Bucharest, 23/12/2012

Guidance Note No. 2

Report on Route Alignment Options – Stage 1 – Option Analysis– Route alternatives 1,2, 3, 4, 5 - (Rev 12.11.2015) issued by JV SPEA /TECNIC

Report on Route Alignment Options – Stage 2 – Analysis of Options selected in Stage 1 - Route alternatives 1 and 2 – (Rev. 16.11.2015) - issued by JV SPEA /TECNIC

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Background

The contract for the Review/Up-date of the Feasibility Study: Sibiu – Pitesti Motorway was signed on 15/07/2015 between CNADNR and J.V Spea Ingegneria Europea (Italia) - Tecnic Consulting Engineering Romania (Contract price: 29 Million RON, VAT excluded). The kick-off meeting for the project was held on 17/07/2015 at JASPERS Bucharest office. Notes of the meeting containing JASPERS recommendations were issued on 27/07/2015.

On 18/08/2015 JASPERS have received for review the Inception Report (electronic format) issued by the Consultant. A first Progress Meeting between RNCMNR, Managing Authority Consultant and JASPERS was held on 21/08/2015. JASPERS opinion on the contents of the Inception Report (IR) and the outcomes of the progress meeting was presented on 25/08/2015.

On 09/12/2015 JASPERS have received for review the following documents:

1. **Route Alternatives Report** - **Stage 1** – Route Alternatives 1, 2, 3, 4, 5 (Rev. 12.11.2015) together with:
   - ✓ Annex 1 – Traffic Study
   - ✓ Annex 2 – Cost Benefit Analysis
   - ✓ Annex 3 – Environmental Report
   - ✓ Annex 4 – Geotechnical Report
   - ✓ Annex 5 – Archaeological Report
   - ✓ Drawings

2. **Route Alternatives Report** - **Stage 2** – Route alternatives 1 & 2 (Rev. 16.11.2015) together with:
   - ✓ Annex 1 – Traffic Study
   - ✓ Annex 2 – Environmental Report
   - ✓ Annex 3 – Archaeological Report
   - ✓ Annex 4 – Utilities Report (drawings)
   - ✓ Drawings

On 18/12/2015, during evaluation of the above mentioned documentation, an up-dated Annex 1 - Traffic Study - Stage 1 was submitted by the Consultant, replacing the 09/12/2015 version.

JASPERS comments and recommendations with regards to the above mentioned reports are presented below in connection with previous recommendations issued by JASPERS:

General considerations

The content of the documents reviewed is not suitable at this stage to support a successful Financing Application for the project.

As recommended in the Commission's Implementing Regulation (EU) 2015/207, the Option Analysis should be carried out in two steps: in the first step looking at basic strategic options (i.e. type of infrastructure and location for the project) and in the second one at specific solutions at the technological level.

The option analysis process should start with the strategic background, the context within the relevant national strategic plans and development programs (e.g. General Transport Master Plan and the Large Infrastructure Operational Program) and determination of key project objectives. The Reports fail to present this strategic background sufficiently.

The background information should certainly include the actual status of the relevant existing road network in the studied area. The problems and constraints identified should provide reasoning and basis for the definition of the general objectives of the project. This information is missing from the reports too.

As far as the Multi-Criteria Analysis (MCA) is concerned, it is noted from the Reports that the same methodology/criteria were applied to both stages of the route alternatives analysis. While this is not necessarily a wrong approach, the analysis provides for a mix of sometimes redundant or irrelevant quantitative and qualitative criteria applied in the same manner in both stages without any qualitative improvement to the data, information or analysis used.

More detailed comments are provided in the chapter Specific Comments and Recommendations below.

In the context of the preparation of a successful financing application, the declared implementation strategy, based on the staged approach of project development by lots, (in particular finishing the study for Lots 1 and 5 earlier) will very likely pose problems. Anyway, if still maintained by the Client it should have been reflected in the route alignment study by a clear identification of the respective sections to be constructed as standalone projects, especially for the section between Pitesti and Curtea de Arges, where this sort of implementation strategy would require an improved link to Ramnicu Valcea. Most importantly, it should have been properly analysed and applied within the Traffic Study and CBA as the relevant information is currently not presented in a transparent manner (see the Chapter Traffic Studies and CBA below).

