nine (9) percent by trucks. The truck trips are split between roughly two-thirds rigid trucks (up to three axles) and one-third articulated trucks (trucks with more than three axles).

Table 8. Distribution of year 2020 total daily vehicle trips by region

<table>
<thead>
<tr>
<th>Region</th>
<th>FBH</th>
<th>RS</th>
<th>Brčko AD</th>
<th>International</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBH</td>
<td>149,100</td>
<td>18,000</td>
<td>2,600</td>
<td>28,000</td>
<td>197,700</td>
</tr>
<tr>
<td>RS</td>
<td>18,000</td>
<td>56,500</td>
<td>3,500</td>
<td>15,700</td>
<td>93,700</td>
</tr>
<tr>
<td>Brčko AD</td>
<td>2,600</td>
<td>3,500</td>
<td>0</td>
<td>1,500</td>
<td>7,600</td>
</tr>
<tr>
<td>International</td>
<td>27,400</td>
<td>15,700</td>
<td>1,500</td>
<td>0</td>
<td>44,600</td>
</tr>
<tr>
<td>Total</td>
<td>197,100</td>
<td>93,700</td>
<td>7,600</td>
<td>45,200</td>
<td>343,600</td>
</tr>
</tbody>
</table>

Source: PCI (2007).

Railway transport

Passenger traffic

3.47 After being broadly static for a long time, railway passenger traffic has been increasing in recent years. Starting from a low base, passenger traffic in BH as a whole, measured in passenger-km, increased by nearly thirty-seven (37) percent over the period

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43 Generation, distribution, assignment and mode choice.
2005-08, as indicated in Figure 5. The growth in traffic was not distributed evenly across the entities, with passenger traffic in terms of passenger-km increasing by nearly seventy (70) percent in FBH, and just under fifteen (15) percent in the RS. The increase in the number of passengers over the same period was less marked (see Figure 6), increasing by approximately eight (8) percent in BH, driven by an increase of fifty three (53) percent in the FBH. Passenger numbers actually fell eleven (11) percent in the RS over the same period.

Figure 5. Passenger traffic 2000-2008 (mill passenger-km)  

Figure 6. Passenger traffic 2000-2008 (000 passengers)

Sources: FBH and RS Statistical Yearbooks 2000-2008, UIC.

Freight traffic

3.48 Freight traffic has also followed an upward trend, particularly in the FBH. The reopening of some of the heavy and extractive industries in Bosnia and Herzegovina since 2004, particularly in the FBH, has led to an increase in both tons and ton-km. The overall increase in BH over the period 2005-2008 was eleven (11) percent in tons carried, and five and one-half (5.5) percent in ton-kms (see Figure 7 and Figure 8). Once again the growth was not distributed equally across the two entity railways, with growth restricted to ZFBH, which reported an increase of over twenty-one (21) percent in tons carried and fifteen (15) percent in ton-kms, while ZRS reported a decline of just over five (5) percent in tons carried, and a decline of twelve (12) percent in ton-km.

3.49 Reliable figures on the traffic volumes carried by the railways are difficult to obtain. The numbers for both freight and passenger traffic should be regarded with a degree of caution, as a simple addition of traffic data from the two entity railway companies overestimates actual traffic. Both ZFBH and ZRS count traffic with an origin in one of the entities and a destination in the other in their respective figures. Traffic with an origin and destination in one of entities, where it crosses the other, is counted by the latter as transit traffic. This requires careful consideration in the appraisal of prospective investments.
In addition, the recent economic crisis has also had a negative impact on rail traffic throughout Europe, and BH is no exception. Provisional data for the first half of 2009 reveal that freight traffic, measured in ton-km, is down by over forty (41.2) percent for ZFBH and by forty percent (40) percent for ZRS. This is very similar to the forty (40.6) percent decline suffered by neighboring Serbian Railways. Passenger traffic, measured in passenger-km, has also been affected by the crisis, falling by over seven (7.6) percent for ZBH and by nearly twenty-eight (27.8) percent by ZRS. Even with a recovery in the second half of 2009, freight and passenger traffic is likely to show a marked decline in 2009.

The composition of current traffic

The commodity structure of freight traffic is dominated by bulk cargo. The main commodities include iron ore and bauxite, brown coal and lignite, aluminum and hydrated alumina, coking coal and coke, and scrap. According to a recent study, major clients for both entities as of 2006 include (i) Eletrkoprivreda, with coal transport from the coal mines to coal-fired power stations, mainly in Tuzla and Kakanj; (ii) Mittal Prijedor export of iron ores; (iii) GIKIL Lukavac with imports of coking coal and export of coke; (iv) Birac Zvornik with hydrated alumina; (v) Mittal Zenica with scrap and metallurgical products; and Aluminj Mostar. The traffic volume of these clients represented over 80 percent of total railway traffic in BH, which represents a relatively strong concentration on a few rail clients and a few commodities.

ZFBH freight traffic is characterized by significant volumes of heavy industrial commodities, in particular, precut (e.g., coal, metals) moving for short distances (average haul distance is forty six km) compared to ZRS freight traffic which is internationally oriented (average haul distance is seventy eight km). Before the war, the main customers of the ZFBH railway were the steel plant of Zeljezarera Zenica, the coal mines of the mid-Bosnian basin and the cookery of Lukavac. The future traffic trend of ZFBH is therefore

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highly dependent on the recovery of these main customers and other industrial actors. Before the war, main customers of the ZRS were coal mines and chemical industries near Tuzla. These industries have been adversely affected by the international economic downturn.

3.53 **Passenger numbers reached 727,688 in 2008 on ZRS, while ZFBH transport 528,000 passengers**—of which 463,000 represented domestic transport, and 65,000 were international passengers. Of total passenger traffic in ZRS, 592,301 passengers used domestic services, 68,715 inter-entity services, and 126,672 international services. For ZRS, the average trip length per passenger averaged a mere 47 km in 2008, with an average of 39 km for entity traffic, 63 km for inter-entity or transit traffic, and 71 km for international traffic. The low average trip length helps explain low traffic volumes in terms of passenger km, which reached 37 million in 2008.

**The projected demand for traffic**

3.54 **Freight traffic growth has been strong, at least in the Federation, and despite a sharp dip is expected to continue.** The earlier paragraphs noted the strong growth in freight transport since 2005, albeit moderated by the sharp decline resulting from the economic crisis in the first half of 2009. Over the longer term, the projections suggest that freight traffic will continue its growth. One recent study, emitted from prior to the recent downturn, predicted that freight traffic growth in 2015 would be double 2006 volumes in the low scenario, and three times 2006 volumes in the optimistic scenario. An earlier study, prepared by SweRail financed by the Swedish Government, projected a doubling of freight traffic over the period 2007 to 2015 for both companies.

3.55 **Both of these projections are likely to be overly optimistic in the short to medium term.** The BH economy is estimated to have contracted by three (3) percent in 2009 and is projected to grow by a mere one-half of one (0.5) percent in 2010, according to the IMF World Economic Outlook of October 2009. Actual freight traffic growth in the medium term is likely to remain markedly lower than projected in these two studies. ZRS is now projecting that freight traffic will attain 5.31 million tons in 2011, compared to 5.32 million in 2007, suggesting that freight volumes will remain broadly static over this five year period.

3.56 **Rail passenger traffic continues to face stiff competition from the road sector and is projected to decline in 2009.** The density of the network, the topography of the country, and the operational speed and quality of service means that rail will continue to face strong competition from road transport in the transport of passengers. Passenger traffic on ZRS has been broadly stagnant since 2000 in terms of passenger kms, and has been declining year-on-year over the same period. The ZRS Business Plan for 2009-2011 projects that passenger traffic is expected to continue to decline to 416,250 in 2009, rising to a mere 424,616 by 2011, reflecting the expected effects of the international and regional economic downturn.

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In the urban transport sector, the main players are the urban centers in BH of: Sarajevo, Banja Luka, Mostar, Zenica, Tuzla, Doboj and BHac. The cities of Sarajevo and Banja Luka in particular are growing rapidly leading to increased pressures on the public transport system. Sarajevo and Banja Luka are by far the largest with metropolitan population levels of 420,000 and 250,000 respectively. However, in public transport terms, Sarajevo is absolutely dominant. GRAS, the only public transport provider (tram, trolley bus, bus, minibus) in Sarajevo carried some 127 million persons in 2008, equating to about 80 percent of the total urban public transport demand in the seven major cities. Banja Luka, BHac, Doboj, Mostar, Tuzla and Zenica all offer the bus mode only.

Bosnia and Herzegovina has experienced rapid motorization. As of 2008, the total number of registered vehicles in BH stood at 822,733 (with 519,690 in FBH, 276,885 in RS and 26,158 in BAD). Of the total registered fleet, over eighty (80) percent are private cars. Annual growth in the number of motor vehicles has been four (4) percent on average in BH over the period 2005-2008. However, where incomes are growing faster and higher, such as in and around urban areas, growth will undoubtedly be higher than this figure. In Sarajevo Canton, the total number of registered vehicles increased by thirty-eight (38) percent over the same period.

The other major trend is a shift from public to private provision of passenger transport services in all the cities with the exception of Sarajevo. Publicly owned operations have declined while the private sector has grown. At present the only significant public sector urban passenger transport operator in the BH is GRAS in Sarajevo. In Banja Luka, an operator was purchased by a combination of pensioner and restitution funds, private companies and small stakeholders. More recently, Banja Luka municipality has awarded a series of route concessions. Mostar is served by a private and a public company (the latter largely accruing from a donation of buses from JICA some five years ago). Public transport providers in Bijeljina and Tuzla are private too. In Zenica, suburban transport has been privatized but city transport remains under public control (canton-run).

The growth of the motor vehicle fleet provides mixed benefits in an urban context. On one hand, it provides greater mobility for vehicle owners and for those industries and services relying on road transport. On the other hand, there are negative consequences such as increased traffic congestion, road traffic crashes and their concomitants, and air pollution. From an economic standpoint, many private car users are not paying the full social costs. The latter are usually defined as the sum of the individual’s private costs, together with the costs imposed on society that are not considered in the private decision on whether or how to travel. These latter costs are known as external costs. To car drivers, the only costs

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50 In Zenica, suburban transportation has been privatized but urban transportation provision is still under the public company Zenicatrans.
that matter are the private costs.\textsuperscript{51} However, these private costs do not equate with the total cost to society for the car usage since external costs remain unpaid.\textsuperscript{52} It is important to investigate options to increase private user costs to better reflect the actual social costs. Potential measures include road pricing, increases in fuel tax, stricter emissions controls and well-priced parking policies and charges.

**Inland waterways**

3.61 The total amount of freight carried on the Sava river amounted to 5.2 million tons in 1990, primarily comprising the movement of bulk freight. Since the end of the subsequent war, the Sava river has been neglected—with little or no maintenance expenditure or investment—and as a result, traffic volumes have been very modest, amounting to a little over 400,000 tons in 2008 (Table 9), having been broadly static in recent years, reflecting the limitations in navigability for much of the year. At present the bulk of the traffic involves transport of crude oil from the oil terminal in Slavonski Brod to the oil terminal in Sisak, both ports located in Croatia. Traffic volumes for the other ports, and on the waterway, remain low.

<table>
<thead>
<tr>
<th>Port</th>
<th>Country</th>
<th>rkm</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgrade</td>
<td>Serbia</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sabač Industrial Port</td>
<td>Serbia</td>
<td>103</td>
<td>27,000</td>
<td>15,000</td>
<td>16,434</td>
</tr>
<tr>
<td>Sremska Mitrovica</td>
<td>Serbia</td>
<td>133</td>
<td>5,000</td>
<td>1,000</td>
<td>39,054</td>
</tr>
<tr>
<td>Brčko</td>
<td>Bosnia and Herzegovina</td>
<td>221</td>
<td>80,628</td>
<td>51,787</td>
<td>0</td>
</tr>
<tr>
<td>Šamac</td>
<td>Bosnia and Herzegovina</td>
<td>305</td>
<td>17,000</td>
<td>10,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Slavonski Brod</td>
<td>Croatia</td>
<td>363</td>
<td>160,000</td>
<td>180,000</td>
<td>180,000</td>
</tr>
<tr>
<td>Bosanski Brod</td>
<td>Bosnia and Herzegovina</td>
<td>368</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sisak</td>
<td>Croatia</td>
<td>583</td>
<td>160,000</td>
<td>180,000</td>
<td>180,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>449,628</td>
<td>437,787</td>
<td>435,488</td>
</tr>
</tbody>
</table>


3.62 In terms of ton-kms, it is estimated that traffic was 590.2 million in 2008. This figure was derived by taking existing throughput in tons in each port and multiplying it by the river kilometers traveled, based on an origin-destination matrix of throughput and distances between origin and destination. As Table 10 indicates, traffic is concentrated downstream, as a large part of throughput has as its destination the Danube or beyond.\textsuperscript{53} As a result, the first river sections not only have traffic originating and destined to them, but they have significant transit traffic from further upstream. In contrast, in the upstream sections

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\textsuperscript{51} Private costs of driving a car typically include fuel and oil, maintenance, tax and insurance and the time of the driver and passenger(s) in the vehicle.

\textsuperscript{52} Here, external costs include the delays caused to others and more importantly the negative environmental effects of using the car, such as noise, air pollution, and the increased safety risks.

\textsuperscript{53} Serbia’s section of river comprises rkm 0-175, a shared section between Serbia and Bosnia between rkm 175-202, a shared section between BH and Croatia from rkm 202-507.4, and the remainder upstream belongs to Croatia.
there is little transit traffic and at present the only traffic upstream is crude oil traffic between the Croatian ports of Sisak and Slavonski Brod.

Table 10. Traffic along the Sava river in million ton Km (2008)

<table>
<thead>
<tr>
<th>River Section</th>
<th>Country</th>
<th>Rkm</th>
<th>2008 Traffic (million ton km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1</td>
<td>Serbia</td>
<td>0 to 98</td>
<td>89.2</td>
</tr>
<tr>
<td>Section 2</td>
<td>Serbia</td>
<td>98-103</td>
<td>89.2</td>
</tr>
<tr>
<td>Section 3</td>
<td>Serbia</td>
<td>103-133</td>
<td>87.5</td>
</tr>
<tr>
<td>Section 4</td>
<td>Serbia/BH/Croatia</td>
<td>133-223</td>
<td>82.6</td>
</tr>
<tr>
<td>Section 5</td>
<td>BH/Croatia</td>
<td>223-305</td>
<td>71.4</td>
</tr>
<tr>
<td>Section 6</td>
<td>BH/Croatia</td>
<td>305-362</td>
<td>65.3</td>
</tr>
<tr>
<td>Section 7</td>
<td>BH/Croatia</td>
<td>362-363</td>
<td>65.3</td>
</tr>
<tr>
<td>Section 8</td>
<td>BH/Croatia</td>
<td>363-583</td>
<td>39.6</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>590.2</td>
</tr>
</tbody>
</table>


3.63 Commercial traffic on the Sava river has grown considerably from 2002, albeit from a very low base. The demand for transport and for port throughput is driven by economic activity, and as a result, overall port throughput has been drastically reduced in the ports along the Sava river, and in 2000 the total port throughput came almost to a standstill. In 2007 total traffic along the Sava river reached 268,000 tons, with BH throughput reaching 111,787 tons, of which 60,000 tons was for Šamac port and 51,787 tons for Brčko port. These totals represent actual cargo transfers between landside and waterside and exclude volume double counting which could occur as a result of landside-lands ide cargo transfer activity.

- Traffic between Sisak and Slavonski Brod, ports located in Croatia, totaled 140,000 tons, highest among the Sava ports. However, this represents oil product being loaded at Slavonski Brod and unloaded at Sisak. The oil shipments between Slavonski Brod and Sisak have been declining in recent years from a high of 657,000 tons in 2001;

- Oil products are the dominant commodity, although steel products are rapidly increasing, particularly so at Šamac port. Excluding oil shipments, Brčko port and Šamac port account for some 50-60,000 annual tons. Both have shown promising increases, with Šamac growing from 17,000 tons in 2006 to 60,000 tons in 2007 (all being imports for the port’s owner Balkan Steel). Brčko port totaled 15,000 tons in year 2003, growing steadily to 80,000 tons in year 2006 before moderating in 2007 - 09; and

- Sand and gravel is listed as a transaction commodity (reaching hundreds of thousands of tons in addition to commercial quantities) particularly at Sisak, Slovanski Brod and Sremska Mitrovica ports. Brčko and Šamac ports indicate no sand/gravel transactions, but confirmed that small operators dredge in the vicinity of the port.
Forecasting traffic on the Sava river

3.64 Forecasting future demand from a low base, particularly given the difficult external environment currently, is notoriously difficult. Reliable traffic forecasting on the Sava river and its ports is difficult, given the current low base for traffic, and the completely changed socio-economic environment which requires the introduction of a wide range of assumptions regarding the economic growth of BH, the rehabilitation of the river and port infrastructure, and the institutional and regulatory reforms. Typically, IWT is more suitable for transporting conventional low-value and less time-sensitive bulk commodities rather than high-value time-sensitive goods. As BH continue to adopt policies to transform its economy towards an industrialized economy, there is scope for increased transport demand and increased market capture by IWT. Realizing this potential is contingent on a number of things, in particular: (i) adoption of the EU Directives on IWT by the ISRBC member states; (ii) substantial investments to improve infrastructure and port facilities; (iii) substantial investments to improve navigation along the Sava river; (iv) improved operational efficiency of the river ports; and (v) good access and interconnections to other modes and leading industries.

3.65 The traffic forecast reflects baseline traffic in 2008 and discussions with potential and existing clients once full navigability is restored. Traffic growth was estimated first by forecasting future port origin and destination throughput, expressed in tons, and this information was then used to calculate traffic growth by river sections in ton km, in a "do minimum" and "do something" scenario. Total forecast traffic along the river comprises three elements:

(i) The base traffic which is the traffic currently using the waterway;

(ii) Diverted traffic switching from other routes, which was modeled as a percentage of existing traffic diverted from Vukovar port in Croatia to ports in Bosnia and Herzegovina upon rehabilitation; and

(iii) Pure generated traffic, defined as traffic that would not have been transport if the rehabilitation of the river had not taken place.

3.66 For the sections from Belgrade to Šamac, it was assumed that traffic would increase significantly in the year of opening—reflecting significant diverted traffic and some generated traffic, the former from the port of Vukovar to ports located in Bosnia and Herzegovina—in 2014, and for sections from Šamac to Sisak it was assumed that traffic rises significantly starting in the year 2016, reflecting the fact that these latter sections will be rehabilitated in a later, second stage. Following the year of opening, conventional growth forecasts in GDP and an appropriate income elasticity of demand were used to calculate incremental traffic growth, in line with economic development, over the defined appraisal period.

3.67 Table 11 presents a summary of projected traffic for four defined time horizons. To put the numbers in perspective, the Feasibility Study projected traffic throughput of 7 million tons by 2027 in the low scenario—it should be noted that in the Feasibility study the
projections were based on tons of throughput and not ton km—while the forecast used in the economic analysis projects traffic of 3.6 million tons in that year. In other words, the traffic forecast to be used in the economic analysis is more than 50 percent lower than the low scenario of the Feasibility Study, and reflects the decision to only include potential traffic that could be confirmed based on discussions with ports and existing and potential clients. It also reflects the fact that the Feasibility Study assumes that port throughput capacity adjusts automatically to significantly larger traffic volumes, whereas this forecast assumes that investments in port capacity are constrained by the need to find financing and the long periods to design, prepare and implement port extensions.

