Case Study on the Croatian Section of the Corridor Vc Motorway: Budapest - Osijek - Sarajevo - Mostar – Ploče

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1. Introduction:

The Pan-European Corridor Vc motorway is planned to branch south from Budapest, via Osijek in Croatia to Sarajevo and Mostar in Bosnia and then to the Croatian port of Ploče. The Croatian section, called the A5, is being promoted by Croatian officials as a motor for the economic development of eastern Slavonija, with expectations that it will stimulate employment and the regional economy.\(^1\) It is not an obvious route for large investments though, as Budapest, Osijek and Sarajevo are not closely linked with one another economically, although Bosnia certainly needs some access to the port of Ploče.

This project takes place against a background of enthusiastic motorway-building in Croatia, with planning documents such as the 1999 Transport Development Strategy of the Republic of Croatia, and the Programme for construction and maintenance of public roads 2005-2008 showing the huge strategic importance accorded to motorways as a motor for economic growth and closer integration with the European Union. It seems, however, that many of the claims made for the motorways are the product of wishful thinking. Several of these projects have not been sufficiently justified from the point of view of traffic volumes, even without taking the huge costs and environmental concerns into account,\(^2\) yet there has until now been no real public discussion about this. The World Bank warned in 2004 that spending on transport in Croatia was excessive, as public expenditure on transportation comprised 5 percent of GDP in Croatia, versus 1.5 percent in the UK and France, while transportation contributes just 8 percent to GDP, only slightly higher than the EU average of 6.5 percent.\(^3\)

In this case study we argue that the Corridor Vc motorway is a poorly-conceived and wasteful investment that is unlikely to improve this balance, and that it is unjustified and environmentally destructive to construct a motorway along this route.

2. Description of the project:

The Croatian section of the Vc motorway is planned to run south from the Hungarian border past Beli Manastir, Osijek, Đakovo and Sredanci through Bosnia to Ploče on the Dalmatian coast. Most of the route is in the planning stages, although a 10km stretch near Sarajevo is already open, and preparation work has recently begun on the 23 km section from Đakovo to Sredanci in Croatia, which is scheduled to open in 2007\(^4\). The 88.8 km Croatian section is expected to cost between €370 and €500 million,\(^5\) but no IFI funding has been secured as yet, and it is not known from which sources financing is being sought. The motorway is planned to run parallel to the Corridor Vc railway, which is being improved with a €40 million loan from the European Investment Bank (EIB)\(^6\).

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1 See for example the statements by the Croatian Prime Minister Ivo Sanader, the President of the Croatian Parliament Vladimir Šeks and Minister of Maritime Affairs, Tourism, Transport and Development Božo Kalmeta in “Motorway A5 will be connection to Europe”, Vjesnik 23.09.2005


Meeting with Prof. Ivan Đadić, University of Zagreb Faculty of Transport, 21\(^{st}\) July 2005


5 “Motorway A5 will be connection to Europe”, Vjesnik 23.09.2005,

Louis Berger SA: Transport Infrastructure Regional Study (TIRS) final report, 2002, Appendix 1, p.7

3. Impacts:

3.1. Unjustified costs:

Spending between €370 million and €500 million on the Corridor Vc motorway can only be justified if it is absolutely necessary to build a motorway on that route, yet our research suggests that it is not currently necessary. The majority of the Croatian section of the route is currently served by a standard two-lane road. A field visit confirmed that the most heavily trafficked part of the route, between Osijek and the Corridor X motorway at Sredanci, is in very good condition, and does not appear to warrant either reconstruction or expansion. It also tends to bypass settlements, so there does not appear to be any justification for expanding and diverting the road on the grounds of taking heavy goods vehicles away from residential areas. The one area where there is clearly a congestion problem is in the centre of Osijek, but a bypass is being constructed which is designed to address this problem, so it is not clear how a separate motorway will bring additional benefits.

