

CORRIDOR X IN SERBIA – APPROACH TO SPATIAL PLANNING

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For the infrastructural corridor's area, of the national importance, is predicted making spatial plans of area of special use, as the most complex instruments for the developing and arranging management of these areas. These plans should have an integrative and problem-oriented approach towards development planning and arrangement of such an area, and it is obliged to include: a complex evaluation of state and function of infrastructural system in the corridor; an analysis of infrastructural corridor influence on the development of the planning area and its surrounding; an alternative conception of long-term protection, improvement, organization and use of the planning area; a choice of the priorities and assumption of the realization phases; instructions for the implementation of the plan etc. The approach in making of this category of plans, as well as, experiences in planning, arrangement and use of multimodal corridors, have been considered on the example of Spatial plan of the infrastructural corridor E-75 section Belgrade-Nis area.

Keywords: *spatial plan, infrastructural corridor development, programs, implementation, accompanying contents.*

INTRODUCTORY REMARKS

European economic integration and the transition of the Southeast European countries take place through the modernisation and harmonisation of the transport infrastructure and services, as the main prerequisites of the societal and economic development. An efficient and high quality transport is indispensable for the international commodities exchange, business activities and the international tourism advancement. For these reasons, the transport infrastructure development is deemed as the priority economic sector of the European Union (EU), wherein a clearly defined road transport development strategy plays a dominant role. The geo-strategic importance of the traditional transport routes along the valleys of the Danube, Sava and Morava, the transport capacities construction level and the achieved transport demand are pivotal to the transport infrastructure development of Southeast Europe. In the European transport network development plans, the pan-European multi-modal transport corridor "X" has been set with the function of integrating the Central and East European transport system. The EU transport policy with regard to the multi-modal corridor development is the undoubted priority in the long-term development strategy of the transport infrastructure in this area to be implemen-

ted in following spheres: The construction/reconstruction, corridor equipment and preparation for public-private partnership investment; equity of access to transport services market; equity of conditions in respect to professional education for the participation in the services market; equity of services charging systems based on the rule that the infrastructure use is to be paid for; introduction of new management technologies (investment of scales in the field of telematics).

In Serbia, defining the strategy development of multi-modal transport corridors was based on the general transport flow growth trends in Europe for the period of 1998-2000 in view of: the road transport demand growth in the overall transport, with a rapid mobility growth ranging from 34% to 50% and freight transport in the Mediterranean and East European countries; the railroad transport growth in the overall transport from 15% to 23%, thanks to stimulating policies in EU countries; and the air transport annual growth rate of 5.9%.

Starting from the indicated tendencies, with regard to the development strategy of the multi-modal transport corridors, next general objectives are defined:

- Development of all transport means infrastructure ought entirely comply with

quality, efficient, safe and economic transport abiding by the sustainability principles and new technologies appliance as to transport flow management, motor vehicles development and information support advancement related to the traffic and transport process;

- A more rapid inclusion of Serbia into European tendencies by the unified market enlargement onto the whole European space and by directing the transport policy towards the creation of an integrated and compatible infrastructure attuned with the multi-modal corridor X and other routes linked to the pan-European transport areas (Mediterranean and Adriatic-Ionian basins);

- Securing the maximal available transport capacities use;

- Rehabilitation, reconstruction, increases of quality and transport system accessibility, financed by means of donations, favourable loans and/or concessions.

The long-term development of the pan-European multi-modal transport corridor X with the legs Xa and Xb on the territory of the Republic of Serbia will encompass:

- Construction of the motorway section from Leskovac to Presevo (the border with FYR Macedonia), from Nis to Dimitrovgrad (the

border with Bulgaria), the bypass around Belgrade (Batajnica-Bubanj potok) and from Horgos (the border to Hungary) to Belgrade (Batajnica);

- Motorway corridor equipment with complementary amenities in line with European criteria and standards;
- Reconstruction and construction of a two track railroad fitting for trains exceeding the speed of 200 km/h for the directions: Croatian border-Belgrade-Nis-Dimitrovgrad, Hungarian border-Belgrade and Nis- FYR Macedonian border;
- Reconstruction and modernisation of the existing railroad track through the correction of the constraining sections and linking of new tracks with parts of the network in accordance to the new railroad flows for the train traffic exceeding the speed of 120-160 km/h;
- Airport "Surcin-Beograd" and "Nis" equipment upgrading, and the increase of the domestic air transport growth rate;
- Development of multi-modal nodes and goods-transport centres;
- Complementing the main gas pipeline and the gas pipeline distribution network along the main gas pipeline, by which the number of gas supplied towns and settlements in Mid- and Southeast Serbia would significantly increase;
- Reconstruction and revitalisation of the existent and the construction of the new electric distribution network and the transforming stations;
- Reserving the space for the potential navigable corridor Danube-Morava-Vardar.

