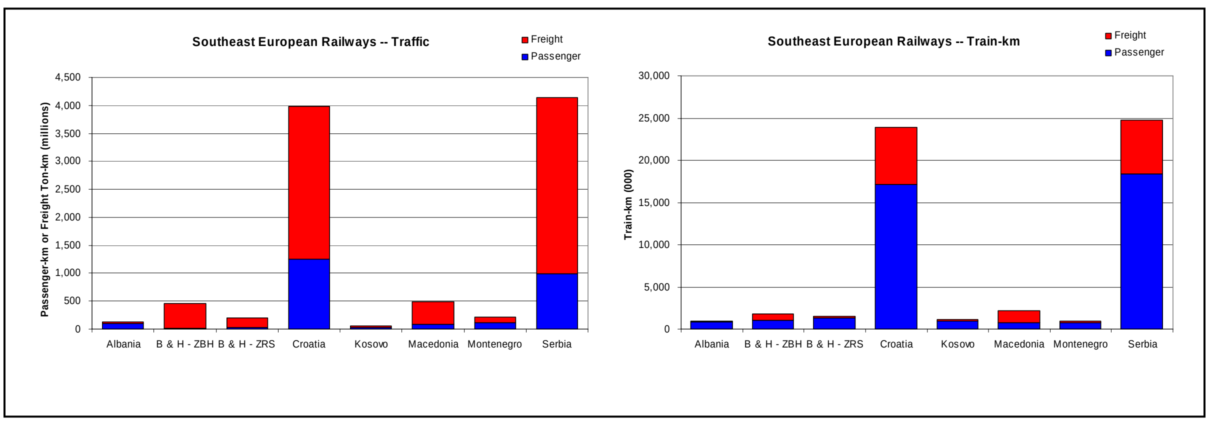
ANALYSIS OF KEY ISSUES AND PERFORMANCE OF THE WESTERN BALKANS RAILWAYS

88. This chapter analyzes key issues for the Western Balkans region and identifies the challenges that railway reform must address. It measures the railways' financial performance and operational efficiency. Efficiency is measured using a range of standard measures, and benchmarked against some appropriately selected international railways. The current organizational and institutional structure of the sector in each of the countries is also reviewed.

RAILWAY TRAFFIC

89. The Western Balkans region includes two moderately sized railways—Serbia and Croatia—and six very small railways. These railways carry a mix of passenger and freight traffic. In terms of volume (passenger-km and freight ton-km), only Albania, Kosovo and Montenegro are predominantly passenger railways. However, the figure below shows that in terms of train-km all the railways, except Macedonia, are primarily passenger railways.[52]

Figure 16 Share of passenger and freight traffic for Western Balkans Railways (Traffic Unit-km, Train-km)



Source: Study Data

Passenger Volumes and Characteristics

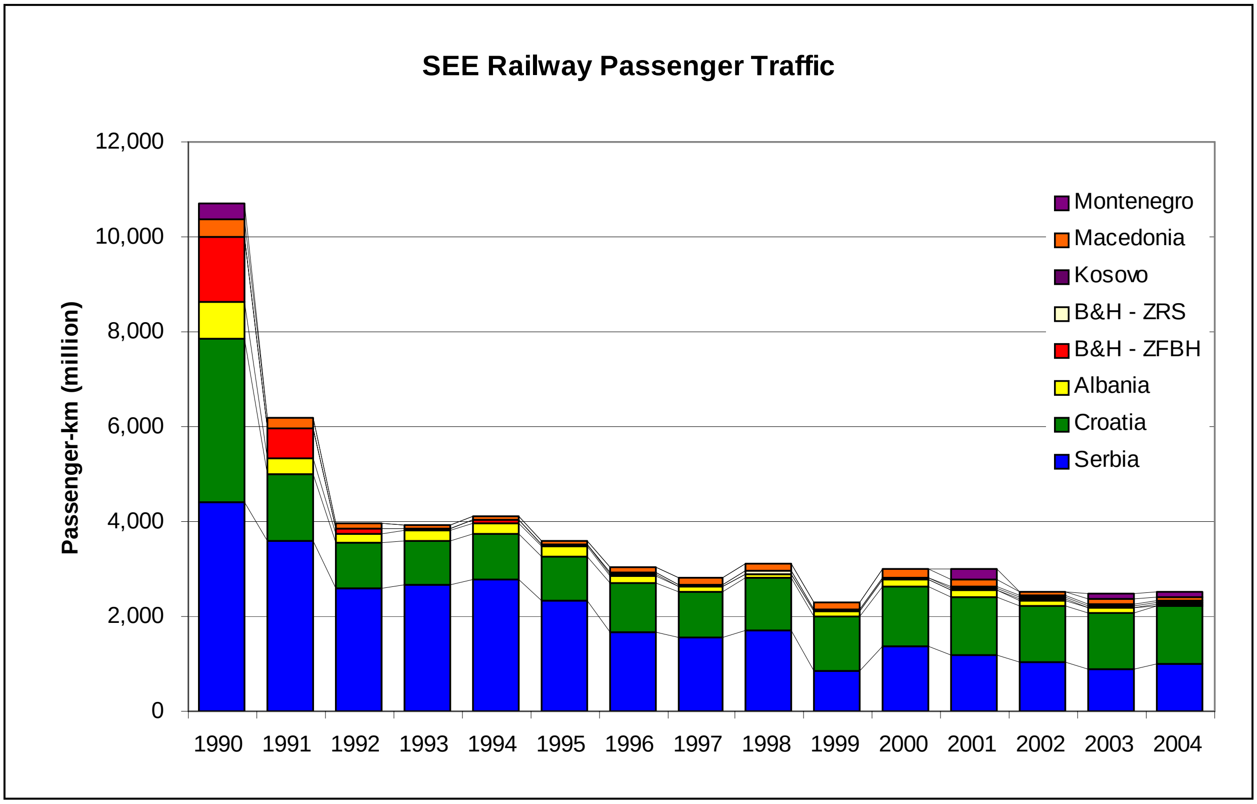
90. The railways of the Western Balkans region used to carry about four times as much passenger traffic as they do now—about 10 billion passenger-km in 1990 vs. 2.5 billion in

[52] Train-km is a better indicator than traffic units of consumption of resources such as locomotives and infrastructure capacity.

2004. (See Figure 17.) With rapid motorization, passengers have been shifting from rail to bus and private automobile, and rail traffic appears unlikely to recover to its earlier level.

91. Rail has a relatively small market share in the region: 32 percent of the public passenger transport in Croatia, 10 percent in Serbia,[53] 3 percent in Albania[54] and low figures in the remaining countries. The comparable rail market share for the EU15 countries (measured by passenger-km) is 6.6 percent. In contrast to the EU15 countries, studies in the Western Balkans region indicate that passengers prefer bus over rail, even through rail is cheaper. This reflects the lower quality of rail *vis-à-vis* bus, as frequency, reliability and comfort are greater on bus.[55]

Figure 17 Passenger traffic for Western Balkans Railways 1990-2004 (Million passenger-km)



Source: Study data

92. Traffic and profitability data by passenger market segment were not available for these railways, so only general observations can be made about which traffic segments the railways should retain, develop or exit. The larger railways provide a mix of international, regional and commuter services, while small railways like Albania and Kosovo provide only

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[53]Croatia Central Bureau of Statistics, *Statistical Information 2004* and Serbia and Montenegro Statistical Office, *Statistical Pocket Book 2004*, p. 43.
[54] Louis Berger, *Albania – National Transport Plan, Draft Final Report*, September 200) p. ES-11.
[55] For example, in Albania, bus has competed away rail's market share even though bus fares are 25-100% higher. Scott Wilson Railways Ltd., *Modernization of Albanian Railways, Final Report* 6 October 2004 p. 50-51.

regional services. International services have the highest tariffs and are reported to be 'profitable'.[56] Commuter services have the lowest tariffs, where the fares are actually collected, and lose the most money. Regional services have tariffs somewhere between the other two, and are, generally, also loss-making.