The traffic volume which may justify a motorway varies according to many factors such as the terrain, and whether there are large numbers of heavy goods vehicles using the road. However, there are certain figures below which a motorway cannot usually be justified. For example the European Commission REBIS study considered that in general less than 20 000 AADT in the moderate scenario for 2015 does not justify the construction of motorways or four-lane roads but that only a feasibility study can give reliable guidance. The REBIS study put the capacity of a 2x2 lane motorway on level terrain at 33 000 – 46 000 AADT and the capacity of a high class 2 lane road at 11 000 – 15 000 AADT. However, the table below shows the REBIS study’s predictions for traffic volume on the route of the planned Vc motorway:

<table>
<thead>
<tr>
<th>Location</th>
<th>Cars 2006</th>
<th>Buses/ Lorries 2006</th>
<th>Total 2006</th>
<th>Cars 2015</th>
<th>Buses/ Lorries 2015</th>
<th>Total 2015</th>
<th>Cars 2025</th>
<th>Buses/ lorries 2025</th>
<th>Total 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beli Manastir - Osijek</td>
<td>6131</td>
<td>331</td>
<td>6462</td>
<td>8404</td>
<td>505</td>
<td>8913</td>
<td>11929</td>
<td>806</td>
<td>12735</td>
</tr>
<tr>
<td>Osijek - Sikirevci</td>
<td>11449</td>
<td>1862</td>
<td>13311</td>
<td>15693</td>
<td>2839</td>
<td>18532</td>
<td>22277</td>
<td>4537</td>
<td>26814</td>
</tr>
<tr>
<td>Sikirevci - S. Šamac</td>
<td>1372</td>
<td>245</td>
<td>1617</td>
<td>1880</td>
<td>373</td>
<td>2253</td>
<td>2669</td>
<td>596</td>
<td>3265</td>
</tr>
<tr>
<td>Average Beli Manastir- S. Šamac</td>
<td>6317</td>
<td>813</td>
<td>7130</td>
<td>8659</td>
<td>1239</td>
<td>9898</td>
<td>12292</td>
<td>1980</td>
<td>14272</td>
</tr>
<tr>
<td>Metković (border)- Metković</td>
<td>4961</td>
<td>762</td>
<td>5723</td>
<td>6800</td>
<td>1162</td>
<td>7962</td>
<td>9653</td>
<td>1858</td>
<td>11511</td>
</tr>
<tr>
<td>Metković- Opuzen</td>
<td>7842</td>
<td>1434</td>
<td>9276</td>
<td>10749</td>
<td>2187</td>
<td>12936</td>
<td>15259</td>
<td>3495</td>
<td>18754</td>
</tr>
<tr>
<td>Opuzen- Ploče</td>
<td>7629</td>
<td>469</td>
<td>8098</td>
<td>10457</td>
<td>715</td>
<td>11172</td>
<td>14845</td>
<td>1142</td>
<td>15987</td>
</tr>
</tbody>
</table>

Undertaken by the authors on Friday 16th September 2005
9 European Commission: Regional Balkans Infrastructure Study – Transport Appendix 4 Final Report: Investment Requirements, p.8
10 The planned route passes through Đakovo and Sredanci and enters Bosnia and Herzegovina at Svilaj rather than passing Sikirevci and Slavonski Šamac, but the traffic predictions for Sikirevci and Slavonski Šamac give an indication of the level of traffic passing in that direction. These predictions do not include any estimate from the Hungarian border to Beli Manastir, which currently handles a very low volume of traffic
These figures contrast somewhat with the Croatian government’s 1999 predictions for traffic volumes in 2010, which put the average figure for the whole Croatian part of the Vc motorway at 11 921 vehicles per day,\textsuperscript{11} in contrast to approximately 8850 vehicles per day estimated using the figures above. Likewise the Croatian government estimates 13 292 vehicles per day for the Metković – Opuzen stretch in 2010 whereas the REBIS estimate for 2010 would be around 9200 – nearly a third lower. The government figures are also suspicious as they name Knežev – (Beli Manastir) – Osijek as the most heavily trafficked section of the route, with an estimated 13 909 vehicles per day in 2010, whereas this section currently handles low volumes of traffic and the REBIS study does not expect it to handle such a high volume of traffic even by 2025.

Even the government figures do not seem to justify a motorway being built within the next 5-10 years and the REBIS figures may justify only the upgrading of the stretch from Osijek to the Corridor X motorway to a dual carriageway before 2025 if no action is taken to encourage some of this traffic to use the railway instead. If these figures are accurate then the motorway is a tremendous waste of money and natural resources.