TRANSPORTATION AND CONNECTIONS

In Serbia, the natural predispositions from the physical-geographic viewpoint and the terrain configuration point to a favourable transport and communication position and a far greater potential as made use of by now. Its central place on the Balkans, with alluvial valleys and easily manageable and adaptable transport corridors links and interweaves Europe with Asia. Foremost, this is true for the Danubian-Sava direction, being effortlessly passable and connected with the centrally formed valley area of Great and South Morava, linking Serbia in the North-South direction. As a consequence of natural settings, the central transport node covers the aquatic area of confluent rivers: Save, Tamiš, Tisa and Great Morava, dominating by Belgrade's urban agglomeration with its spatial-functional, metropolitan importance

and the multifarious developmental impact upon the integration of Serbia's overall territory.

The strategic importance of Serbia's territory in view of transport is especially emphasised by providing an exceptionally favourable communication between Europe and the Near East. Via the continental connection, Serbia's territory interlinks the West European area, the Alps but also the Scandinavian, Baltic and Danube area with Southeast Europe (East Mediterranean) and Near East. In terms of establishing transport connections in European dimensions but also beyond of particular significance are the links within the former Yugoslav territory, especially two transport corridors: (a) along the river Save in the West-East direction with an almost complete, but conked out road and railroad infrastructure systems and (b) along the Adriatic coast by which the coastal areas have been connected with the eastern parts of the former Yugoslavia. These corridors' short and long-term lot is uncertain, however, their exceptional international geo-strategic relevance ought not be overlooked.

Serbia's mid position on the Balkan Peninsula and the mid section of the Danube area enables a more extensive interlinking and involvement into the international labour division. In spatial-functional and especially the developmental potential terms, the Danube-Save and Morava axes stand for the so-called "cross-concentration", i.e. development polarisation. This matter of fact is of crucial impact for the understanding and defining the key assumptions and factors affecting the organisation system, arrangement and use of Serbia's space.

By intensifying the links based upon the advantageous geographic and transport position with Central and West European, but also South and East European countries, i.e. by advancing and developing transit and mediating functions between Europe and Asia, the Republic of Serbia possess the potentials to rationally and efficiently develop its spatial-functional position. The centripetal and convergent features of the mid-Danube geographic area, particularly along the direction of Novi Sad-Belgrade-Pancevo-Smederevo, where Serbia's largest urban agglomeration with metropolitan forms and contents is located, together with the exit legs along the rivers Save and Morava act polarising upon Serbia's entire territory. This area's attractiveness is demonstrated through the production concentration of economic and non-economic activities and

consequently the agglomerating population.

On the other hand, the attractive power of the two-tangled development axes (the Danube-Save and Morava axes) works depleting in relation to the population of the broader border, i.e. peripheral and mountainous areas. The concentration of secondary and tertiary economy sector activities within the relatively narrow area has consequences upon the spatial use and organisation. Within Serbia's space, three territorial entities might be discerned. Vojvodina is the plain region of the mid-Danube area, where the prevailing concentration tendencies take place along its south ridge in the direction of Novi Sad-Belgrade-Pancevo-Smederevo. However, in view of the international labour division, the advantageous geographic and transport potential has not been exploited. The central part of the Republic of Serbia is a complex spatial entity, which along the north-south direction transforms from plain to more jagged hilly and mountainous areas. The Morava development axis stretches midway and is linked transversally with the West Morava axis with substantial developmental and spatial-functional potentials- determinants. This axis has been developed with broad activities potentials lessening the pressures upon Belgrade's metropolitan region. Onto this transversal development axis, via Nis as the macro-regional centre, follows somewhat lesser prominent axis along the river valley of Nisava towards the Bulgarian border. Kosovo and Metohija, as the territorial macro-entity show the most intricate geographic structure. The Kosovo ravine is relatively well connected with Serbia from the transport viewpoint and particularly compared with the Metohija ravine.

THE INFRASTRUCTURE CORRIDOR X

In the Spatial Plan of the Republic Serbia (subsequently PPRS), the transport corridors, and particularly the motorways and high-speed railroads have been determined as strategic determinants. Given that the transport network is part of the European network, one of major tasks is the spatial integration of Serbia with the neighbouring countries and further with other European countries but also the internal spatial integration.

In the European transport development network plans, the pan-European multi-modal transport corridor X has been defined (Salzburg-Ljubljana-Zagreb-Belgrade-Nis-Skopje-Veles-Thessalonica) with its two legs: Budapest-

Belgrade (Xb) and Nis-Pirot-Sofia (Xa). Incidentally, from 1990 Serbia's main link with Europe was realized via the road E-75 Belgrade-Novi Sad-Subotica-Hungarian border, whereas the road E-70 as the pivotal connection in former Yugoslavia linking Serbia with Europe was laid off. However, it is believed that with changed political and other relations, these roads will be rehabilitated in the economic and other connotations, which for it is important to solve the interconnection of the road E-75 Belgrade-Budapest and the road E-70 (Batajnica-Dobanovci).

From the standpoint of internal integration objectives, of particular importance is the more efficient linking of the E-70 motorway sections Batrovci-Belgrade with Mid and South Srem, north Save area and Macva. This is achievable by the improvement of the regional and local network and the more intensive use of the existent motorway entrances-exits.