Table 11. Forecast traffic along the Sava river (million ton km)

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2020</th>
<th>2030</th>
<th>2045</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>590</td>
<td>4,411</td>
<td>4,791</td>
<td>5,668</td>
</tr>
<tr>
<td>Do Minimum</td>
<td>590</td>
<td>582</td>
<td>729</td>
<td>991</td>
</tr>
<tr>
<td>Diverted</td>
<td>0</td>
<td>239</td>
<td>291</td>
<td>377</td>
</tr>
<tr>
<td>Generated</td>
<td>0</td>
<td>3,590</td>
<td>3,771</td>
<td>4,300</td>
</tr>
</tbody>
</table>

Sources: PCI (2008) and study estimates.
4. THE MAIN CHALLENGES FACING THE SECTOR

Harmonization with the *acquis*

4.1 While a considerable amount of progress has been achieved to align the transport sector with the requirements of the *acquis communautaire*, much remains to be done. The remainder includes not only the majority of the secondary legislation, but also some of the primary legislation awaiting harmonization. The broad progress made by BH is summarized in Box 1 below (a more detailed summary of the remaining challenges are presented in the respective sector annexes).

<table>
<thead>
<tr>
<th>Box 1. BH progress in meeting requirements of the EU transport <em>acquis</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Transport sector.</strong> Good progress has been made on the PAN-European Transport network. BH continues to be actively involved in the South East European Transport Observatory (SEETO), and in particular the updating and implementation of the multi annual plan 2008-12. Upgrading of the Pan-European Corridor Vc is ongoing. An MoU was signed with Montenegro on the preparatory action for the construction of a railway link between the two countries.</td>
</tr>
<tr>
<td><strong>Road sector.</strong> Since the entry in force of the SAA agreement in July 2008, BH has been granting unrestricted access through its territory to European Community (EC) traffic. Legislation on traffic regulation and licensing of vehicles and drivers is covered by the Law on Road Traffic Safety, which is considered to be compliant with the corresponding <em>acquis</em>. The state Law on Public Roads and the legislation on digital tachographs were also adopted. Despite the road safety and other laws, improvements in road safety are being hampered by the poor quality of the road infrastructure. Also, limited additional progress can be reported in the process of approximation of the legislation. Actions in this sector need to be accelerated.</td>
</tr>
<tr>
<td><strong>Railway sector.</strong> Some progress has been made with the implementation of the state level Law on Railways but efforts remain limited. Network statements providing train operators with a single information source on railway infrastructure were prepared. The Railway Regulatory Body, which also acts as the National Safety Authority, has come into operation and staff selection is ongoing. Separation of the railway undertaking and infrastructure management functions has progressed, but remains to be completed. The main outstanding issue is the precondition for functioning as vertically integrated entities with the performance of independent audits to confirm effective separation. FBH has agreed to the establishment of a single infrastructure manager, while the RS government still insists on having a separate infrastructure manager. The railway technical and safety regulations are not in line with the <em>acquis</em>. Railway Package II directives have also not been implemented. Efforts to improve the quality of the railway service have continued with the purchase of new equipment. The full implementation of the Railway Law including harmonization for full inter-operability, the appointment of the infrastructure manager, and implementation of the EU safety directives, are all advancing at a slow pace.</td>
</tr>
<tr>
<td><strong>Inland waterways and ports.</strong> FBH has adopted a Law on Water Transport. Preparations for the rehabilitation and development of the Sava river waterway are ongoing and a feasibility study was presented by the Sava River Commission. The Commission has also adopted rules and regulations for navigation and transport/traffic safety and marking the navigation route on the Sava river. However, BH is still not a party to the SOLAS Convention (International Convention for the Safety of Life at Sea) or to the ISPS Code (International Ship and Port Facility Security Code). Preparations in these fields remain limited.</td>
</tr>
</tbody>
</table>

*Source: Adapted from EC progress reports for BH, (2007 and 2008)*
A complex and contradictory institutional framework

The road sector

4.2 The cumbersome and confusing institutional framework for the road sector needs clarification. The current situation of three laws on public roads, one in each entity and one in BAD, and a further draft law under preparation at the state level, is unsustainable. The result is different arrangements for the management of different levels of the road network within each domain, confusion over institutional responsibilities regarding the development of the strategic road network, the SEETO Core network, and the Pan-European network, and additional transaction costs for stakeholders.

4.3 The role of the MOCT needs to be defined and formalized through the passage of the state Law on Roads. There has been little success in defining the primary legislation to provide an appropriate basis for this mandate, and a draft state Law on Roads has been under preparation, awaiting agreement amongst stakeholders, for a number of years. There remains a lack of agreement on which level is responsible for defining national strategies or priorities, and possibly not surprisingly, a lack of agreement on what the actual strategy should be, or the priorities are, at the national level.

4.4 The legal framework for concessions needs to be simplified and harmonized to ensure it does not act as a barrier to the private sector. There are four different concessions laws in BH: the state Concessions Law, the Federation Law on Concessions (currently in the process of being revised), the RS Law on Concessions, and the BAD Concessions Law. In addition, there is also legislation at the canton level which is pertinent to the development of concessions. While concessions can be granted at a number of different levels—state, entities, municipal (district or canton), subject to the nature and particulars of a given concession—the lack of clear coordination between the various laws, the different requirements of some, and their respective strengths and weaknesses (for example, the state Concession Law lacks the so-called ”stability clause” that allows the application of more favorable rules in case the legal framework deteriorates once the concession is signed), collectively form a barrier of considerable complexity to potential investors. The concomitant is a significant disincentive to the introduction of private finance, likely to result even when it is forthcoming in a marked increase in the cost, or a deterioration of the terms.

4.5 Some progress was attained with the passage of a state Law on Road Safety, approved in January 2007, but even here problems remain. While the passage of this new national law on road safety is very welcome, its technical scope is limited to issues pertaining to driver licensing, rules of the road and associated penalties. Accordingly, it is far from providing the framework necessary for a comprehensive, results-focused, road safety intervention, such as the more successful efforts of some of the Western European countries, or even those of some neighboring countries in the region. In addition, while the new law is considered to be compliant with the requirements of the acquis communautaire,

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54 The MOCT and entity ministries have already produced manuals in each of these areas to apply nationwide.
implementation is hampered by the poor quality of the infrastructure, and a lack of coordination between the various stakeholders in both entities.

4.6 The Law on Organization and Functioning of Local Governments (July 2000) and the constitutions of the entities and their laws, provide the municipalities with full administrative, service, investment and regulatory powers for the management of the local road network. Municipalities have to comply with the standards issued by the line ministries. The laws provide financial autonomy to the municipalities through unconditional transfers based on a distribution formula. In addition to the unconditional transfers, municipalities receive shared taxes and other transfers from the states to cover wages in the education and health sectors, and for the payment of social benefits to poor households. In addition, they are allowed to derive revenues locally in the form of local taxes, fees, levies, rents and sale of property, or fines in compliance with the laws on local government finance. Managing local roads is one among many of the responsibilities transferred to the municipalities. In this context, local roads represent an infrastructure without real funding specificity, and are rather perceived as a burden by the municipalities.

4.7 In addition, recent legal changes have stabilized revenues and municipal government status and strengthened their role in local service delivery. Both FBH and RS have adopted new local government laws that clarify functional assignments to municipalities and their revenue sources. Also, the European Charter on Local Self Governance, strengthens the role of local communities (MZ), and provides a legal framework for the Association of Cities and Municipalities to participate in legislative and policy-making processes in FBH. However, many of the ten cantonal laws have yet to be aligned to these new laws.

4.8 Weaknesses have also been identified with the law on local government finance. For example, in FBH, many canton laws remain ambiguous, resulting in misunderstandings or misinterpretations. It is not clear in many instances if a canton, after reviewing a municipality borrowing proposal, has to approve such a proposal explicitly, and if such an approval would constitute an explicit guarantee. Another example is of the Federation law that caps municipal borrowing at twenty (20) percent of the budget, which is interpreted by many cantons and municipalities as referring to “debt service” and not as an absolute “debt limit.”

The railway sector

4.9 The state Law on Railways of Bosnia and Herzegovina was adopted on June 30, 2005. This law regulated the overall structure and operation of railway transport in BH, the


56 Local budget expenditures reached 23 percent of total public expenditure in 2003.

57 In FBH, these include the Law on the Principle of Local Self-Government (Official Gazette 49/06), and the new Law on Distribution of Public Revenues in FBH (Official Gazette 22/06). In FBH, this includes the Law on the Local Self-Government (Official Gazette 101/04) and Amendments to the Law on Budgetary System of RS (Official Gazette 34/06).
conditions and manner of management of the railway infrastructure, conduct of rail transport, control, supervision, regulatory and appeal functions, as well as other issues relevant to the work and functioning of the rail system. It is consistent with the relevant EU directives, requiring the separation of transport services and infrastructure management, the obtaining of a license and a safety certificate to operate, and requiring the establishment of a Railway Regulatory Board (RRB), and the introduction of track access charges for the infrastructure.58

4.10 **However, actual implementation of the initiatives allowed by the primary legislation is lagging.** The RRB was formally established in 2008, but it has limited capacities. The function of the RRB as a national safety authority needs to be strengthened and depending on its eventual mission and organization. The estimation of infrastructure costs to facilitate the introduction of a track access regime remains in the preparation stage, and the preparation of a harmonized network statement remains under preparation, despite the regional work funded by the European Union, and managed by SEETO; also, the required work on train driver certification, interoperability and safety management systems, all remain at the preparation stage. In addition, an explicit public service obligation (PSO) measure has yet to be defined, let alone introduced.

4.11 **In addition, much of the necessary secondary legislation remains to be amended/adopted.** The Federation of Bosnia and Herzegovina (FBH) Railway Law issued in 2001 states that the railway system is operated by one railway company Zeljeznice Federacije Bosne i Hercegovine (ZFBH), the railway in the Federation of Bosnia and Herzegovina. ZFBH is both the infrastructure manager and railway operator and must be operated as a profitable business. Article 13 states that revenues from infrastructure must be kept separate from operations, without possible transfer. The network is open to other operators, provided that they provide traction, have a license, and pay a fee which is determined by Bosne i Hercegovine i Bosanskohercegovačke Zeljeznicke Javne Korporacije (BHZJK), the state-level coordinating body. Article 15 states that the Government of the FBH or cantons must pay for non-profitable transport that may be imposed on ZFBH.

4.12 **The Republika Srpska (RS) Railway Law issued in 2001 stated that the railway is operated by one company, Zeljeznice Republike Srpske (ZRS), but has now been amended.** The 2001 Law states that ZRS is both the infrastructure manager and operator and that there is only one railway infrastructure manager. Certificates are delivered by the RS Ministry of Transport and Communications and the RS budget pays for infrastructure maintenance. A law amending the Railway Law of 2001 was adopted on June 4, 2008. One of the main changes is to Article 3, which has a new item stating that ZRS, as the infrastructure manager, shall be required to submit an application within five years to the RRB of BH for the issue of a permit for management of infrastructure managements and safety certification, within a period of 5 years. Article 4 has been amended so that the duties of the railway transport operator and those of the infrastructure manager are clearly separated. Article 6 has been changed so that that the use of budget funds from the

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58 The role of BHZJK is to verify technical standards of infrastructure, while the role of RRB is to guarantee on a fair basis that rules are applied and respected by all bodies concerned. The RRB is also in charge of supervising the separation of accounts between operations and infrastructure and between freight and passenger services.
Government of RS shall be regulated by a contract signed between ZRS and the Government of RS. But actual implementation is yet to follow.

4.13 **In addition, some overlapping competencies between state and entities remain.** In Article 13, the law in the RS stipulates that the width of the track can be modified upon decision at RS level, an article which appears to conflict with the responsibilities accorded to BHZJK. Several points need careful consideration to ensure compliance, for example, according to the state law BHZJK is in charge of harmonizing technical specifications of the whole BH network, whereas the entity laws state that the entities are themselves entirely responsible for all technical matters relating to their respective networks.59

**The urban transport sector**

4.14 **The institutional framework of BH is also a complicating factor in the provision of urban transport.** Bosnia and Herzegovina is divided into two entities and one administrative district: the FBH, the RS, and Brčko Administrative District (BAD). The FBH is further divided into 10 cantons, which are themselves further subdivided into a total of 74 municipalities, while the RS is divided into 63 municipalities. The BH state Ministry of Communications and Transport (MOCT) is, as per the Dayton Peace Accords, concerned only with matters relating to “international” and “inter-entity” transport and communication. The entity line ministries are responsible for inter-urban transport.

4.15 **Functional matters relating to urban transport issues are the mandate of the respective canton/municipality.** In the two entities, FBH has a more complex structure than RS. Within the RS, most urban transport responsibility is delegated to the 63 municipalities. Within the FBH the division of responsibility is more complex, with substantial responsibilities assigned to each of the 10 cantonal governments (which do not exist in the RS). The 74 municipalities of FBH rank below the canton level governments, but do have urban transport responsibilities especially with regard to road maintenance. Further complicating the local administrative picture are four designated official cities which include Sarajevo, East Sarajevo, Banja Luka and Mostar. The Banja Luka and Mostar city boundaries coincide with their municipal boundaries, while Sarajevo and East Sarajevo consist of several municipalities.

4.16 **Difficult questions regarding the future urban form of cities, including residential, commercial, industrial and historical components are not being addressed.** With few exceptions, urban spatial plans date from the pre-war period.60 Making matters worse is the fact that no comprehensive urban transport studies have been conducted since the end of the war. The recent TransSec study developed a strategic transport model for the whole of BH. However, there are no efforts to use this model to inform any of the planning decisions being undertaken at the canton or municipality levels.

59 The transposition of the interoperability directives, in particular Directive 2001/16/EC, modified by Directive 2004/50/EC, and the directive on safety, Directive 2004/49/EC, would abolish technical divergences and maintain safety and interoperability in BH. Licenses should be issued at the state level, at the level of the state Ministry of Communications and Transport or at the level of RRB and should be put in line with the requirements of Directive 95/18/EC, as modified by Directives 2001/13/EC and 2004/49/EC.

60 Sarajevo is one of few exceptions, having updated its Urban Spatial Plan in 2003.
The inland water transport sector

4.17 The institutional framework for the IWT in BH is no less complex than any other sector in BH. The Dayton Peace Accords, and particularly Annex 9, imply that international and inter-entity water infrastructure, as well as traffic on that infrastructure, are the responsibility of the state Ministry of Communications and Transport (MOCT). However, until the passage of a state level Law on Inland Water Transport, this is a mandate without a clear legal basis. By contrast, all intra-entity river traffic, as well as all aspects of waterway management and operations, are the responsibility of the respective entity ministries of transport, and Brčko Administrative District, for a short section of the river, which are responsible collectively for the transport infrastructure within their respective domains. IWT is at present regulated in accordance with the Law on Internal Navigation of the Republic of Srpska and the FBH Law on Internal and Maritime Navigation of the Federation of Bosnia and Herzegovina. No legislation exists at the level of the state, as the draft Maritime and Inland Waterway Law of 2005 has yet to be adopted. BH is represented in the International Sava River Basin Commission (ISRBC) by the MOCT, which is the focal point for implementation of the Framework Agreement on the Sava River Basin (FASRB) in BH.

4.18 The entity laws on inland navigation currently regulate the IWT in BH. The entities laws on inland navigation are generally harmonized, allotting the responsibility to determine the navigation regime on inland waterways to entities’ governments. These laws state that the enacting of regulations on navigation safety and monitoring, and their implementation are under the responsibility of the entities’ ministries of transport. In addition, entities’ laws stipulate that regulations regarding vessels are under the competence of the entities’ ministries of transport, and regulation on piloting are to be adopted by entities’ governments. Maintenance of the navigability of the waterway is an obligation of the entities’ ministries of transport, which can stop navigation on a waterway, or part of a waterway, for safety reasons. However, the management of the watercourse, and hence responsibilities for maintenance, are the responsibilities of the respective ministries of environment/water, and the two entity agencies for the management of the water resources within the basin.

4.19 The entity laws state that technical checking of vessels shall be carried out by an authorized company and licenses shall be issued by the ministries. In addition, the Laws define crew’s qualifications and certificates needed for navigation in a certain category, as well as the sanitary and health conditions for obtaining the certificate. Inspection was recently regulated in the two entities by the Laws on Inspectorates which establish in each entity an independent administrative body, the inspectorate; inspectors are therefore independent in performing their tasks according to the law. Inspectors are directly supervised by the head inspector, nominated by the government. In the event of disputes, based on documents issued by the inspector, an appeal may be submitted to the ministry relevant to the particular area.

4.20 BH does not have currently a merchant fleet or ship register. The proposed BH Law on River and Maritime Transport foresees the introduction of a register, licenses and

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62 Official Gazette of FBH, Dec. 28, 2005, no.73 year XII.
expertise requirements, technical characteristics of vessels, fees and payment obligations, as well as various operational issues. Currently most vessels serving the ports of BH are registered in Serbia. Private shipping companies in Serbia are currently interested in the business of minor bulk traffic on the Danube and the Sava Rivers, with plans to expand container traffic, primarily from the Black Sea and most likely in partnership with a deep-sea operator. Nevertheless, deep-sea operators are reluctant to commit themselves until the Sava river is fully navigable again. At present, depending on the navigability and conditions of the Sava at different sections, vessels of up to 650 tons on Class II sections to up to 1,500 tons on Class IV sections operate on the Sava.

There is no national transport strategy

4.21 As noted earlier, there is no national strategy to guide the development of the transport sector in BH. There are five main reasons why a national transport strategy and action plan is essential for the balanced development of the sector at this time: (i) A national transport strategy and action plan, agreed upon by all stakeholders, helps people to understand the reasoning behind their government’s decisions and actions in the sector by explaining the government’s goals and the principles that guide; (ii) it would display how actions in different policy areas are linked in pursuit of common goals, rather than appear as a set of disparate actions undertaken for less objective reasons; (iii) it would guide decision-makers by showing them the context of their actions and their expected progress towards specific objectives (thereby also providing the basis for a system of monitoring and accountability); (iv) It would help to ensure consistency in the application of policy principles across all transport subsectors and in pursuit of different objectives; and (v) it would help to identify gaps and shortcomings in existing policies and strategies, and prioritize addressing them.

4.22 It would also link into a strategy for the development of the rural areas in BH, something else that has been missing. A rural transport strategy that covers the management and financing of local road infrastructure, as well as the operation of transport services on these roads, would help the municipalities greatly, providing them with guidance on the management of the assets. A coherent rural development strategy would be drawn from engaging all agencies and institutions with an interest in the local roads at the state, entity, canton, municipality, and local community level. In addition, this would include organizations dealing with agriculture, mining, tourism, transport and rural development. Formulation of the strategy should ideally engage all the donors as well as NGOs.

The management of the road sector

4.23 The complexity of the legal framework is mirrored, or even surpassed, by the complexity of the organizational structure within the road sector. Currently, without considering the tertiary, or local road, level, there are eighteen distinct bodies that are assigned responsibilities in the road sector in BH: (i) The MOCT; (ii) the entity line ministries; (iii) the Federation Road Directorate, responsible for the management of the primary road network, excluding motorways and expressways; (iv) the RS Road Company, responsible for main and regional roads, excluding motorways; (v) the two entity motorway/highway companies; (vi) the ten cantons, and four Cantonal Road Directorates,
responsible for regional roads in the respective cantons within FBH; and (vii) BAD Council, responsible for the roads within the district.

