

SLOVENE TRANSPORT POLICY

Sibout Nooteboom¹ and Peter Lipar

Background

To ensure sustainable development, The Republic of Slovenia adopted modern environmental legislation in 1993. The economic development plan, adopted in 1995, includes sustainability objectives. National and international economic perspectives are optimistic. This will inevitably cause an increase of traffic in Slovenia. The relative backwardness of the transport infrastructure causes, even at present, severe congestion, accidents and other environmental problems. Effectuation of the existing infrastructure plans for road and rail will clearly solve most of these problems, at least for some time. Their adverse environmental impact will be reduced where possible and feasible, because EIAs will be conducted at the level of routing in corridors and design. On the other hand, ongoing project EIA procedures demonstrate clearly that there is strong opposition in society against the uncritical execution of infrastructure plans. This opposition is based on a strong respect for the cultural and natural heritage and agricultural land preservation. It is also caused by the fact that in this hilly country, the main corridors run through vulnerable and densely populated areas.

There is a west-east road axis (the main route from south-western Europe, through Italy and the port of Koper to Ljubljana, Maribor, Hungary and beyond), and a north-south corridor (the main route from northern Europe through Austria, Ljubljana, Croatia and to Greece and Turkey). Both national and international traffic are increasing very significantly, not only on these two axes but also in corridors of regional and local importance. At present, the main bottleneck is around Ljubljana, which is the most densely populated area and simultaneously the crossing of both European main axes. Traffic on the axis from Ljubljana to the south will increase dramatically after the political situation has become stable in former Yugoslavia. Activities in the port of Koper is also projected to grow significantly.

Slovenia has Mediterranean and continental climate. It is mostly forested. In the valleys, mostly rather traditional, small scale agriculture is still practised. Most of Slovenia is sparsely populated. Industrial areas and urbanised areas are rare, and the landscape is mostly still unaffected. The main urban centre and capital is Ljubljana (about 250,000 people). The main seaport is Koper, on the 20 km coastline.

Transport policy

The Slovene government has decided that updated versions of the pre-independence National Motorway Construction Programme (NMCP) and the National Railway Programme (NRP) will be effectuated. They are congruous with the framework of the Trans-European Transport Network, as affirmed in the Treaty between the Republic of Slovenia and the European Union in the domain of transport. The development of Slovene transport infrastructure will be co-financed by the European Bank for Reconstruction and Development (EBRD). The NMCP provides for the construction of 390 kilometres of new motorways until 2004. The west-east corridor alone includes 150 km of motorway to be constructed before 2000 (75 km is already constructed). It has been approved by parliament. The NRP includes about 200 km of new railroad, as well as rehabilitation and improvement works, and the construction of a High Speed Rail line Trieste - Ljubljana - Zagreb. The NRP is still under discussion by parliament.

Rationale for SEA

Clearly, this infrastructure policy will have important environmental impact. This has been acknowledged during policy preparation, by requiring EIA at the level of corridors. Environmental regulations (noise, air) act as constraints for infrastructure development. The infrastructure programmes were confirmed by the adoption of

¹ Sibout Nooteboom, DHV Environment and Infrastructure BV, PO Box 1076, 3800 BB Amersfoort, The Netherlands, Phone: +31 33 468 2700, Fax: +31 33 468 2801, E-mail: Sibout.Nooteboom@MI.DHV.NL, and Peter Lipar, Traffic Technical Institute of the University of Ljubljana, Slovenia, PO Box 579, 61000 Ljubljana, Slovenia, Phone: +386 61 176 85 85, Fax: +386 61 125 06 92, E-mail: PLIPAR@FAGG.UNI-LJ.SL. The assessment of local impact of the High Speed Rail has been conducted by Razvojni center Planiranje Celje, Slovenia. This paper is based on a project carried out for the Ministry of Transport and Communications and the Ministry of Environment and Physical Planning of Slovenia. The project was financed by the European Commission.

the Spatial Plan in 1995, which was based, *inter alia*, on maps showing the areas vulnerable for infrastructure construction. Cumulative impact and the more general environmental impact of transport policy were not assessed, however. Even so, the Slovene government had not yet given attention to other methods to control traffic flows. The Slovene Ministry of Transport and the Ministry of Environment decided to prepare a Transport Master Plan (TMP), dealing with these issues. It was decided that potential elements of transport policy aimed at reducing traffic on motorways were to be subject to environmental assessment, except irrevocable investment decisions, such as the treaty with the European Union and related decisions in the NMCP and NRP.