Next to Belgrade, the interconnection of the corridor X with the transport route E-70 (Croatia, Belgrade-Vrsac-Romanian border) leading to Romania ought to be carried out. The road from Belgrade towards Romania has not been evaluated adequately as yet (neither in the planning nor in the project sense), although the long-term economic relations of Serbia with East Europe are superior compared to West Europe.

The corridor X section from Belgrade to Nis and further on to Skopje and Athens (E-75) is crucial for Serbia. This is the central communication in Serbia, replacing the ancient road to Istanbul-Djod. This time, the position of the Morava catchments area acts as the centralising power upon the entire Serbian space. Formerly existent motorway E-75 on this section did not have the expected stimulating impact on the economic development and the transport integration of Serbia. At the same time, the analyses show that there are either less or more motorway entrances from the surroundings as would be optimal for a road of such character and speed. The problem lies not only in the number of entrances/exits but also in the main and regional connection of the existent entrances/exits. Thus, a better use of the motorway Belgrade-Nis is to be accomplished by improving the regional and local connections network with existent entrances/exits.

In the road integration analysis of Serbia it has been known for a long time that there are no adequate "transversal links" between the

western parts of Serbia, via the Morava area with the eastern parts of the Republic. In the planning of new links, the motorway E-75, section Belgrade-Nis ought to become the skeleton of such interconnections. Therefore, in the PPRS some new links, especially those of East Serbia with the motorway are proposed. Present links operate only in one direction: Bor-Zajecar-Paracin. New links are planned via the future main road Bor-Markovac and the existent road Negotin-Kladovo-Pozarevac-the Motorway.

Along with the linking of the east part of the Republic with its central and west parts, the corridor is also very important for the regional and sub-regional development, mainly in respect to urban and economic centres in corridor's immediate vicinity and tourism regions and other areas of special use. The construction, equipment and arrangement of the motorway E-75 infrastructure corridor, section Belgrade-Nis, will contribute to strengthen the transport, economic and other functions of Belgrade, Kragujevac and Nis, Jagodina-Cuprija-Paracin, Aleksinac and numerous smaller towns. Consequently, this would facilitate the objectives achievement of the PPRS and the overall strategy of Serbia's development through the cutback of negative tendencies in demographic developments of the Central and Southeast Serbia. Thus, Serbia's metropolisation process would be trimmed down, inducing a more rapid development of Nis, the regional centres and smaller towns in regional entities east and west of the corridor. In the infrastructure corridor as planned in the PPRS, following main infrastructure systems for the Belgrade-Nis direction have been determined: motorway E-75 (M1); high speed railroad E-85 and the modernisation of the existent railroad; main fibre glass cable; main gas pipeline, long-distance power line 220V and 400V; objects for flood protection – protection dikes. Furthermore, some profound research is needed relating to the hydro-energy and navigable system "Morava", so as to determine actual potentials and conditions for their realisation.

Approach to the SPATIAL PLAN ELABORATION FOR THE INFRASTRUCTURE CORRIDOR AREA OF THE MOTORWAY E-75, SECTION BELGRADE-NIS

For the infrastructure corridor area of national importance, according to the Act on planning and organisation of spaces and settlements,

the Act on the Spatial plan of the Republic of Serbia and the Manual on the contents and spatial plans elaboration, it is foreseen to work out the infrastructure network plans as the most complex instruments for the development and organisation governance of these spaces. The plans should display an integrative and problem-oriented approach in the development planning and areas' organisation. They must contain: complex assessments of the infrastructure system state of the art and functions for the infrastructure corridor; the infrastructure corridor impact assessment upon the planned area's and surrounds' development; alternative program and planning concept for the long-term protection, advancement, organisation and use of the planned area; priorities classification and phases realisation proposition; plan's implementation guidelines, etc.

The approach in the elaboration of such plans category with experiences in the plan's appliance have been elucidated upon the case of the Spatial plan for the motorway E-75 infrastructure corridor area, section Belgrade-Nis. Bearing in mind the fact, that a considerable part of this motorway E-75 corridor section has been constructed more than 20 years ago, a particular problem was the non-planned construction of the motorway's complementary contents and objects in its protected zone. With the Spatial plan, a rational model for the equipment and arrangement of the motorway corridor has been planned, the implementation of which will depend on complying with and applying the planning criteria.

Spatial plan's subject¹

The content of the Spatial plan for the motorway E-75 infrastructure corridor area, section Belgrade-Nis (subsequently: the Spatial plan) is an area of special infrastructure use, stretching through the plain alluvial valleys of the rivers Great Morava and South

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Morava, covering an area of 1835 km². With the Spatial plan, long-term grounds for the organisation, use and arrangement of the infrastructure corridor area have been determined. The corridor is located in the zone of the most significant development axes of the Republic, passing by Belgrade and other larger settlements agglomerations, such as: Smederevo, S. Palanka, V. Plana, Jagodina, Cuprija, Paracin, Aleksinac and Nis. Within the Spatial plan's area, there is a substantial concentration of population, industry, and economic and other activities, bringing about numerous conflicting interests and the environmental degradation, i.e. the degradation of particular natural resources (water, soil, vegetation). Being an area of intensive development of particular importance as set in the PPRS (reference map II), it is necessary to consider the overall development and establish the planning instruments for the appeasement of development conflicts and constraints in the reconstruction, organisation, use and protection of the infrastructure corridor.

