Andrej GULIČ

The Influence of Transport and Energy Supply Infrastructure on Regional Development in Slovenia

1. Synthetic emphasis of basic present and expected development problems

The modernisation and development of new transport (highways, railways) and energy supply infrastructure (400 kV power lines, international gaslines and product lines) in Slovenia, in general create better conditions for a higher level of transport and energy infrastructure supply, thus better connectedness of Slovenia with neighbouring countries and the European Union and between towns and their pertaining regions in Slovenia. However the new traffic, energy and communication infrastructure alone cannot stimulate economic, social, spatial and environmental development of the country, thus also diminishing regional development differences, If it will not represent a complementary part of a comprehensive (regional) development strategy. Construction of infrastructure networks can create new spatial, regional and environmental problems, which should be attended to by the nation and policies or measures for their diminishment or solution devised. A new opportunity is the proposed Strategy of regional development of Slovenia.

Let us point out some of the toughest problems, as they appear in particular macro-regions:

1.1 Primorska and the Coastal-Kras regions

- We believe, that the layout of the road system in this area, according to guidelines from OCSSC [1], NPRIDS [2] and NPHC [3] doesn't strengthen strategic development interests of Slovenia, which should be better expressed in direct connections of Ljubljana and the other development centres in Slovenia with centres of equal or higher rank in Italy and Western Europe (direction Ljubljana – Palmanova (Gorizia) – Milano). On the other hand the proposed layout on Slovene territory "richly" encircles and strengthens the gravitational pull of Trieste, because of the indirect connection Nova Gorica – Ljubljana, partly also Gorizia, through a territory that Italy not so long ago, had under its jurisdiction.
- Execution of guidelines from OCSSC, NPRIDS and NPHC practically equalises the lengths of two, in fact competing highway routes, namely Palmanova – Trieste – Reka – Zagreb and Palmanova – Nova Gorica – Ljubljana – Zagreb, thus reducing the synergetic effect of highway construction in Slovenia towards Italy. At the same time, infrastructure pre-conditions for improving the competitive advantages and further development of the port in Koper and the economy of the Coastal region, are weakened.
- The proposed gasline M8 (Italy – Croatia), running across four regions in Slovenia (Vipavsko, Notranjska, Kočevsko, Dolenjska), avoids all important urban centres.

1.2 Dolenjska, Zasavje, Posavje and Celje regions

- Construction of the highway segment Višnja Gora – Trebnje – Novo mesto – Bregana – (Zagreb) and the highway segment (Zagreb) – Macelj – Ptuj – Maribor, according to OCSSC and NPHC, widely open the area for further strengthening of the gravitational pull of the Zagreb agglomeration in Posavje, Dolenjska and Štajerska regions, while simultaneously weakening the functional significance and gravitational influence of national development centres Maribor, Ptuj, Novo mesto, Brežice and Krško. The strength of the negative effects of the Zagreb agglomeration for future development of Slovene regions and centres will be even more pronounced after relations with Croatia will be normalised and the expected inclusion of Croatia into European integration processes.
- Construction of the two mentioned highway segments according to OCSSC and NPHC weakens the Slovenian horizontal development axis (so called Slovenica), which should represent the strategic development backbone of domestic economy.

1.3 Štajerska and Pomurje regions

- Modernisation of the existing railway line Pragersko – Ptuj – Ormož – Ljutomer – Murska Sobota, with an appendix to Hodoš on the Slovene-Hungarian border is less advantageous, because it has a "by-pass" character, i.e. it doesn't respect the criteria of attaining direct connections thus disabling the development of Maribor as an important railway knot. Instead of Maribor (according to OCSSC and NPRIDS) the knot will be strengthened on an existing railway junction – Pragersko!

2. Explanation of primary development problems and presentation of basic principles and possible scenario's for their diminishment or solution

One of the primary goals of the future Strategy of regional development of Slovenia should also be the formulation of professional and design guidelines, so that by spatially and technologically joined reconstruction of existing infrastructure, and new construction of the traffic and energy infrastructure, conditions will be achieved for:

– swifter and better connections with the European Union, adequate connections between major development centres in Slovenia stimulating dynamic and quality economic development, preserving the basic characteristics of the settlement pattern and cultural countryside and finally facilitating similar living conditions in all parts of the country.