93. Table 6 shows the average number of passengers per train, an indicator of the market and social value of providing the train, and the average distance a passenger travels. In Serbia and Croatia the passengers per train is 50 and 68, respectively, while in Bosnia & Herzegovina, the figures are 19 for ZFBiH and 26 for ZRS. The train occupancy figures are higher in Albania, Kosovo, Macedonia and Montenegro, and appear comparable to the selected international benchmarks for those countries. The average distance traveled is also quite short, ranging from 32 km for Croatia to 78 km for ZFBiH.

Table 6 Average loadings and average trip lengths (kms) by railway (2003 unless indicated otherwise)

Country	Passengers Per Train	Average Distance
Albania	124	51
B&H - ZFBiH	19	78
B&H – ZRS	26	38
Croatia	68	32
Kosovo	214	60
Macedonia	115	102
Montenegro (2004)	167	111
Serbia	50	63
Denmark	101	35
Finland	107	56
Sweden	84	163
Germany	96	41

Source: study data

94. Typically, the rail mode is more cost effective than bus, when large volumes of people need to move between a defined origin and destination, particularly where there is congestion on parallel roads. By contrast, bus or mini-bus is more cost effective for low volume services where road capacity is available. The low train occupancy in the Western Balkans region, especially in Serbia, Croatia and Bosnia and Herzegovina, suggests that a number of the passenger railway services could be provided both more efficiently and more effectively by bus.

Freight Volumes & Characteristics

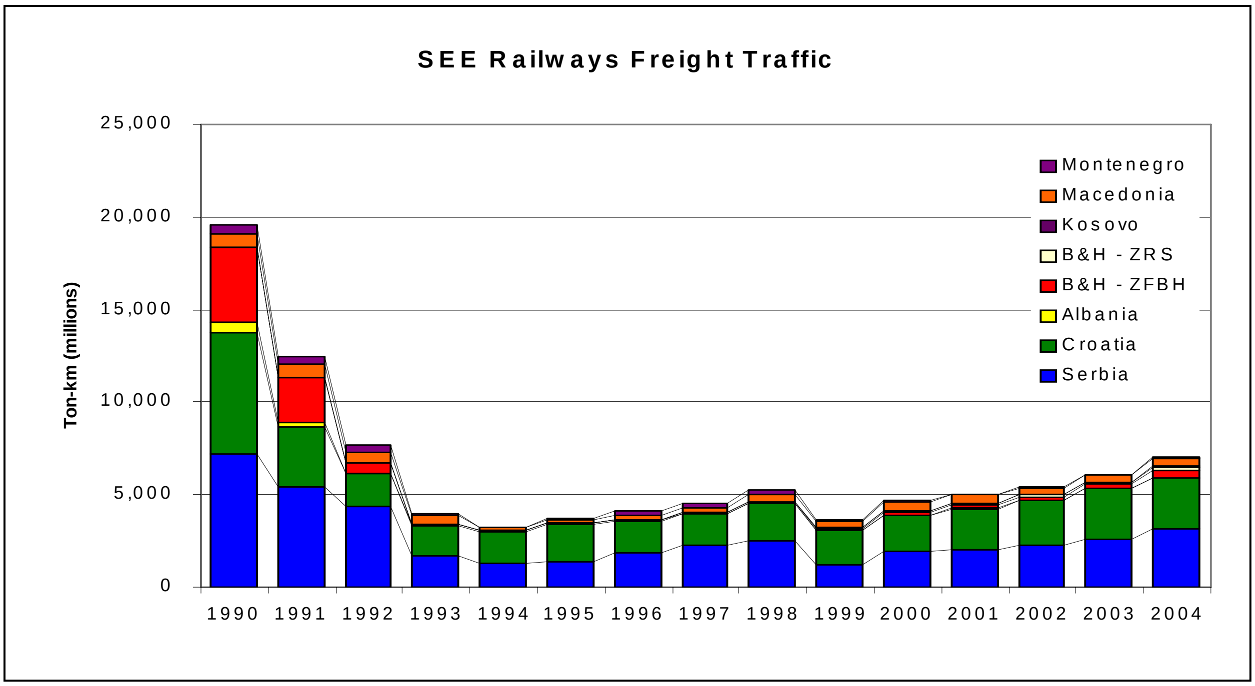
95. The railways of the Western Balkans region used to carry almost 3 times the amount of freight traffic as they do now—about 20 billion ton-km in 1990 vs. 7 billion ton-km in 2004. (See Figure 18.) Traffic volumes have recovered from the low points reached after transition and conflict, driven primarily by increases in transit traffic and reopening of some

[56] These services cover direct operating costs such as fuel and staff, but likely do not contribute to costs of infrastructure.

of the heavy industries that use rail for the movement of bulk inputs and outputs. Given the low level of traffic on these railways, the opening (or reopening) of a major industrial facility, such as a mine or steel works, can have a substantial effect on a railway's traffic.

96. For example, in September 2003, US Steel purchased the Serbian steelmaker 'Sartid'. After a rehabilitation and modernization project, scheduled for completion in mid-2005, production capacity is expected to double to 2.4 million tons.[57] This expansion could potentially bring another 2.5 million tons of inbound limestone and coke to the railway. Similarly, in August 2004, the Mittal Group acquired a majority interest in steel plant in Zenica, Bosnia and Herzegovina, together with an interest in the RZR Ljubija iron mines, which reopened in November 2004. Production increases at these facilities would boost the demand for inbound materials (both from domestic sources and through the port of Ploce) and outbound product.[58]

Figure 18 Freight traffic for Western Balkans Railways 1990-2004 (Million Ton-km)



Source: Study data

97. Despite these events, the railways are unlikely to recover the volumes that they carried in 1990. Changes in the structure of demand and the growth in competition from road haulage mean that even with improved operations, they will only be competitive for selected traffics. Table 7 provides a summary of current freight volumes, haul lengths and composition of traffic (where available) for the Western Balkans railways for 2004.

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[57] www.ussteel.com/corp/facilities/international/serbia.htm, accessed 6 May 2005.
[58] "If Lakshmi Mittal, the Indian entrepreneur at the helm of Mittal Steel meets his production and export goals, 10 trains will be needed daily to haul crude steel out of the Zenica valley…" Financial Times, *Special Reports, Bosnia-Herzegovina* 23 November 2004.

Table 7 Freight volume (Ton-km), Average Haul (km) and Traffic Type for Western Balkans Railways (2004 unless otherwise indicated)

Railway	Ton-km (millions)	Average Haul (km)	Domestic	Export	Import	Transit
Albania (2003)	31	74	~95%	~0%	~5%	0%
B&H - ZBH	446	96				
B&H - ZRS	170	129				
Croatia	2,734	206	30%	16%	20%	34%
Kosovo	18	68	4%	8%	88%	0%
Macedonia	396	166				
Montenegro	94	92	58%	15%	19%	8%
Serbia	3,160	290	27%	10%	14%	49%