Annex II (*Format for submission of the information on a major project*) to the Commission's Implementing Regulation (EU) 2015/207 states that for a project which represents a phase* of an overall project, a concise description of the proposed phases of implementation should be presented together with an explanation on how they are technically and financially independent. The criteria used to determine the division of the project into phases are to be presented as well. This is where information provided in the option analysis is required.

*Note: As stated in the EU Guide to CBA of Investment Projects, *"in project identification, the basic principle is that its scope must always be a stand-alone socio-economic and technical unit i.e. it should generally be functional and independently useful from a transport perspective without depending on the construction of other projects (which may however provide synergies)*". Nevertheless, the same guide states that: "*when a project consists of realising a given section, sub-portion or phase of a well identified transport investment, the CBA (and the supporting feasibility*

study) should be focused on the entire investment, regardless of the object of the ERDF/Cohesion Fund assistance."

As provided in the existing design contract, feasibility studies should have been completed by now for the two lots to be implemented in the first phase. The documents reviewed do not provide sufficiently detailed analysis required by such outputs and therefore could not support a financing application.

Specific Comments and Recommendations

Stage 1 of MCA
There are various approaches to the MCA applied across the industry. The approach recommended by the abovementioned EU regulations and the EU Guide to CBA of Investment Projects is a stage approach, where during the first stage a wide range of alternatives is analysed and assessed using a mainly qualitative MCA (even without using a CBA), while the second stage is normally based on mainly quantitative methods (CBA).

This recommended staged approach has been generally followed, and a quantitative assessment (CBA) has been incorporated into the Stage 1. This approach can be only commend as given the length, complexity and constraints of the project and the data available this seems to be the most appropriate way to select the most suitable motorway corridor from the considered options, if properly applied.

However, in its present form the Stage 1 MCA framework as presented in the Report – Stage 1 with its mix of quantitative and qualitative criteria with multiple duplications and without a clear methodology described fails to achieve the required purpose and objective and should be therefore redone.

<u>Preliminary information</u>

As recommended during the kick-off meeting, at this stage, a brief qualitative analysis of the competing modes of transport for Sibiu – Pitesti should have been included in the preamble of the alignment study. The recommendation was not followed.

The ToR required a brief analysis of the existing legislation and technical standards and regulations applicable. It is important, from the early project development stages to have an input regarding the applicable standards considered by the Designer. Romanian design standards could be discussed in comparison with other selected European motorway design standards considered appropriate for the best development of the project. The issue is very briefly covered in the report by a statement of compliance without any conclusions of the activities performed.

The basis for any option analysis presentation is a clear, detailed, narrative description of the options studied. The description, together with alignment plans would help the reader understand the scope of the analysis. The description of each alignment studied should follow the same structure of information in order to allow comparison. Main constructive elements subject to comparison should be identified and summarised.

The information presented in the report is difficult to follow and asses. The descriptions of the alignments consist of combination of incomplete narrative descriptions and tables setting advantages and disadvantages without any identification of the criteria against which these elements are identified as such. Moreover, presentation of the advantages and disadvantages seems to be biased towards the preferred Variant 1 as all the other options have only their disadvantages presented with almost any advantages.

<u>Option analysis</u>

Overall, the proposed MCA scoring framework is based on a multilevel analysis as follows:

- Level 1 - 4 main overall objectives - technical, financial, socio-economic and environmental;
- Level 2 - 30 evaluation criteria stemming out of the objectives set at level 1;

- Level 3 - 32 evaluation sub-criteria (defining details considered relevant for the comparison of the proposed options).

The proposed number of criteria and sub-criteria is very high although we understand this was driven by an attempt to develop a comprehensive MCA framework. From our experience a solid ranking can usually be obtained from a reduced number of key criteria that are most relevant for the specific project circumstances and that can be reliably assessed/scored. Therefore, we suggest streamlining the whole scoring framework. A simplified scoring framework should be considered based on key criteria that can be realistically scored and can make difference between the studied alignments.