To achieve these goals, the following principles should be respected:

1. Planning and construction of particular transport infrastructure modes should be spatially, technologically and organisationally more co-ordinated and simultaneously co-ordinated with planning and construction of energy supply infrastructure. In the field of transport infrastructure development, conditions should be met for realising so called continuous transport chains, which will solve present conflicts between highways and railways. Internatio-

nal, national and regional optimal transport offer is needed, where any transport mode can fulfil goals applying to their character and properties

2. New infrastructure endeavours, especially those connected to construction of transport infrastructure catering to present and future international transit, should be realised in an environmentally friendly and spatially rational manner
3. New transport infrastructure (partially also energy supply infrastructure) as part of the national distribution network should be adapted to the desired settlement system
4. Co-ordinated planning and construction of transport and energy infrastructure in spatially sparing, functionally compatible, environmentally friendly and economically acceptable corridors, could indirectly strengthen attempts at developing decentralised concentration of urban settlements in Slovenia
5. Planning of new traffic and energy infrastructure – especially new highways, long distance railways and hydroelectric power plant chains – should, as much as possible, prevent further "parcelisation" or "disjointedness" of space with different infrastructure. Wherever technically possible, despite higher investment costs, different sub-systems of the new traffic infrastructure should be spatially joined with planned energy supply and other corridors (hydroelectric power plant chains, gaslines, pipelines, power lines, etc.).

By formulating three scenario's of designing joint and spatially unified transport-energy supply corridors in Slovenia, we present possibilities for implementation of these development principles, thus in the framework of regional spatial planning creating objective basis for: environmentally friendly connections between settlements and other places in Slovenia and the transportation network; provision of adequate international integration into traffic and energy supply infrastructure; high quality infrastructure connections between major regional development centres, with a possibility of strengthening competitive advantages of Slovenia in comparison with other European countries and their urban centres; controlling possible excessive growth in spatial mobility, that can lead to added sub-urban dispersion of settlements and excessive growth of competitiveness between particular regional centres.

2.1 The Ideal development scenario for joint infrastructure corridors in Slovenia

The ideal scenario of joint infrastructure corridors in Slovenia is predominantly based on the proposal for the plan of road and railway networks, as defined in the research Possible effects and consequences of the road and railway networks on settlement development and land use in Slovenia (Gulič, et al., 1995). We named it *Ideal*, because we believe that in the best way it solves spatial, environmental and regional problems, that appear by placing different types of infrastructure of national and international importance in Slovenia. The scenario could also be named *Idealistic*, because possibilities for implementation are extremely limited. Reasons for predictably minimal feasibility of this development scenario can be found in the fact, that they largely differ from guidelines and goals in some basic adopted development documents, that are already being materialised. Some of these are: The long-term plan of Slovenia from 1986 to 2000 (LTPS); Ordinance on changes and supplements of spatial components of the long-term and mid-term plan of the Republic of Slovenia (OCSSC); National programme of railway infrastructure development in Slovenia (NPRIDS); National programme of highway construction in Slovenia (NPHC).

Within the framework of the ideal scenario for development of joint infrastructure corridors, taking into account proposals by the commissioner of the project, we proposed two ideas, A and B. The difference between the two is the new 400 kV powerline running along the highway (Lendava) – Genterovci – Ljubljana – Nova Gorica.

As can be seen on the maps (1 and 2), compared to LTPS, OCSSC, NRPIDS and NPHC, we propose considerable changes on the planned highway, railway and gaslines networks. They are presented according to particular macro-regional areas.

2.1.1 Primorska and the Coastal-Kras region

Slovenia is trying to establish good transport and energy supply infrastructure connections with Southern and Western Europe across the Primorska and Coastal-Kras region and improve traffic access of its centres. Our proposals are numerous.