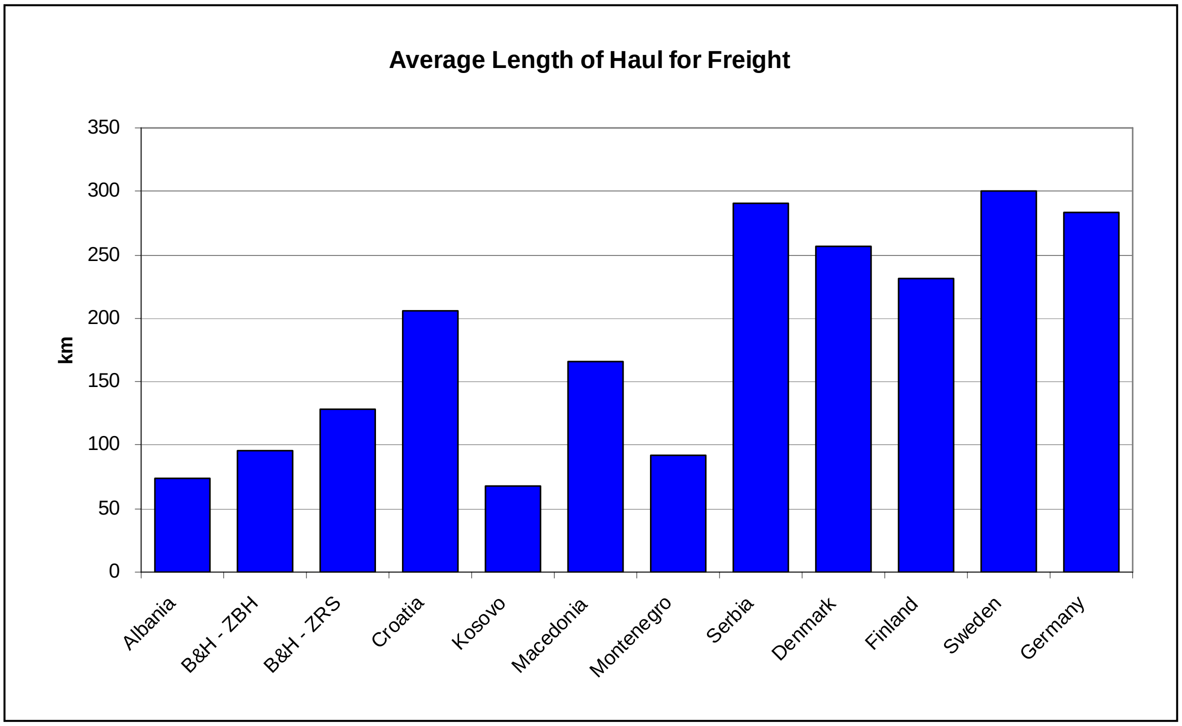
Source: Study Data

98. Because of its price and service characteristics, rail freight service is typically competitive with truck for: (a) large volume, point to point movements and (b) heavy, low value freight that moves long distances. Rail is more efficient, and often typically priced lower than truck, after an initial threshold of about 400 kilometers. The price differential increases with distance, making rail's price advantage more compelling for long distance movements.[59] Rail may be competitive for shorter movements if the volumes are large enough. Rail service is also typically slower and less reliable than truck. Consequently, high value freight for which inventory holding costs are high and where transport is a relatively low share of total costs will tend to move by truck, while lower value product will be more suited for transport by rail.

99. As in all of Europe, the Western Balkans railways suffer from fragmentation and very short haul length. The problem is particularly severe in Albania, Bosnia-ZFBiH, Kosovo and Montenegro, where average haul is less than 100 km. Because of the scale of the individual countries, distances for domestic movements are short, so most domestic traffic is likely to move by truck. The exceptions are high volume bulk shipment. For example, in Montenegro, the largest source of freight traffic is Rudnici Boksita Niksic (RBN), a bauxite mine, which ships to Kombinat Aluminijuma Podgorica, an aluminum processing facility, a haul of about 50km.

[59] If the customer facility is not served by rail, however, rail imposes additional handling costs. Where a truck can be loaded at origin and unloaded at destination, goods for rail must be loaded into a truck or container, trucked to the rail facility and tran-shipped onto rail. For short distances, the lower line haul price of rail will not offset the cost of the additional handling.

Figure 19 Average Length of Haul for Freight for Western Balkans Railways and Comparators in 2004 (Km)



Source: Study data

100. Other than a few specific market segments—primarily the movements of inputs and outputs associated with heavy or extractive industry—the railways of the Western Balkans region must seek traffic growth in international markets. (Indeed much of their existing traffic is international.) Some of this traffic is likely to be exports or imports from/to national markets, where the national carrier may have a monopoly (until open access is established) or competitive advantage.

101. But the modest scale of the domestic markets suggests that transit traffic will represent a significant share of traffic on the rail networks of the Western Bakans countries in future. Already, 2/3 of all Serbian Railway's freight traffic is international, with over 25 percent being transit traffic, nearly all of which is carried on Corridor X[60]. Serbian Railways already operate whole trains north-south on Corridor X across Serbia on behalf of European freight forwarders. International markets, however, will be more competitive than domestic ones.

102. Transit service is particularly competitive, as shippers have both other rail alternatives as well as truck alternatives. To compete effectively for transit and other longer distance traffic, the railways will need to (a) lower their cost structures, and (b) overcome their fragmentation. As noted by Railion[61], "*…today, more than 100 goods trains cross borders in Europe without stopping to change engine nor drivers or to settle paper work.*"[62] The

[60] ZS (2005).
[61] Railion is one of the new international rail freight operators.
[62] www.railion.dk/underside.asp?id=184, accessed 6 May 2005.

railway operators in the Western Balkans region need to mimic this service level, if they are to be competitive and have a viable future.

103. The railways have made some progress in this area. The railways of Slovenia, Croatia, Serbia, Bulgaria, and Turkey have recently created a joint service "East Express" scheduled to operate between Ljubljana and Istanbul, with a journey time of under 60 hours. A similar service, the Sava Express, operates once weekly between Ljubljana and Belgrade. The problem with these services, however, is that they require special agreements to be negotiated between the railways to implement them, raising the transaction costs significantly. The smooth transfer between railways, and low transaction costs to obtain such a service, needs to be the norm, not the exception, if small national railway operators are going to be competitive in an 'open access' market.

The Threat of Future Competition

104. Infrastructure operators in EU countries are required to open the parts of their networks included in the Trans-European Rail Freight Network (TERFN) to international freight operators established in member states, from 2008[63] and to open their entire railway network by 2015. The further expectation is that national networks will be required to allow 'open access' competition in the passenger market by 2010 [see COM (2004) 139, discussed in Annex A]. The Western Balkans countries are mirroring this open access regime in their railways, with some countries (e.g., Serbia) allowing access ahead of the EU schedule.

105. As the open access system is introduced, the national freight and passenger operators will face severe competition for the most profitable shipments from larger, better financed new entrants. Small railway operators in an enlarged 'open access' market are unlikely to be able to survive, purely because of their limited scale and the 'cherry-picking' of profitable flows and routes by larger competitors. The experience with the introduction of competition in Romania, as discussed in the following text box, provides an indication of what is likely to happen in the Western Balkans countries.

Railway Reform in Romania

In 1996, the Romanian Government launched a railway reform program to reduce the fiscal burden and to meet EU accession standards. The national railway company was ultimately separated into three companies: infrastructure (CFR), freight (Marfa) and passenger (Calatori), with the state as sole shareholder in all three. A new Railway Law created an environment that permitted private participation in the railway industry in Romania. In the new environment, some 24 private freight operators have been licensed as carriers. These carriers are aggressively competing, especially for unit train freight traffic. Private operators are now producing 16% of the freight train-km and 0.03% of the passenger train-km, and the market for transport has become much more a "commodity" market rather than a network service market.

[63] Member states established railway undertakings **must** be granted access to the Trans European Rail Freight Network (TERFN) by March 15 2008, and to the entire rail network by 2015, for the purpose of operating freight international services. EC. Directive 2001/12.

106. The experience of the railway supply industry in Europe, as national barriers were removed, is also instructive. In the rail supply market, competition forced the industry to consolidate across national boundaries to achieve the right scale for the overall market, with system integrators such as Adtranz, Alstom, Bombardier, and Siemens growing through rapid acquisition.[64] The railway industry in Western Balkans is likely to see both effects.