The preparation of an SEA for Slovene transport policy, in conjunction with the preparation of a Transport Master Plan, was not required by Slovene or European legislation. One main reason for its initiation was the opposition encountered by the Ministry of Environment during the preparation of EIAs for road construction. It was believed by the initiators that an SEA and TMP would offer opportunities to reduce the impact by pro-active thinking, and simultaneously would create public support for proceeding with activities which inevitably have adverse side impact.

For the preparation of the SEA, both ministries launched in 1995 a traffic study and an environmental study. During the process it turned out that both studies can serve as basic input for policy formulation and assessment. The environmental study therefore is in this paper referred to as preliminary SEA. It is discussed hereafter in more detail.

Objectives of the preliminary SEA

The preliminary SEA had the following main objectives:

- to assess the possibilities to achieve a sustainable transport development by means of an active transport policy
- to assess the institutional arrangements and practice of environmental management in the transport sector in Slovenia, and make recommendations for improvement, including the management of baseline data
- to assess the cumulative impact of the route for High Speed Rail which had been selected, and to suggest measures for improvement.

It was the specific purpose to make an assessment of cumulative impacts at national level, and to appraise the potential of specific national policy measures. For impacts occurring at local scale, a generic approach would be adopted being crude at the local level, but robust at the national level. The quantitative analysis should focus on the options to control traffic flows on existing and planned infrastructure. For the assessment of decision making at lower tiers and environmental management, a more qualitative approach was chosen.

Scoping

A preliminary scope for environmental impacts was based on the views of the ministries of environment and transport, as well as the European Commission. This was extended by the results of a scoping meeting. National NGOs were invited, as well as experts from relevant institutes and governmental bodies; 45 persons attended the meeting. It included an oral presentation by the State Secretary of Transport, and by the Director of Physical Planning (Ministry of the Environment). DHV Consultants presented the international experience with SEA for High Speed Rail. After that, there was opportunity for questions, remarks and discussion. The opinions expressed were incorporated in the scope of the preliminary SEA. The scoping meeting resulted in a list of results/conclusions. One result was the submission of a statement by 40 NGOs, entitled 'Transport in Slovenia: Demands and Proposals'. Part of the discussion was about corridor decisions which were already irrevocable; this could possibly have been prevented by giving a better explanation of the problem and objectives of the preliminary SEA (e.g in the invitation letter).

It is the authors' impression that the invited people were a more or less complete selection of all organisations which may be expected to be interested in this issue. Nevertheless, this scoping meeting is a somewhat limited method to attain a wide public discussion on such an important matter. Such a wide discussion would be useful to attain more clarity about the views of groups from society, so that parliament will be able to take decisions with more public support. It is the intention that such a discussion will be organised in the follow-up.

Environmental assessment of the transport policy

Traffic policy alternatives

In order to assess the environmental impact of realistic proposals for a TMP, the SEA team made two alternative assumptions about the outcome of the TMP: an 'unchanged policy' and a 'turn around policy'. The unchanged policy assumed no additional measures to control traffic flows. The 'turn around policy' is based on 'push-and-pull' measures to encourage the use of more environmentally friendly transport modes. The selected measures had proved successful in similar countries. It may be viewed as a realistic scenario for a strong policy to reduce road transport and to attain a shift towards public transport. This policy was assembled on the basis of expert judgement, involving Slovene and international transportation experts.

Traffic scenarios

Passenger and freight traffic forecasts for the year 2012 were based on a computerised model. Common starting points, such as assumptions with respect to national and international political, economic and population development, were based on discussions with experts from the Ministry of Transport and several other experts in the field. Estimations of traffic volume were made for car, bus, truck on 21 road sections, as well as rail. A distinction was made between international and national traffic. The main result was that the 'turn around policy' would reduce the overall motorway traffic in 2012 by about 10% as compared to 'unchanged policy'.