In the road system:
- eliminating the construction of the connecting highway Razdrto – Nova Gorica (Gorizia) and building the highway route Logatec – Col – Ajdovščina – Nova Gorica;
- construction of the connecting highway between Slovenia and Trieste on the route Koper (Škofije) – Trieste and highway connection with Istria, Kvarner and Dalmatia on the route Trieste (Koper) – Buzet – Reka.

In the railway network:
- eliminating the fast railway under research Trieste – Ljubljana and the research of the fast railway Ljubljana – Villach, connecting Ljubljana to the emerging European fast railway network;
- eliminating the coastal connecting highway Koper – Izola – Portorož and construction of a regional railway along the same route.

In the gaslines network:
- in general, international transit gaslines should be placed along parallel highway or railway infrastructure, as proposed in this scenario;
- in sectional studies of the proposed pipeline M8 connecting Italy and Croatia across the Vipava, Notranjska, Kočevska and Dolenjska regions should be eliminated. Instead, the pipeline should run along the proposed highway Nova Gorica – Ajdovščina – Col – Logatec – Ljubljana and further through the Posavje and Zasavje regions.

In the network for transport of petroleum and petroleum derivatives:
- the route should follow the highway Koper – Postojna – Logatec – Ljubljana and further to Lendava.

In the electrical energy supply network:
- Scenario A doesn't differ from the established routes (A. Tiršek, et al., 1996);

– Scenario B proposes the construction of a new transit 400 kV power line along the highway Nova Gorica – Ajdovščina – Col – Logatec – Ljubljana and further to Lendava.

The basic arguments behind these changes are as follows:

1. Construction of the highway Logatec – Col – Ajdovščina – Nova Gorica will not only improve direct connections between Ljubljana and the other development centres in Slovenia and nodes of equal or higher rank in Italy and Western Europe, but also improve direct connections to Zagreb, Budapest, Bratislava and other important urban centres with centres in Western Europe, thus improving the significance of the transport node in Ljubljana.
2. From the viewpoint of economic co-operation and according to the significance and power of Ljubljana, central Slovenia and Udine, the most important economic centre in Friuli-Julia in Italy, direct connections are at least as important, if not more important, than connections with Trieste, which is in fact only an administrative regional centre.
3. Adopting the highway segment Logatec – Col – Ajdovščina – Nova Gorica would improve traffic connections and integrate the northern Posočje and Idrijsko-Cerkljansko regions with central Slovenia and the coastal region.
4. The highway system according to OCSSC and NPHC, other than intensifying the role and significance of Trieste also enables reconstruction of its fairly outdated port and other complementary activities.
5. Connections between Slovenia and Trieste through Koper (Škofije) would enable partial "infrastructure neutralisation" of the predictable overpowering functional influence of Trieste and easier achievement of possible division of services between the two ports, Koper and Trieste, especially after Slovenia becomes a full member of the European Union.
6. The highway connection between Slovenia and Reka (Istria, Kvarner, Dalmatia and partially the Zagreb macro-region) with Trieste through Koper (Škofije) would strengthen the role of Koper as an important traffic node, while at the same time preventing direct connections between the ports in Trieste and Reka, and furthering development of the port in Koper and the regional economy.
7. Other than stimulating the creation of negative strategic development effects, the guidelines in the OCSSC and NPHC concerning planned construction, propose too many highways (described in kilometres) and overuse of land (described in km^2), unnecessarily used for road construction. If the connecting highway Razdrto – Nova Gorica (Gorizia) was eliminated and the highway Logatec – Col – Ajdovščina – Nova Gorica adopted, the length of highways would decrease by 20 km, thus substantially diminishing possible negative environmental effects.
8. Adoption of the Logatec – Col – Ajdovščina – Nova Gorica highway would substantially diminish the amount of irretrievably lost (meliorated) agricultural land in the Vipava valley and pollution of remaining agricultural land. A similar somewhat smaller reduction would be achieved if the highway segment Divača – Sežana (Trieste) was eliminated.
9. Elimination of the fast railway between Trieste and Ljubljana and the adoption of the fast railway between Villach and Ljubljana instead, if the fast railway Venice – Villach – Graz – Vienna and Trieste – Ljubljana – Zagreb are built, would enable better and adequate connections between Ljubljana (Slovenia) and important Western, Central, and East European urban centres, partial neutralisation of the predictable overpowering functional attraction of Trieste, similar to the planned highway network; smaller predictable construction and technical problems and lower costs of construction, than the adopted route running across extremely sensitive Kras terrain with many height differences.
10. Construction of the coastal connecting highway Koper – Izola – Portorož would irretrievably destroy a large part of the already modest Slovene coast, which has already undergone unpunished devastation (e.g. the construction of marina's); it would also stimulate further "automobilisation" and sub-urbanisation phenomena. That is why we propose the construction of a regional railway along the same route.
11. Since the proposed gasline M8 Italy-Croatia, according to sectorial plans, doesn't connect any important urban centres in the Vipavska, Notranjska, Kočevska and Dolenjska regions, our proposal is to eliminate this route and research the possibility of placing it next to the Nova Gorica – Ajdovščina – Col – Logatec – Ljubljana highway and further along the Posavje and Zasavje corridor.
12. Concerning electrical power supply lines, i.e. the planned 400 kV, 220 kV and 110 kV power lines, in scenario A there are no changes, because we feel that changing existing and planned routes would be dis-functional in Slovenia, expensive and prolonged, without immediate results. Scenario B however, for research purposes, proposes a transit route next to the Nova Gorica – Ajdovščina – Col – Logatec – Ljubljana highway and further to Lendava.