FINANCIAL PERFORMANCE

107. The railways of the Western Balkans region are all loss making enterprises and heavily dependent on government subsidy. As shown in Table 8[65] in all cases, operating expenses exceed revenue, even when revenue includes a government operating subsidy.[66] Labor is a substantial share of the cost structure for each of the railways, accounting for more than a third of operating costs for Albania (36%), Croatia (47%), Kosovo (55%), Macedonia

Table 8 Annual Income Statement for the Railways of the Western Balkans Region

Income Statement (US$ millions)

Country Year	Albania 2003	B&H - ZBH 2002	B&H ZRS 2002	Croatia 2003	Kosovo 2003	Macedonia 2003	Montenegro 2004	Serbia 2003
Revenue								
Passenger	0.9	na	na	42.5	-	1.6	na	26.1
Freight	2.2	na	na	84.5	1.6	17.3	na	70.1
Operating Subsidy	3.7	5.6	14.2	141.5	1.5	4.3	na	177.5
Other	0.2	na	na	51.0	0.6	2.8	na	8.0
Total	6.9	27.2	20.3	319.5	3.7	26.0	na	281.7
Operating Expenses								
Labor	3.3	10.1	na	223.5	2.2	18.4	12.8	139.2
Energy	1.1	na	na	35.7	0.9	3.1	2.3	96.5
Materials	1.4	na	na	43.4	0.4	2.3	3.1	in energy
Depreciation	0.8	na	na	47.6	0.5	8.7	in other	219.5
Other	2.3	na	na	121.3	0.0	7.5	9.0	15.7
Total	9.0	43.5	20.5	471.5	4.0	40.0	27.2	471.0
Operating Income	(2.1)	(16.3)	(0.2)	(151.9)	(0.2)	(14.0)	(27.2)	(189.3)
Interest expense (net)	0.0	-	-	17.0	0.0	3.9	-	6.8
Other non-operating expense (net)	2.7	4.3	0.6	(20.6)	(0.4)	(5.0)	-	26.8
Net Income (US$, millions)	(4.8)	(20.6)	(0.8)	(148.3)	0.2	(13.0)	(27.2)	(222.8)
Operating ratio								
Including government subsidy	1.30	1.60	1.01	1.48	1.06	1.54	na	1.67
Excluding government subsidy	2.78	2.02	3.34	2.65	1.76	1.84	na	4.52
Working ratio								
Including government subsidy	1.18	na	na	1.33	0.94	1.20	na	0.89
Excluding government subsidy	2.52	na	na	2.38	1.56	1.44	na	2.41

Source: Data from Individual Railways

[64] Jeremy Drew, The Railways Supply Industry (2000), p. 87-101.

[65] The financial and operating data in this study were compiled from numerous primary and secondary sources. Rather than list multiple data sources for each graph and table, the source are contained in the Reference. Data used are for the most recent year for which a relatively complete data set is available.

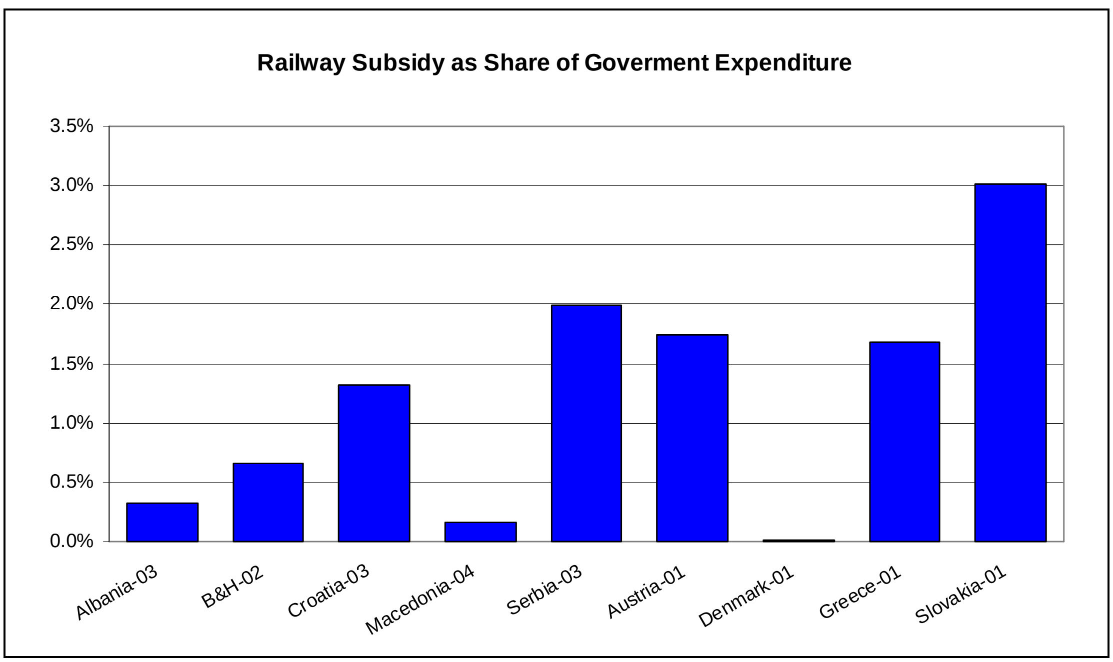
[66] The operating ratio includes depreciation. If depreciation were excluded, Serbia, for example, would have an operating ratio less than one. That is, the Serbian government is providing an operating subsidy large enough to cover its cash operating deficit, but not depreciation.

(46%) and Montenegro (47%). Coupled with the low labor productivity found on all of the railways, shrinking labor force is obviously needed. Energy expenditure is relatively low for the Western Balkans railways, probably a function of their light density of operation. Materials expenditure is likewise low, indicating likely under spending on maintenance. For all but Serbian railway, depreciation is very low and not a good indicator of the railway's ongoing capital needs.

108. The Western Balkans railways carry significant loss-making passenger services, so the need for operating subsidies is not surprising. The level of subsidies, however, is quite significant. In Serbia for example, operating subsidy in 2003 amounted to US$178 million. This operating subsidy is quite substantial, representing nearly one percent of GDP and two percent of government expenditure in 2003. For Croatia, the operating subsidy was US$142 million and amounted to 0.5 percent of GDP and 0.9 percent of government expenditure.

109. In addition, the Western Balkans railways are unable to self-generate funds for capital investment, and look to government to fulfill their needs. For example, in Albania, the railway is seeking government support for a US$82 million capital project—a substantial increment beyond the US$3.7 million operating subsidy received in 2003. The railway in Croatia received a US$236 million capital subsidy in 2003, bringing the total subsidy that year to US$378 million, or 1.3 percent of GDP (just over 2 percent of government expenditure

Figure 20 Railway Subsidy as a Share of Government Expenditure



Source: Study data.