The Croatian section of the Corridor Vc motorway has also been examined in both the European Commission Regional Balkan Infrastructure Study: Transport (REBIS)\textsuperscript{12} and the Transport Infrastructure Regional Study (TIRS).\textsuperscript{13} Although the Corridor was designated by the European Commission itself, its REBIS study recognised that the project is only meaningful if the motorway is built in Bosnia, which is very expensive because of the terrain.\textsuperscript{14} Given the current situation in which motorways in Croatia are not met by corresponding ones in Slovenia and Hungary, there is a danger that the Croatian government is hurrying to build the motorway only to find that the Hungarian and Bosnian sections are nowhere to be seen. Neither of the reports gave the project a glowing assessment: the REBIS report gave it an economic rating of 48.9 out of 100 and overall rating of 2c (a longer term project),\textsuperscript{15} while the TIRS study concluded that the motorway should be categorised as IIb: a project requiring further investigation for final definition and scheduling before possible financing.\textsuperscript{16}

3.2 Competition with other modes of transport:

\textbf{Nationally:} The Croatian government’s enthusiasm for building motorways is creating great competition for resources with other modes of transport, and exceeding even the government’s own spending plans in terms of its modal split.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Expenditure</th>
<th>Years</th>
<th>Average per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads (total)</td>
<td>€4 248 254 945 (31 651 430 000 KN)</td>
<td>2005-2008</td>
<td>€1 062 063 734 (7 912 857 500 KN)</td>
</tr>
<tr>
<td>Motorways</td>
<td>€2 382 328 495 (17 749 430 000 KN)\textsuperscript{17}</td>
<td>2005-2008</td>
<td>€595 582 124 (4 437 357 500 KN)</td>
</tr>
</tbody>
</table>

\textsuperscript{11} Republic of Croatia, Ministry of Maritime Affairs, Transport and Communications: Transport Development Strategy of the Republic of Croatia, Zagreb, November 1999 p.32/33
\textsuperscript{12} European Commission: Regional Balkans Infrastructure Study: Transport, July 2003
\textsuperscript{13} Louis Berger SA: Transport Infrastructure Regional Study (TIRS) final report, 2002
\textsuperscript{14} European Commission: Regional Balkans Infrastructure Study: Transport, Appendix 6, Project Screening/Project Details, July 2003, p.33
\textsuperscript{15} European Commission: Regional Balkans Infrastructure Study: Transport, Appendix 6, Project Screening/Project Details, July 2003, p.6
\textsuperscript{16} Louis Berger SA: Transport Infrastructure Regional Study (TIRS) final report, Appendix 1, 2002, p.7
\textsuperscript{17} Government of the Republic of Croatia: Programme for construction and maintenance of public roads for the period 2005-2008, 29.12.2004, p.44
This makes a yearly average total expenditure on transport of €1 549 878 367 (11 547 298 222 KN). The table below shows a comparison between the planned modal split of transport expenditure according to the 1999 Transport Development Strategy.  

<table>
<thead>
<tr>
<th>Mode</th>
<th>Percentage of total transport budget planned (1999)</th>
<th>Percentage of total transport budget for years stated in above table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads and road transport</td>
<td>40%</td>
<td>68.5%</td>
</tr>
<tr>
<td>Railways and railroad transport</td>
<td>25%</td>
<td>21%</td>
</tr>
<tr>
<td>Maritime and river transport</td>
<td>20%</td>
<td>5%</td>
</tr>
<tr>
<td>Air transport</td>
<td>5%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Integrated transport</td>
<td>10%</td>
<td>Not stated separately</td>
</tr>
</tbody>
</table>

Motorways by themselves make up 38% of total transport expenditure – nearly the entire planned percentage for all roads. On one hand the Croatian government recognises that railway transport is superior to road transport for ecological, safety and spatial reasons, yet continues to pour resources into motorways.

It appears that the construction of motorways is also crowding out funding for maintenance of state, local and county roads, which are used by many more people than motorways.