4.24 **One difference between the management of the road network in the two entities is the three levels of government in the FBH compared with two in RS.** At the first tier, the management functions for the magistral (primary) (main) roads are entrusted to the Federation of Bosnia and Herzegovina Road Directorate (FBHRD),\(^63\) while the management functions for the motorways are entrusted to the Federation of Bosnia and Herzegovina Highway Directorate (FBHHD).\(^64\) FBHRD is thus responsible for the planning, management, maintenance and upgrading of the magistral (primary) road network. Road maintenance and construction is contracted out to the private sector through competitive bidding.

4.25 **FBHRD undertakes little multi-year planning of work, and there is no up-to-date Asset Management System.** As in the RS, FBHRD also undertakes little multi-year planning of its maintenance requirements. An inventory of the technical characteristics of the road network, the condition of the road network, and the level of traffic was undertaken in 2004, and an Asset Management System was also established in the FBHRD at considerable cost under the World Bank Road Management and Safety Project. This was used to produce a network analysis prioritizing interventions on an objective basis for all the road sections on the network. This plan led directly to the current European Investment Bank/European Bank for Reconstruction and Development/World Bank intervention. Despite this, the necessary annual data collection to maintain this database and update the strategic plan has not been carried out.

4.26 **At the second-tier, regional roads are managed by the road directorates in the respective cantons.** At the third-tier, local roads are managed by the municipalities, working under the umbrella of the respective cantons. This three-tier system reflects the federal structure, but it is non-optimal for the management of a road network in a relatively small area. It atomizes the limited competencies, inhibits the use of professional management, raises transaction costs, and reduces efficiency of expenditures. There is currently an initiative in the FBH to amend the Law on Roads so that FBHRD will become responsible for both magistral and regional roads. The cantons would retain responsibility for local roads only. Preliminary consensus has been obtained with the cantonal authorities in this regard but a decision has not been made yet.\(^65\)

4.27 **The management of the main and regional network is undertaken by the Public Company Republika Srpska Roads (RSR).** But RSR undertakes little multi-year planning of work, and there is no up-to-date Asset Management System. An inventory of the technical

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\(^63\) The Road Directorate of the Federation of Bosnia and Herzegovina was registered in the Cantonal Court in Sarajevo on October 28, 2002 on the basis of the Law on Roads of the Federation of Bosnia and Herzegovina (“Official Gazette of Federation of Bosnia and Herzegovina,” No. 6/02) under which the Road Directorate of FBH is authorized to manage the main road infrastructure. The Road Directorate of FBH harmonized its form of organization, title, company and activities with the Law on Public Companies (“Official Gazette of FBH”, No. 8/05) and it operates today under the title “Public Company Road Directorate of Federation of Bosnia and Herzegovina, limited liability company, Sarajevo.”

\(^64\) The Highway Directorate of the Federation of Bosnia and Herzegovina was established in July 2006 and currently employs 47 staff.

\(^65\) This decision is expected in February 2010.
4.28 The management of the local road network in BH suffers the same deficiencies observed in other countries in the South East Europe region. These deficiencies include: an unclear delineation of responsibilities, lack of capacity, lack of appropriate design standards, and, most important of all, insufficient financing, although the latter is less relevant in BH. The length of the "active" road network is simply not known, the classification of some roads remains a contentious issue and the condition and usage of the assets are unknown and not monitored. Consequently, proper planning and prioritization for interventions are not possible. Interventions are undertaken in an ad hoc manner, often based on subjective priorities. In the Federation, the Federation of Bosnia and Herzegovina Road Directorate (FBHRD) often acts informally, in agreement with one or more cantons, to undertake activities on the local road network, but these tend to be activities involving capital expenditure, rather than preemptive maintenance. In RS, the Republika Srpska Roads (RSR) fulfils this role.

Maintenance expenditures remain inadequate

Expenditures on the road network

4.29 FBHRD’s expenditures on the magistral road network have been rising since 2007. The funds expended on routine and winter maintenance have increased markedly over the period 2004-2008, excepting a recent slight downturn reflecting the impact of the economic crises (see Table 12). Approximately BAM 30 million per year (US$22 million) are now spent on the maintenance of magistral (primary) roads from the public budget,\(^66\) which translates into approximately BAM 8,800 per km (US$6,500) for routine maintenance, and approximately BAM 6600 per km (US$4,900) for winter maintenance. The former is approximately twenty-five (25) percent more than the estimated average cost per km for routine maintenance (BAM 6,500, US$4,800) on 2 lane bituminous highways in the World Bank ROCKS database.\(^67\) While such comparisons need to be treated with a considerable degree of caution, reflecting contextual and definitional differences, the differential might be indicative of inefficiencies associated with the market and/or current practices.

<table>
<thead>
<tr>
<th>Type of maintenance</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current maintenance</td>
<td>25.5</td>
<td>30.3</td>
<td>32.2</td>
<td>31.0</td>
<td>32.4</td>
<td>31.9</td>
</tr>
</tbody>
</table>

\(^{66}\) These numbers exclude any capital expenditures financed by multi-lateral or bilateral donors.

\(^{67}\) The ROCKS database provides an estimated cost of US$3500 per km in Constant 2000 US$, which can be updated with an appropriate GDP deflator (see www. BEA.Gov) and converted into BAM for comparative purposes.
4.30 **Annual maintenance expenditures on the FBH regional road network are not readily available.** Responsibility for the management of the regional road network in FBH lies with the cantons, and there is little reliable information available on the amount of recurrent expenditure on the network. There is also little information on the condition of the regional road network. One way of gaining an indication of expenditure requirements on regional roads is to use a simple unit cost, as above, for average routine maintenance costs on roads of similar characteristics (around 4,200 BAM per km, US$3100). This suggests that the average budget required for routine maintenance on the regional road network is BAM 11 million per year (US$8 million), with a further BAM 9 million (US$6.6 million) for winter maintenance. This comparison also excludes the cost of periodic maintenance on the regional road network.

4.31 **The RS now spends BAM 57 million (US$42 million) a year on recurrent expenditures on the magistral and regional road network.** There is a significant difference in responsibilities for the road network in the FBH and RS. In the former, the FBHRD is responsible for the maintenance of the magistral road network, and the respective cantons are responsible for the maintenance of the regional roads; the municipalities maintain the local roads. In the RS, RSR maintains all magistral roads and regional roads and local ones are maintained by local administration units. By law, RSR is responsible for the magistral road network and regional roads in RS, which is at present made up of 1,763 km of magistral roads and 2,157 km of regional roads. The whole network is divided into 13 regions. The unit costs for routine and winter maintenance are BAM 11,600 (US$8,600) per km, and BAM 2,900 (US$2150) per km, respectively.

**Table 13. Expenditures on magistral and regional road maintenance in RS 2005-2009 (BAM millions)**

<table>
<thead>
<tr>
<th>Type of maintenance</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current maintenance</td>
<td>27.5</td>
<td>28.4</td>
<td>31.2</td>
<td>56.8</td>
<td>57.0</td>
</tr>
<tr>
<td>Routine</td>
<td>15.9</td>
<td>19.9</td>
<td>23.0</td>
<td>45.1</td>
<td>45.5</td>
</tr>
<tr>
<td>Winter</td>
<td>11.5</td>
<td>8.4</td>
<td>8.2</td>
<td>11.7</td>
<td>11.5</td>
</tr>
<tr>
<td>Capital expenditures</td>
<td>13.8</td>
<td>4.5</td>
<td>9.5</td>
<td>34.2</td>
<td>44.7</td>
</tr>
<tr>
<td>Total Expenditures</td>
<td><strong>41.3</strong></td>
<td><strong>32.9</strong></td>
<td><strong>40.7</strong></td>
<td><strong>91.2</strong></td>
<td><strong>84.0</strong></td>
</tr>
</tbody>
</table>

Source: RSR.

4.32 **Reliable and comprehensive information on local road expenditures is very difficult to obtain.** There are differences in the categorization of the different types of expenditures across different municipalities, and across the two entities. There is often no distinction made between recurrent and capital expenditure, even if all expenditure is
recorded. Finally, accountability remains a problem, especially in a context where the access to information on the local roads is almost non-existent at both the local and central government level. However, one recent study,\(^{68}\) admittedly based on a small sample, estimated the expenditures on the local road network in BH at around BAM 27 million per year (US$20 million).

**Expenditure requirements on the road networks**

4.33 **The financing requirements of the road network include three categories of future expenditure needs:**

i. The recurrent expenditure needs in terms of routine, winter and scheduled periodic maintenance that are necessary to ensure that the recovered road network is maintained in good condition (what can be termed the normal maintenance needs);

ii. The annualized capital expenditure requirement necessary to clear any current maintenance backlog and return the road network, (of a size commensurate with current and projected demand), to good condition; and

iii. The development needs of the network—the level of additional capital expenditure necessary to upgrade the network to keep pace with growing traffic volumes and the needs of a competitive market economy.

4.34 **The estimated recurrent expenditure required to keep the magistral and regional road network in a “steady state” amounts to BAM 155 million (US$115 million) per year.** This estimate includes an aggregate of BAM 85 million (US$63 million) for routine and winter maintenance (approximating current levels of expenditure) and just under BAM 70 million (US$51.9 million) for periodic maintenance.\(^{69}\) This estimate is based on the defined unit costs for specific activities, together with the current length of the network and classification, the assumed interventions, and an overall objective of sustaining the current condition of the road networks.

**Table 14. Estimated BH road maintenance needs (2010 – 2018) in BAM millions**

<table>
<thead>
<tr>
<th>Road Class</th>
<th>Activity</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magistral</td>
<td>Addressing backlog</td>
<td>100.3</td>
<td>100.3</td>
<td>100.3</td>
<td>100.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Routine/winter</td>
<td>50.3</td>
<td>50.3</td>
<td>50.3</td>
<td>50.3</td>
<td>50.3</td>
<td>50.3</td>
<td>50.3</td>
<td>50.3</td>
<td>50.3</td>
</tr>
<tr>
<td></td>
<td>Periodic</td>
<td>40.6</td>
<td>40.6</td>
<td>40.6</td>
<td>40.6</td>
<td>40.6</td>
<td>40.6</td>
<td>40.6</td>
<td>40.6</td>
<td>40.6</td>
</tr>
<tr>
<td></td>
<td>Total (Magistral)</td>
<td>191.1</td>
<td>191.1</td>
<td>191.1</td>
<td>191.1</td>
<td>90.9</td>
<td>90.9</td>
<td>90.9</td>
<td>90.9</td>
<td>90.9</td>
</tr>
<tr>
<td>Regional</td>
<td>Addressing backlog</td>
<td>82.3</td>
<td>82.3</td>
<td>82.3</td>
<td>82.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Routine/winter</td>
<td>35.3</td>
<td>35.3</td>
<td>35.3</td>
<td>35.3</td>
<td>35.3</td>
<td>35.3</td>
<td>35.3</td>
<td>35.3</td>
<td>35.3</td>
</tr>
<tr>
<td></td>
<td>Periodic</td>
<td>28.5</td>
<td>28.5</td>
<td>28.5</td>
<td>28.5</td>
<td>28.5</td>
<td>28.5</td>
<td>28.5</td>
<td>28.5</td>
<td>28.5</td>
</tr>
<tr>
<td></td>
<td>Total (Regional)</td>
<td>146.1</td>
<td>146.1</td>
<td>146.1</td>
<td>146.1</td>
<td>63.8</td>
<td>63.8</td>
<td>63.8</td>
<td>63.8</td>
<td>63.8</td>
</tr>
<tr>
<td>Local</td>
<td>Addressing backlog</td>
<td>32.2</td>
<td>32.2</td>
<td>32.2</td>
<td>32.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Routine/winter</td>
<td>13.9</td>
<td>13.9</td>
<td>13.9</td>
<td>13.9</td>
<td>13.9</td>
<td>13.9</td>
<td>13.9</td>
<td>13.9</td>
<td>13.9</td>
</tr>
</tbody>
</table>

\(^{68}\) World Bank (2008b) *op cit.*

\(^{69}\) Assuming an overlay of 40mm of asphalt every seven years.
### Table

<table>
<thead>
<tr>
<th>Periodic</th>
<th>4.6</th>
<th>4.6</th>
<th>4.6</th>
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<tr>
<td>Total (Local)</td>
<td>50.7</td>
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<td>50.7</td>
<td>18.5</td>
<td>18.5</td>
<td>18.5</td>
<td>18.5</td>
<td>18.5</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>387.9</td>
<td>387.9</td>
<td>387.9</td>
<td>173.1</td>
<td>173.1</td>
<td>173.1</td>
<td>173.1</td>
<td>173.1</td>
</tr>
</tbody>
</table>

Source: Study Data.

4.35 **The capital expenditure necessary to address the backlog of maintenance expenditure has been estimated at BAM 913 million (US$676 million), or nearly six (6) percent of 2007 GDP.** This estimate is again based on the unit costs for specific activities, together with the current length of network and classification, the assumed interventions, and a policy objective of returning all roads to good condition. An updating of the current functional classification, or a willingness to accept a lower quality standard on lower category/volume roads, would be expected to lead to a corresponding decrease in the estimate of both backlog and normal maintenance needs. The annual expenditure needs to clear this maintenance backlog over a five year period would be BAM 182.6 million (US$135 million) to clear the maintenance backlog on the magistral and regional road network.

4.36 **The total maintenance needs (routine, winter, periodic and backlog) for the magistral and regional road networks in BH has been estimated at some BAM 337 million (US$250 million) per year over the next five years.** Neither of the above estimates considers the ongoing BAM 292 million (US$215 million equivalent) initiative jointly sponsored by the EIB, the EBRD, and the World Bank, to reduce the maintenance backlog on the magistral and regional road networks. However, while this initiative is expected to have a substantial and positive impact, it will not clear the maintenance backlog at its current scale. In addition, inadequate maintenance expenditures in the interim are likely to reduce the benefit of this joint program on the accumulated backlog.

4.37 **A significant financing gap exists, but it is not just the level of spending, but the quality of spending.** Even assuming a sum of this size could be absorbed in the sector, which given implementation constraints in recent years is not guaranteed, there would appear to be a significant financing gap at current levels of revenue, without considering the requirements of the development plans in the sector. The sustainability of the road network revolves around the timely execution of routine and periodic maintenance which is in turn dependent on the existence of a steady and adequate flow of funds irrespective of source, good management, sufficient implementation capacity and effective use of the funds. While addressing the issue of sufficient finance is necessary condition, it is not a sufficient condition. The need to improve the management in the sector, and the effectiveness and efficiency of expenditures in the sector ranks as high, if not more so.

**Closing the financing gap**

4.38 **At present, the revenues allocated to the sector do not cover the full maintenance requirements of the magistral and regional network.** Additional funds are required to clear the maintenance backlog, to develop the primary and secondary network to meet the growing demand for transport, and to sustain the magistral and regional network once
returned to good condition. In January 2007, the Committee\textsuperscript{70}, in charge of optimizing road user charges issued three main recommendations on how to adjust those charges to the road sector needs. The three main recommendations from the January 2007 review were:

(i) The BAM 0.15/liter fuel tax was acknowledged to be insufficient as it only generates sufficient finance for the routine and winter maintenance of the magistral (primary) and regional (secondary) roads (and the earmarked portion for the development of the motorway network). It acknowledged that the level of fuel tax in BH was low in comparative terms (nine percent) compared to that of other nations. The comparative experience ranges from 15 percent of per liter of sales in the EU earmarked for road maintenance, to 25 percent of sales in Serbia earmarked for maintenance and construction of roads. The revenues should also be entirely redirected to specific accounts of organizations responsible for the magistral (primary), regional and local road networks—only about 50 percent is financing the road sector at present. These accounts should be special sub-accounts of the Indirect Tax Administration, and the accruing resources should not be used for payment of foreign debt, funding of state bodies or other obligatory services;

(ii) By year 2010, the total amount of the fuel tax for financing road maintenance, rehabilitation and construction should be increased to 25 percent of the retail fuel price. The increase in the allocation of funds should be introduced over time to ensure that no other spending priorities suffer a reduction in their nominal funding levels. It is estimated that this would provide sufficient expenditures for the financing of all necessary maintenance on the magistral (primary) and regional network, the construction of some additional sections along Corridor Vc, and the construction/upgrading of priority sections of the magistral (primary) and regional (secondary) network.

(iii) A unified system of vehicle registration fees should be put in place. The system that is presented considers a fee for trucks based on vehicle mass plus loading capacity from BAM 48 per annum for trucks up to three tons to BAM 526 plus BAM 69 per ton over 10 tons for trucks over 10 tons. Buses and similar vehicles would be charged on a per-seat basis, recommended at BAM 10 per registered seat. The fee for trailers would be based on vehicle mass plus loading capacity (from BAM 36 per year per ton for trailers up to three tons, and up to BAM 1,000 plus BAM 106 per ton over 20 tons for trailers over 20 tons). The fee for passenger cars and similar vehicles would be set at a flat rate of BAM 25 per year.

4.39 Accordingly, the BAM 0.15/liter fuel tax was increased to BAM 0.25 per liter fuel on June 18, 2009. However, the entire increase of BAM 0.10 per liter will be allocated to the respective entity motorway directorates to fund the development of the motorways. [But the problem of inadequate revenues for the maintenance of the remainder of the network

\textsuperscript{70} The Committee, which includes representatives of the state, the entities, and all ethnic communities, was established in 2005 by the MOCT.
The realization of sufficient revenues will require an increase in the level of the tax collected, together with an adjustment of the taxation scheme.

**Road safety remains a major challenge**

4.40 Road safety is an increasing social and economic issue, which requires a coordinated effort at all levels. The estimated impact of road traffic accidents is estimated at between 1.5-2.0 percent of GDP or twenty-seven (27) percent of total health spending. Road accidents are the second largest cause of death/injury for males between 15-44 years of age, and responsible for nearly two (1.7) percent of total deaths, and nine (9) percent of disabilities. On average over the past six to seven years, about 35,400 accidents occur on an annual basis, resulting in 470 deaths and 10,100 injuries. The fatality rate of 5.3 per 10,000 vehicles is high compared to the EU-27 average of 1.87.

### Table 15. Road accident statistics (2008)

<table>
<thead>
<tr>
<th></th>
<th>RS</th>
<th>FBH</th>
<th>BH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of fatalities and injuries</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatalities</td>
<td>180</td>
<td>245</td>
<td>425</td>
</tr>
<tr>
<td>Injured</td>
<td>3,639</td>
<td>7,830</td>
<td>11,469</td>
</tr>
<tr>
<td>Total</td>
<td>3,819</td>
<td>8,075</td>
<td>11,894</td>
</tr>
<tr>
<td><strong>Number of accidents</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material damage</td>
<td>8,399</td>
<td>24,033</td>
<td>32,432</td>
</tr>
<tr>
<td>Injured</td>
<td>10,469</td>
<td>5,541</td>
<td>16,010</td>
</tr>
<tr>
<td>Total</td>
<td>10,933</td>
<td>29,574</td>
<td>40,507</td>
</tr>
<tr>
<td><strong>Fatality and injury rate per 10,000 vehicles</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatality rate</td>
<td>6.5</td>
<td>4.7</td>
<td>5.3</td>
</tr>
<tr>
<td>Injury rate</td>
<td>131.4</td>
<td>150.7</td>
<td>144.0</td>
</tr>
</tbody>
</table>

Sources: FBH Statistical Office and RS Institute of Statistics.