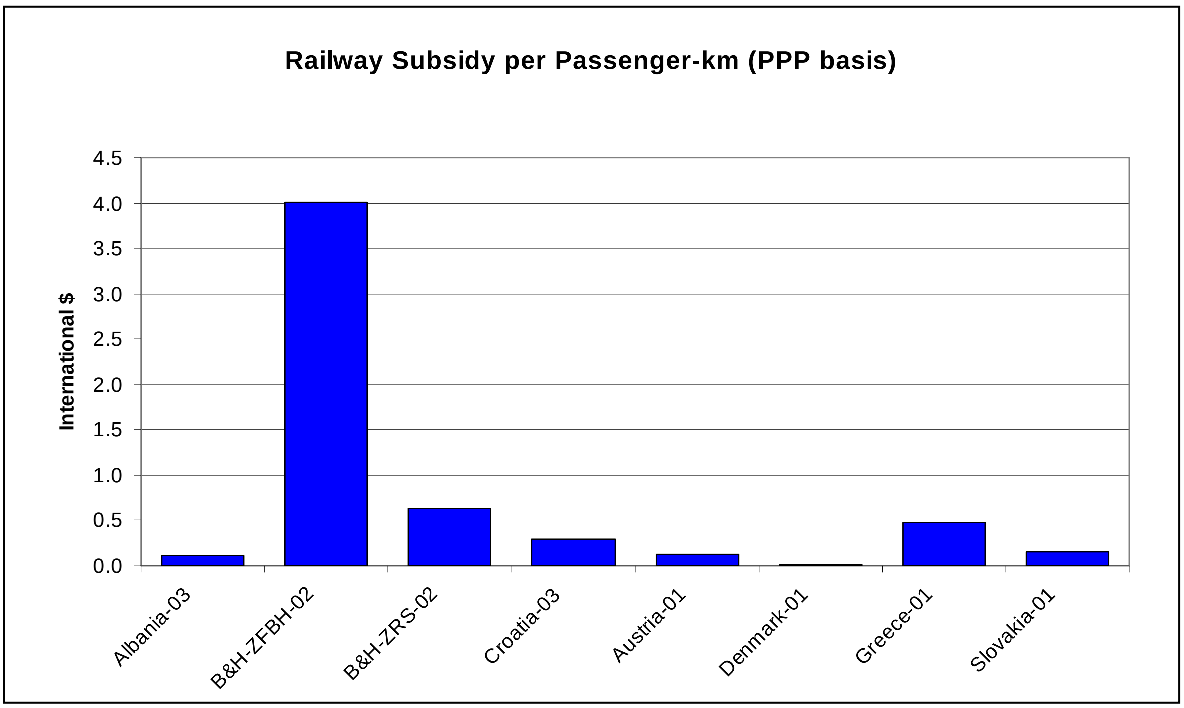
110. Figure 20 illustrates the subsidy levels of the SEE railways benchmarked against four other European railways. The figure reveals that he level of subsidy for Western Balkans railways is comparable to benchmark European railways. Nonetheless, given that the state

sector is overlarge in Western Balkans countries, and that governments have many other pressing priorities, a European level of subsidy for railways is not affordable.

111. Although data are incomplete for some railways, the available information indicates that subsidy is quite high relative to the service provided. For example, the operating subsidy was over US$12 per passenger trip in Serbia in 2003, and near US$80 per passenger trip for ZBH in Bosnia and Herzegovina in 2002.

112. Figure 21 shows total subsidy per passenger-km, measured on a purchasing power parity basis[67]. By this measure, the Croatia subsidy is twice that of Austria and Slovakia and 32 times the subsidy in Denmark (which is so low it is not visible on the graph). Serbian subsidy is not shown on a PPP basis because the PPP conversion rate was unavailable. On a US$ basis, the Serbian subsidy per passenger-km is 15% greater than the Croatian subsidy. The subsidy in Bosnia and Hertzegovina is greater yet, with ZRS subsidy twice the level of Croatia and ZBH 14 times higher.

Figure 21 Railway Subsidy per Passenger-km in Purchasing Power Parity Terms (2003 unless indicated)



Source: Study data

113. In addition, many of the railways are carrying significant amount of debt, which they lack the financial resources to repay. For example, Croatian Railways has US$580 million and the former ZTP in Serbia has US$440 million of long term debt. In Macedonia, the total debt of the railway at the end of 2004 amounted to US$143 million, or 3.3 percent of GDP. The introduction of institutional reform, consistent with EC. Directive 1991/440, as discussed elsewhere in this paper, requires the Western Balkans countries to establish appropriate

[67] The PPP measure employed is series code is PA.NUS.PPP, from SIMA, Economic Indicators.

mechanisms to reduce the indebtedness of railway undertakings to permit them to reach financial viability. This government acceptance of accumulated national railway debt at reorganization is a consistent practice in the EU15 countries.

114. The debt and fiscal position of the Western Balkans countries makes the provision of operating subsidy, capital subsidy and the clearing of accumulated debt very difficult. Limited latitude in the fiscal space of some of those countries means that such a practice is likely to reduce the opportunities for public investment on other modes, or in other sectors that may generate higher returns. World Bank and other International Financial Institutions (IFI) need to take care that their lending does not encourage Western Balkans governments to expand greatly their financial commitments for railways. Rather, IFI lending should support high return investments that help the railways to improve efficiency and reduce costs. Such investment should help shrink railway subsidy over time, not expand it.

OPERATIONAL PERFORMANCE

115. Railways are a capital intensive mode of transport, characterized by high fixed cost and relatively low variable costs. They are cost efficient when the high fixed costs can be shared by a large volume of traffic and when good utilization is made of expensive assets. The railways in the Western Balkans region suffer from poor resource utilization. This stems in part from historical reasons, as the railways were built to handle many times the level of traffic they carry currently. They inherited many more locomotives, wagons and coaches than they need. They also inherited many more staff. A major challenge for these railways is to "right size" the resources they use to better reflect the actual and potential demand.

Infrastructure

116. The Western Balkans railways make up a standard gauge network that links to railways in Western Europe. The table below contains a description of the infrastructure. The infrastructure has suffered from deferred maintenance, but main lines carrying significant traffic are being rehabilitated.

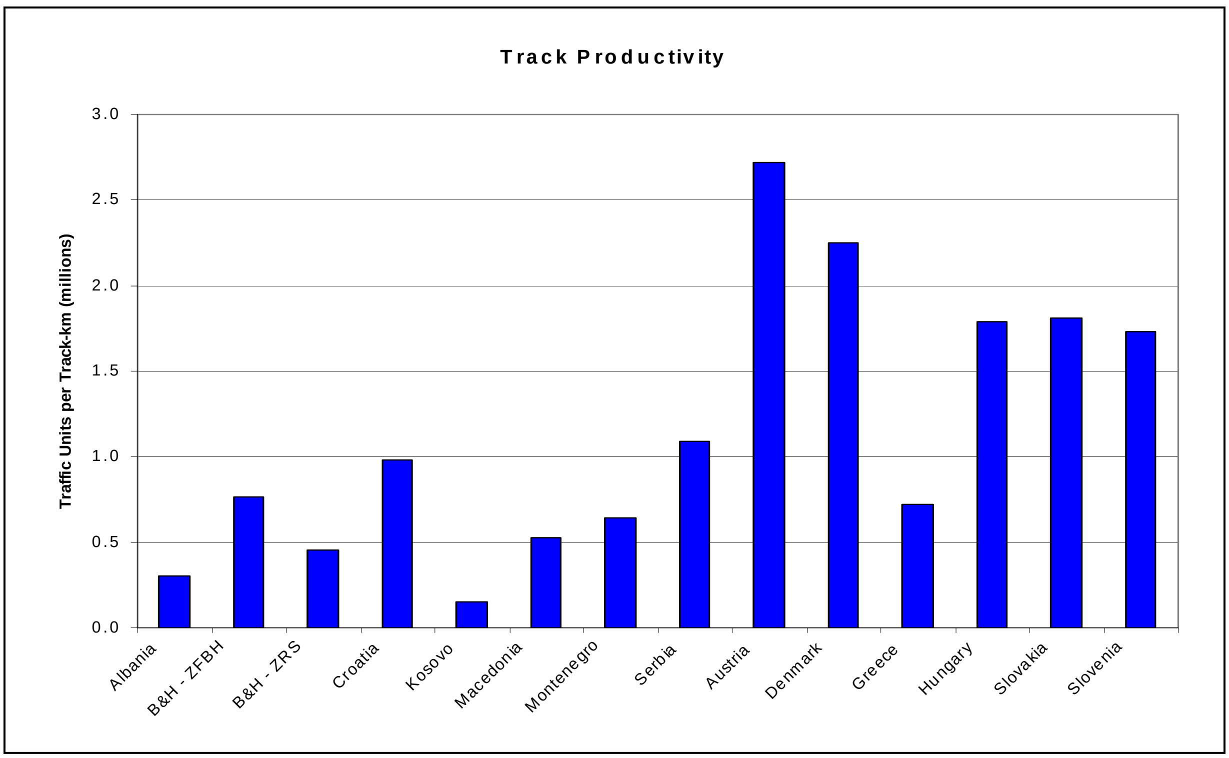
Table 9 Western Balkans Composition and Condition of Railway Infrastructure (2004)