Moreover, we have reservations against the relative weightings proposed, as the multi-level approach leads to negligible weightings, which do not reflect the actual importance of a certain element in the selection process (e.g. geotechnical constraints – the 15% weighting of these constraints within the 10% allocated to ground constraints within the overall 25% weighting of technical constraints - 0.375 % - does not actually capture the impact of such constraints).

The manner in which the methodological framework is presented does not provide the base for a clear identification of the steps followed and does not present arguments behind the selection of the criteria as well as of the scoring system. The option analysis is reduced to a summary table of results. Therefore, the correctness and appropriateness of the option analysis process cannot be checked.

For the purpose of accountability and transparency, each and every criterion needs to be clearly defined together with the reason for considering it relevant. If scoring is considered, then the scores should be defined in the presentation of the methodology. Criteria for which the existing level of information at this stage does not allow a relevant differentiation between options should be identified as such and excluded from the assessment process (e.g. hydrological/hydrotechnical constraints, seismic constraints, traffic safety, utilities relocation, interested population, etc.).

Information is not consistent across the report (e.g. the number of interchanges in the narrative description of the alignments differs from the one declared in the summary table of the technical characteristics and from the numbers considered in the cost evaluation; design speed values in the narrative description differ from the values in the summary table etc.).

Climate change vulnerability and risk assessment are particular aspects which should be considered, especially if the project is to apply for EU assistance. JASPERS recommendations with regards to climate change vulnerability and risk assessment were not considered in the option analysis process.
Many of the proposed criteria are redundant as their effects are captured by the preliminary CBA (project costs, traffic values, implementation duration, and benefits associated to the project VoT, VoC, accidents costs and environmental impact). The construction cost already includes the impact of other sub-criteria considered (e.g. length of the project, geometrical characteristics, design speed, land surface to be acquired, technological complexity of works).

The implementation periods required for all project lots including logical sequencing should be adequately assessed taking into accounts specific engineering, environmental, geological etc. issues affecting them (currently the implementation period considered for all lots is 4 years and 5 years used in the CBA, see below). But as the impact of implementation periods is implicitly captured in the CBA it should not be considered as a separate criterion.

The proposed split of the project cost in sub-criteria, under the financial criterion is not relevant and since the impact of all the project cost components (CAPEX and OPEX) is captured through the CBA, these costs should not be considered as separate criteria.

The socio-economic criterion is actually captured by the CBA outputs. If as shown in the report, a basic CBA was carried out at this stage for all the alternatives, then one of the output indicators (NPV or BCR) should be considered as the relevant criterion, since it captures the impact of both costs and benefits of the project.

As no tolls which might generate revenues to affect the option selection are foreseen for any particular option, the financial indicators are not relevant for the scope of the MCA. In this case, the financial

analysis is a tool to assess the need of co-financing of the project from ERDF/Cohesion Funds and shall be therefore carried out only for the preferred option within the final CBA.

All the proposed sub-criteria related to environment benefits considered within the socio-economic section such as the positive impacts on the local development or the negative impact on the built-up areas, relocation of human communities and employment opportunities are based on the information presented considered not relevant since they do not highlight any specific differences between the options analysed. Such criteria should either be properly analysed and supported by relevant data and information (e.g. number of properties to be demolished or number of inhabitants to be relocated etc.) or if found not to be relevant excluded from the scoring framework.

The relevant benefits related to environment are noise, air pollution and GHG emissions and are actually captured by the CBA.

While the value of the public consultations is recognized, they are legally covered under the EIA procedures and therefore should not be considered as a separate criterion.

With regards to the environmental assessment, based on the contents of the Environmental impact assessment report for Stage 1, it is not clear why a fourth level of analysis was proposed for Natural Parks when in fact it is identical with level 3 and not used for other environmental sub-criteria.

It needs to be clarified why the number of localities affected was proposed as a sub-criterion for air pollution, as well as why interference with wetland areas was considered as a sub-criterion since there are no Ramsar sites in the area of the project.