### Figure 9. Fatality rate (per 10,000 vehicles; 2004-2008)

Sources: FBH Statistical Office and RS Institute of Statistics.

4.41 The governments of BH are aware that more needs to be done to improve road safety in BH. The current state of the network, driver behavior and limited education, poor or nonexistent enforcement, and significant growth in vehicle ownership and use, still contribute to make Bosnia and Herzegovina’s one of the worst road safety records in Europe. In 2007, the Global Road Safety Facility, following a request from the authorities, financed a Road Safety Management Capacity Review in BH. The findings of this report were bleak, “...road safety performance management across government is virtually non-existent, institutional arrangements are weak, interventions are fragmented and there is little country focus on achieving results. As more than one stakeholder noted, serious road safety work has yet to begin in Bosnia and Herzegovina.” The findings are summarized below.
Box 2. Summary of findings of road safety management capacity review

**Results focus.** Leadership regarding a country focus on achieving road safety results in Bosnia and Herzegovina is currently lacking. While ministries of communications and transportation now exist at state and entity levels, their leadership role (consistent with European norms) is not yet established. New arrangements need to be put in place to develop capacity for the range of institutional management functions which can deliver understanding of the road safety problem (without emphasis on blame) together with the delivery of multi-sectoral, data-led strategies and countermeasures. Apart from police data on final outcomes at entity and canton level, no measurement is carried out of safety performance, including key road user behaviors. Overarching state road safety strategy and entity road safety action plans are needed to set out clear management responsibilities on the part of the different government agencies and to provide for effective coordination arrangements with a dedicated secretariat.

**Coordination.** Working relationships across government, both vertically and horizontally, are poor and currently impede progress. Effective multi-sectoral working relationships on road safety need to be established urgently at senior managerial level and secretary/assistant minister levels, with properly financed and supported lead agency coordination at state and entity level.

**Legislation.** A framework for primary legislation has recently been introduced to set out the key conditions for entry and exit from the road system, but will need further development to meet the road safety task ahead.

**Funding and resource allocation.** Road safety funding arrangements are inadequate and lack transparency. Funding provision for state level provision of road safety needs to be established urgently.

**Promotion.** High level promotion of action to achieve results is not yet carried out.

**Monitoring and evaluation.** Very limited and incomplete monitoring and evaluation activity is carried out at a country level. Country-wide crash injury data systems, road system registries in health, justice and transportation sectors are envisaged or partially developed and urgently need to allow shared use and better correlation between sectors to enable crash injury problems to be identified and understood. Intermediate outcome data are not collected. These are critical threshold issues which need to be addressed as a priority.

**Research and knowledge transfer.** National capacity for dedicated road safety research and development and the necessary technical support barely exist and need to be fostered to support future road safety strategy development and implementation.

**Interventions.** A legislative framework is in place which sets out the key conditions for entry and exit of drivers and vehicles to the road network and this will need to be upgraded progressively in line with good European practice. Similarly there is much potential for national road and vehicle standards and safety methodologies (including safety audit and safety rating systems) to be introduced to good European practice in the short term and best practice for the longer term. With some notable exceptions e.g., random breath testing and a 50km/h urban speed limit, key safety rules are in place for the use of the system, but compliance is low.

A small hospital-based study in 2000 concluded that drivers and passengers do not have access to active and passive vehicle safety systems in accordance with EU standards, and a large proportion failing to use seat belts were over the legal blood alcohol limit. There is a lack of management capacity in the road user behavior field which constrains the ability to identify and implement behavior-related policy improvements. There is no emergency call system. Most road crash victims are brought to the hospital by road users. The need for improvement in access to the pre-hospital medical system, the reduction of inequalities in trauma care due to fragmented health sector insurance and the introduction of country-wide trauma care registries are acknowledged.

**Results.** While it is clear that there is some evidence of will to improve Bosnia and Herzegovina’s road safety performance, no systematic analysis has been conducted to see what could reasonably be achieved. Challenging but achievable final outcome targets need to be set. In the first instance, intermediate outcomes need to be identified (for example, limited data on average speeds indicate that speed limits in many cases will warrant review) Estimates of the socio-economic costs of road traffic crashes, consistent with European Union country good practice estimates, need to be established at national level.

4.42 Some of the recommendations of this study are to be implemented through the World Bank financed Road Infrastructure and Safety project. The US$3.75 million assistance will mainly focus on building the institutional framework and institutional capacity within each entity, and will test the implementation of policies and techniques directly in the field, through pilot operations in high-risk areas. But coordination and cooperation between all stakeholders are vital if a results focused road safety intervention is to be introduced and significant improvements in road safety realized in Bosnia and Herzegovina.71

The operating performance of the railway sector is poor

4.43 The overall condition of the railway network in BH remains poor, with operational weaknesses reducing line capacity markedly. Despite extensive rehabilitation on many sections, overall operational speeds remain low because of: (i) the existence of temporary speed restrictions, due to the condition of some tunnels (notably Tunnel Ivan south of Sarajevo where there is a speed restriction of 40 km/hr); (ii) poor track alignment (due to topography and gradient) and condition; and (iii) the number and functioning of crossings (on around 80% of the railway lines on Corridor Vc, train speed is limited to a range between 30 km/hr and 70 km/hr depending upon the conditions of the track). In addition, there are limitations on ballast in the curves, weak sleepers, and inadequate fastenings. Another significant problem is the length of the crossing sidings in stations (with a usable length of 570 meters) leading to restrictions on train length (550 meters) and train weight (1,500 tons).

4.44 Freight traffic density in BH is relatively high compared to neighboring countries. Compared to other South East European countries, freight traffic density—at just under 1.3 million ton km per km of line—is high in BH. It is about the same level as in Romania and it is higher than in Bulgaria and Serbia, although lower than in the EU (Table 16). However, passenger traffic density is very low in BH, reflecting the inherent unsuitability of the railway mode for short to medium length journeys in this type of typography. Passenger rail services are simply less attractive than alternative transport modes, such as buses.

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71 The US$3.75 million (US$2.5 million in the FBH, and US$1.25 million in the RS) road safety component will focus on strengthening the institutional framework, developing a results-focused strategy, building capacity and introducing pilot operations.
### Table 16. Freight and passenger traffic density (2007, unless otherwise indicated)

<table>
<thead>
<tr>
<th>Country</th>
<th>Freight traffic density (000 ton kms per km of lines)</th>
<th>Passenger traffic density (000 pass. km per km of line)</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>1,439</td>
<td>2,825</td>
</tr>
<tr>
<td>Germany</td>
<td>2,685</td>
<td>2,205</td>
</tr>
<tr>
<td>EU</td>
<td>1,806</td>
<td>1,806</td>
</tr>
<tr>
<td>Hungary</td>
<td>1,044</td>
<td>783</td>
</tr>
<tr>
<td>Poland</td>
<td>2,243</td>
<td>880</td>
</tr>
<tr>
<td>Croatia</td>
<td>1,313</td>
<td>592</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1,788</td>
<td>722</td>
</tr>
<tr>
<td>Serbia</td>
<td>1,112</td>
<td>200</td>
</tr>
<tr>
<td><strong>Bosnia and Herzegovina (2008)</strong></td>
<td><strong>1,257</strong></td>
<td><strong>77</strong></td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1,171</td>
<td>602</td>
</tr>
<tr>
<td>Romania</td>
<td>1,265</td>
<td>697</td>
</tr>
<tr>
<td><strong>Albania</strong></td>
<td>125</td>
<td>121</td>
</tr>
</tbody>
</table>

Sources: UIC, ZRS, FBH Statistical Office.

4.45 **Labor productivity remains very low in Bosnian railways, suggesting the need for further staff reductions.** The two railway companies (ZFBH and ZRS) are overstaffed: as of 2008, ZRS had 3,519 employees, of which 2,082 were in the infrastructure department with the remainder in the operations department, while ZFBH had 4,084 employees, of which 1,904 in infrastructure—levels that have remained broadly unchanged since 2004. The average traffic units per employee is only 178,482 for BH, considerably lower than many countries in South East Europe, with the exception of Albania—and markedly below the EU average of 683,260 (see Table 17). Although this represents an improvement over the labor productivity reported in the 2005 study, which noted productivity of 105,000 for ZFBH and 59,000 for ZRS—reflecting the growth in traffic. In addition, as the next section reveals, staff costs make up a substantial portion of total operating costs, and therefore are a key element in any attempt to improve the financial performance of the railways and move towards financial viability.

### Table 17. Railway labor productivity by country (2007, unless otherwise indicated)

<table>
<thead>
<tr>
<th>Country</th>
<th>Traffic units</th>
<th>Average Staff</th>
<th>Traffic unit/staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>125,734,000,000</td>
<td>165,810</td>
<td>758,302</td>
</tr>
<tr>
<td>Germany</td>
<td>165,753,000,000</td>
<td>231,000</td>
<td>717,545</td>
</tr>
<tr>
<td>EU</td>
<td>758,029,000,000</td>
<td>1,109,429</td>
<td>683,260</td>
</tr>
<tr>
<td>Poland</td>
<td>60,629,000,000</td>
<td>123,472</td>
<td>491,034</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>23,827,000,000</td>
<td>55,155</td>
<td>432,001</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>7,138,000,000</td>
<td>17,446</td>
<td>409,148</td>
</tr>
<tr>
<td>Croatia</td>
<td>5,185,000,000</td>
<td>13,503</td>
<td>383,989</td>
</tr>
<tr>
<td>Romania</td>
<td>20,888,000,000</td>
<td>66,139</td>
<td>315,820</td>
</tr>
<tr>
<td>Serbia</td>
<td>5,313,000,000</td>
<td>20,920</td>
<td>253,967</td>
</tr>
<tr>
<td>Hungary</td>
<td>10,478,000,000</td>
<td>46,000</td>
<td>227,783</td>
</tr>
<tr>
<td><strong>Bosnia and Herzegovina (2008)</strong></td>
<td><strong>1,357,000,000</strong></td>
<td><strong>7,603</strong></td>
<td><strong>178,482</strong></td>
</tr>
<tr>
<td>Albania</td>
<td>104,000,000</td>
<td>1,991</td>
<td>52,235</td>
</tr>
</tbody>
</table>

Sources: UIC, ZRS, FBH Statistical Office.

4.46 **There is no clear indication of a decisive commitment to address the overstaffing issue in the medium-term.** For example, in the Business Plan 2009-2011, ZRS is projecting that operations department employees will decline from 1,437 in 2009 to 1,390 in 2011,
Infrastructure maintenance remains problematic due to inadequate equipment. ZFBH is responsible for maintaining 601 km of main railway lines (out of which 441 km are electrified and 68 km are double track line). ZRS are responsible for maintaining 416 km of main railway lines (out of which 330 km are electrified and 24 km are a double track line section of the Corridor Vc Line). Vehicles and equipment for infrastructure maintenance owned by the two railways can only perform relatively small work projects (unscheduled repairs in case of emergency). All larger work required are contracted out. Specialized vehicles for railway infrastructure maintenance are maintained in Workshop Blazuj (owned by ZFBH) or in a commercial workshop. At present, some of the necessary equipment to maintain the railway vehicles in line with the specifications is missing.

The condition of the rolling stock on both railways is generally poor. The locomotives, cars, and passenger units of both railways have a high average age, with many awaiting rehabilitation after the end of the war. Both companies used locomotives to haul passenger services, even on some shorter routes, despite the higher costs of these operations, reflecting a lack of modern Diesel/Electric Multiple Units (DMU/EMU).

Locomotive productivity, measured as traffic units per locomotive, stood at 7.1 million in 2008. This level of productivity is lower in BH than in neighboring Serbia, the Czech Republic, Hungary, and Bulgaria, although higher than Romania and Albania (Table 18). Without passenger traffic, locomotive productivity per ton km would compare more favorably to other countries in the region, although it would still remain significantly below the EU average. One factor driving locomotive productivity is that the number of locomotives in operation is small relative to the total stock. In the case of ZRS, out of 83 locomotives, only 53 were operational in 2009, reflecting the age structure of locomotives—with over 22 locomotives exceeding 40 years, and 50 engines of between 31 and 40 years, the rolling stock is old. ZFBH has 97 pre-war locomotives (43 electric and 54 diesel), of which 44 are actually operational.

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Table 18. Locomotive productivity by country (2007, unless otherwise indicated)

<table>
<thead>
<tr>
<th>Country</th>
<th>Traffic units</th>
<th>Locomotives</th>
<th>Ton km/Locomotives</th>
<th>Ton km/Locomotives/Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>125,734,000,000</td>
<td>4,289</td>
<td>29,315,458</td>
<td>80,316</td>
</tr>
<tr>
<td>Germany</td>
<td>165,753,000,000</td>
<td>4,128</td>
<td>22,047,723</td>
<td>60,405</td>
</tr>
<tr>
<td>Croatia</td>
<td>5,185,000,000</td>
<td>244</td>
<td>14,647,541</td>
<td>40,130</td>
</tr>
<tr>
<td>EU</td>
<td>758,029,000,000</td>
<td>26,387</td>
<td>14,362,603</td>
<td>39,350</td>
</tr>
<tr>
<td>Serbia</td>
<td>5,313,000,000</td>
<td>331</td>
<td>13,749,245</td>
<td>37,669</td>
</tr>
<tr>
<td>Poland</td>
<td>60,629,000,000</td>
<td>3,538</td>
<td>12,308,649</td>
<td>33,722</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>23,827,000,000</td>
<td>1,952</td>
<td>8,694,672</td>
<td>23,821</td>
</tr>
<tr>
<td>Hungary</td>
<td>10,478,000,000</td>
<td>1,005</td>
<td>4,212,935</td>
<td>21,542</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>7,138,000,000</td>
<td>602</td>
<td>7,830,565</td>
<td>21,454</td>
</tr>
<tr>
<td>Bosnia and Herzegovina (2008)</td>
<td>1,357,000,000</td>
<td>180</td>
<td>7,105,556</td>
<td>19,467</td>
</tr>
<tr>
<td>Romania</td>
<td>20,888,000,000</td>
<td>1,961</td>
<td>6,869,454</td>
<td>18,820</td>
</tr>
<tr>
<td>Albania</td>
<td>104,000,000</td>
<td>57</td>
<td>929,825</td>
<td>2,547</td>
</tr>
</tbody>
</table>

Sources: UIC, ZRS, FBH Statistical Office.

4.50 There are over 4,000 freight cars between both entity railways and productivity is poor by EU standards. As of 2008 ZFBH had 2025 cars, of which 118 were covered cars, 1,583 were high sided cars, and 155 flat cars. However, this is the total fleet; in reality the age and condition of the fleet means that a fraction is operational at any one time (currently about seventy (70) percent of that number). But ZFBH has plans to procure a further 2,000 cars. ZRS has slightly more cars, at 2,571, of which 1,169 are between 31 to 40 years old, 411 over 40 years old, and only 31 with less than 10 years of service. The size of the operational fleet in the RS is just over forty (40) percent of the total fleet (1,131 cars). Productivity in the car fleet is just below the regional average, but well below EU norms. There has also been limited investment in new stock in recent years, with ZRS limiting itself to the purchase of one locomotive in both 2006 and 2008, and the modernization of 80 freight cars in 2006 and a further 20 in 2007.

Figure 10. Freight car productivity by country (2007)

The financial performance of the railway sector is also weak

4.51 In terms of financial performance, the two BH railway companies are significant loss makers that are dependent on public subsidy, and reliant on the public purse for all investments. On ZFBH, operating expenses exceed revenue, even with the inclusion of the operating subsidy. There has been a slight improvement in both the operating ratio and the
working ratio in the last few years. However the proportion of revenue necessary to cover expenses in the first six months of 2009 was over 130 percent, including operating subsidies. Without subsidy, it was over 160 percent. On ZRS, revenues with subsidies broadly cover operating expenses. However, without subsidy, the proportion of revenue necessary to cover expenses in the first six months of 2009 was over 120 percent. Freight generates more than 18 times more revenue than passenger services, with freight revenues reaching nearly BAM 37 million in 2008. Comparing the first half of 2009 with the first half of 2008, the net income of ZRS, including subsidies, declined from BAM 9.4 million (US$7 million) to BAM 320,000 (US$290,600) reflecting steep declines in freight and passenger traffic.

4.52 **Labor costs represent a substantial and growing share of the cost structure for both railway companies.** Labor costs increased by over forty (42.2) percent over the period 2005-2008 on ZFBH, in contrast to revenues, which excluding subsidy, increased by twenty-nine (28.7) percent over the same period, primarily driven by the increase in freight traffic. Labor costs accounted for more than nearly half of total operating costs and nearly three quarters of total revenues in 2008, up from approximately one-third of total operating costs and sixty-eight (68) percent of total revenues in 2005. Salaries and allowances expenditures have increased in recent years, rising from BAM 27.8 million (US$20.6 million) in 2005 to BAM 47.1 million (US$35 million) in 2008. Labor costs increased by nearly seventy (69) percent over the period 2005-2008, in contrast to revenues, excluding subsidy, which increased by less than twelve (11.5) percent over the same period. This upward trend of expenditures on salaries continues in the first half of 2009. These increases seem hard to justify given the restrictive working practices, poor productivity, and static numbers.

4.53 **A robust system of project identification and prioritization has not been developed.** The prepared list of priority projects is not always contributing to a comprehensive and integrated network development and although planned investments involve major capital investments, there is no prioritization that is in line with available financing resources. Generally, with revenues that cannot cover the operational services, major investments in the sector are to be funded from the governments’ budgets and from participations and initiatives from international donors and IFIs.

**Urban transport faces particular problems**

**Sarajevo**

4.54 **Sarajevo is experiencing a range of urban transport challenges.** Interventions are needed to adequately address the needs of the Sarajevo residents, and to provide the needed support to the local economy. The following strategy is recommended to address these challenges:

- Pursuing institutional reorganization and strengthening;
- Directing highest priority investments at improving the public transport system;

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74 The operating ratio is defined as the proportion of revenue necessary to cover expenses, including depreciation. The working ratio is defined as the total operating expenses, less depreciation and debt service, divided by revenues.
• Placing greater emphasis on low cost and high payoff traffic management measures;
• Making selective improvements to the road system as the budget permits; and
• Improvements for non-motorized transport.

4.55 Urban transport conditions are deteriorating, in large part due to the rapid increase in private motor vehicle ownership in recent years. Vehicle ownership in 2008 stood at 106,593 for a population estimated at 421,289. The fleet has increased rapidly in the last three years: up nearly eight (7.8) percent in 2007, and just under seven (6.8) percent in 2007, and over twenty (21.7) percent in 2008. However, passenger cars stood at 100,411 in 2000 and went down sharply in 2001 to 79,102, and only exceeded the 100,000 mark in 2008. This may reflect the 1999 law that prohibits importing cars more than seven (7) years old, which is strictly enforced by customs. However, there are discussions now to increase the maximum allowable age of imported cars, as the age profile has improved in recent years. However, there are potentially significant environmental implications to such a decision.