The Spatial plan's area development planning and arrangement concept is based upon the integrative and problem-oriented approach. Alongside the spatial factors, the *Integral approach* to the organisation and arrangement equally heeds the socio-economic and ecological factors of the infrastructure corridor's area development, i.e. towns and municipalities development along the corridor. The *problem-oriented approach* to this area's planning and arrangement demands a methodological specification of the planning approach with procedures and techniques aimed primarily at the functional use of the infrastructure corridor, i.e. the provision of spatial conditions for the optimal distribution, construction, and equipment and reconstruction of complementary contents for main infrastructure systems in line with international standards and criteria.

One of the important issues considered in the Spatial plan are the impacts/effects of the motorway and other infrastructure objects upon the overall development of the infrastructure corridor gravitation zone, principally from the regional standpoint. They were weighed upon the production/resources sub-regions, the existent production systems network, flow of raw materials and goods, but also in view of the future economic development projection, activities concentration, investment strategies and migratory flows. Moreover, it has been explored which activities are required to

achieve higher positive effects of the corridor upon: the economic development, tourism (spas and mountains) and the public services network, the overall economic and social integration of East Serbia with the territory of Central and North Serbia. The impact assessment upon the regional development of the territory in question was based on the objectives and propositions of the PPRS, the regional, town and municipal development programs for this area and other studies, plans and programs. Given that in the previous period, on the infrastructure corridor's area, a large amount of main infrastructure objects had been constructed, in the Spatial plan elaboration, the emphasis was put on the assessments and deliberations based on analyses referring to former motorway and other infrastructure systems impacts.

Because of the protection of natural conditions and assets, the cultural heritage and landscapes and before the final coordination of infrastructure systems routes and their elements (especially the motorway and the railroad) in the corridor, according to special regulations, it was necessary to work out a strategic environmental impact analysis. Consequently, the environmental impact assessment suggests measures as to the damages prevention. This analysis, for the needs of the Spatial plan elaboration, meant a special impacts synthesis upon the physical spatial attributes on the one hand, and upon the activities and life in the area in question, on the other. That's why all the results of the sector analyses (settlements, transport, economic flows, nature, environment, tourism, etc) have been involved into a complex environmental impact assessment, so as to entirely define the developmental constraints, interrelations and potentials, as well as measures for the prevention or reduction of negative environmental impacts.

The information base and the conceptual framework for the Spatial plan elaboration were the spatial plans for the organisation of broader territorial entities and other planning documentation (PPRS, regional spatial plans, municipal spatial plans, etc), technical-economic documentation (feasibility studies, investment programs, etc.), developmental strategies and programs of other special spatial uses and the technical infrastructure documentation for the corridor.

The technical documentation for the infrastructure systems in the corridor used for the

Spatial plan elaboration was of inconsistent quality and varying in the detail level. A satisfactory quality and detail level was displayed in the technical documentation for the motorway corridor, which was rather important in respect to suggested planning propositions, given the equipment priority and the motorway corridor arrangement. Therefore, in the Spatial plan for the motorway corridor, the planning propositions were decided upon with a higher reliability degree compared to other main infrastructure systems corridors (railroads, gas pipeline, glass fibres, navigable canals, etc). After the studies and technical documentation upgrading to the level of general, i.e. concrete project, adequate changes and amendments of the Spatial plan will be adopted. This encompasses also the detailed elaboration at the regulation plan level for the route, objects and contents of the main infrastructure systems in the corridor as to construction priorities.

The alterations occurred in the corridor since the commencement of the motorway operation until now indicate that for the needs of the Spatial plan elaboration it is indispensable to carry out some complementary terrain research:

- The survey of the motorway's functional contents state of the art, comprising the complementary contents for the motorway users' needs, in which the systematised data as to sections would cover: the objects use, the objects location (as stations from the main project), the content, covering area, capacity, communal amenities, ownership, territorial designation, existent objects documentation, etc.
- Enquiry in respect to problems, objectives and municipal development priorities for the Spatial plan area, the results of which were the starting point in defining the Spatial plan's objectives, planning solutions and implementation. The enquiry was executed with verified representatives of the municipal assemblies and referred to following domains: existent planning documentation, the standpoint in terms of spatial use and complementary objects in the narrower and broader motorway corridor, other infrastructure state of the art and development, economy, natural and cultural heritage, etc.

Contents of Spatial plan

The Spatial plan consists of: The Spatial plan draft, plan's documentation base and the Spatial plan's elaboration to the regulation plan level.