2.1.2 Dolenjska, Zasavje, Posavje and Celje region

In these regions Slovenia is trying to establish high quality transport and energy supply infrastructure connections with the Balkans and East European countries and improve accessibility of pertaining centres. Our proposals are as follows:

In the road system:
– elimination of the proposed highway segments Višnja Gira – Trebnje – Novo mesto – Bregana and Ljubljana – Domžale – Vransko – Žalec – Celje. Instead of these we propose the segments Bregana – Brežice – Krško – Sevnica – Hrastnik and in Hrastnik, the macro-locational knot, two branches, one towards Trbovlje, Zagorje, Litija and Ljubljana, and the other towards Celje.

In the gaslines network:
– in sectorial studies of the proposed pipeline M8 connecting Italy and Croatia across the Vipava, Notranjska, Kočevska and Dolenjska regions should be eliminated. Instead, the pipeline should run along the proposed highway Brežice – Trbovlje – Ljubljana and further towards Italy along the Col and Vipava corridor.

The basic arguments behind these changes are as follows:

1. Construction of the highway segment Bregana – Brežice – Sevnica – Hrastnik and branches from the Hrastnik macro-locational node: Trbovlje – Zagorje – Litija – Ljubljana and Celje would after eliminating the route (Zagreb) – Macelj – Ptuj – Maribor, prevent negative gravitational effects of the Zagreb agglomeration, promote development in the depressed Zasavje region and equalise its traffic accessibility to the Ljubljana, Celje and Posavje regions, strengthen the functional significance and gravitational pull of Celje and Maribor, surpass the development duality between Maribor and Ljubljana and strengthen the role of Celje on the central Slovenian development axis. The modernised regional road Ljubljana – Trebnje – Novo mesto – Brežice would be quite adequate for satisfying accessibility to the Dolenjska region. Even more, Novo mesto would substantially improve its access to Celje (via Krško), Maribor and the Pomurje region and further to important Central and East European centres.
2. The Zagreb agglomeration and with it all Eastern Europe and the Balkans, in near perspective also the Middle-east would gain access to Western Europe through Slovenia on one (basic) highway route, thus strengthening (despite negative environmental consequences) the central Slovenian development axis.
3. The elimination of the highway segment Ljubljana – Domžale – Vransko – Žalec – Celje would prevent further processes of sub-urbanisation along the route Ljubljana – Celje. The highway between Ljubljana with Celje across the Zasavje region would connect a large number of higher ranking centres and settlements with more inhabitants, than the proposed routes in OCSSC and NPHC.
4. The proposed highway connection between Ljubljana and Celje across the Zasavje region is substantially better than the proposed routes in OCSSC and NPHC concerning irreversible loss of agricultural land and direct endangerment to water resources and the water table.
5. The proposed highway connection between Ljubljana and Celje across the Zasavje region is more functional than the proposed routes in OCSSC and NPHC because it also creates better possibilities for creating a unified transport – energy supply corridor, containing the planned chain of hydroelectric plants on the Sava river, existing main railway and planned second track, highway, international gasline M8 and the fast railway. Thus, the proposed routes would be in the physical, spatial and even functional sense unify different infrastructure networks and simultaneously substantially diminish the "cutting" of Slovenian territory with different types of infrastructure – a major achievement in the spatial and environmental sense.
6. Construction of the highway segment Višnja Gora – Trebnje – Novo mesto – Bregana – (Zagreb) would irretrievably destroy a lot of agricultural land and seriously endanger very important water resources on the Krško-Brežice water table.