Environmental indicators

The partial impact of both traffic scenarios on environmental indicators was estimated, keeping all other factors (such as technical improvement of cars) the same. This will show the potential of traffic policy as environmental policy instrument. The main results are shown in the following table.

Partial change in environmental impact caused by reduction of traffic volume on motorways in 2012, by adopting a 'turn around policy' (relative to 'unchanged policy')

Noise	Ambient Air	Greenhouse Effect	Photochemical Smog and Acid Deposition	Depletion of Fossil Energy
Affected number of residents	Area where standards are exceeded	Emission of CO ₂	Emission of NO _x	Energy content
4%	negligible	13%	13%	9%

Obviously, partial impact of traffic policy may become different if other factors change, such as technological improvement of cars, and new noise mitigation policy (e.g. screens). A qualitative discussion indicated that the differences in the table are upper limits. The environmental benefit of traffic policy may therefore be smaller than indicated in the table. On the other hand, all environmental indicators will deteriorate very significantly in the future, up to about 70% for air emissions.

The following assessment methods have been applied:

Noise impact. Number of people living in houses where the legal noise standard is exceeded was estimated by means of a computerised model to calculate noise contours based on traffic volumes. Western assumptions for emissions factors were applied. The noise dispersion model was based on German methodology. The isophones were overlaid with GIS maps of residential areas. It was argued that the inaccuracy of the estimation is small with respect to the differences between both scenarios;

Ambient air. Calculations with a dispersion model indicated that air quality standards will not be exceeded in any scenario or any location. There was thus no need for estimations of the number of affected people. Only the total emission of toxic gases from the motorway system was estimated. For emission factors, the worst case for technical innovation was assumed. It was argued that emission by the rail system will be negligible compared to motorised transport;

Greenhouse effect. Emission of CO₂ was estimated based on energy consumption (hereafter);

Photochemical smog and acidification. NO_x-emission for the whole motorway network was estimated by means of specific emission data by vehicle type;

Energy consumption. Dutch estimations of present fuel consumption by kilometre were used (this was regarded realistic).

Conclusions and recommendations

If Slovenia does not adopt an active policy to reduce the environmental impact of transport, no sustainable development will be achieved according to the strategy set out in the economic plan of 1995. Such a policy could certainly have beneficial environmental effects. Limitation of the increase of motorway traffic is feasible, and will, especially, be beneficial with respect to global impacts. (They will also reduce congestion on the road network). Assuming that cost-effective transport/environmental policy includes traffic policy (as in most countries), one of the first targets should be to reduce the number of short distance trips (up to 15 km). It has relatively large potential benefit, and is workable in the Slovene situation. Effective measures would further be:

- promotion of public transport for commuting, expansion of services, possibly introduction of light rail in the Ljubljana area;
- promotion of the bicycle; there are favourable circumstances;
- introduction of restrictive parking policies in urban areas.

Even with these traffic measures, the environment will deteriorate significantly. It is recommended to contemplate additional measures, aimed at reduction of specific fuel use, average speed and noise mitigation measures.

To make a more detailed appraisal of options for a transport policy, an assessment of costs and benefits would have to benefit from a closer linkage between policy making and environmental assessment. Options such as a general analysis of cost and benefit of tunnels could be elaborated. It is recommended to set out a joint strategy, prepared by the Ministry of Transport and Communications and the Ministry of Environment, for the development of a sustainable transport policy. Part of that strategy could be the monetary valuation of environmental goods, as proposed by the Economic Plan for Slovenia (1995).

Environmental Assessment of High Speed Rail

For the High Speed Rail line (the only new infrastructure assessed in this case study), the following assessments were made.

Generic description

A description of environmental issues of High Speed Rail lines was made, as they have been studied in other countries, as well as their applicability in Slovenia.

Alignment case study

Before independence, a route was proposed for the High Speed Rail connection Trieste - Ljubljana - Zagreb. The environmental impact of this route was assessed as a case study. The following indicators were used:

- a qualitative description of the effect on vulnerable areas, including a professional judgment classified as negligible, observable or major impact; this was specified for the following vulnerable land uses: agriculture, forestry, tourism, housing, visual landscape;
- social impact was assessed in a similar way, for natural heritage, cultural heritage, habitat fragmentation.