4.56 Traffic congestion is increasing, parking spaces are limited, and an aging passenger transport system is not serving the needs of the population. Traffic congestion has emerged as a serious problem in the city particularly in the Stari Grad and Centar municipalities and also along Kurta Shorka (Route 18) in the Ilidza and Novo Grad portions of the Sarajevo metropolitan area, due primarily to a poor intersection connection between Zmaja od Bosne (Dzemala Bijedica) and Kurta Shorka in the municipality of Ilidza.75

4.57 GRAS is operating at a loss, despite receiving significant compensation from Sarajevo Canton for discounted fares. In 2008, GRAS made a loss of BAM 16.8 million (US$12.4 million), up from a loss of BAM 6.8 million (US$5.0 million) in 2007, reflecting a large increase in expenditure on salaries and benefits. The rising loss occurred despite a rise in Sarajevo Canton support which equaled BAM 7.6 million (US$5.6 million) for subsidizing monthly tickets, BAM 10.2 million (US$7.5 million) to support business. In the first half of 2009, the operating loss equaled BAM 10.4 million (US$7.7 million)—higher than the annual operating loss in 2007—largely reflecting a sharp fall in cantonal support to the two categories mentioned above.

4.58 Financial performance appears to have been deteriorating even before the economic crisis. There has been a marked deterioration in both the operating ratio and the working ratio in the last few years.76 The proportion of revenue necessary to cover expenses in the first six months of 2009 was over 140 percent, including operating subsidies, up from 110 percent in 2007. Without subsidy, it was over 240 percent, up from 170 percent in 2007. The working ratio displays a similar decline over the same period. Given the poor financial performance, one worrying sign is that salaries and benefits increased by over twenty-five

75 The backup along Kurta Shorka (Route 18) typically extends for several kilometers every day due to an inadequate interchange design (see Figure 4) for accommodating the high traffic volumes at this location.

76 The operating ratio is defined as the proportion of revenue necessary to cover expenses, including depreciation. The working ratio is defined as the total operating expenses, less depreciation and debt service, divided by revenues.
(25.5) percent 2007 to 2008, whereas total revenues increased by just over two (2.2) percent over the same period.

4.59 One of the factors explaining the large losses are the number of passengers travelling with discounts, which are not fully compensated by Cantonal transfers. An estimated forty (40) percent of passengers do not pay the full the cost of the ticket— the monthly pass without discounts is BAM 53 (US$39), but there are many categories of passengers receiving discounts which are not fully covered by cantonal subsidies. For example, there are 31,000 pensioners earning less than BAM 299 (US$222)—there are 53,000 pensioners receiving discounts—who do not pay for the monthly pass, but the cantonal subsidy only covers BAM 15, with the rest of the subsidy provided by GRAS. University students pay BAM 33 and GRAS receives no cantonal subsidy for this category, which includes about 30,000 passengers. GRAS makes proposals for the level of discounts, but these need to be approved by the cantonal government.

4.60 Fares for passenger transport rides are relatively expensive at BAM 1.5 (US$1.12) for a single trip. However, fares have not been raised since 2005. There are four zones and a different price per zone, with single, return, five, daily, monthly, three-month, six-month and annual passes available. Tickets are validated upon boarding the vehicle and changing tram or bus requires validation of a new ticket. The research division of GRAS estimates that about 10 percent of passengers do not pay for tickets or passes, and although there are inspections, the cases cannot be processed as what is missing are regulations or a rule book at the Cantonal level with regard to the rights of inspectors to collect fines. At present, for a single ride costing BAM 1.5, the fine is BAM 28 (US$21.5), but there are difficulties collecting fines. There is a need to establish an improved system to address fare evasion, including possibly a smart card system plus better information and sensitization campaigns. In 1999 a new electronic system was introduced in the trams, for the use of magnetic tickets for one, two, and five rides only. Recently, GRAS has submitted to the cantonal government a proposal for introducing smart cards for trolley buses, buses and mini-buses, with a provisional cost estimate of BAM 2.5 million (US$1.89 million).

4.61 There is a serious parking shortage in Sarajevo. This is both in the congested commercial part of the old city as well in housing blocks which were not adequately designed for the higher levels of private vehicle ownership. The city has about 1,200 parking spaces in the city center and public garages with a capacity of about 4,000 cars in the new part of the city near the airport. Additional capacity is being planned, with an additional storey to an existing lot which will create 156 new parking spaces, and an additional parking

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77 At present, passenger categories receiving discounts include the unemployed, students (primary, secondary, tertiary), pensioners, military police, children, veterans, families of fallen soldiers, among others.

78 The fare is BAM 1.6 if paying the driver. A day card valid for unlimited travel on all local public transportation in zone A is available for about BAM 5 (US$3.7). There are private bus companies operating in the suburban area in Sarajevo. The largest of these is Centrotrans Eurolines, which takes passengers from the suburbs to Sarajevo at fares below those of GRAS.

79 GRAS is under the Ministry of Transport and Communications of Sarajevo Canton and as a cantonal public utility enterprise must comply with the FBH road law, cantonal law, and the FBH law concerning limited liability companies.
garage of between 2,000 to 3,000 spaces, with three to four levels, which will probably be opened to bidding under a concession to build and operate. The detailed design for this new public garage already exists. Parking is critical in that it gives policy makers traction in balancing the need for demand management with the need for supporting economic development activities (like providing parking spaces for shoppers). Parking, if considered and well designed as part of an overall transport strategy, can also be a reliable source of much needed revenues.

4.62 Sarajevo Canton has three priority road projects, which are parallel and traversal roads in the city of Sarajevo, as means to relieve traffic pressure. These include: (i) the first transversal; (ii) the seventh transversal; and (iii) the south longitudinal. The first section of the first transversal is 3.1 km long, running from S.S. Kranjčevića to Kobilja Glava, and is estimated to cost BAM 51.2 million (US$38.1 million); project documentation has been completed and the estimated costs of expropriation is estimated at BAM 36 million (US$26.7 million). The first section of the seventh transversal from Stupska petlja to the entity border is 3.5 km long and is estimated to cost BAM 5.8 million (US$18.9 million), with an estimated cost of expropriation of BAM 11.3 (US$10.4 million). Finally, the first section of the south longitudinal is 3.5 km long, running from the zero to seventh transversal, estimated at BAM 12.3 million (US$9.1 million), with an estimated cost of expropriation at BAM 9.9 million (US$7.4 million). In all three cases, there are no secured funds and the canton is expecting to finance these projects entirely by loans. These improvements will have to be carefully staged in relation to available funds.

Figure 11: Proposed arterial road system

Source: based on a map provided by Sarajevo Canton.
4.63 **Beyond internal road improvements, the importance of constructing the proposed C-5 as a bypass around the west side of the Sarajevo metropolitan area cannot be underestimated.** This road link would provide much needed relief to Routes 17 and 18 within Sarajevo by removing a significant percentage of traffic that wishes to bypass Sarajevo. It should also be recognized that the C-5 road link will affect development of the western portion of the Sarajevo metropolitan area by providing much improved accessibility to this area.

4.64 **It is equally important to address the needs of non-motorized transport users as a matter of priority in a bid to provide more environmentally friendly means of transport.** Improving the environment for non-motorized users, including pedestrians and cyclists, is an important step in affecting the modal share imbalance and reducing reliance on the private car. Investigations can be made into possibilities for increased pedestrian and cycle safety. Provision of better crossing facilities at junctions is one consideration. Provision of more conducive walking and cycling environments that take advantage of available spaces and scenery (e.g., river banks) are among other possible avenues for interventions.

**Banja Luka**

4.65 **The main challenge facing local officials in Banja Luka is what to do to upgrade passenger transport services.** A number of recent studies have advocated the introduction of electric transport (trolley buses and trams). In addition to improving urban passenger services within Banja Luka, there is a desire to improve bus services to outlying suburban areas and nearby settlements which are less well served. However, any decisions on the appropriateness of recommendations for Banja Luka should carefully consider current and projected demand and the feasibility of the proposals. The Banja Luka municipality is currently evaluating two options:

- **Option A**, with electric trolley buses gradually replacing service on eight bus lines in three phases. Typical planned headways are 20 minutes or less. Since existing services are provided by diesel buses, this option would require provision of new infrastructure: catenaries, transformers, depot facilities, stations and turn-arounds. The option would include rolling stock provision of an estimated 29 diesel buses and 73 trolley buses. Total cost: BAM 75.88 million (US$56.2 million).

- **Option B**, with staged approach to implementation as in Option A above but using buses, trolley buses and trams/LRT with selection by corridor depending on demand and physical constraints. This option offers the benefit of evolving an integrated transport system. As with Option A, costs for new infrastructure would have to be incurred: total cost: BAM 210 million (US$155.7 million).

4.66 **The outlays for Option B, which includes introduction of a tram system, are significantly higher than for Option A.** In addition to requisite vehicles and depots for the trams, extra costs arise due to construction of new routes for the trams, remodeling of the

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80 With the assistance of consultants from the Czech Republic.
street profile, and relocation of public utilities. Option A, with the trolley bus network would only require the introduction of power infrastructure along the existing bus routes. The justification for choosing a particular option or indeed of determining which modes to utilize necessitates more comprehensive study. In 2008 a transport study was prepared, which will be the basis of the urban regulation plan that is currently under discussion and is expected to be adopted in the first half of 2010. This study also reviewed the public transport options. At present the city administration is leaning toward Option B.

4.67 **A project for monitoring public transport is currently in preparation.** This project aims to (i) monitor buses and compliance with the timetable; (ii) provide a more realistic assessment of public transport and needs; (iii) provide information on buses running late, which will be necessary for the planned center for traffic management; (iv) explore options for electronic tickets in order to obtain more reliable data; and (v) review public transport revenue by network line and time of day. The bidding terms for this project has yet to be issued, but financing remains an issue.

4.68 **Banja Luka has 40 signalized intersections, but these are not centrally synchronized.** With the exception of 9 intersections with newer traffic signal installations, the traffic signal installations can provide only one timing plan. The city plans to signalize 15 additional intersections and to add central control. An international tender for project design documentation for the centralized management system, including a center for traffic management, is ongoing, with the bid period having closed at the end September 2009. This is a priority project for the city and will be financed through loans from commercial banks. The estimated budget for this is in the range of BAM 4.8 million (US$3.6 million). The city had planned approximately 10 traffic circles, of which one has been built and three traffic circle designs have been finalized.

*Realizing the potential of inland waterways will be challenging*

4.69 **The current navigation conditions along the Sava river are difficult and need improvement for the mode to realize its potential, but there are many stakeholders.** The inland water transport sector in BH and the SEE region has been neglected too long. As a sector, both energy consumption and the emission of greenhouse gases per ton-kilometer are lower than for any other land-based mode of transport. The benefits are realizable for relatively modest investments, compared to required investments in the other modes.\(^81\) Water transport is safe, clean, eco-friendly and, if well organized, highly efficient. However, this potential, even to be partially realized, is entirely conditional on the different international, national, and private stakeholders agreeing and delineating responsibilities for the rehabilitation and the maintenance of the waterway.

4.70 **A parallel challenge is the development of the port infrastructure, while protecting the public interest.** The competitive position and the operational efficiency of the port infrastructure is to be improved to meet the expected cargo volumes once the

navigability of the waterway is returned. However, this needs to be done in a manner consistent with the public interest. Sadly, there have been examples within the region where the manner of private sector involvement precluded further consideration of the public interest, leading to little or no development.

**Private sector participation remains limited**

4.71 Attracting necessary private sector finance to the sector remains difficult. A recent study completed by the World Bank undertook some detailed analysis of the experience with private sector participation in the Central and Eastern Europe Region over the last ten years. The main lessons that emerged from this exercise is that any PPP scheme, in order to be successful, requires strong (material) government support and long lasting political will and engagement. At a more specific level, the following lessons, reproduced from the above study, also emerged:

- Highly complex transactions like development, bidding, negotiation, financing, construction and operation of a toll motorway concession project can be completed successfully only if and when the appropriate regulatory and legal framework is in place, the economic background is evaluated by the private sector as promising, and there is strong political will to achieve a deal;

- Under the prevailing conditions in the Central and East European countries, a substantial public sector contribution (up to 40-60% of total project cost) is needed, through the provision of existing assets as an in-kind contribution, equity participation, sovereign guarantees, subsidies, etc., to make motorway concession projects bankable under a PPP scheme;

- The amount and kind of this government contribution (presumably reimbursed completely, under an appropriate profit sharing scheme, within the concession period) would have to be determined and agreed upon during commercial negotiations carried out with the preferred bidder(s) and preferably with the participation of potential lenders;

- To mitigate conflict of interests (implied by the fact that, in most cases, road contractors are the main shareholders of motorway concession companies), negotiations aimed at formulating the main agreements attached to the concession contract (construction contract, operation and maintenance contract, independent engineer’s contract, insurance contracts, etc.) should be attended and supervised by representatives of potential lenders;

- The reluctance of private investors and lenders to accept commercial (traffic) risk exposure, means that financing structures with cash flow deficiency guarantees

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82 Cuttaree et al., (2009).

83 In the form of a concession with limited recourse financing.
(operational subsidy, shadow toll, availability fee/capacity charge) are preferred, especially in the initial years of the operation before traffic levels buildup and the commercial and financial risks are highest;

- A sound in-depth traffic and revenue study should be carried out by an independent consultant (selected with consent of and guided by potential lenders), and use of that study should be mandatory for preparing reliable financial plans, including governmental support mechanisms needed to make the toll motorway project bankable;

- If tolling is used, special attention should be paid to the potential loss of traffic on the motorways as a function of the toll rates, as high tolls and skewed value of time distribution for trucks may result in low capture rates by the motorway, heavy truck traffic on roads in the vicinity of the motorways, high damage of such roads, serious environmental nuisances, and public upheaval;

- Commercial contracts regulating the partnerships should be conceived in a manner that provides flexibility and appropriate time to find the right measures if ever a hardship or emergency situation arises; and

- Intervention based on political motivation instead of sound economic principles, or incongruent transport policies of subsequent governments, may prevent or seriously hamper private sector involvement into the motorway financing, construction and operation business.

4.72 In conclusion, the above points can be summarized to highlight the key prerequisites, whose absence would undermine the rationale for progressing with a PPP:

- A strong political will, an appropriate and stable regulatory and legal framework, and a stable macro-economic environment;

- The willingness of the public sector to provide the (substantial) public sector contribution (up to 40-60% of total project cost) through the provision of existing assets as an in kind contribution, equity participation, sovereign guarantees, subsidies, etc.;

- Sufficient traffic volumes to make it viable to the private sector. A new road is unlikely to be viable without a flow equal to, or exceeding, 15,000 vehicles per day, unless the respective national government offers an additional substantial subsidy to the concessionaire. By contrast, the rehabilitation of a road, particularly where there are no competing corridors, can be viable where the flow is just 6,500 vehicles per day; and

- A robust economic and financial appraisal of the project that asks, and endeavors to answer three questions: Is the project beneficial for society? Is it commercially viable for the potential concessionaire? and Is the required public sector contribution justified in terms of the additional benefits engendered by that contribution?
The World Bank, together with the Public-Private Infrastructure Advisory Service (PPIAF), has developed and recently updated the *Toolkit for Public-Private Partnership in Highways* (World Bank/PPIAF, 2008). This resource, when used appropriately, provides a reliable way of screening potential projects, in any transport sub-sector, as for private sector participation, prior to further detailed investigation.
5. OUTLINE STRATEGY AND ACTION PLAN

THE STRATEGIC OBJECTIVES

5.1 There is an explicit statement to guide the development of the transport sector in BH. The Medium-Term Development Strategy (MTDS) of BH asserts that the transport sector should contribute to the achievement of three broad objectives: (i) it should facilitate sustainable economic development; (ii) it should contribute to a reduction in poverty; and (iii) it should accelerate integration into the European Union (EU). The outline strategy in this section is presented within this broad framework and presents its recommendations under four sub-headings: a) improving the institutional framework for the sector; (b) improving the sustainability of the transport sector; c) facilitating broad based economic growth; and d) mitigating the social and environmental detriments associated with transport.

IMPROVING THE INSTITUTIONAL FRAMEWORK FOR THE SECTOR

Improving the legal framework

5.2 The legal framework for the road sector needs to be strengthened through the adoption of a state law on roads. A clarification of responsibilities in the sector, particularly respecting the development of the strategic road network, the SEETO Core network, and the Pan-European network and other cross-entity issues, and a clear mandate for the responsible institutions, with no ambiguities between different laws, would undoubtedly be of benefit to BH. The adoption of a state Law on Roads would be a key first step to addressing the ambiguity, reducing the confusion and improving conformity with the acquis. The new law, which should be in full compliance with regional requirements, needs to address the current weaknesses and remove the confusion in the sector. If there is a need for entity and BAD laws, they should be revised in accordance with the state law.

5.3 The development and adoption of a consistent framework for concessions is a prerequisite to attracting serious private sector participation. The four different concessions laws in BH—the state Concessions Law, the Federation Law on Concessions (currently in the process of being revised), the RS Law on Concessions, and the BAD Concessions Law—need to be harmonized and made consistent. This also applies to the applicable secondary legislation and the legislation at canton level. The development of a state level PPP unit to facilitate the development of private sector participation should also be considered.

5.4 Further work is required to harmonize the institutional framework internally and align with the requirements of the acquis communautaire. The remainder includes not only the majority of the secondary legislation, but also some of the primary legislation awaiting harmonization. In line with European policy, the main focus of attention in terms of road transport legislation will have to be on market access and social legislation. Substantial progress has been made in introducing the appropriate legislation to make (international) road transport conform to the requirements of the acquis.
5.5 **The respective responsibilities in BH’s IWT sector need to be clearly defined.** The confusion regarding the various responsibilities in the IWT sector of BAD, entities and state government, and their respective agencies needs to be clarified. An integral part of the clarification is the need to clarify the post-rehabilitation maintenance regime on the Sava river, as currently the risk is that responsibilities for navigation and maintenance will be atomized amongst the various stakeholder organizations, at all the different levels: entity, state, national, international. Ideally, maintenance would be contracted out along the entire waterway under one contract, coordinated by the ISRBC. This would realize the greatest efficiencies and economies of scale.

5.6 **The adoption of a state Law on Inland Water Transport would be a key first step to addressing the confusion and improving compliance with the acquis.** The new law, which should be in full compliance with FASRB and its protocols, needs to address the current weaknesses and remove the confusion in the sector. It should confirm the status of the Sava river, and define the mandate of the state Ministry of Communications and Transport. It should also ensure greater conformity with the relevant EU directives and the acquis, particularly with regard to the freedom of chartering and pricing, conditions on cabotage, rules for access to profession, boat master certificates, and technical and safety conditions. If there is a need for entity and BAD laws, they should be revised in accordance with the state law.

**A national transport strategy and action plan should be prepared**

5.7 **For the authorities, the starting point should be the setup of a sound sector policy and strategy.** An over-arching transport strategy with clear goals, incorporating both a development strategy and action plan is deemed to be of vital importance. This will help set priorities in the road sector, as determined by clear technical, economic and financial considerations. It will also enable the coordinated sequencing of interventions within the available funding constraints, and even determine the necessary changes in legislation, institutions, and financing to implement the plans for the development of the road sector, in a manner consistent with the development needs of BH as a whole.

5.8 **A comprehensive rural development strategy for BH would be a welcome complement.** A rural transport strategy that covers the management and financing of local road infrastructure, as well as the operation of transport services on these roads would help the municipalities greatly, providing them with guidance on the management of the assets. A coherent rural development strategy would be drawn from engaging all agencies and institutions with an interest in the local roads at the state, entity, canton, municipality, and local community level. In addition, this would include organizations dealing with agriculture, mining, tourism, transport and rural development. Formulation of the strategy should ideally engage all the donors as well as NGOs.