2.1.3 Štajerska and Pomurje region

In these regions Slovenia is trying to establish high quality transport and energy supply infrastructure connections with the Central- and East European countries and improve accessibility of pertaining centres. Our proposals are as follows:

In the road system:
- elimination of the highway segment (Zagreb) – Macelj – Ptuj – Maribor, removal of the segment Maribor – Lenart – Murska Sobota – Genterovci – Lenti further North, so that it would run "through" Murska Sobota and not "through" Beltinci.

In the railway system:
- construction of the main railway Maribor – Lenart – Murska Sobota – Genterovci in the joint corridor with the mentioned highway.

In the gaslines network:
- the route of the international gasline Italy-Hungary M9, should run in the same corridor as the railway Maribor – Lenart – Genterovci.

In the network for transport of petroleum and petroleum derivatives:
- the route of the pipeline should run in the same corridor as the railway Maribor – Lenart – Genterovci.

In the electrical energy supply network:
- Scenario A doesn't differ from the established routes (A. Tiršek, et al., 1996);
- Scenario B proposes the construction of a new transit 400 kV power line in the highway and railway corridor Maribor – Lenart – Genterovci.

The basic arguments behind these changes, other than those already mentioned for the Dolenjska, Zasavje, Posavje and Celje regions, are as follows:

1. Selection of a more direct connection between Maribor and Murska Sobota than the one in OCSSC and NPHC, strengthens the nodal position of Murska Sobota and Maribor and improves the strategic-development position of the Štajerska and Pomurje regions in Slovenia, also towards other regions in neighbouring countries, especially the position of Maribor compared to neighbouring Graz.
2. Construction of the main railway Maribor – Lenart – Murska Sobota – Genterovci – Lenti in a joint infrastructure corridor, with the proposed highway would influence more efficient construction of both systems, facilitate improvements in possibilities for combined transport, enabling development of a joint slovene-hungarian highway-railway transport logistic terminal and equal railway and highway connections on the E65 route (Lenti – Zalaegerszeg – Kormend – Szombathely – Bratislava) and E71 route (Lenti – Nagykanisa – Budapest). This solution would require the Hungarian side to build a connecting railway Lenti – Zalalovo, which would also have to be financially supported by Slovenia, because the Murska Sobota – Hodoš route passes through a sparcely populated and demographically threatened area and wouldn't have special synergetic effects.
3. Eliminating the highway segment (Zagreb) – Macelj – Ptuj – Maribor from the OCSSC and NPHC would be beneficial because it preserves existing agricultural land and doesn't endanger the water table near Ptuj.

Rough estimates of benefits from implementing the *Ideal* scenario in development of joint infrastructure corridors

are: shortening the length of highways in Slovenia by approximately 80 km and the length of the fast railway by 20 km while simultaneously spatially and functionally connecting the gaslines and petroleum pipelines with the transport network.

2.2 The Active development scenario for joint infrastructure corridors in Slovenia

The difference between the *Ideal* and the *Active* scenario, in development of joint infrastructure corridors, stems from the hypothesis, that guidelines and directives of legally binding documents, such as OCSSC, NPHC and NRPIDS cannot be totally changed, but in certain details. In this scenario the placement of energy supply infrastructure was adapted to the planned network of highway infrastructure

As illustrated in the map (figure 3), we propose substantial changes predominantly in routes of power lines. Similarly as in the *Ideal* scenario, these changes are presented according to particular macro-regions.