<table>
<thead>
<tr>
<th>Class of road</th>
<th>Planned expenditure 2005-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local and county roads</td>
<td>€665 999 640 (4 962 000 000 KN)25</td>
</tr>
<tr>
<td>State roads</td>
<td>€1 199 926 800 (8 940 000 000 KN)26</td>
</tr>
<tr>
<td>Motorways</td>
<td>€2 382 328 495 (17 749 430 000 KN)27</td>
</tr>
</tbody>
</table>

18 Government of the Republic of Croatia: Programme for construction and maintenance of public roads for the period 2005-2008, 29.12.2004, p.21, p.43, p.44. The total figure is from p.21 adding up all fields except the 960 million KN designated for county and local road maintenance.
20 "Croatian Railways plan to invest HRK 12.1 billion in the next five years" Vjesnik, 10.02.2005 http://www.buyusa.gov/croatia/en/49.html#_section13
26 Government of the Republic of Croatia: Programme for construction and maintenance of public roads for the period 2005-2008, 29.12.2004, p.21, p.43, p.44. The total figure is from p.21 adding up all fields except the 960 million KN designated for county and local road maintenance.
The Road Plan 2005-8 expects highway users to contribute 53% to the costs of motorways but the expected toll for the Osijek to Sredanci stretch is 35KN for cars. If we take the predicted number of vehicles using the busiest stretch of the motorway in 2006 we could expect tolls to raise around €29 665 375 per year, allowing for extra charges for heavy goods vehicles. However, this figure seems to predict the traffic on the existing road, which would then be divided between the existing, well-maintained road, and the motorway, for which people would not only have to pay but also wait at toll booths. It is hard to see who would choose the motorway in these circumstances, so the income is likely to be considerably less. It is perhaps instructive to see that the Croatian government recently announced a reduction in motorway tolls outside of the holiday season, which seems to be an admission that the motorways are under-used, and in the case of the Vc we are also likely to see under-use and therefore a considerable sum of public money being diverted to pay for the motorway. It can be expected that some people will be more interested in saving money than time, as already happens with the Corridor X motorway – People travelling between Osijek and Zagreb often take the slower northern route rather than paying the motorway toll of 83 KN between Velika Kopanica and Ivanja Reka. It is hard to see how this will change with even higher charges.

Locally: The Corridor Vc consists of both a motorway and a railway which will be in direct competition with one another. This is likely to work to the detriment of the railway, because people perceive road transport to be more cheap and convenient, even though this is not necessarily true. The Corridor Vc is also duplicating the western bypass around Osijek, which is currently under construction. It is designed to take freight traffic out of the city centre, but in this case there is no justification for constructing a separate motorway.

3.3 Environmental Impact:

The Corridor Vc's main environmental impact in Croatia will be in its northern section, where it would cross the Drava Wetlands (Dravski ritovi) west of Osijek. These wetlands are home to numerous threatened species including White-Tailed Eagles (Haliaeetus albicilla), Black Storks (Ciconia Nigra) and Ferruginous Ducks (Aythya nyroca) which are all included on the European Union's List of Europe's Most Threatened Birds. The Black Stork is also listed in Annexe II of the Bern Convention as strictly protected, as are the fire-bellied toad (Bombina Bombina) and the yellow-bellied toad (Bombina Variegata), which also inhabit the area, whilst the White-Tailed Eagle and Ferruginous Duck are included in Appendix 1 of the Bonn Convention on Migratory Species as being endangered. The area is not currently protected by law and its value has been rather overlooked due to its proximity to the Kopački Rit Nature Park, but local groups Green Osijek and Osijek Greens have called for it to be declared a Nature Park and in 2003 sent recommendations.

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29 D. Boros: “From Osijek to Zagreb in 2.5 hours and for 105 Kuna”, Glas Slavonije, 21.07.2005
33 “Bridge across Drava on pampas to pass from Višņevac by overpass”, Osječki Dom, 16.07.2005

to the then Ministry of the Environment and regional authorities outlining their demands. The area is also part of the Drava Corridor which is the subject of wider demands for legal protection.

The River Drava, which runs roughly along the border between Croatia and Hungary before joining the Danube is an area of enormous natural value and home to numerous threatened species. It formerly formed part of the Iron Curtain and was therefore left relatively untouched by human activities for 40 years, allowing its wildlife to flourish. The Hungarian side of the Drava is included in the Danube-Drava National Park, but in spite of pressure from the NGOs of the Drava League coalition it has no current protected status on the Croatian side. However, several different proposals are being worked on and it is vital that legal protection is implemented as soon as possible to preserve this unique area:

- The Drava and Mura riverbanks have been designated as a priority for protection in the Croatian National Strategy and Action Plan for the Protection of Landscape and Biodiversity
- There are current plans to declare the Drava-Mura area a Regional Park.
- The area is a potential Natura 2000 site, but Croatia has not officially nominated its list of sites yet.
- The area has been nominated for UNESCO protection as a Biosphere Reserve but the Ministry of Culture (in charge of Nature Protection) is not yet publicly supporting this idea.