Railway	Route-km	Double Track (km)	Electrified (km)	Comments
Albania (HSH)	447	0	0	Tirana-Durres line in serviceable condition. All other lines in poor condition.
B&H - -ZBH	608	0	441	Heavily damaged during conflict, some lines being rehabilitated with EBRD loan
B&H – ZRS	425	23	362	Heavily damaged during conflict, some lines being rehabilitated with EBRD loan
Croatia	2726	1,334	622	Medium to good condition
Kosovo	333	0	0	Mountainous with 115 bridges, main line in poor condition, some lines closed.
Macedonia	699	226	318	Na
Montenegro	250	80	167	Mountainous with many bridges tunnels, in poor condition

Railway	Route-km	Double Track (km)	Electrified (km)	Comments
Serbia (ZS)	3533	276	1247	Main line being rehabilitated with EIB & EBRD loans

117. The Western Balkans railways have low utilization of their infrastructure, especially the smaller railways. Albania, for example, produces only 300,000 traffic units per track-km. The most productive of the Western Balkans railways—Serbia—gets 1.1 million traffic units per track-km, while the benchmark European railways except Greece achieve 1.7 – 2.7 million traffic units per track-km—some 70 percent to 150 percent better. The Western European railways are themselves lagging when compared to the leading railways in terms of track productivity: Railways in US, Russia and Estonia, for example, produce 8 - 12 million traffic units per track-km.

Figure 22 Traffic Units Per Track-km for Western Balkans railways and Benchmark railways (2003/4)



Source: Study Data

118. The Western Balkans railways were built to handle much higher traffic volumes than current or forecast levels. Consequently, the infrastructure needs to be pruned back to the lines justified by current and forecast traffics. The Serbian Railways, for example, has started this process by identifying 7.5 percent of the lines that could be closed immediately and a minimum of 6.3 percent that should be closed unless service specific subsidy is received to keep them open. Each railway needs to undertake such an analysis—these railways can only afford to maintain and renew lines with strong traffic demand.

119. This network pruning can be of two types. In some cases, a whole line may be taken out of service. Equally important is eliminating surplus assets on lines in service. This could include removal of a second track, where traffic volume only justifies one line, closure of stations, elimination of unneeded yard track, and elimination of electrification. Serbian Railways provides an example of this type of pruning in its plan to reduce its stations from 320 to 160 during 2005.

Rolling Stock

120. The Western Balkans railways inherited large locomotive, coach and wagon fleets from predecessor railways. Much of this rolling stock is little used and should be scrapped. This is illustrated in the case of locomotives in Table 10, with active fleets being substantially smaller than total fleets. The impact of the hiatus in investment over the last 15 years can be clearly seen, with all the fleets having a high average age and a limited proportion of the total fleet currently active.

Table 10 Locomotive fleet description for Western Balkans railways (2004)

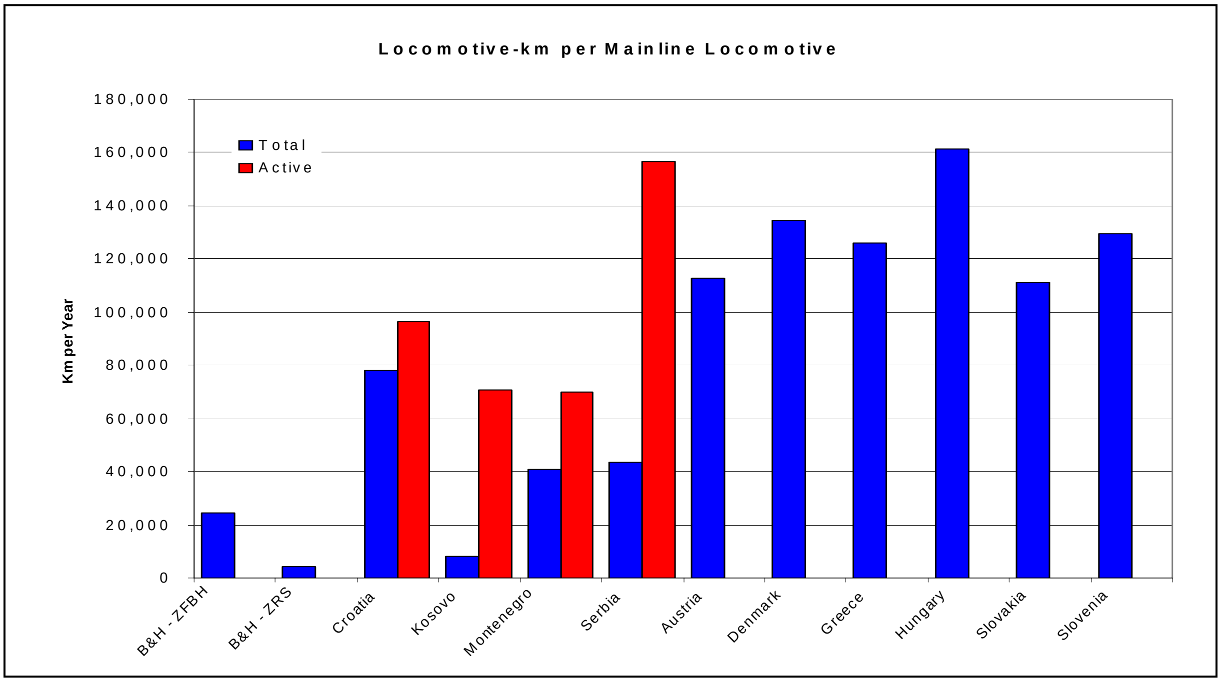
Railway	Total Fleet	Active Fleet	Percent Active	Estimated Average Age
Albania	57	25	44%	~27
B&H – ZBH	100	Na	Na	Na
B&H – ZRS	76	Na	Na	Na
Croatia	297	245	82%	Na
Kosovo	35	5	14%	>30
Macedonia	56	Na	Na	Na
Montenegro	35	18	51%	>30
Serbia	381	131	34%	>30

Source: Study Data

121. The Western Balkans railways also use their locomotive fleet less than the average. (See Figure 23, which shows locomotive-km worked per locomotive.) The blue bars show this measure considering all the mainline locomotives in the fleet. By this measure, all the Western Balkans railways have quite low utilization, ranging from under 10,000 km per year per locomotive for Kosovo and Bosnia & Herzegovina-ZRS, to 25,000 for Bosnia & Herzegovina-ZFBiH, to about 40,000 for Montenegro and Serbia, and 78,000 for Croatia. This compares to more than 110,000 km per locomotive per year for the benchmark railways.

122. If only the active fleet is considered, the Western Balkans railways look considerably better. Serbia reaches almost 160,000 km per locomotive per year, which is comparable to the benchmark railways. The other railways are still well below the benchmark railways. (Comparable active fleet figures for the benchmark railways are not available.) To some degree the low productivity is a function of having more rolling stock than necessary, so the railways have little incentive to use it efficiently. It is also a function both of the low density nature of the services provided and the fact that old equipment needs more frequent maintenance.