2.2.1 Primorska and the Coastal-Kras region

Slovenia is trying to establish good transport and energy supply infrastructure connections with Southern and Western Europe and improve traffic access of its centres. Our proposals are several:

In the road system:
- complying to guidelines and directives of OCSSC, NPHC, NRPIDS and LTPS.

In the railway network:
- eliminating the fast railway under research Trieste – Ljubljana and adding the fast railway Ljubljana – Monfalcone – Venice (under reserach). In this way Ljubljana would be directly connected to the railway junction in Monfalcone and thus to the Northern Italian part of to the emerging European fast railway network;

In the gaslines network:
- as in the *Ideal* scenario, international transit gaslines should be placed along parallel highway or railway infrastructure;
- in sectoral studies of the proposed pipeline M8 connecting Italy and Croatia across the Vipava, Notranjska, Kočevska and Dolenjska regions should be eliminated. Instead, the pipeline should run along the proposed highway Nova Gorica – Ajdovščina and then along the proposed fast railway Monfalcone – Ljubljana and further through the Posavje and Zasavje corridor.

In the network for transport of petroleum and petroleum derivatives:
- the route should follow the highway Koper – Postojna – Logatec – Ljubljana and further to Lendava.

In the electrical energy supply network:
- no changes are proposed, proposed routes are taken from most recent sectorial proposals for new power lines (A. Tiršek, et al., 1996).

The basic argument behind these changes applies to the proposed fast railway:
- Elimination of the fast railway under research Trieste – Ljubljana, and the inclusion of the route Ljubljana -. Monfalcone – Venice, thus Ljubljana would be directly connected to the railway junction in Monfalcone and to the Northern Italian branch of to the emerging European fast railway network. In our opinion this route is not as good as Ljubljana – Villach, shown in the *Ideal* scenario, but much better than Ljubljana – Trieste, shown in the *Tendency* scenario. By this route Ljubljana could "by-pass" Trieste, meaning at least partial infrastructure neutralisation of predictable overpowering functional influence of Trieste. In this case it won't be necessary to build an unusual and difficult deviation towards Koper, where the fast railway reroutes towards Ljubljana.

2.2.2 Dolenjska, Zasavje, Posavje and Celje region

In these regions Slovenia is trying to establish high quality transport and energy supply infrastructure connections with the Balkans and East European countries and improve accessibility of pertaining centres. Our proposals are as follows:

In the road and railway system:
- complying to guidelines and directives of OCSSC, NPHC, NRPIDS and LTPS.

In the electrical energy supply network:
- no changes are proposed, proposed routes are taken from most recent sectorial proposals for new power lines (A. Tiršek, et al., 1996).

In the gaslines network:
- in sectoral studies of the proposed pipeline M8 connecting Italy and Croatia across the Vipava, Notranjska, Kočevska and Dolenjska regions should be eliminated. Instead, the pipeline should run along the proposed highway Ljubljana – Trebnje – Novo mesto – Bregana.

In the electrical energy supply network:
- no changes are proposed, proposed routes are taken from most recent sectorial proposals for new power lines (A. Tiršek, et al., 1996).

The basic argument behind these changes applies to the gaslines network:

1. Similar as in the *Ideal* scenario, placement of the gaslines along the proposed highway Ljubljana – Trebnje – Novo mesto – Bregana would substantially diminish "disconnectedness" of this part of Slovenia with different types of infrastructure networks. Possible positive effects and financial benefits can occur following joint construction of both infrastructure systems.

2.2.3 Štajerska and Pomurje region

In these regions Slovenia is trying to establish high quality transport and energy supply infrastructure connections with the Central- and East European countries and improve accessibility of pertaining centres. Our proposals are as follows:

In the road and railway system:
– complying to guidelines and directives of OCSSC, NPHC, NRPIDS and LTPS.

In the gaslines network:
– the route of the international gasline M9 between Italy and Hungary, Lendava – Ljutomer – Ptuj – Slovenska Bistrica should be eliminated and that the same should run next to the proposed highway Lendava – Genterovci – Murska Sobota – Lenart – Maribor.