**The organizational structure of the road sector should be streamlined**

5.9 **Aggregation of managerial responsibilities will realize significant savings in the local road sector.** Most municipalities in BH do not have the capacity, nor the funds, to maintain the local roads they are responsible for. In theory, the situation could be addressed in four different ways: (i) the management of the local roads could be transferred to a higher
level of the administration (the cantons or the entity in the case of FBH, only the entity in the case of RS); (ii) the management could be delegated to a specialized implementation agency; (iii) the municipalities could join together through some form of Joint Service Committee (JSC) to administrate a larger network; and (iv) the management could be contracted out—although this latter option is probably a little early for BH at this time.

5.10 **JSCs are fairly common models in developed countries.** In most cases, the central government ministry remains in charge of the planning and coordinates the local roads. But it encourages the municipalities to come together (through use of financial incentives) to form Joint Services Committees, or cooperatives, to provide services for participating local agencies. Under this arrangement, resources are pooled and individual agencies are better able to plan and manage their affairs and therefore can let larger and more cost-effective contracts for procurement of goods and services. Services may extend to the provision of road maintenance, waste disposal and other services as the participating members deem appropriate. The group of local government agencies generally assigns the tasks of organizing procurement and supervising implementation to one of their members, or to a higher level of government, or to a local consultant.

5.11 **The aim is to allow the municipalities to reach a minimum capacity to administer services properly.** JSCs would be responsible for local road management. They could also manage additional services that currently fall under the responsibilities of the municipalities. Such services traditionally include landfill site management, refuse collection, water and sanitation, school commutes, etc. Because they would group municipalities and deal with several services, JSC’s would ensure a minimum technical capacity to manage the services on their territory efficiently.

5.12 **Such cooperation already exists in BH, although on a limited scale.** Some of the solid waste collection and limited investment to rehabilitate existing landfill sites are managed through cooperation of municipalities. Six multi-municipal waste management districts exist at present with very positive results in Sarajevo, Banja Luka, Zenica and Bijeljina. From this experience, it seems that inter-municipal boards could function very well and municipalities could cooperate smoothly with each other. One positive experience involving a JSCs already exists in BH with Sarajevo Canton. This region has created a JSC that manages waste collection and disposal, road maintenance, public parking management, and winter services with significant economies of scale, a better service and higher client satisfaction.

**The functional classification of the road network should be updated**

5.13 **The road network classification should shift to a classification by function in order to highlight the importance of the road for planning and design purposes.** The current road network classification is based on an administrative classification and a rather complex set of administrative layers.84 A functional road classification should become part of

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84 The need for a reclassification of the road network is even more important, as the latest reclassification was done in 1987, and since the Dayton Peace Agreement there have been important shifts in traffic flows, with some magistral roads losing their importance, and conversely, some regional roads gaining considerably in terms of traffic. A reclassification would require a new set of criteria to be defined and agreed upon.
the state Law on Roads. It would provide the ground for funding allocation mechanisms. This new classification would also foster consensus among the state and the entities about adjustment in the responsibility matrix. The new classification would provide the mechanism for a more logical and financially sustainable approach in terms of assistance from the international community for financing network enhancements.

5.14 The functional classification review process should be accompanied where necessary by strengthening of the legal framework to ensure that any future changes to the classification of roads are clear and adhered to. The laws should be explicit in referring to the criteria for each class of road—main, secondary and local—and in describing the procedures under which transfer from one class to another or designation for new roads occurs. Responsible agencies for each class of road should also be mentioned, including clear chains of command, responsibility and funding. Any changes to the road network, at any level, would need to be clearly reflected in the ownership record.

5.15 The road network classification should shift to a classification by function in order to highlight the importance of the road for planning and design purposes. The current road network classification is based on an administrative classification and a rather complex set of administrative layers. A functional road classification should become part of the state Law on Roads. It would provide the ground for finance allocation mechanisms. This new classification would also foster consensus among the state and the entities about adjustment in the responsibility matrix. The new classification would provide the mechanism for a more logical and financially sustainable approach in terms of assistance from the international community for financing network enhancements.

5.16 The most dramatic adjustment would probably be the reduction of the total length of the regional and local road network. It is expected that approximately one-third of this network would be downgraded to local road status. As for the magistral road network, the provisional expectation would be that it would increase by approximately fifteen percent, linking primary centers, administrative centers and main border centers, including the SEETO core network and the motorway projects. Similarly the regional road network would be expected to reduce by one third to about 3,000 km (about 1,600 kms being transferred to local roads), and a significant proportion of the current local road network would be de-classified. However, these numbers are preliminary approximations, and a detailed review would be necessary to determine the final reallocation among the different road classes.

5.17 After the reclassification, the role of the various ministries involved would need to be adjusted to the functional classification. The state MOCT would assume the responsibility for strategic planning of the international routes (850 km). This would build on the existing regulation whereby MOCT is already the BH delegate for matters related to the SEETO network. However MOCT will not be able to carry on with strategic planning unless (i) consensus with the entities is reached, (ii) a road master plan is adopted together

85 The need for a reclassification of the road network is even more important, as the latest reclassification was done in 1987, and since the Dayton Peace Agreement there have been important shifts in traffic flows, with some main roads losing their importance, and conversely, some regional roads gaining considerably in terms of traffic. A reclassification would require a new set of criteria to be defined and agreed upon.
with the functional road classification scheme; and (c) the state Law on Roads is adopted. MOCT will still have no implementation responsibility—those will remain at the entity level. The entity MTCs would be in charge of the strategic planning on the rest of the magistral (primary) network, and on all the regional (secondary) roads. Here again, the entity MTCs will not be able to perform unless the road master plan and the proposed functional road classification scheme are adopted together with the state Law on Roads. Motorway companies in both entities would assume responsibility for motorway implementation, and FBHRD and RSR will implement all the other activities both on the magistral and regional road network in their respective entities.

**Design standards for local roads should be developed**

5.18 **Local road design standards should be developed to reflect the context and available resources.** Standards are an economic choice and therefore given the low level of traffic on most local roads, and the continual scarcity of funds for maintenance, the emphasis should be on the use of technical standards that are appropriate to the context and low cost. There is a need to design and maintain local roads in relation to specific levels of serviceability in terms of access for vehicles or in providing what are known as “all-weather roads”. Options should be evaluated for design standards which offer substantial accessibility benefits while lowering construction costs and ensuring that the future maintenance burden can be minimized. The prime considerations for the rural roads should remain reliability and durability rather than considerations for width and speed. Drainage provision is also an important element in ensuring the durability of the road asset and in helping to sustain the maintenance efforts.

**IMPROVING THE SUSTAINABILITY OF THE SECTOR**

*Improving cost recovery in the sector*

5.19 A constant refrain in a number of studies\(^86\) in the region is that cost recovery from some road users is presently too low. The levels of diesel fuel tax and registration fees, particularly for larger, heavier commercial vehicles, do not currently cover the social costs of use, including the damage caused by the vehicle to the road itself. Since heavy goods vehicles cause significantly greater damage to the road pavement than other vehicle types, the recommendation to increase road user charges for these vehicles would seem justified. A clear study would however need to be undertaken prior to such a move to ensure that this does not compromise the competitive position of Bosnia and Herzegovina as a potential transit country for traffic. It would also be advisable to have an analysis of the cost recovery proportions from the various vehicle types weighed against a calculation of the damage costs inflicted by those vehicles, to get a sounder basis for decision making. This study should include consideration of the current enforcement regime.

*Place greater emphasis on maintaining the assets*

5.20 **The Government ought to make the maintenance of the existing assets the main priority.** At present, road maintenance can already be fully supported from existing funding

\(^86\) Cowi (2003).
sources, if all the road-related revenues were to be redirected to the sector. The first and foremost goal regarding the magistral and regional road network is to ensure an adequate level of routine, winter, and periodic road maintenance. All maintenance should be supported via domestic funding sources to ensure sustainability. This policy is already successfully implemented by both entities for routine and winter maintenance.

5.21 New approaches/methods to maintenance should be piloted to improve efficiency and quality. Output and performance-based maintenance contracts for routine and winter maintenance were due to be started in 2008 under the World Bank financed Road Infrastructure and Safety Project, but unfortunately despite the potential benefits, as realized in other countries in the region, there has been little progress in the introduction of these techniques, even on a pilot basis, at this time. Other approaches like the use of surface treatment/surface dressing can be utilized, particularly for regional roads, to extend the life of the road at lower cost.

Strengthen the financing of the road sector

5.22 Based on the current financing scheme, no funds are available for network enhancement on any of the road network. A higher fuel road tax is required to support network enhancements via domestic funding. Possible options in this regard include:

Option 1. 100 percent of the accrued BAM 0.25 per liter tax revenue plus vehicle registration fees to be fully allocated to the magistral, regional and local road networks to fund recurrent maintenance needs. This option would allow the financing of all maintenance from domestic resources. However, no domestic funding would be available for road enhancements other than via approaches used in the past (special budget allocations) or an increased reliance on borrowing. A staged increase to BAM 0.30 per liter would result in additional revenues for capital expenditures on the network. This option would remove the current earmarking of the BAM 0.10 per liter for motorways, removing the double taxation of motorway users, and also prevent the cross-subsidy from all road users to motorways users. The respective shares would be BAM 0.16 per liter for magistral and regional roads, and BAM 0.9 per liter for local roads, significantly improving poverty alleviation and improved access in the rural areas.

Option 2. Immediate increase of the fuel tax to BAM 0.35 per liter with the breakdown of BAM 0.10 per liter for motorways, BAM 0.16 for magistral and regional roads, and BAM 0.09 for local roads. The available total revenue is estimated to double from this approach. With reasonable assumptions about economic growth, year 2020 income has been estimated at about BAM 900 million, allowing the financing of all maintenance (BAM 480 million), motorway construction (BAM 210 million) and upgrading of non-motorway roads (BAM 210 million). This option would not address the current double taxation of motorway users, nor prevent the cross-subsidy from all road users to motorways users. By 2020 this option would be expected to contribute significantly to the development of the BH road network.
Option 3. Immediate increase of the fuel tax to BAM 0.40 per liter (approximately 2/3 to the EU accession directive) with the breakdown of BAM 0.12 for motorways, BAM 0.18 for magistral and regional roads, and BAM 0.10 for local roads. This option would not address the current double taxation of motorway users, nor prevent the cross-subsidy from all road users to motorways users. However, global revenue for motorways would reach a cumulative total of BAM 1,872 million by year 2020 and BAM 1,400 million for magistral (primary) and regional (secondary) roads, allowing for slightly more motorway sections and magistral (primary) road upgrades to be implemented by 2020 (compared to option 2).

Option 4. Increasing the total fuel road tax to a BAM 0.65 per liter as per EU accession directive with identical relative stratification per road type. Under this option, the funds available for road work would vastly increase. However, this level of fuel tax is considered socially and economically inappropriate for Bosnia and Herzegovina at this time. The global revenue for motorways would reach a cumulative total of some 3,725 million BAM by year 2020, and a cumulative BAM 3,880 million would be available for of magistral (primary) and regional (secondary) road by the same year. It is worth noticing that even under this rather optimistic scenario (in term of financing), the funds would still remain less than required for funding the full network as currently envisioned.

5.23 However any increase in the road tax should be gradual to ensure acceptability and affordability. It is recommended that the government implement the increase in fuel tax in a staged manner, with the goal of reach EU accession requirements at some future date. Option 2 is the recommended option at this time, for four main reasons: (i) it reflects recent domestic efforts to review the fuel tax and is considered affordable and acceptable at this time; (ii) it provides increased revenues for the entire road network, while still allowing funds for the implementation of a priority program for network upgrading and motorway construction; and (iii) it also provides an increase in the revenues available for local roads, thereby improving poverty alleviation and improved access in the rural areas.

5.24 Increased revenues to the sector need to be carefully considered against the fiscal resources available to the authorities and the demands in other sectors, and should only represent part of the measures necessary. In addition, a prerequisite to an increased allocation from the budget, either directly, or via an increase in the proportion of fuel tax should be a demand to improve the efficiency and effectiveness of all expenditures in the sector, at each level of the network. As a first step, and in conjunction with more substantive reform in the sector, the following measures would appear to be necessary on the magistral and regional road network:

- Strengthen the planning, prioritization and design stage of all proposed work;
- Re-establish and utilize a professional asset management system in the sector;
- Reduce duplication of responsibilities and consolidate the management of the regional road network in the Federation;
- Strengthen the supervision of work projects in the sector; and
• Maximize the use of new technologies, or new approaches, to reduce costs and improve efficiencies in the sector—such as output and performance-based maintenance, surface dressing, and electronic toll collection.

**Improve the operational performance of the road sector**

5.25 As good practice, there should be an up-to-date road inventory that covers all the classes of roads under the agency’s control. The inventories should include details on the surface type, condition, drainage structures and usage (volume and type of traffic) on individual roads. It is important to standardize the road inventory and keep it as simple as possible to avoid incurring extra costs on collecting large pieces of information that may not be useful. The second step is to use the road inventory to review and update the functional classification system. The functional classification review process should be accompanied where necessary by strengthening of the legal framework. The laws should be explicit in referring to the criteria for each class of road—main, secondary and local—and in describing the procedures under which transfer from one class to another or designation for new roads occurs. Responsible agencies for each class of road should also be mentioned, including clear chains of command, responsibility and funding. Any changes to the road network, at any level, would need to be clearly reflected in the ownership record.

5.26 The established asset management system should be maintained and updated. Essential data such as traffic counts should be collected continuously. Pavement condition should be monitored on a rolling basis and the revolving functional importance of different roads in the network e.g., populations served, villages accessing road etc., monitored to aid network wide maintenance priorities. This Asset Management System should support the preparation of both annual and multi-annual plans for maintenance, rehabilitation and reconstruction of the road network, taking into account the condition, function, available funding and prioritization. The use of economic decision models like the Highway Design and Management model (HDM-4) model would be instrumental in assisting effective prioritization processes.

5.27 Good management practices also require increased accountability. This is not just in terms of accounting for money received and showing how this has been spent. It includes the whole process of being accountable to the road users and stakeholders. This is ideally achieved in a best practice agency through:

• Strong financial management systems and auditing processes;
• Assessing needs of road users through user satisfaction surveys;
• Assessing performance of the agency against predetermined performance criteria; and
• Preparing annual agency reports to include results of all the above elements.
**Improve the operational and financial performance of the railways**

5.28 **In the short term**

- *Establish accounting to support profit centers.* A critical step to implementing profit centers is to develop accounting information and analytical tools that provide information on a profit center basis;

- *Measure performance and provide incentives to staff.* The railway’s board of directors should set goals for railway management, which in turn should set corresponding goals for staff that reflect the policy goals for the railway. These goals should include a combination of financial, safety, environmental and service quality/quantity measures.

- *Institute marketing and service design.* The BH railways would benefit significantly from efforts to increase traffic. With marketing and service design, the railway seeks information about actual and potential customers to provide services that better meet the customers’ needs;

- *Improve governance.* In BH, national governments are the owners of railway stock and exercise supervisory control through boards of directors. This role should be used to encourage railway management to take up the strategy issues discussed above, which are within the railway’s control: commercial management, boosting productivity, and integrating railway services;

5.29 **In the medium-term**

- *Scrap excess rolling stock.* Each railway should review and identify the non-functional rolling stock that could be cleared from its inventory and scrapped;

- *Implement staff reduction plan.* The two railways should implement the staff reduction plan in the medium term to improve the financial and operating performance of the railways;

- *Reduce unprofitable lines.* The procedures for closing unprofitable lines and services, where service specific subsidy is not forthcoming, should be started to close the line/service;

- *Privatize non-core activities.* The railways should shed all non-core activities and focus on their core activities;

- *Close unviable stations.* A similar process should be followed for all unviable stations on the network; and

- *Formalize the line of business separation for freight and passenger services.* Commercial railways organize themselves in lines of business or profit centers,
which focus on groups of customers external to the railway\textsuperscript{87} whose traffic has shared characteristics which cause it to benefit from being managed together. At a minimum, the railways should separate freight and passenger lines of business.

**CONTRIBUTING TO BROAD BASED ECONOMIC GROWTH**

*The development of the motorway network needs to be considered carefully*

5.30 **The governments consider the motorway/expressway program to be the highest priority.** The development of motorways/expressways crossing the country is a national priority agreed upon by all parties, and the authorities have begun to implement and open key sections on Corridor Vc, and the Banja Luka-Gradiska links. Both entity ministries have established motorway/highway companies to develop and manage nascent motorway network within their respective domains based on respective entity road laws.

5.31 **However a clear message from this study is that, in future, road enhancements within BH must proceed along a broader strategy than “only build motorways.”** It is also important to note that motorways can generate their own problems; for example, some parallel links and feeder roads, such as between Sarajevo and Zenica, are unlikely to be able to fully accommodate the (relatively) high volume of traffic to/from the motorway.

5.32 **There is an additional disadvantage to the motorway scenario—the high cost of implementation.** Some sections of Corridor Vc are estimated to cost up to BAM 38 million (US$28 million) per kilometer. Although the motorway network is a priority, affordability and viability are key issues, and many of the same benefits can be realized by more affordable solutions, for example, building expressways with a lower design speed and less stringent geometric characteristics. A clear and transparent sequencing, both transverse and horizontal, of the construction of any further sections of motorway, based on a robust assessment of the financial, economic, technical, social and environmental considerations, is essential.

*There is a need for upgrades to the magistral and regional road networks*

5.33 **The screening of priority projects identified during the study results in twenty-five priority projects which should be subjected to further due diligence as part of the project cycle.** The strategic economic assessment undertaken in this study has indentified the twenty-five projects which are assessed to be the most beneficial in economic terms, and the most necessary, over the next twenty years. However, the screening process does not imply that these projects should not be built, merely that in a constrained environment, these do not appear to be priorities at this time, on the basis of the strategic economic assessment. It is important to reiterate that the estimated economic criteria only reflect the direct benefits from vehicle operating cost savings and vehicle time savings, and exclude accident cost savings and maintenance savings, and other indirect benefits, which may exist for potential project sponsors and which can justify expenditure of funds from available local sources. The essential next step involves starting the necessary preparatory work, where this is lacking, the pre-feasibility and feasibility studies, together with the requisite environmental and social

\textsuperscript{87} The profit center must have external customers. If the customers are all internal to the railways (e.g., the locomotive department), it is a cost center, not a profit center.
studies, and the detailed designs. Even this sub-set will require a total capital investment of some BAM 5.5 billion (US$4 billion) or nearly twenty-five (25) percent of 2007 GDP, and further prioritization and realistic scheduling will be essential.