Figure 23 Locomotive-km per Mainline Locomotive for Western Balkans Railways and Benchmarks (2004)



Source: Study data

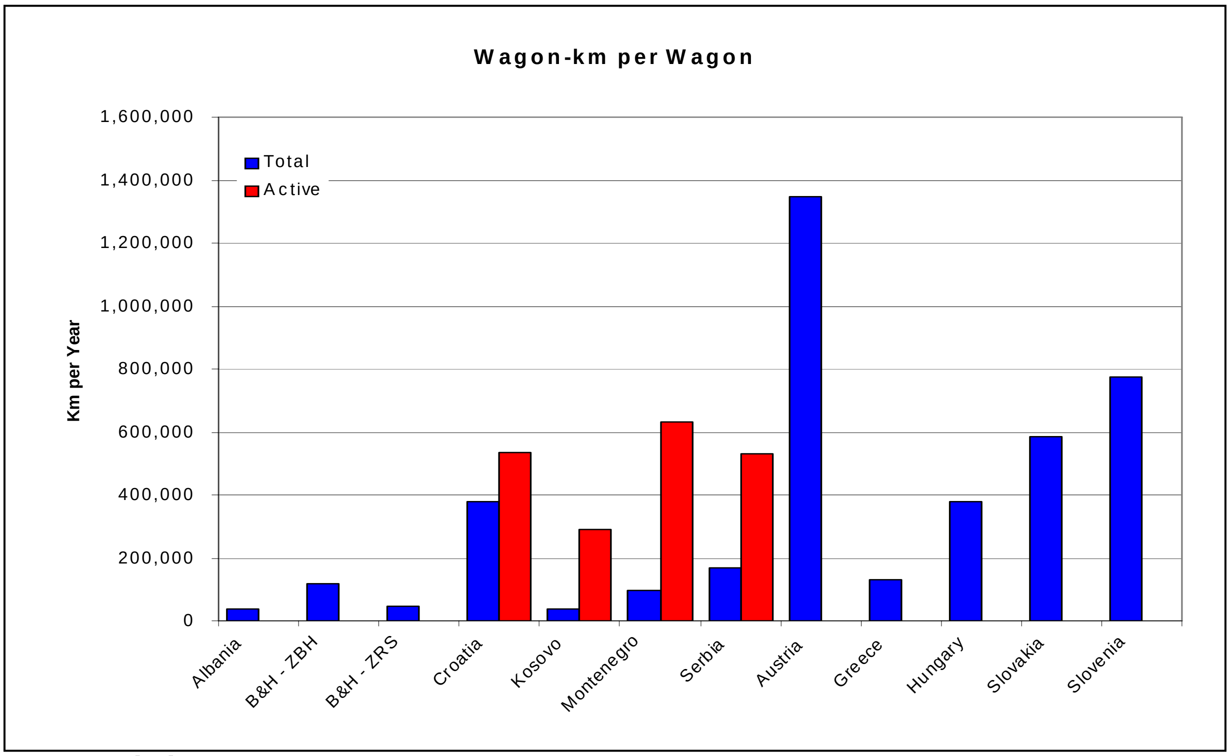
123. However, the realization of low levels of equipment productivity has two implications. First, the railways of the Western Balkans region maintain in an operational condition more rolling stock than needed, if the fleet were to be used efficiently. Second, it means that as existing rolling stock becomes life expired and is replaced, replacement capital expenditure will be higher, predicating constant fleet size. The financial position of these railways, and the corresponding requirement to minimize both recurrent and capital expenditures, means that utilization is important, even if rolling stock is in current surplus.

124. Another measure of the productivity of the tractive fleet, is the amount of traffic each unit produces. Since some of the railways carry much of their passenger traffic in trainsets comprising multiple units, this measure was calculated on the basis of traffic unit (passenger-km + ton-km) per tractive unit (mainline locomotives + EMU trainsets + DMU trainsets). This measure produces similar results to the previous one: Serbia at 23 million traffic-units has comparable utilization of its active fleet (but not its total fleet) as the better of the benchmark railways.[68] Croatia, with 14 million traffic units has about 15 percent lower utilization than the lower of the benchmark railways. The smaller of the Western Balkans railways have very low utilization, ranging from 3 million traffic units per tractive unit to 12 million traffic units per tractive unit.

[68] As measure of what is physically possible, Russian Railways achieve about 84 million ton-km per locomotive and US railways achieve 111 million ton-km per locomotive. Traffic density and long length of haul contribute to the US/Russian high efficiency—characteristics the Western Balkan railways are unlikely to have as long as they operate as small national railways rather than as part of a larger network.

125. Figure 24 presents wagon-km per wagon for both Western Balkans and benchmark railways. Where available, this measure is shown for both total and active fleet. The sharp contrast between total and active fleet productivity is an indicator of the sharp drop in traffic experienced and the extent of surplus rolling stock in the fleets. However, these figures should be interpreted with a degree of caution. Railways such as Albania, Bosnia & Herzegovina-ZFBiH and Montenegro interchange relatively few wagons with other railways, so the wagon-km operated on the railway are mostly produced by the wagons in their fleets. But for railways such as Serbia, which carry a substantial volume of transit traffic, not all the wagon-km are produced by Serbian railway wagons. The graph does indicate generally that as the Western Balkan railways reinvest in their wagon fleets, they will need far fewer wagons than currently owned,[69] and that getting high utilization will be a challenge for the smaller railways that do not have high volume domestic hauls.

Figure 24 Wagon-km per Wagon for Western Balkan and Benchmark Railways (2004)



Source: Study data

Employment

126. The railways in the Western Balkans currently employ approximately 58,000 staff. The productivity of these staff is very low compared to international benchmarks. As discussed earlier, the Western Balkans railways are all loss-making, despite substantial operating subsidies. Staff costs make up a substantial portion of operating cost, and therefore

[69] They may, however, need more wagons of a certain type. For example, tank wagons and semi-wagons are in short supply on some of the Western Balkan railways.

are a key element in any assessment to improve the railways' financial viability and value for subsidy paid.

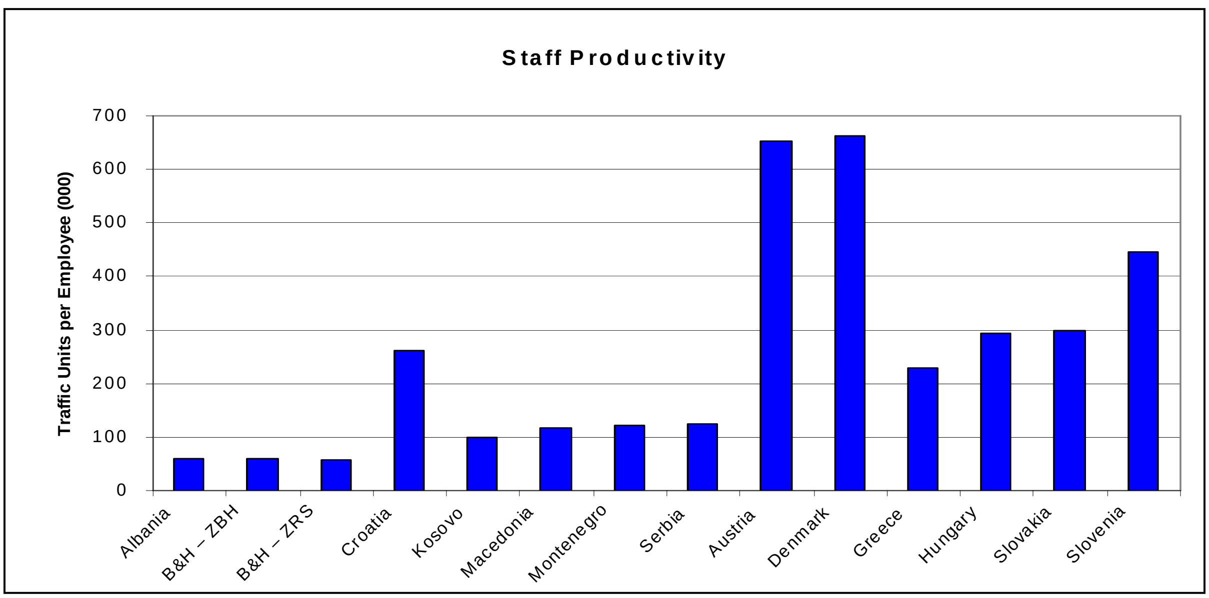
Table 11 Labor size and productivity indices for Western Balkans railways (2003 unless indicated)