In the network for transport of petroleum and petroleum derivatives:
– the route of the pipeline should run in the same corridor as the highway Lendava – Genterovci – Murska Sobota – Lenart – Maribor.

The argument behind these changes basically applies to the gasline network:

1. Similar as in the *Ideal* scenario, when dealing with the Primorska and Coastal-Kras region and the Štajerska – Pomurje region, along the Lendava – Genterovci – Murska Sobota – Lenart – Maribor highway, would substantially diminish "dis-connectedness" of this part of Slovenia with different types of infrastructure networks.

Implementation of the *Active* scenario in development of joint infrastructure corridors wouldn't shorten the length of highways in Slovenia, as the *Ideal* scenario would. The length of fast railways however would, and at the same time the gaslines, pipelines for petroleum and derivatives and the planned transport network could be sensibly spatially and functionally joined.

2.3 The Tendency development scenario for joint infrastructure corridors in Slovenia

The hypotheses behind the Tendency scenario in development of joint infrastructure corridors were:
– the guidelines and directives of legally binding documents, such as OCSSC, NPHC and NRPIDS cannot be changed;
– the most recent guidelines and directives, proposed in expert material for the Spatial plan of Slovenia concerning energy supply infrastructure (Babuder, Porenta, et al., 1995a; and Babuder, Brečevič, et al.,1995b; Tiršek et al., 1996) will be included in the Spatial plan instead of present guidelines and directives.

As is illustrated (figure 4) we don't propose any changes to transport and energy supply routes. Therefore, presentation in the macro-regional sense, as we had done for the previous two scenarios, *Ideal* and *Active*, is not necessary.

The figure shows, that almost all the segments of transport or energy supply infrastructure run along separate routes, thus substantially increasing "parcelisation" and "dis-jointedness" of national territory with all kinds of infrastructure networks, meaning a serious spatial and environmental problem. In this way synergetic effects cannot be expected, for example simpler and cheaper procedures for obtaining land, as is the case in joint construction. Of course, design of joint transport and energy supply corridors demands negotiation between separate sectors, so far not a common practice.

3. Conclusions

The presented scenario's, in our opinion, are a suitable basis for carrying out detailed studies – especially strategic environmental impact assessment, where the emphasis should be on determining direct and indirect effects of realising joint transport and energy supply corridors, as well as calculations on quantities of selected types of land uses which would be affected by construction and operation of such infrastructure. In this framework environmental, spatial and social influences of constructing joint corridors could be determined (in detail), as well as their technical, technological and financial dimensions. When establishing scenario's, especially the *Ideal* one, our guiding principle was (also emphasised in the Austrian spatial plan), that to "define problems and possible solutions an ideal picture, a 'measuring stick', is necessary, despite questions on feasibility" (Oesterreichisches Raumordnungskonzept, 1991:13). We believe that defining the *Ideal* and *Active* scenarios for developing joint infrastructure corridors, is a qualitative professional basis for designing a "measuring stick" even in Slovenia, thus giving possibilities for objective measurements of positive and negative effects or consequences of building transport and energy supply infrastructure. We are nevertheless aware of the fact, that numerous, especially highway segments have already started to materialise guidelines from the OCSSC, NPRIDS and NPHC, but still believe, that the presented *Ideal* and *Active* scenarios – especially the first emphasising achievement of ideal locations for transport and energy supply infrastructure – are not idealistic and that there still exists an objective possibility for serious strategic thinking concerning the future transport and energy supply infrastructure networks in Slovenia.

Andrej Gulič, M.Sc., sociologist, Urban Planning Institute of the Republic of Slovenia

Endnotes

1 Ordinance on changes and supplements of spatial components of the long-term and mid-term plan of the Republic of Slovenia

2 National programme of railway infrastructure development in Slovenia

3 National programme of highway construction in Slovenia

Figures

Figure 1: *Illustration of the Ideal scenario "A"*
Figure 2: *Illustration of the Ideal scenario "B"*
Figure 3: *Illustration of the Active scenario*
Figure 4: *Illustration of the Tendency scenario*

For sources and literature see page 16.