Table 19. Priority road projects in the 2020 “intermediate” scenario based on economic performance

<table>
<thead>
<tr>
<th>Designation</th>
<th>Improvement</th>
<th>Name</th>
<th>NPV (mill BAM)</th>
<th>EIRR</th>
<th>B/C Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corridor Vc</td>
<td>4L Motorway</td>
<td>Sava-Doboj</td>
<td>175.0</td>
<td>17.0</td>
<td>1.55</td>
</tr>
<tr>
<td>Corridor Vc</td>
<td>4L Motorway</td>
<td>Doboj-Zenica</td>
<td>280.1</td>
<td>15.9</td>
<td>1.43</td>
</tr>
<tr>
<td>Corridor Vc</td>
<td>4L Motorway</td>
<td>Zenica-Kakanj</td>
<td>112.7</td>
<td>17.0</td>
<td>1.55</td>
</tr>
<tr>
<td>M-14</td>
<td>2L Main</td>
<td>Bihac-Bos. Krupa</td>
<td>38.1</td>
<td>24.4</td>
<td>2.40</td>
</tr>
<tr>
<td>M-15</td>
<td>2L Main</td>
<td>Kljuk-Sanski Most</td>
<td>4.3</td>
<td>17.3</td>
<td>1.39</td>
</tr>
<tr>
<td>M-18</td>
<td>2L Main</td>
<td>Tmovo-Dobro Polje</td>
<td>0.8</td>
<td>13.3</td>
<td>1.11</td>
</tr>
<tr>
<td>M-18</td>
<td>2L Main</td>
<td>Sarajevo-Tuzla</td>
<td>257.3</td>
<td>26.0</td>
<td>2.75</td>
</tr>
<tr>
<td>M-4</td>
<td>4L Xway/2L Main</td>
<td>Doboj-Tuzla</td>
<td>328.1</td>
<td>33.4</td>
<td>4.11</td>
</tr>
<tr>
<td>M-4,2</td>
<td>2L Main</td>
<td>Srbijani-V. Kladusa</td>
<td>64.6</td>
<td>52.1</td>
<td>5.07</td>
</tr>
<tr>
<td>New</td>
<td>4L Expressway</td>
<td>Lashva-D. Vakuj</td>
<td>2120.4</td>
<td>60.9</td>
<td>11.14</td>
</tr>
<tr>
<td>M-6/15</td>
<td>2L Main</td>
<td>Mostar-Posuje</td>
<td>199.6</td>
<td>54.9</td>
<td>7.41</td>
</tr>
<tr>
<td>M-5</td>
<td>2L Main</td>
<td>Renovica-Mesici</td>
<td>12.2</td>
<td>14.4</td>
<td>1.24</td>
</tr>
<tr>
<td>New</td>
<td>4L Motorway</td>
<td>Banja-Luka – Doboj</td>
<td>368.9</td>
<td>17.1</td>
<td>1.58</td>
</tr>
<tr>
<td>M-1.8</td>
<td>2L Main</td>
<td>Leptica-Blazevac</td>
<td>40.4</td>
<td>39.2</td>
<td>4.52</td>
</tr>
<tr>
<td>M-14.1</td>
<td>2L Main</td>
<td>Loncari-Bijeljina</td>
<td>268.4</td>
<td>75.0</td>
<td>11.10</td>
</tr>
<tr>
<td>M-14/19</td>
<td>2L Main</td>
<td>Bijeljina-Znornik</td>
<td>134.6</td>
<td>37.8</td>
<td>4.69</td>
</tr>
<tr>
<td>M-16</td>
<td>2L Main</td>
<td>Karanovac-C.Rijeka</td>
<td>24.0</td>
<td>15.7</td>
<td>1.38</td>
</tr>
<tr>
<td>M-18</td>
<td>2L Main</td>
<td>Raca-Bijeljina-Tuzla</td>
<td>73.6</td>
<td>26.8</td>
<td>2.61</td>
</tr>
<tr>
<td>M-20/5</td>
<td>2L Main</td>
<td>Gorazde-Visegrad</td>
<td>17.3</td>
<td>15.4</td>
<td>1.33</td>
</tr>
<tr>
<td>M-4/16</td>
<td>2L Main</td>
<td>Prijedor-Karanovac</td>
<td>148.3</td>
<td>34.8</td>
<td>4.15</td>
</tr>
<tr>
<td>M-5</td>
<td>2L Main</td>
<td>Sarajevo-Pale</td>
<td>16.3</td>
<td>23.1</td>
<td>2.27</td>
</tr>
<tr>
<td>M-6</td>
<td>2L Main</td>
<td>Stolac-Ljubinje</td>
<td>4.2</td>
<td>15.6</td>
<td>1.34</td>
</tr>
<tr>
<td>R-405</td>
<td>2L Regional</td>
<td>Bronzani-Sanski Most</td>
<td>14.9</td>
<td>19.9</td>
<td>1.82</td>
</tr>
<tr>
<td>R-413</td>
<td>2L Regional</td>
<td>Knezevo-Turbe</td>
<td>0.9</td>
<td>12.5</td>
<td>1.05</td>
</tr>
<tr>
<td>R-474</td>
<td>2L Regional</td>
<td>Srbac-Ukrina</td>
<td>6.6</td>
<td>16.7</td>
<td>1.46</td>
</tr>
</tbody>
</table>


**Private sector participation is essential**

5.34 Greater involvement of the private sector would bring real benefits. Commercialization and risk sharing should be used to overcome inefficiencies in the sector. Involvement of the private sector in financing and constructing infrastructure and providing transport services could bring benefits such as the reduction in user costs, more rapid completions, additional choices offered to users, avoidance of monopolies, and more efficient ways of payment (performance-based contracts). The private sector may also foster the adoption of cost-recovery principles via greater commercialization of infrastructure and better management.

5.35 A recent report published by the World Bank provided some sensible conclusions for countries with limited experience in PPPs like Bosnia and Herzegovina.
The recommendations made by the report\textsuperscript{88} include the following (i) introduce the prospect of developing PPPs as part of a broader public sector reform, thereby reducing the perceived risks for potential investors; (ii) modernize the legal code for public finances and commercial transactions to reflect the legal requirements for a PPP; (iii) define the potential role of PPPs, or prospective PPPs, with the long term strategy for the sector, or the country; (iv) ensure that all potential institutional impediments are addressed in advance of the development of a PPP, as ad hoc reforms at a later stage, or worse during negotiations, can cause serious project delays and undermine the government’s reliability as a counterparty to the private sector.

5.36 **Identify, and mitigate as far as possible, all prevailing country risks.** Given that most of the countries of the former Yugoslavia have a non-investment grade credit rating, they are still considered as highly risky locations for investment. Many investors shun non-investment grade political environments unless the prevailing country risks are mitigated. International financial institutions can help in this regard through their risk guarantee and political risk insurance mechanisms. Alternatively, the government may have to provide considerable subsidies during the preparation and implementation of a PPP project to entice private sector involvement.

**Necessary investment in the railway sector**

5.37 **Priority should be given to improving the quality of service rather than raising line speeds.** The proposed investments (summarized in Table 20) prioritize projects to rehabilitate track on the key lines to meet the 22.5 ton axle load, as required by the TER standards, improving signaling, and upgrading line speeds to 120 km per hr.

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost (BAM Mill)</th>
<th>Period</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completing rehabilitation of southern section of Corridor Vc between Sarajevo and Gabela (Croatian border) Total length covered by the project is 73 km (100 km of the 173 km long line is covered by the EBRD- EIB loan).</td>
<td>76.2</td>
<td>Short - Medium term.</td>
<td>The line is completely electrified and connects to the line Metković - Ploče in Croatia. The rehabilitation of the section Čelebić – Mostar – Čapljina – Croatian border is part of the EIB-EBRD plan. The section Bradina – Konjic, part of this proposal, has a very complex set of tunnels and turns over a 25 km distance.</td>
</tr>
<tr>
<td>Completing rehabilitation of northern section of Corridor Vc between Samac and Sarajevo. Total length covered by the project is 235 km.</td>
<td>245.6</td>
<td>Medium – Long term.</td>
<td>The medium term requirements to implement the project includes completing the feasibility and technical studies and determining the further funding needs on the basis of the available EBRD- EIB loans. The project focuses the sections not covered prior by EBRD-EIB or other investments.</td>
</tr>
<tr>
<td>Completing Rehabilitation of Sections Novi Grad – Doboj and Doboj – Tuzla (Line parallel to Corridor X). Total length covered by the project is 190 km: 125 km (section 1) + 65 km (section 2).</td>
<td>198.6</td>
<td>Medium – Long term.</td>
<td>The medium term requirements to implement the project includes completing the feasibility and technical studies and determine further funding arrangements on the basis of the available EBRD-EIB loans. The project focuses the sections not covered by the EBRD-EIB investment.</td>
</tr>
<tr>
<td>Rehabilitation and electrification of the railway line Brcko – Tuzla. Total length covered by the project is 75 km.</td>
<td>78.4</td>
<td>Long term.</td>
<td>With the expected growth of river transport via Brcko port, Improved railway interconnectivity linking the port with the BiH railway network and Corridor Vc will create opportunities for intermodal transport linking river and railway.</td>
</tr>
</tbody>
</table>


\textsuperscript{88} Cuteree et al, (2009).
Urban transport—safe, clean and affordable

Sarajevo

5.38 Institutional arrangements for Sarajevo are particularly important. The FBH government, the Sarajevo Canton, several municipalities, and the city of Sarajevo have, or potentially could have, a role in urban transport within the metropolitan area. Currently there is a proposal for the Sarajevo Canton to relinquish control of the regional road system and lesser roads as well, with the former being transferred to the FBH Ministry of Transport and the latter to each of the municipalities within the Sarajevo Canton. This proposal, which would limit canton responsibility to 200 km—only the primary city network—was submitted for consideration in September 2009. Should this devolution occur, the canton would in effect have to relinquish responsibility for associated traffic management measures on the street and road system within the city.

5.39 The proposed devolution of responsibility for urban transport away from the canton poses concerns. Until today, Sarajevo Canton has acted as the principal entity in charge of urban transport in the Sarajevo metropolitan area. The metropolitan region is comprised of four municipalities that comprise the city of Sarajevo (Stari Grad, Centar, Novo Sarajevo, and Novi Grad). In addition, the municipalities of Llidza and Vogosca are in effect suburban areas of metropolitan Sarajevo and are likely to absorb a high percentage of total metropolitan area population growth. These six municipalities are not well staffed and equipped to handle to maintain the road system, much less complex urban transport problems. Perhaps more importantly, they do not have sufficient geographic coverage to address metropolitan transport problems that transcend their limited municipal boundaries. Similarly, the city of Sarajevo, whose parliament is comprised of representatives of the four constituent municipalities, has very limited authority to address urban transport needs and issues.

5.40 The most logical alternatives for urban transport governance within metropolitan Sarajevo appear to be: either retention of this function at the Sarajevo canton level or, alternatively, to devolve some urban transport responsibilities to a metropolitan transport authority. The possibility of creating such an authority merits serious study given the following considerations:

- The Sarajevo metropolitan area extends across different municipalities and even beyond FBH boundaries into RS (especially east of the airport);
- All units of government within the metropolitan area would be involved in making key transport decisions by virtue of being represented on the board of the authority; and

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89 Municipalities are now receiving a larger share of the fuel tax than before, and the new categorization would shift responsibility for roads to the wealthier municipalities. In 2006, the allocation of fuel tax to FBH was reduced from 4.9 percent of total FBH revenues to 3.9 percent, with the difference being given to municipalities.
• The weak capacity of individual municipalities both on technical and financial grounds render them incapable of effectively running urban transport matters.

5.41 **The functions of the authority could include:**

• Preparing and updating the urban transport plan for the metropolitan region (Some of this work could be contracted out under the direction of the authority);
• Preparing capital investment budgets for passenger transport and for major road investments. (This is an especially crucial function as needs for urban transport investments far outstrip available funds);
• Planning public transport service network and transit system integration;
• Contracting for passenger transport services with the public sector operator (GRAS); and
• Regulating and contracting for services by private sector bus operators.

5.42 **The authority would not have an operational role, leaving this to operational entities (including GRAS and the private sector operators).** Its primary functions would be to assist in setting urban transport investment priorities according to a rational transport plan, establishing inter-modal transport coordination and integration within the metropolitan region, and contracting for and regulating passenger transport services. It is also considered necessary that the authority take the lead in pushing for more commercial initiatives from operators including more efficient fare ticketing systems, public transport information dissemination and central management and control of services.

5.43 **The authority would need to report to a high level Metropolitan Sarajevo Board.** This board could consist of representatives of FBH, Sarajevo Canton, Sarajevo city, local municipalities, and other key stakeholders that would meet periodically to review and endorse proposals made by the transport authority staff.

5.44 **Institutional strengthening of GRAS would also be very important, especially the definition and implementation of restructuring proposals on a staged and progress-sensitive basis.** This includes possibilities for privatization of some or all assets including route concessions for bus and minibus services. Possible stratification of GRAS into 12 profit centers has been recommended in the past as follows:

• Tram operations;
• Trolleybus operations;
• Energy and power;
• Bus operations;
• Minibus operations;
• Maintenance and overhaul;
• Ancillary services;

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90 UK assisted study recommendations from *Projektat Restruktuiranja, Kantonalnog Javnog Komunalnog Preduzeća GRAS Sarajevo* by PPERP/IMC Consulting, IPSA Sarajevo, June 2004.
• Technical and administrative management;
• Logistics management and procedures;
• Technical standards and EU accession requirements;
• Traffic management and control; and
• Ticketing, revenue and finance.

5.45  In line with best practice in many cities, it is important to separate transport operations from planning and regulation. While GRAS is the logical entity to retain responsibility for providing electric transport services (tram and trolley bus), the emergence of private sector operators in Sarajevo and other cities of the BH suggests that there is a greater role for the private sector in providing bus services within Sarajevo. This being the case, it will be appropriate for GRAS to concentrate on the efficient provision of electric transport services, leaving the planning and regulation of passenger transport services to a separate body, preferably either a separate metropolitan level transport authority or a separate unit within the Sarajevo cantonal government.

5.46  Commensurate with the emergence of the private sector in the provision of bus services, it will be important to establish better mechanisms to improve these services. Experience in other cities suggests that this can be done through carefully developed route structure planning combined with enhanced competition among operators for exclusive provision of services “on the route” or within prescribed districts of the city. Longer term concessions and possibly modest subsidies may be required to secure higher quality service than is currently provided.

5.47  The discount policies should be reviewed to ascertain whether they are meeting their objectives. There are extensive options for discounted tickets to travel on the GRAS system, and as a result a considerable proportion of passengers travel on one form of discounted ticket or another. As the subsidy provided by Sarajevo canton falls short of the full cost incurred by each journey, GRAS is essentially subsidizing each passenger on a discount ticket. In light of the affordability of these schemes, it would be appear appropriate to review the current range and scope of the discount schemes, and ascertain whether improved targeting would realize the objectives at lower cost.

5.48  The fare levels and financing of GRAS needs to be reviewed. GRAS is currently operating at a loss, reflecting the fact that the fare structure of tickets and passes is infrequently adjusted and because GRAS does not receive full compensation from Sarajevo canton for the sale of discounted tickets and passes. An explicit subsidy for passenger services provided at a discount would eliminate the subsidy that GRAS currently provides and raise the level of revenue for improvements in services.

5.49  There is a need to establish an improved system to address fare evasion, including possibly a smart card system plus better information and sensitization campaigns. In 1999, a new electronic system was introduced in the trams, for the use of magnetic tickets for one, two, and five rides only. Recently, GRAS has submitted to the cantonal government a proposal for introducing smart cards for trolley buses, buses and mini-buses, with a provisional cost estimate of BAM 2.5 million (US$1.89 million).
Public transport improvements

5.50 Given the narrow valley in which Sarajevo is located, and the relatively high population density, development of a high grade public transport system deserves highest priority. This program would entail the modernization of the dilapidated elements of the tram and trolleybus systems. Elements of improvement could include: improvement of tram tracks and catenary systems, rehabilitation of tram and bus stock, rehabilitation of stations and implementation of a central management and control center. Upgrading the existing tram service over time into a higher quality light rail transit (LRT) system with better speed and comfort is an important consideration. Beyond this core improvement, continued upgrading of the bus and trolley bus passenger transport system both as a feeder to the tram system, and as line haul service, will also continue to be important. Other improvements like enhanced access for persons with disabilities and tram signal priority treatments at key at-grade intersections are also worthy of consideration.

5.51 At present, there is limited access to information on public transport services. A key element to the success of any public transport system is the ready and efficient provision of information to the public. This provides users with clear choices and alternatives for travel and removes the stress and anxiety in deciding travel plans. Information provision is also important in engendering efficient adherence to timetables, reducing waiting times at stops and increased confidence in the reliability in public transport services. Measures in this direction could include: preparation of leaflets with bus route and timetable on each bus, providing timetables at stops, internet timetables, preparation of city public transport maps including all modes available, and distributing at stations. In the longer term, improvements could go as far as providing real time public transport information at bus/tram stops showing when the next bus/tram is due.

5.52 For more efficient transport and land use planning, public transport studies are necessary for Sarajevo to address the following issues:

- Building a transport model for Sarajevo based on an established existing operational and demand profile (from passenger trip origin and destination surveys);
- Developing a financial plan that balances the estimated costs with projected revenues, including considerations for setting the appropriate fare pricing structures;
- Performing feasibility reviews (operational, economic and financial) for public transport enhancement options;
- Formulating development plans that will guide the operational and financing strategy in the medium to long term (2010-2015; 2015-2020).

Traffic signal system upgrade

5.53 The most cost effective short term improvement to traffic and transport conditions in Sarajevo is perhaps through improvements to the traffic signal system. The cost of improving this system would be relatively low and improvements in traffic flow would be immediate. Moreover, an improved traffic signal system could be used to improve public transport operations, by affordng priority treatment to tram services at intersections.
Parking program

The need for a comprehensive parking policy and program is particularly important in Sarajevo. The lack of adequate parking spaces in the city is serious from several standpoints as both residential and commercial parking spaces are in short supply. Moreover a comprehensive parking policy is needed as a means for addressing traffic problems. It will be important to establish parking charges in the central area of the city that discourage all day parking by employees and to encourage them to take public transport as an alternative. Conversely, it will be helpful to encourage parking turnover in commercial areas to assist businesses. Park and ride facilities at outlying locations on the public transport system are another consideration. The city should also actively seek private sector investment in off street parking facilities by charging high enough on-street parking fees (and enforcing illegal parking) to create an improved basis for private investment.

Improvements to the arterial road system

While more emphasis is recommended on improving the public transport system, improvements to the arterial road system are also important. The Sarajevo Canton Roads Directorate has prepared a road plan that if adequately funded should assist in strengthening the overall road network in the city which is heavily reliant on the Zmaja od Bosne road corridor running down the center of the valley. The proposed road network improvements should help to balance east-west travel volumes.

The need for an urban transport master plan and investment program is clear

Given the serious urban transport problems in Sarajevo, it is strongly recommended that a comprehensive urban transport master plan be prepared. At present, an urban transport plan has been drafted, and if adopted it will replace existing regulations and will define new city public transport lines. However, plans focus on individual sectors, but there is no coherent integrated urban transport plan currently under preparation in Sarajevo Canton. Despite the urban transport plan, the need for a master plan remains and it can be structured to investigate the urban transport problems in Sarajevo in greater depth, quantify the same, suggest appropriate remedial measures and stipulate how the programs of interventions are to be carried out in the short to medium term (0-5 and 5-10 year timeframes). Failure to address and plan for these problems will be costly in the long run. While development of an agreed upon plan is important, equally important will be the development of realistic 5 and 10 year capital improvement plans covering all candidate urban transport investments. These time based investment programs should be updated on a yearly basis to reflect current transport priorities within available budget resources.
Banja Luka

5.57 Banja Luka appears to have only modest transport problems compared to Sarajevo. It currently appears to be well on the way to adequately addressing outstanding issues. The most pressing issues appear to be what to do to improve the quality and sustainability of passenger transport services within the city, and how to improve services to suburban areas and nearby communities.