The interference with Natura 2000 sites was considered the most important criterion from the environmental point of view. Following this criterion, the most advantageous is considered the Route Alignment 5 while the Route Alignment 2 is determined to be the most disadvantageous option. This is not discussed in the option selection process, which recommends, at the end of stage 1 the Route Alignment 2 as one of the preferred options. In connection with this result, special attention should be paid to the assessment of alternatives in the Appropriate Assessment Study.

The list of weighted criteria and sub criteria in the Report – Stage 1 is followed by three criteria which are actually not defined at all: risks, eligibility conditions and other aspects. Since no description of these criteria is presented in the Report and no proof of their application is provided, their relevance cannot be assessed.

A risk evaluation has been carried out for the Stage 2 (only for Route Alignments 1 and 2) but not according to the mandatory list of risks identified in Commission's Implementing Regulation (EU) 2015/207 - Annex III. The risk evaluation provided is a list of risks and their probabilities and level of impact without any risk management measures proposed.

Stage 2 of MCA

The second stage of the option analysis, carried out for the short-listed options, should include a refined MCA based mainly on the cost benefit analysis (CBA) together with other elements that are relevant for the option selection.

The CBA is a method that analyses the project impact (cost and benefits), translates them into common denominator (currency unit) and compares their efficiency (in the form of ENPV, EIRR or B/C ratio) in most transparent and objective way (compared to subjective scoring and weighing). Admittedly, CBA is not able to capture all project impacts, but certainly it does capture the majority of them. It is therefore logical to assign the most weight to the CBA indicator (B/C ratio or NPV), say between 60 – 70% (with noise, emissions, accidents, Level of Service etc. implicitly included), and the rest to other aspects not considered in the CBA. These other aspects, to be determined by the Consultant as relevant for the project might include the environmental impact (e.g. impact on Natura 2000 sites, cultural heritage and water), climate risks (floods, landslides and other relevant risks – although normally these would be reflected in the project cost) and social (e.g. loss of agricultural land, resettlements etc.) and planning (national and local) considerations.

The second stage should consist of the adjusted definition and expansion of the variants considered (i.e. based on combinations of several alignments by route sectors, different design speeds and cross-section alignments, optioneering for structures etc. based on the latest survey and environmental information), readjustment of the traffic model and assumptions used (e.g. timetables, if required) and revision and update of the cost estimates based on the most recent survey information (e.g. topographical information, ground investigations, latest environmental information, climate change assessment, progressing design including buildability considerations etc.).

The level of detail required for this stage of assessment should be developed based on topographical surveys (LIDAR Aero surveys) which provide for a 3D modelling of the selected route alignments and allow for proper identification of potential technical constraints and buildability issues as well as for a proper cost assessment to be used in the option analysis. The availability of such data even at an earlier stage in the option analysis would have supported a better assessment of the proposed alignments.

The MCA used for the assessment of the two preferred options (route alignments 1 and 2) was developed following the same criteria employed for the Stage 1. The only reference for review is the summary table of the option analysis, which shows a slight modification of the scores, not supported by any additional information.

For the environmental impact assessment the following elements were noted in the relevant report:

- No clear distinction between Stage 1 and Stage 2 and no interpretation and justification of the outcomes of Stage 1 were provided;
- Two additional tables (as part of the Stage 1) were presented: no. of protected areas crossed and no. of intersections with water courses without any interpretation or relevance for the assessment.
- The analysis in Stage 2 was limited to presentation the Natura 2000 sites concerned for the Alternative 1 and Alternative 2 without presentation of any other environmental considerations; the presentation of the advantages and disadvantages is limited and the justification provided is not convincing;
- The mitigation measures presented in the table, even if it is a preliminary estimation, could not be identified in this stage of the assessment. Considering the complexity of the project it is needed to have more detailed and structured information about the impact of the project on environment, including impact on Natura 2000 sites before defining the mitigation measures or, if needed compensatory measures;
- The climate change aspects were not considered at all in the analysis. According to the requirements of the Commission Implementing Regulation (EU) 207/2015 laying down detailed rules implementing Regulation (EU) No 1303/2015 *"the options should be compared against different criteria, including for example technical, institutional, economic, environmental and climate change aspects. The Financial Application for major projects (FA) should provide information that such an assessment took place during project preparation. It is required, under section D.2.2 (iv), to provide information on risks involved for each alternative, including risks related to climate change impacts and weather extremes. A summary of this assessment should also be presented in Section F.8.2 and section F.8.3. of the FA. As a support in providing such information can be use the Non-Paper Guidelines for Project Managers: Making Vulnerable Project Climate Resilient developed by DG Climate Action of the European Commission:* http://ec.europa.eu/clima/policies/adaptation/what/docs/non_paper_guidelines_project_managers_en.pdf.