The Spatial plan's documentation base consists of: excerpt from the Spatial plan of the Republic of Serbia and other relevant development documents; the equipment and arrangement program of the motorway corridor, analyses and diagnoses of the state of the art; prognoses; planning definitions and elucidations of planning solutions; data, conditions and other documents from the preparation procedure, the public insight and expert debate and expert control of the Spatial plan with appropriate graphic maps and other documentation on which the Spatial plan is based. The Spatial plan documentation base is graphically shown on 15 survey sector maps. The equipment and motorway corridor arrangement program (subsequently: the Program) has been prepared upon the client's order (Ministry of Urbanism and Construction with the participation of the Republic's road agency), as the interstice between the documentation base phase and the Spatial plan draft. The Program's elaboration objective was to preliminarily identify and assess the justification of existent nodes and motorway's complementary facilities with proposals as to their betterment. Additionally, it was necessary to analyse the taken obligations and/or various local communities or potential investors requests pertaining to actual needs and planning criteria for the distribution of motorway nodes and complementary contents. The Program's decisions and findings were the ground for the elaboration of the planning solutions, location and priorities definition as to the construction and reconstruction of the motorway's complementary facilities, measures for the Spatial plan's appliance and its elaboration at the regulation plan level. Not all issues customary for the infrastructure corridor integrative planning were addressed, but the elaboration approach contained some methodological specifics by which it differs from former elaboration approaches for infrastructure corridor spatial plans. These specifics refer to defining the functional capacities of motorways' complementary contents, i.e. the defining of basic and specific criteria for the complementary contents location choice.

The Spatial plan draft consists of: general and specific objectives, long-term planning propositions for the organisation, arrangement and protection of the infrastructure corridor planning area, measures and guidelines for the appliance and realisation of planning propositions, as well as digital graphics of the Spatial plan. They entail: the reference map 1-Infrastructure systems location in the infra-

structure corridor-, the reference map 2-Land use plan-, reference map 3-Tourism development plan and environmental protection measures- and a special thematic map -Survey of the existent and planned motorway's complementary contents- in the scale 1:50 000.

The Spatial plan's component part will also be the detail elaboration at the regulation plan level for particular sections and objects of the motorway E-75 infrastructure corridor: enlargements, intersections, terminals, service contents and other objects in the motorway function.

SCOPE, OBJECTIVES AND TASKS OF THE SPATIAL PLAN

The Spatial plan's scope

The preliminary spatial scope of the infrastructure corridor area is defined conforming to the elaboration phases and the Spatial plan's contents:

- For the Spatial plan's preparatory activities and the documentation base (first phase), the motorway corridor gravitation zone (regional area) has been encompassed with varying spatial scope corresponding to the research subject (functional areas of main infrastructure systems and areas of special use, determined by the Spatial plan of the Republic of Serbia); particular emphasis has been put on the motorway's contact area (surrounds), i.e. the municipal and urban territory through which the corridor passes through and where the corridor's impacts upon the immediate surrounds and vice versa have been explored, covering an area of 8000 km².
- The Spatial plan draft (second phase) included entirely or partially the cadastre municipalities at the towns' territory of Belgrade and Nis and 15 municipalities through which the infrastructure corridor passes through (Grocka, Sopot, Mladenovac, Smederevo, Smederevska Palanka, Velika Plana, Lapovo, Batocina, Svilajnac, Jagodina, Cuprija, Paracin, Cicevac, Razanj and Aleksinac).

Encompassed with the Spatial plan in the draft version are:

(1) Motorway E-75 corridor section Belgrade-Nis with the overall length of 317 km divided in:

Motorway corridor section from Bubanj Potok to Trupala, with the length of 216 km and the width of 700 km, which entails the route with protection belts (the immediate route and the complementary contents such as loops,

terminals, objects for the users' needs in transport, protective green, etc. and the broader protection belt);

Motorway corridor sections covered by the General plan of Belgrade: Batajnica-Zemun and Dobanovci-Bubanj Potok some 51 km long and the bypass Batajnica-Dobanovci-Ostruznica-Bubanj Potok-Vinca (Danube) some 50 km long and 150 km wide (encompassing the route with its immediate protection belt and complementary contents);

(2) Existent and planned main infrastructure systems with the route and protective belts (immediate and broader), which are within the spatial scope: railroads (with the overall width of 250m), gas pipeline (with the overall width of 200m), fibre glass cable (with the overall width of 4m) and the potential navigable road of Morava (with the overall width of 300m);

(3) Complementary infrastructure systems of the motorway-alternative road directions of the motorway E-75 (without the pay toll)

(4) The space between certain zones of main infrastructure systems, which are in the physical and functional connection with the motorway corridor (closest settlements, tourism and recreation objects and areas, etc), except for the area covered by the General plan of Belgrade, where the spatial scope of the Spatial plan is reduced to the motorway corridor E-75.

The elaboration area of the Spatial plan at the regulation plan level will encompass: the motorway infrastructure corridor (in the narrower sense), i.e. the area under the object with the protection belt along the main road (motorway) and complementary contents such as loops, terminals, objects for the users' needs in transport (gas stations, rest places, motels, etc.) auxiliary roads with catering, commercial, tourism, sports and recreation and other objects. The construction and arrangement conditions of these objects and areas will be precised with the detailed elaboration at the regulation plan level, based on propositions and criteria of the Spatial plan and the technical documentation at the design plan with the adequate feasibility study and the environmental impact analysis.