The analysis made extensive use of GIS, confronting the route with map layers of all categories of vulnerability, and calculating lengths of crossings, and land use. For all indicators, critical points along the route were identified, and recommendations were made to relieve these bottlenecks. For the alternative of upgrading of the existing tracks to accommodate a High Speed Train, an analysis of generic advantages and benefits was made.

Recommendations

The previously proposed route clearly allows much unnecessary adverse local impact, whereas the upgrading of existing lines will have adverse implications for route length and speed. It was recommended to reconsider all routing options. Suggestions for an integrated assessment were made. This approach consists of a combined routing study and SEA, first determining whether High Speed Rail could with any routing or design be desirable considering the least credible environmental impact and maximum credible macro- and micro-economics benefit, as well as beneficial effects for international policy. The second step would be to conduct corridor studies to identify the most preferred alignment (integrating transport and environmental objectives).

Environmental decision making in the Slovene transport sector

Corridor studies and EIA

EIA legislation and practise of corridor studies were assessed by a review of legal texts, and by an reviewing a recent corridor study /EIA. This particular section of road had encountered serious opposition from the public. It was reviewed in detail by a national committee of experts, which asked the international experts for their judgement. The conclusions were favourable: the Slovene system of EIA complies with, for example, the EIA Directive of the European Union.

National level

Infrastructure planning at national level takes account of technical evaluations of the vulnerability of the crossed areas. The results have been politically approved. However, other assessments about the environmental effects of transport policy, were not prepared. The economic plan of 1995 includes preliminary objectives and guidelines for sustainable development in sectoral plans, but they have not yet been elaborated for the transport sector. In this report, recommendations are made to improve the integration of the environment into sectoral planning at national strategic level.

Availability of baseline data

For EIAs as well as for the SEA, environmental baseline data and information could be obtained from the Ministry of Environment, managing a Geo-Information Center (GIC). The GIC is a 'meta data system', a data base containing data about data, obtainable in about 100 organisations. Much information is available in GIS format. Also for transport and traffic, sufficient data are available.

Conclusion

Feasibility

This preliminary SEA indicates that it is possible to assess the environmental consequences of a given national transport policy without unreasonable input of man days or time loss: the project was completed within six months, and needed an input of about two man years. The same team would do another assessment of another transport policy option in much less time. The feasibility of the approach was much enhanced by the availability of extensive computerised baseline data in the area of infrastructure, traffic and the environment (use of GIS). Slovene experts have sufficient knowledge about traffic and environment at the level of corridors and design. It was possible to positively identify the types of environmental impact that can effectively be diminished by reducing traffic volume. International consultants could contribute to the establishment of comprehensive policy proposals and cumulative assessment, and a general transfer of knowledge about international and national transport policy and SEA.

Transport scenarios were discussed with the main Slovene organisations in the field of transport. Many informal meetings were organised, where experts expressed their views on draft proposals. They were informed about the environmental impact about hypothetical policy assumptions. This method of work has contributed to the support for a transport-environmental policy in the transport sector, and for the follow-up of the preliminary SEA with a more active contribution of the transport sector.

For the High Speed Rail line, it was possible to demonstrate that the present proposals have unnecessary environmental impact, and that reconsideration of the alignment is recommendable. It was also recommended to make a basic comprehensive analysis of its potential advantages and disadvantages, so that a democratic decision can be made about the principle of its construction.

Further steps

The preliminary SEA was a starting signal of a more integrated planning process. The Ministry of Transport has started the elaboration of a transport/environmental policy. Preparations for the development of an integrated TMP and SEA are presently made. It will be discussed and approved by parliament. The results of the TMP and SEA will be presented in the media so that public feed back is expected, and will be accounted for. For the High Speed Rail line, it is likely that the recommendations will be followed up.

References

DHV Consultants and Traffic Technical Institute, 1996. "Preliminary Strategic Environmental Assessment of the Transport Master Plan". Ministry of Transport and Communications, Ministry of Environment, Ljubljana,

Slovenia / European Commission (in preparation).

DHV Consultants and Traffic Technical Institute, 1996. "Preliminary Strategic Environmental Assessment of the High Speed Rail". Ministry of Transport and Communications, Ministry of Environment, Ljubljana, Slovenia / European Commission (in preparation).

MAP OF SLOVENIA

Planned motorways are striped