The planned motorway would carve straight through this habitat and pose a threat to its wildlife. The Croatian government has made some efforts to accommodate concerns about wildlife in its road-building programmes, such as building game bridges, but these are only beneficial to certain species and do nothing to address the disturbance caused to habitats by noise, emissions and vibrations. Game bridges and animal fences are a mitigation measure but are insufficient in this case since the motorway is not necessary for the foreseeable future, particularly north of Osijek where the Drava Wetlands are situated.

The impact of the road will be multiplied by the combined effect of the Corridor Vc and the bypass around Osijek, which is designed to take freight transit traffic out of the city centre. This is separate to the Vc motorway, but it is far from clear that it is necessary or economical to build two different roads with two bridges across the Drava with their corresponding impacts.

3.4 Claimed benefits:

The Corridor Vc has been the subject of some particularly wild claims, exemplified by the recent newspaper article entitled "With Corridor Vc, Slavonia will be the centre of the World" Other predictions have been slightly less outlandish but all rely on the same assumption: that the Vc will be the motor for local economic development. However, The claim that motorways benefit local agriculture and industry and therefore economic growth is unlikely to be true, as motorways used by local producers can also be used by outside producers to bring goods to the local market, which is likely to threaten local companies. The decisive factor, except for a few high quality speciality companies, is which companies can keep their costs down most, not in whether their home country has good motorways or not. It is more likely that supporting small enterprises in rural areas would have a greater effect on stemming depopulation and centralisation than building motorways.

36 “Dravske ritovi proglasiti Parkom Prirode! Glas Slavonije” 01.02.2003
37 Official Gazette 81/99
38 Letter from Minister of Culture Božo Biskupić to the Mayor of Koprivnica, 20th September 2005
39 Letter from Minister of Culture, Božo Biskupić, to Minister of Agriculture, Forestry and Water Management Petar Čobanković, 11th April 2005
40 Letter from Minister of Culture Božo Biskupić to the Mayor of Koprivnica, 20th September 2005
41 “Bridge across Drava on pampas to pass from Višnjevac by overpass”, Osječki Dom, 16.07.2005
42 Miroslav Filipović (interviewing Prof. dr Anka Mašek): “With Corridor 5c Slavonia will be the centre of the world”, Glas Slavonija, 03.10.2005 http://www.glas-slavonije.hr/trazi2.asp?ID=46928, viewed 04.10.2005
43 See for example the comments of Prime Minister Ivo Sanader and President of the Croatian Parliament Vladimir Šeks in “A5 motorway will be connection to Europe” in Vjesnik, 23.09.2005
The other main claim that has been made for the Vc is that it will encourage eco-tourism. The former Director of Kopački rit Nature Park, Melita Mihaljević, has publicly claimed that she expects the Vc to have a similar effect on Kopacki rit Nature Park as the main road through Lika has on the Plitvice Lakes National Park. (It should be noted that her views are not representative of others working in the Park). This is hardly likely to be true as Plitvice Lakes are situated on what was the main road between Zagreb and Dalmatia, which is perhaps the most important road for tourists in the country. Only a few Hungarians are likely to travel through eastern Croatia and Bosnia to get to Dalmatia, especially when there is a choice to go more directly from Budapest via Zagreb to Dalmatia on the main road through Lika or the Zagreb-Split motorway, and in addition Kopacki rit is not likely to have great novelty value because Hungary has similar habitats nearby in its own Drava-Danube National Park. Motorways usually produce neutral or even negative results for tourism, as they act as tunnels through the countryside, taking tourists at high speed to specific definitions, which has the effect of concentrating them in certain areas and leaving other areas neglected. Slovenia for example, has taken the opposite approach towards tourism and is promoting areas off the main arteries with the slogan ‘By-ways are better than highways’.