The elaboration areas of the Spatial plan at the regulation plan level have been preliminarily determined during the Spatial plan elaboration, at the end of the study and documentation phase and would entail the corridor section bypassing Belgrade the motorway corridor passing through Belgrade. If necessary, they

would also encompass other motorway sections, as well as motorway corridor sections with complementary contents, where needed (loops, bases, pay toll stops, motels, petrol stations, rest places, etc.).

It has been assessed that there is no need to plan in detail the already constructed motorway sections at the regulation plan level, neither for other infrastructure systems within the infrastructure corridor area encompassed by the Spatial plan until the study and technical documentation of these systems is not brought to the general or design plan level.

Spatial plan's objectives and tasks

In the last years (1992-1999), the transport system in our country has been in a poor situation. Insufficient investment in the road and railroad systems maintenance have been reflected upon the present quality and services level, which does not comply with current European requirements, especially those set for this system in future.

Therefore, the system's state of the art and the needs have been considered within the Spatial plan, i.e. within special sector analysis as well as the intervention types and scopes with the purpose to upgrade the system to the satisfactory level.

Alongside the reflection on changes in the previous period, in the Spatial plan, the achieved and expected transport flows until 2020 have been analysed, and were used as the ground for considering other Spatial plan solutions. Surely, the prognoses must be based not only on our overall development trends, but also on grounds of European strategies and development tendencies, as well as countries' development emerged at the former Yugoslav territory.

Following basic objectives of the long-term development, use and arrangement of the Spatial plan's area have been determined:

- (5) Securing spatial conditions for the construction, reconstruction, equipment and functioning of main infrastructure systems in the corridor;
- (6) Deciding on the optimal distribution of activities, physical structures and the population at the Spatial plan area with compliance to economic, technologic, environmental, social and spatial-functional criteria;
- (7) Securing conditions for a better functioning of the existent production plants,

settlements and main transport objects, which are situated in the infrastructure corridor, envisaging also their displacement.

In the Spatial plan elaboration, the main tasks were to make planning solutions and appliance guidelines provide for:

- (1) Transport (physical), economic and social integration of certain regional entities in the Republic, as well as the integration of the Republic with neighbouring countries;
- (2) Assess effects of the intended and transit transport upon the local communities development (towns and municipalities);
- (3) Assess effects of the infrastructure corridor upon certain activities (agriculture, industry, tourism, etc);
- (4) Appease developmental, physical (spatial) and environmental conflict between the motorway (corridor) and the immediate surrounds;
- (5) Coordinate and determine routes for the transport and other main infrastructure systems, determine the location and construction conditions and arrangement of the intersection nodes of single routes, with the intention of the inclusion into the European transport system;
- (6) Determine the planning elements and criteria for decision making in respect to investments and location choice for new economic objects;
- (7) Integration and synchronisation of the basic infrastructure corridors functioning, above all the motorway E-75, with the regional and local network at the Spatial plan's area and the surrounds. This task refers mostly to the road network in view of:
 - a) Integration and a more substantial role of the motorway E-75 in the local transport improvement, and thus in the impact upon the economic and social development of the area;
 - b) Alternation and enlargement of the regional and local road network role for the district and inter-district transport, aimed at decreasing pressures upon the E-75;
- (8) framework for the elaboration of new and revision of existent spatial and urban plans at the Spatial plan's area, as well as the elaboration and adoption of other plans, programs and the technical documentation.

The immediate special task of the Spatial plan's elaboration was:

- To point at the motorway's positive and

negative effects, with the aim to endow the Spatial plan with development document attributes and not only technical;

- To record and assess the transport system's state of the art, motorway's complementary contents and suggest a rational model for the motorway's corridor equipment and arrangement;
- To explore the connections quality of the existent motorway with the main regional and local road network in the contact area and suggest consequent improvements;
- To determine norms for the infrastructure systems spatial use in the corridor and criteria for the distribution of the motorway's complementary contents.

CRITERIA FOR THE LOCATION CHOICE OF THE MOTORWAY'S COMPLEMENTARY CONTENTS

As to the function, two main groups of the motorway's complementary contents have been differentiated:

- (1) Road transport's functional contents for the maintenance, management and provision of a faster, safer, more comfortable and more reliable transport of goods and people on the motorway: the road maintenance base, objects for control and management and pay toll stops
- (2) Complementary contents for transport users' needs: petrol stations, motels, restaurants, shops, parking spaces, rest places, information centres, etc.