5.58 A traffic signal program including signalization of additional intersections and upgrading the existing system would be a cost-effective solution. This would provide coordinated traffic signal control and also include possibilities for multiple timing plans all in a bid to ensure the smoother movement of traffic.

5.59 An urban transport master plan for Banja Luka is recommended to: (i) follow up on the recent studies on options for public transport investments; (ii) review and address the other pertinent urban transport issues; and (iii) stipulate how the investment programs of interventions are to be carried out in the short to medium term (0-5 and 5-10 year timeframes), discussing issues of financing and feasibility.

5.60 The following immediate actions in the urban transport sector are recommended. These are considered to be of substantive benefit, and would lay the ground for more concrete and appropriately targeted actions (see Table 21).

Table 21. Proposed action plan for urban transport for 2010-2015

<table>
<thead>
<tr>
<th>Urban Area</th>
<th>Issues</th>
<th>Proposed immediate actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarajevo</td>
<td>Complex governmental structure</td>
<td>• Studies to address institutional issues including: (i) future role of Sarajevo Canton in the road sector and in urban transport; (ii) possible separation of passenger transport operations from planning and regulation; (iii) proposals for creation of a metropolitan transport authority.</td>
</tr>
<tr>
<td></td>
<td>Service quality provision</td>
<td>• Study on improved bidding and competition for the provision of passenger transport services. Focus could be on requiring higher quality services with longer term concession periods.</td>
</tr>
<tr>
<td></td>
<td>Inadequate parking</td>
<td>• Parking concession study: examine ways and means of securing private sector participation in providing off-street parking.</td>
</tr>
<tr>
<td>Transport &amp;</td>
<td></td>
<td>• Study to update urban transport and capital investment plans: update the urban transport investment plan for metropolitan Sarajevo and compile a capital investment plan; take into greater consideration the viability of proposals, including the introduction of smart card ticketing systems, available budgeting resources and likely financing options.</td>
</tr>
<tr>
<td>Investment Plans</td>
<td>Discount Schemes</td>
<td>• Study to review the nature and scope of the current discount schemes</td>
</tr>
</tbody>
</table>
### Transport & Investment Plans

- **Study to evaluate feasibility of current urban transport proposals.** This study would analyze current proposals for introducing tram or trolley bus services, taking into account issues of demand, available financing as well as review the alternative of improving standard autobus services. The study would also include proposals for improving overall services through longer term concessions in the provision of services.

<table>
<thead>
<tr>
<th>Banja Luka</th>
<th>Weak Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other Urban Areas</strong></td>
<td><strong>Study on institutional arrangements for technical assistance to smaller urban areas.</strong> This study would examine the options of staffing up local governments and/or the alternative of providing assistance to local governments by outreach from the transport ministries of the FBH and RS on urban transport planning issues.</td>
</tr>
</tbody>
</table>

Source: Study team.

### Necessary improvements to the inland waterways

**5.61 The potential for the IWT sector in BH is significant given reasonable investments in the waterway and the ports.** The key intervention is the rehabilitation of the Sava river itself, to Class Va status between Belgrade and Brčko, and Class IV status between Brčko and Sisak. The cost of this intervention has been provisionally estimated to total BAM 137.3 million (US$101.8 million) for the entire stretch. This estimate includes: (i) dredging the navigation channel; (ii) strengthening river banks; (iii) constructing groynes; (iv) smoothing river bends to improve the radius of the curve; (v) increasing the height of the three bridges; and (vi) removing sunken vessels, mines and unexploded ordnance. It should be noted that these estimates have been made without the detailed designs.

**5.62 Table 22 provides a summary of the costs of rehabilitation on the two sections.** Total construction costs are BAM 35.4 million for Sections 1 to 4 to be rehabilitated between Belgrade and Brčko and BAM 91.7 million for Sections 5 to 8 from Brčko to Sisak. In addition, there is a further BAM 9 million (US$7 million) for demining and the removal of unexploded ordnance in the Bosnia and Herzegovina sections of the river. It should be noted that over 50 percent of the costs are for Section 8, reflecting higher dredging and river bend work, than for the entire phase I. It is assumed that all removal of mines and unexploded ordnance takes place in phase I of the project.

**Table 22. Summary of construction costs (BAM millions)**

<table>
<thead>
<tr>
<th>River Section</th>
<th>Rkm</th>
<th>Dredging and training work</th>
<th>Bridge replacement</th>
<th>River bends</th>
<th>Sunken vessels</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase I to Class Va</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section 1</td>
<td>0 to 98</td>
<td>4.5</td>
<td>4.7</td>
<td>0.0</td>
<td>0.0</td>
<td>9.0</td>
</tr>
<tr>
<td>Section 2</td>
<td>98 - 103</td>
<td>1.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.2</td>
</tr>
<tr>
<td>Section 3</td>
<td>103 - 133</td>
<td>0.0</td>
<td>9.4</td>
<td>0.0</td>
<td>0.2</td>
<td>9.4</td>
</tr>
<tr>
<td>Section 4</td>
<td>133 - 223</td>
<td>15.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.2</td>
<td>15.8</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>21.1</td>
<td>14.1</td>
<td>0.0</td>
<td>0.4</td>
<td>35.4</td>
</tr>
<tr>
<td><strong>TOTAL including demining costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45.2</td>
</tr>
<tr>
<td><strong>Phase II to Class IV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section 5</td>
<td>223 - 305</td>
<td>1.4</td>
<td>0.0</td>
<td>0.7</td>
<td>0.0</td>
<td>2.1</td>
</tr>
<tr>
<td>Section 6</td>
<td>305 - 362</td>
<td>12.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>12.1</td>
</tr>
</tbody>
</table>
5.63 The economic costs of phase I for BH are estimated at BAM 19.1 million, including demining costs. Table 23 below presents a breakdown of work to be conducted during phase I for Bosnia and Herzegovina and for Serbia, rehabilitating to Class Va. The table assumes that where the river is shared by both countries, costs will be split evenly, with the exception of demining, which is necessary only on the Bosnia and Herzegovina part of the river. In addition, rehabilitation work from the border between Serbia and Bosnia and Herzegovina onwards will be borne exclusively by Bosnia and Herzegovina, despite the fact that in this section of the river, from rkm 202, there is a common border with Croatia.

### Table 23. Phase I construction costs by country (BAM millions)

<table>
<thead>
<tr>
<th>Project</th>
<th>Rkm</th>
<th>Total cost</th>
<th>Cost Split</th>
<th>Cost by country</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bosnia and Herzegovina</td>
</tr>
<tr>
<td>DTW4</td>
<td>173.8-176.6</td>
<td>8.2</td>
<td>0.5</td>
<td>4.1</td>
</tr>
<tr>
<td>DTW5</td>
<td>177.8-187.4</td>
<td>2.0</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>DTW6</td>
<td>189.2-202.5</td>
<td>2.2</td>
<td>0.5</td>
<td>1.1</td>
</tr>
<tr>
<td>DTW7</td>
<td>202.5-225.1</td>
<td>3.1</td>
<td>1</td>
<td>3.1</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>9.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total including demining</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Serbia</td>
</tr>
<tr>
<td>DTW1</td>
<td>79.9-85.8</td>
<td>0.6</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>DTW2</td>
<td>88.3-101.9</td>
<td>3.7</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td>DTW3</td>
<td>103.5-109.8</td>
<td>1.2</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>DTW4</td>
<td>173.8-176.6</td>
<td>8.2</td>
<td>0.5</td>
<td>2.1</td>
</tr>
<tr>
<td>DTW5</td>
<td>177.8-187.4</td>
<td>2.0</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>DTW6</td>
<td>189.2-202.5</td>
<td>2.2</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>B1</td>
<td>2.6</td>
<td>4.7</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>B2</td>
<td>104</td>
<td>9.4</td>
<td>1</td>
<td>4.8</td>
</tr>
<tr>
<td>S1</td>
<td>0 – 202</td>
<td>0.4</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>26.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRAND TOTAL</td>
<td></td>
<td>35.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRAND TOTAL including demining costs</td>
<td>45.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: DWT = dredging and training work, RB = river bend improvements, B = bridge replacement, and S = sunken vessel removal. All demining is assumed to take place in phase I.*

Sources: PCI (2008) and study estimates.

5.64 The critical next step remains the commissioning of the detailed design of the rehabilitation work in the river and the associated environmental impact assessment (EIA). The recent decision by the ISRBC to delineate responsibilities for the funding and implementation of the detailed design and the EIA is not necessarily beneficial, and careful
coordination will be necessary to ensure that the output meets the formal requirements of the European Union and the World Bank in this respect. If the government decides to use Instrument for Pre-Accession (IPA 2010) funding for the detailed design and EIA, it is unlikely that either document would be available until the end of 2011 at the earliest.

**Necessary improvements to the public ports**

5.65 The concessioning of Brčko port under the ”landlord model” will ensure the professional management of the port, while ensuring the public interest. The necessary activities to ensure that the port can be a concession, in conjunction with the rehabilitation of the Sava river, should commence now. These comprise the following steps in the first of three phases:

a. **Institutional preparations.** The institutional preparations regarding the restructuring, relate to key decisions to be made by BAD. These include: (i) the decision to restructure the port of Brčko into a landlord model, aimed at granting a concession for the loading and unloading activities and storage leasing; (ii) the decision to create a port authority and establish a temporary public concession between the port authority and the pure (public) port operator before the long-term concession is brought to the market; and (iii) appointment and mobilization of a project implementation unit, responsible for the port reform process.

b. **Implementation of necessary changes to the legal and institutional framework.** The necessary legal reforms are detailed in the following table.

<table>
<thead>
<tr>
<th>Step</th>
<th>Required actions</th>
<th>Law</th>
<th>Required legal reform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>The district authority should get the right to found a legal person as a grantor of concessions.</td>
<td>Law on Concessions of the Brčko District of BH</td>
<td>Amendment in order to include in the law the possibility of the Brčko District Authority founding a legal person as a grantor of concessions.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Establishment of a port authority regulating the establishment and functioning of the port authority</td>
<td>Law on the Port Authority of Brčko port</td>
<td>Adoption of the new Law on the Port Authority of Brčko port</td>
</tr>
<tr>
<td>Step 3</td>
<td>Actual founding of the port authority</td>
<td></td>
<td>None, based on new Law on the Port Authority (step 2)</td>
</tr>
<tr>
<td>Step 4</td>
<td>Decision to establish the right to grant a concession with the port authority</td>
<td></td>
<td>None, based on amended Law on Concessions (step 1)</td>
</tr>
<tr>
<td>Step 5</td>
<td>Transfer of the right to dispose of the port land and assets, taking effect on January 1, 2011.</td>
<td></td>
<td>None, solely registration according Law on the Register of Land and Rights over the land in the Brčko District BH</td>
</tr>
<tr>
<td>Step 6</td>
<td>Decision to grant a temporary concession, taking effect on January 1, 2011.</td>
<td></td>
<td>None, port authority has the new mandate to grant this concession (step 2 and 4)</td>
</tr>
</tbody>
</table>

Source: MTBS (2009).

5.66 **Implementation phase 2: Intermediate period.** During implementation phase 2, the intermediate period, the temporary (public) concession is active between the port authority and the (public) port operator. During this Intermediate period, the newly established port authority and the (public) port operator work towards professionalization, strengthening and
rationalization of their respective roles within the landlord model with a temporary concession. The objective of the intermediate period is to ensure that the required internal and external conditions are met to be able to bring the concession to the market.

5.67 **Implementation phase 3: bringing the concession to the market.** Basically, there are two methods for the public sector to enter into a new long-term concession contract:

- **Opening the concession to bidding:** bringing a new concession to the market, following the temporary concession.
- **Sale of shares:** bringing J.P. Luka Brčko to the market through the sale of shares, including a long-term concession.

5.68 **Necessary investments to improve the operational efficiency of Brčko port.** As mentioned, this includes an estimated BAM 5.1 million (US$3.8 million) in the short term to ensure an immediate improvement in the operational efficiency of the port, together with necessary investments, amounting to BAM 7.9 million (US$5.8 million) in improving access to the port. This would be followed by investments in the longer term, potentially by the prospective concessionaire, of an additional BAM 4.6 million (US$3.4 million) for the items as detailed in Table 25.

**Table 25. Necessary short and long-term investments in Brčko port (BAM 000)**

<table>
<thead>
<tr>
<th>Investment</th>
<th>Costs (BAM 000)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short Term</strong></td>
<td></td>
</tr>
<tr>
<td>Procurement of loader</td>
<td>360</td>
</tr>
<tr>
<td>Completion of work on the construction of the quay wall</td>
<td>1,500</td>
</tr>
<tr>
<td>Procurement of a forklift</td>
<td>150</td>
</tr>
<tr>
<td>Connection of rail main track to track of operating shores 1 and 2</td>
<td>3,000</td>
</tr>
<tr>
<td>Procurement of grabs of 3 m³ (x2)</td>
<td>100</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td><strong>5,110</strong></td>
</tr>
<tr>
<td><strong>Parallel Investments</strong></td>
<td></td>
</tr>
<tr>
<td>Rail access to Brčko port</td>
<td>6,900</td>
</tr>
<tr>
<td>Road access to Brčko port</td>
<td>1,000</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td><strong>7,900</strong></td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>13,015</strong></td>
</tr>
</tbody>
</table>

Sources: MTBS (2009) and Study Data.

**MITIGATING THE SOCIAL COSTS OF TRANSPORT**

**Improving road safety performance**

5.69 **The following amendments are recommended to strengthen the legal framework for road safety:**

- Review legislative needs and provisions compared to good practice, including the introduction of reduced urban speed limits (to reduce pedestrian deaths in particular), the introduction of random breath testing procedures, a penalty points system and
fixed penalty system, heavy commercial transport and long distance public transport work and rest times; and

- Address deficiencies in the mandatory third-party motor vehicle insurance scheme and the health sector insurance schemes to produce country-wide coverage and reduce inequalities.

5.70 **The following actions are recommended to ensure sufficient capacity for a results focus for road safety:**

- Establish a new BH Road Safety Coordination Council—a high-level coordination body under the state MoCT to act as the coordinating body on road safety interventions in BH;
- Adopt a long-term goal for effective road safety management to enable the production and implementation of effective road safety strategy and programs;
- Establish a lead agency for road safety at state and entity levels on a ”first amongst equals” basis. The overarching function of the lead agency is the creation of a consistent and harmonized results framework for the delivery of the national road safety strategy;
- Establish small but appropriately resourced road safety offices at state and entity levels within the lead agencies with sections covering road safety strategy, policy and action programs, road safety statistics, road safety economics and road safety promotion. The offices would identify and work on the preparation of a harmonized road safety strategy and entity action plan, commence capacity building initiatives and create the results focus;
- Prepare a harmonized national road safety strategy with supporting state and entity action plans;
- Specify the responsibilities of the key government stakeholders—transport, roads authorities, police, health and education—for road safety, ensuring that regulatory and compliance functions are separated according to good European practice; and
- Upgrade road safety capacity across all departments and urban administrations to improve understanding of the road safety problem; crash injury problems and cost-effective, evidence-based strategies and countermeasures.

5.71 **The following actions are recommended to improve the funding constraints currently impeding efforts to address the road safety problem:**

- Establish sustainable sources and mechanisms for annual funding for road safety results by e.g., earmarking resources from general taxation, creating a road safety fund from user fees and insurance levies;
- Earmark ten percent of all new road project funding for safety purposes beyond those projects;
- Earmark ten percent of mandatory third party insurance to road safety budgets;
- Develop long term funding proposals and associated prioritization and financial management systems with clear road safety funding streams in government budgets;
• Start to develop a rational framework for allocating resources e.g., by estimating the costs and benefits of countermeasures and the value of preventing death and serious injury; and
• Implement cost-sharing arrangements between the entities for emergency trauma care.

5.72 The following actions are recommended to improve monitoring and evaluation of road safety issues and interventions:

• Put systems and surveys in place nationally and at entity level to collect and manage final and intermediate outcomes and output data; to help achieve the national results focus on:
• Achieving a country-wide computerized vehicle registry as soon as possible;
• Road crashes, fatality and injury outcomes, building upon the system in place in RS and yet to be implemented in the Federation (an urgent high priority action);
• Average vehicle speeds, seat belt and crash helmet use, excess alcohol, vehicle fleet safety standards, safety rating of road infrastructure, access to emergency medical system (an urgent high priority action);
• Quantities of safety interventions implemented, e.g., policing operations, promotional activities, and systematic engineering treatments;
• Strengthen health system recording of road traffic injuries; and
• Introduce greater data sharing between police, highway authorities and urban administrations.

5.73 The following key interventions are also recommended to improve road safety. Safety engineering knowledge and capacity need to be upgraded to ensure the following:

• Good practice safety audit needs to be adopted;
• Highest risk network locations to be identified and interventions to address the risk designed and implemented;
• Guidelines for low cost/high return engineering treatments to be upgraded or developed;
• Safety standards, compliance requirements, road safety audit policies to be updated;
• understanding of ”safe system” (sustainable safety) approach needs to be developed and reflected in the design standards for roads;
• Review and reduce urban road speed limits;
• Pilot multi-sectoral countermeasures for highest risk lengths and area-wide locations in urban and rural areas;
• Review and address land use planning and traffic management issues which are a genuine safety risk—e.g., impact of roadside commercial development, areas of unlimited roadside access in urban areas and areas of linear development along rural highways, need for further signalization or traffic circle treatments at intersections and further provision of relevant signage, including advance warning signage for pedestrian crossings in urban areas; and
• Include passing lane construction within road rehabilitation projects to address limited opportunities for passing on busier routes especially those with frequent horizontal and vertical curves.

5.74 The following interventions are also recommended to establish an appropriate emergency response for road crashes:

• Set up a country-wide emergency call system;
• Provide for knowledge transfer between emergency services and medical trauma specialists;
• Review performance of emergency trauma care based on analysis of hospital trauma data; and
• Establish ambulance response times.

5.75 Finally, the following interventions are recommended to improve compliance with safety standards and rules on the road network:

• Encourage closer cooperation between cantonal traffic police forces in FBH and also with RS police;
• Review operational strategies and policing tactics to develop effective deterrence models for activities. This will include information and advocacy on the part of other government stakeholders and encourage twinning with EU police personnel to strengthen knowledge and police/public credibility;
• Make automated speed enforcement (mobile and fixed speed cameras) an early priority after an initial information campaign, including back office requirements;
• Review court processes for lower level offences;
• Provide for knowledge transfer in transport and police sectors to achieve capacity for development of road user awareness and behavior measures;
• Determine traffic police equipment and operational training requirements and set related national and regional priorities to address current road safety risks; and
• Review funding, resources, equipment and training requirements to deliver traffic safety education in pre-schools, primary and secondary schools.
REFERENCES

BCEOM (2005), “Bosnia and Herzegovina Road Management and Safety Project: Roads, Bridges and Tunnels Database.”


COWI (2003), “Regional Balkans Infrastructure Study” (REBIS), supported by the European Union CARDS Program.


International Monetary Fund (2009), World Economic Outlook, Washington, DC.


MTBS (2009), “Reforming the Management of the Port of Brčko,” A study funded by PPIAF.