4) Public Participation

There is no evidence of the authorities failing to fulfil their basic legal obligations with respect to public participation, but local people, with the exception of ecologists, have not taken much interest in the development of Corridor Vc. This may be partly due to the frequently conflicting information which can be found in the local media on the subject, as well as the general lack of tradition of public participation in Croatia. For example some of the newspaper reports appear to say that the Osijek bypass is part of the Vc, whilst others show that they are separate projects. Much of the media coverage makes great but undefined and unsubstantiated claims about the project, whilst scepticism is limited to some concerns about environmental impacts.

Issues about whether the road is actually needed have not been covered at all in the media, and people assume it must be necessary and desirable, if they have heard about it at all. A survey of 200 students in the Faculty of Economics in Osijek University was carried out in 2004, and it was found that 58% per cent of them had never even heard of the Corridor Vc, whilst only 17.5% of them knew what it was, which suggests that information is not only of poor quality but that it is generally lacking. It could be said therefore that although the authorities have fulfilled their legal obligations, they could certainly improve the quantity and quality of information available about the project through the local media.

5) Conclusion and alternative priorities for transport in Croatia

Great hopes are being put into the Corridor Vc motorway, particularly as a motor for the economic development of Slavonia, but there is no evidence to back up claims that the motorway is necessary for economic development, as the busiest section of the motorway route is already served by a good 2-lane road. On the other hand, the motorway will cost Croatian taxpayers dearly, and destroy the Drava Wetlands before they are properly legally protected, without bringing noticeable improvements in travelling time or road safety. It will also compete with the railway on the same route, and with the Osijek bypass, which also serves the purpose of taking freight traffic out of the city centre. It is highly unfortunate that information about the motorway in the media has often been highly inconsistent and evangelical, and that no real public debate has taken place, in spite of the authorities’ formal fulfilment of their obligations. The construction of the first section has therefore begun without the project being subjected to appropriate public scrutiny.

5.1 Final recommendations:

44 Miroslav Filipović: “With the motorway even more tourists will come”, Novi List 05.05.2004
• The Corridor Vc motorway project should not be supported by the High Level Group on TEN-T extension to neighbouring countries, as it does not correspond to a sufficient level of demand, and should therefore not constitute a priority at the European level.

• The project should not be granted IFI or EU funding because it is not likely to bring benefits for local people, the environment, the local economy, or the Croatian economy.

• The preparation of the Croatian section of the motorway project should be suspended for the foreseeable future to avoid wasting public money, heavy competition with the parallel railway and environmental destruction. At the minimum no motorway should be built until the Bosnian and Hungarian parts are in the late stages and until the traffic demand justifies it. It is highly unlikely that the traffic level will justify a motorway north of Osijek at any time, and the plan for the motorway to pass through the Drava Wetlands must also be abandoned and an existing road used instead.

• Future transport projects must be better analyzed in relation to other projects being undertaken in order to minimise environmental impact and duplication, and maximise efficient use of financial resources.

• Any future motorway projects must be undertaken with a much greater degree of transparency, must demonstrate clearly that they are absolutely necessary, and must be subject to much wider-ranging public participation, not only including the EIA but a real public debate as to the costs and benefits of the investment. Those involved should also avoid making irresponsible and unrealisable promises about the benefits of infrastructure investments.

Instead of pursuing further motorway construction, we recommend that the Croatian authorities’ transport policies concentrate on:

• Continuing to strengthen the railways and allocating a higher proportion of the transport budget for this purpose. This would include renewing sections of tracks where there are speed restrictions, constructing a second track where there is currently only a single track, and electrification of the remaining lines.

• Putting more effort into developing inter-modal transport facilities to allow an increase in the proportion of freight travelling by rail.

• Putting more effort into making rail freight more efficient, with fewer delays at border crossings and delays whilst waiting for passenger trains to pass.

• Devoting more resources to maintaining existing second and third class roads.

• Allocating more resources to improving public transport and cycling facilities in urban areas. For example a quarter of Croatia’s population lives in Zagreb and the number is still growing, yet resources going into the expansion of the public transport system is not sufficient to guarantee a high level of service on the expanded lines. More resources for extended tramlines, plus shuttle buses to enable more efficient use of the urban railway could help to ease this situation.

• Allocating more resources to promoting travel by public transport and bicycle, as well as promoting freight transport by rail. This should be aimed at the Croatian public, foreign visitors, and companies transporting goods.

46 Julijus Pevalek, Director, Zagreb Electric Tramway (ZET), during roundtable discussion held at Green Action, 21.09.2005