In the Spatial plan's elaboration, following criteria have been employed for the distribution of the motorway's complementary contents (E-75):

- (1) The distribution of the complementary contents ought to provide for:
 - Basic requirements in view of the present and future needs and the possibility of the phased realisation;
 - Motorway users and complementary contents users comfort;
 - Basic requirements as to the transport safety – critical are all those complementary contents locations at the traffic loops and in their vicinity, i.e. entrance and exit loops legs; the connections with the motorway are to be established by special entrance and exit transport tracks as to the criteria applied for traffic loops.
- (2) Abiding by the principle –one dominant function one location; the appliance of this criterion stipulates more complementary contents

locations with less users, instead of less complementary contents locations with more users;

(3) Balanced functions distribution along the whole motorway section (because of the more equitable direct and indirect benefits distribution for the local communities);

(4) Complying with optimal functional distances between the complementary facilities, but respecting the inherited state of affairs;

(5) Because of the more frequented entry and exit transport at motorway's approaches to macro-regional centres (as to PPRS: Belgrade, Kragujevac and Nis) it is possible to deviate from the last two criteria;

(6) To rank the sections conforming to the utilisation probability of the motorway's complementary contents based on the annual average of the daily transport frequency and the characteristics of the gravitation area of the motorway section in question;

(7) Obligatory landscape arrangement and complementary facilities complexes maintenance.

Special criteria have been defined as to the motorway's complementary facilities placement¹:

¹ Criteria for location and motorway's complementary contents are derived from ensuing sources:

- Planning and designing main roads' complementary contents, Institute for Roads and Geo-technique of the Civil Engineering Faculty, University of Belgrade, Prof. M. Maletin, Prof. V. Andjus, Belgrade 1993.
- Equipment analysis and program base for the construction and reconstruction of complementary facilities for the motorway Belgrade-Nis, Road Institute Belgrade, Agency for Transport and economy, B. Borojevic, Belgrade 1997.
- Autostrade I.R. in Italia, S.p.A. Roma (Gruppo I.R.I.) Dicembre 1980.
- Spatila plan draft for the infrastructure corridor area Nis-FYR Macedonian border, Institute of Architecture and Urbanism of Serbia, 2000.
- Conception proposal for the motorway's complementary facilities (Commission for the expert control of Spatial plans of the Ministry of Urbanism and Construction), Institute of Architecture and Urbanism of Serbia, 2001.
- Motorway E-75 traffic prognosis, section Belgrade-Nis;
- Adriatic Motorway-Transport-urbanism study, Road Institute, L.J. Kuzovic, S. Mitrovic, I. Albrecht, Belgrade 1969.
- State of affairs and expected road network development of SR Yugoslavia with the emphasis on directions belonging to the TEM network and pan-European multi-modal transport corridors and transport areas, Prof. L.J. Kuzovic, D.

- Road maintenance bases: settlements vicinity, possibility for the communal infrastructure equipment, environmental correctness; functional distance 50-70 km; possibility for vehicle manipulation (traffic loops, pay toll); available space of at least 2-3 ha;

- Rest places: the location at or in the vicinity of a valuable natural ambience, with special parking spaces; local road and/or rural settlement vicinity; location suitability for communal infrastructure equipment; functional distance of 10-15 km; available space of 0.5 - 3 ha (depending on the type);

- Gasoline stations: functional distance of 20-30 km; organisation of independent gas stations of two types: type I (gasoline-service station) and type II (gasoline - passengers station), whereas these station types usually alternate as independent both-side gas stations; existent gas stations for petrol supply positioned by a motel of lesser capacity serve the motel guests and are not planned for capacity enlargement; at locations planned for motels new gas stations are not planned except for the motels in tourism-recreation complexes; green inter-space; possibility of two way access (from the motorway and regional and/or local road); available space of 1.5-3 ha (depending on the type);

- Motels: functional distance of 30-60 km; the location is stipulated by natural and built assets, settlements vicinity, the linking possibility with existent regional and local roads, i.e. near significant transport nodes and turns towards important tourism destinations; motel organisation in two types: type I (standard motel) and type II) motel in the tourism-recreation complex); green inter-space; number of parking spaces (one parking space for one person in the motel or one parking space for four seats in the restaurant) or depending on the scope and structure of the transport frequency; available space of 5-15 ha (depending on the type);

SPATIAL PLAN'S APPLIANCE AND REALISATION CONCEPT

Spatial plan's appliance approach is based upon the belief that the objectives, planning conceptions and propositions of the Spatial plan will be implemented by the appliance of: defined criteria; particular policies, measures

Radosevic, IV Congress of the Yugoslav road society, Budva 2000, Magazine of the road society: Road and Transport, Belgrade

and instruments; defined norms and standards; elaborated and incorporated planning propositions through development plans and programs of municipalities, smaller territorial entities, settlements, public enterprises, as well as other programs and projects; research and planning continuation, technical documentation elaboration, spatial changes monitoring and the operationalisation of fundamental Spatial plan conceptions.