  The document provides information on the steps that can be undertaken to integrate climate resilience within a project development.

As an overall remark, in the absence of a defined methodological framework, with details of the criteria and scores used for the assessment of the two options, the process cannot be followed and confirmed.

The existing report needs to be revised to provide the relevant level of details needed for a proper analysis to lead to the preferred alignment option.

Traffic Studies and CBA Reports

The manner in which every route alignment option and its connection to the existing network are considered in the traffic model has an impact on the estimated traffic volumes and hence the economic performance i.e. viability of the specific option.

As the number of interchanges for each route alternative analysed is not consistent across the reports it cannot be identified if all the interchanges where actually considered for the traffic modelling (e.g for Route Alignment 1 the summary table of the technical characteristics refers to 8 interchanges, the narrative description identifies 5 interchanges and the traffic study defines 5 sections which would be generated by 6 interchanges).

The cost of the rehabilitation of DN73C (which provides for the connection with Ramnicu Valcea) is considered in the cost estimates for all the five options studied, but there is no actual proof of the link being included in the traffic model.

With regards to the future network development considered in the traffic study, since some of the data in the project implementation horizon are questionable (Comarnic – Brasov completed in 2020) it is recommended for the Beneficiary to liaise urgently with relevant bodies (e.g. the Strategy Department of the MTI) in order to establish realistic network development assumptions for input into the Demand Analysis.

For the first stage of the option analysis a preliminary traffic study was developed based on the National Transport Model within the GTMP. On 18/12/2015, during evaluation of the documentation, an up-dated Annex 1 - Traffic Study - Stage 1 was submitted by the Consultant, replacing the 09/12/2015 version. Given the short time given for JASPERS review, the model could not be reviewed in its entirety, but it is recommended for the Consultant to consider most recent traffic estimates for both stages. More detailed comments and recommendations regarding the Traffic Study will be provided in due course pending a proper review of the document.

CBA excel files were not made available for JASPERS review and therefore the correctness of the calculations cannot be confirmed.

Several inconsistencies are still noted: the implementation duration in the CBA (5 years) differs from the one estimated in the MCA (4 years); the operation and maintenance costs were not considered for the existing road network in the “with project” scenario. All these should be checked.

The structure of the benefits is unusual, with a very low share of VoC savings (0.5%) and very high accidents savings share (15.2%). Moreover, the VoC savings are identical for all the route alignments studied, while they have different characteristics in terms of length and geometry.

In both CBA reports, the chapter which should describe the traffic demand is missing, which makes the assessment of the analysis difficult.

Note: The Applicant Guide for the Large Infrastructure Operational Program will be soon completed with the National CBA Guidelines. This document should be considered for the future development of the CBA.

Moreover, the results of separate studies within the route alignment analysis identify different alignment options as more appropriate (Final Traffic Study Report – Options 1 and 4, Environmental assessment report – Option 5). The option selection process should be made consistent across the entire study.

Conclusion

While the merits of the proposed preferred options are acknowledged, the manner in which the option analysis is presented does not allow for a clear and certain confirmation of the selection process.

Based on all of the above JASPERS cannot confirm the adequacy of the documents for the support of a successful Financing Application and recommends review and redoing of the route alignment study using a clear methodology, robust and adequate scoring framework without duplications, based on reliable and robust Traffic Study and reliable CBA tool, realistic timetables, engineering solutions optioneering considering buildability and environmental issues and the latest surveys and information. JASPERS support remains available assist with future development of the project.