Railway	Year	Staff	Wage Bill (US$ million)	Wages as Share of Total Operating Expenses	Traffic Units (millions)	Traffic Units per Employee	Traffic Units per $ of Wages
Albania	2003	2,248	3	36%	136	60,676	42
B&H – ZBH	2002/2003	3,889	10	23%	231	59,398	23
B&H – ZRS	2002/2003	2,452	Na	na	140	57,096	na
Croatia	2003	14,905	223	47%	3,911	262,395	18
Kosovo	2003	607	2	55%	60	98,609	28
Macedonia	2003	3,855	18	46%	447	116,052	24
Montenegro	2004	1,862	13	47%	226	121,404	18
Serbia	2003	28,222	139	30%	3,494	123,804	25

Source: Study data

127. Table 11 presents information about staffing and staff productivity in the Western Balkans railways. The Western Balkans railways have productivity between 60,000 and 260,000 traffic units per employee. Croatia, whose staff productivity is more than twice any of the other Western Balkans railways, is comparable to the less productive of the benchmark railways. (See Figure 25.) Note that Croatia, because of high relative wages, has the lowest productivity per $ of wages of the Western Balkan railways.

Figure 25 Labor productivity indices for Western Balkans and benchmark railways (2003 unless indicated)



Source: Study data

128. Several factors contribute to this low staff productivity. Historically, rail traffic declined faster than staff, leaving more staff working at the railway than needed to do the work. The Albanian railway had staff productivity of 170,000 traffic units per person in 1989, compared to 60,000 today. The Yugoslav Railways (JZ) from which the other railways of the region were formed, had staff productivity of 240,000 traffic units per person. Today only Croatia achieves that level. Serbian Railway, by contrast, employs nearly twice as many staff as Croatia, despite having fairly similar traffic volume, traffic mix and technology.

129. Traffic mix and density are also factors. A passenger railway will employ more staff than a freight railway, and a railway with high traffic density will use staff more efficiently. The effect of density is seen with the Ukraine Railway, for example, which achieves 1.6 million traffic units per employee, more than 10 times greater productivity than the Western Balkans railways. This density issue will be a particular challenge for the railways of Albania, Bosnia and Herzegovina, Kosovo, Macedonia and Montenegro, the modest scale of which underlines the need for regional co-operation to increase traffic density.

130. Technology is also a factor. Modern signaling can eliminate the need to staff small stations. Information technology can reduce the need for clerical workers. Modern track maintenance machinery can reduce the need for track maintenance workers. Reliable motive power reduces the need for locomotive maintenance workers. The right mix of technology and labor will differ by railway. Average railway wages in Croatia, for example, are 10 times the wages in Albania, so the value of investment in labor saving technologies will be similarly greater in Croatia.

INSTITUTIONAL AND ORGANIZATION STRUCTURE

131. The Western Balkans railways are all in the process of adapting their railway legislation to harmonize with the requirements of the *acquis communautaire*. Croatia, the only EU candidate country, passed a new railway law in 2003, with an effectiveness date of 2006. Serbia, a potential applicant, passed a revised railway law in March 2005, which became effective immediately. A number of the smaller railways' countries have also passed, or are in the process of drafting and/or reviewing, new laws. The new laws provide for third party access to railway infrastructure and regulation of infrastructure access and prices. The laws eliminate the legal basis for regulation of freight tariffs, properly leaving this to the "regulation" of the marketplace.

132. Serbia is now in the process of establishing what it calls the Railway Directorate (effectively a rail regulator), together with the rules and framework for infrastructure pricing and access. The other countries are similarly situated. The lack of implementing institutions and clarity/reliability on pricing and access rules will discourage operators, in the short term, from entering rail markets in these countries. In the longer term, as institutions become established, strong competition can be expected.

Table 12 Institutional Status of the Western Balkans Railways (2004)

Railway	Railway Law Compliant with EU Railway Directives	Implementation of New Railway Law	Railway Structure Compliant with EU Railway Directives	Development of Competition
Albania	New railway law adopted November 2004	Implementing governmental institutions not established	No, although law requires accounting separation of infrastructure	No operators other than HSH although legally possible
B&H – ZBH	New law approved by Council of Ministers in Feb 2005	Implementing governmental institutions not established	No	No operators other than ZBH although legally possible
B&H – ZRS	New law approved by Council of Ministers in Feb 2005	Implementing governmental institutions not established	No	No operators other than ZRS although legally possible
Croatia	Passed July 2003, effective January 2006	Implementing governmental institutions not established	Accounting separation of infrastructure, effective January 2006	Only HZ until EU accession
Kosovo	Railway law being drafted	Na	No	No
Macedonia	A restructuring Law for MZ was adopted in April 2005,a law governing the rail sector was adopted in July 2005	Na	Reorganization underway	No operators other than MZ, although legally possible
Montenegro	Law adopted March 2004, effective January 2005	Implementing governmental institutions not established	No	None
Serbia	Passed & effective March 2005	Railway Directorate established in May 2005	Reorganization underway	No operators other than ZTP, although legally possible

Source: Study data

133. The Western Balkans railways are also at a fairly early stage of organizational restructuring. Most of the railways legal entities separate from the Ministry of Transport, and governed by a Board of Directors, so they have some management independence. But the Boards are largely appointed by government and the railways are financially dependent on government, so independence is limited.

134. The railway in Serbia is in the process of divesting non-railway activities, with the first two entities scheduled for privatization in 2005. Divestiture of the railway supply businesses, however, is not planned. In Croatia, the railway has moved non-railway activities into subsidiaries, and plans to divest them in future years. None of the railways is yet organized around lines of business, although this is planned in Serbia.

Table 13 Organizational Status of Western Balkans railways 2004

Railway	Divestiture of Non-railway Entities	Divestiture of Railway Supply Entities	Organized into Profit Centers (Passenger & Freight)	Management Independence
Albania	Na	No	No	Government owns railway stock.
B&H – ZBH	Na	Na	Na	Na
B&H – ZRS	Na	Na	Na	Na
Croatia	Entities have been put into subsidiaries, but not divested	No	Planned, but not implemented	Government owns railway stock.
Kosovo	Na	Na	No	Not legal entity. 2/3 of Board of Directors appointed by Kosovo trust Agency.
Macedonia	Na	No	Planned, but not implemented	Government owns railway stock.
Montenegro	Na	Na	No	Na
Serbia	Commencing.	Not planned.	Planned, but not implemented	Govt. owns ZTP stock. Govt. & trade unions appoint Board of Directors.

Source: study data

135. The proposed legislation, driven by the relevant EU directives, will create a new structure for supporting passenger services. For the first time, the responsibility for choosing the level of rail service to be provided and the obligation to pay for them will be placed together in a single government body. This represents an important opportunity to reduce railway subsidies by eliminating low value-for-money services. Also the creation of separate passenger and freight operators will bring greater transparency to the costs and revenues of the individual services. This should allow decisions about whether or not to continue a service to be based on solid analysis of costs and benefits.

136. This proposed structure will provide the governments in the Western Balkans countries with the opportunity to both become informed purchasers of rail services, and to provide a financial incentive for them to “buy smart.” The government will be able to make a transparent assessment of whether a required public service, such as access to a particular community or region, is best made by subsidizing a public, or private, railway operator, or tendering the service to a lower density option such as bus, minibus or taxi.

137. The analysis of the Western Balkans railways’ finances, markets, operations and structure indicates that these railways are placing an unsustainable strain on their government’s budgets and they are likely to face strong competitive challenges in the short to medium term. The next section discusses reforms needed to address these problems.