In the planning objectives and conceptions implementation, as well in the appliance of defined criteria, measures and instruments, norms and standards the priority is given to:

(1) The provision of indispensable conditions and reduction of spatial construction constraints to an acceptable level, infrastructure systems equipment and functioning in the corridor compliant with Spatial plan's legal regulations, general development determinations and postulates;

(2) Removal of emerged damages caused by the existent infrastructure systems and future rigorous prevention of direct and indirect negative impacts;

(3) Social, economic and environmental population protection in the infrastructure corridor affected by the infrastructure systems construction and function;

(4) The appliance of spatial-planning, urban, and environmental measures defined by the Spatial plan, general acts in view of the environmental protection and immediate technical-technological protection measures;

(5) Stimulation through fiscal and financing measures of those activities, which boost up employment and procure benefits for the planned area;

(6) Provision of institutional, organisational and information conditions for the Spatial plan implementation, as well as conditions for the continuation of commenced researches, programs, plans and projects elaboration from interest for the area's development.

Spatial plan's appliance phases

On grounds of possible phases assessment, along with the justification evaluation and in compliance with the propositions and criteria defined in the Spatial plan, the first phase priorities in the Spatial plan's appliance have been precised for the ensuing fields:

- The construction of new and equipment and arrangement of existent sections with functional contents (road maintenance base,

pay toll gates) and complementary contents for the motorway E-75 users' needs (rest stops, gas stations and motels). In line with the available means, within the planning period, the possibility of phased construction of the motorway's complementary contents has been given. This will be defined by the more detailed elaboration of the planning propositions to the regulation plan level.

- Construction, modernisation and reconstruction of certain main corridor and regional roads sections, but also railroad connections of regional and sub-regional development importance;
- Water utilisation and protection and water energy infrastructure;
- Reconstruction and revitalisation of the existent and the construction of the new electric distribution network and transforming plants, the main gas pipeline and the gas pipeline distribution network and telecommunication infrastructure;
- Environmental protection by the erection of new forests and protection belts;
- Detailed elaborations of the Spatial plan to the regulation plan level.

Obligations in the appliance and activities in the supplement of the Spatial plan

With the plan's appliance guidelines, the obligations have been specified and termed as to the harmonisation of the existent urban plans for encompassed urban building areas and other plans, programs and documentation of responsible public enterprises and special organisations with the Spatial plan's propositions, regulations and guidelines.

The priority measures and activities for the implementation of the planning propositions and guidelines are defined by précising responsibilities, specifying and terming the departmental organs' obligations, together with those of public enterprises and special organisations (the republic's Road Agency, Railroad enterprise "Belgrade", NIS "Energogas", public enterprise "Elektroprivreda Srbije", public enterprise "PTT Srbija", public enterprise "Srbijavode"), expert services of the Danubian, Sumadija, Morava, Rasinski and Nis districts, commercial chambers, the cities of Belgrade and Nis, responsible town assemblies and municipalities in the control and spatial use of the existent and planned corridors of main infrastructure systems.

A special attention was paid to précising the obligations of responsible public enterprises, special organisations and the local government level in view of providing updated information and expert interpretations and instructions to the local population. These information relate to the preparation, adoption and realisation of mid-term and annual spatial rehabilitation and arrangement, environmental protection and compensation provision to afflicted spatial users (as to objects removal, rights constraints in the immovable goods use, damages occurred during the works or exploitation of infrastructure systems) in the immediate protective belts of the main infrastructure systems defined by this Spatial plan.

The obligation to periodically inform the Ministry of Urbanism and Construction on the actors' undertaken activities and problems is specified as to enable the Government of the Republic of Serbia to pass measures for a more efficient implementation of planning solutions, guidelines and measures defined by the Spatial plan.

The grounds for the Spatial plan supplements and probable amendments have been determined. For specific main infrastructure systems in the infrastructure corridor this means the completion and/or alteration and verification of the technical documentation at the general project level. The Spatial plan supplements through the detailed elaboration of the planning solutions at the regulation plan level for planned main infrastructure systems might be realised subsequent to the provision of the technical documentation at the design project level. The responsible public enterprises and special organisations release such information grounded on guidelines determined in the Spatial plan. For the planning solutions elaboration at the regulation plan level a guidelines package has been set, defining exact locations, intersections levelling of the motorway and railroad, water and environmental protection.

CONCLUSION

The Spatial plan's elaboration approach of the infrastructure corridor area was elucidated upon the case of the Spatial plan for the motorway E-75 infrastructure corridor area, section Belgrade-Nis as an example of integral infrastructure corridor planning. The elaboration of planning solutions was based on the problem approach appliance directed primarily

to the provision of the functional infrastructure corridor use, i.e. the optimal distribution, construction, equipment and reconstruction of the motorway's infrastructure corridor complementary contents together with the motorway's connections improvement with the surrounds.

The planning conceptions and Spatial plan's propositions will be implemented through the appliance and in compliance with the determined criteria and measures as to the defined priorities and phases. The obligations and mandatory tasks for the planning propositions implementation have been specified intended for the Ministry of Urbanism and Construction, Republic's responsible public enterprises and special organisations, the district's, town's assemblies' and municipal expert agencies.

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4. The Manual for the contents and spatial plan elaboration (Official Register of the Republic of Serbia, N° 1/99).
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7. Spatial plan for the E-75 Motorway infrastructure corridor area, section Belgrade-Nis, Equipment and motorway corridor arrangement program, Institute of architecture and urbanism of Serbia, 2001.