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METHODOLOGICAL NOTES FOR PROJECT APPRAISAL IN CIS COUNTRIES

Note by the secretariat

1. BACKGROUND

The Working Party on Transport Trends and Economics, at its last session (6-8 September 1999) decided, *inter alia*, to examine transport project appraisal methodologies in CIS countries. In this context, the Working Party asked the delegate of the Russian Federation:

- To elaborate a list of main aspects on Strategic Environmental Assessment (SEA), including the availability of data, on the basis of the experience in CIS countries, and to compare it to the recently issued EU's handbook on SEA (TRANS/WP.5/26, para.8).
- To co-ordinate a comparison of the TINA's methodology for transport project assessment with current practices and needs in CIS countries, and to produce a note of synthesis to be later discussed (TRANS/WP.5/26, para.29).

Following the request of the Working Party, the secretariat translated into Russian the *EU's handbook on SEA* and the TINA's appraisal guidance *Socio-Economic Cost-Benefit Analysis*, together with two short questionnaires to be distributed among CIS countries' experts (questionnaires are attached as annexes 1 and 2).

The information received from the Russian Federation on both issues is reproduced below.

2. STRATEGIC ENVIRONMENTAL ASSESSMENT

Legislative and regulatory instruments in the Russian Federation establish the mandatory nature of an environmental impact assessment (EIA) for major specific projects, including transport projects, and an expert environmental appraisal of these projects.

The Russian Federation has virtually no experience of strategic environmental plans for the development of transport infrastructure. The need for such assessments is, however, dictated by the considerable adverse environmental impact of transport systems and the possibility of its minimization during the preparation of transport infrastructure development plans and programmes. In this connection, the introduction and use in the Russian Federation of a strategic environmental assessment (SEA) methodology applicable to programmes and plans for the development of transport networks and systems is a matter of immediate concern. The European Commission's Manual on Strategic Environmental Assessment of Transport Infrastructure Plans is, in our view, entirely suitable for the Russian Federation both as regards the concepts and methodological approaches and as regards the use of general indicators of the environmental impact of transport infrastructure.

The draft questionnaire on SEA for CIS countries seems to us to be sufficiently comprehensive to give a picture of existing practice and priorities regarding environmental assessments of transport development plans in the countries concerned and does not require any further elaboration.

It should be pointed out that environmental issues do not take priority in the Ministry of Transport of the Russian Federation during the preparation of different transport programmes. This will make it difficult for us to prepare answers to the questionnaire. We will be able to give substantive replies to only 30% of the questions.

3. TINA'S PROJECT ASSESSMENT METHODOLOGY

The present notes assess TINA recommendations for developing a trans-European transport network, compares them with practice in the Russian Federation, and makes proposals for further work on the matter with a view to taking more fully into account the benefits of implementing projects for the development of an international transport network.

Without claiming to be an exhaustive survey of this extensive issue, the study covers virtually the entire list of points raised in the Russian Ministry of Transport's draft questionnaire for socio-economic cost benefit analysis.

It begins with an overall assessment of the TINA recommendations and then gives some views on particular sections of them in the light of the draft questionnaire.

3.1. Overall assessment of the TINA recommendations

On the whole, the TINA approach and recommendations concerning socio-economic cost benefit analysis in connection with the development of an international transport network reflect the practice in this sphere and can serve as a basis for general methods of analysis. In other words, they are adequate for the intended purpose.

In terms of their basic approach, their general and particular schemas of analysis and the set of factors they examine, they have a lot in common with the methodological guidelines for cost-benefit analysis that is used in the Russian Federation.

Decisions concerning the development of the transport infrastructure in the Russian Federation have always been taken on the basis of feasibility studies and comparisons of the principal possible engineering solutions, including the building of new transport facilities and upgrading of existing ones. Investment efficiency has, as a rule, been assessed by comparing the transport-network performance obtainable by implementing a project with the performance of the network in its current state (what is termed in the TINA context the do-minimum scenario). The studies have been made relative to the foreseeable network operating conditions and for entire network sectors or routes at a time, thereby enabling account to be taken of the interaction between network segments (for individual and multiple modes of transport alike) and traffic to be redistributed over the segments in accordance with changes in their standard.

The benefits of developing the Russian Federation's transport infrastructure have been the subject of numerous studies of both national and international importance. Methodological guidelines exist for performing such studies for all modes of transport; they state the procedure for making the calculations and the values of the various necessary standards.

With the country's transition to a market economy, the Methodological Instructions for Assessing the Economic Effectiveness of Investment Projects (Second Version) and for Selecting Such Projects for Implementation, Bearing in Mind International Experience and the Requirements of International Financial Organizations became part of Russian law earlier this year.

The differences between the TINA recommendations that have been studied and Russian practice mostly have to do with approaches to the definition of the individual components of projects' effect (benefits) and with terminology.

In addition, it is recommended in the case of TINA that a cost-benefit analysis be made only of those elements which can be valued in monetary terms, with additional reporting of environmental impacts and policy and other impacts. That is to be done by decision-makers at the decision-making stage.

The list of costs and benefits expressible in monetary terms includes investment costs, maintenance and operating costs and user benefits. The latter are defined on the basis of operating costs and thus do not expand the sphere of the appraisal.

In the Russian Federation, the process of screening investment projects is also based on comparison of the projects by investment cost and recurrent costs. In addition, account is taken of the "non-transport effect", meaning the benefits obtainable from project implementation in the sectors of production served by transport and in the social sphere, together with the savings in the cost of carrying passengers and freight. It is recommended that these elements too should be expressed in monetary terms or, if that is not possible, in qualitative terms.

The overall effect is determined by summing the results for all the elements mentioned.

As in the TINA recommendations, investment projects to be analysed in depth are pre-screened to determine their competitiveness. The scenarios taken into account in this respect include keeping transport facilities in their existing state, or what is called in TINA terminology the "do-minimum scenario".

The framework proposed for appraising projects is, by and large, entirely acceptable. However, in the Russian Federation the efficiency of projects is not merely a matter of the results of cost-benefit analysis in the sphere of transport; it is a wider concept. Project efficiency is determined in the light of all the consequences beyond the bounds of the transport system, including the economic, environmental, social and policy impacts.

3.2. Purpose and objectives of socio-economic cost-benefit analysis

Socio-economic cost-benefit analysis is proposed for investment projects that will in the future be considered for implementation within the envelope for funding by international financial institutions up to 2015 of the development of international transport infrastructure: railways, roads, airports, seaports, river ports and terminals. The purpose of the analysis is to identify the most socio-economically and financially viable of the projects that States submit to international financial institutions and organizations.

The Russian Federation submitted a provisional list of projects of this kind covering the Russian sections of international transport corridors to the first Euro-Asian Conference on Transport (St Petersburg, 1998). Work is in hand on refining the list and features of the projects it contains.

The technical specifications for the facilities to be included in such projects are taken from the relevant Russian standards. Where necessary, account is taken of European standards.

The list was compiled after assessing a variety of scenarios, including schemas for rehabilitating existing facilities and for keeping them in working order. Naturally, the appraisals made at that stage of work were very approximate and were not based on any uniform base information regarding expected volume or composition of traffic flows, modal split, etc.

3.3. Data needs and availability

It is rightly stated in the TINA documentation that project appraisal is almost completely dependent on the quality of the base data concerning freight and passenger flows and the factors that govern traffic growth, as well as on changes in the overall economic situation, with their impact on project efficiency. It is primarily from this data that it can be determined whether a project is viable and whether it is technically feasible within the requisite time frame.

The Russian Federation, like other countries, has a well-developed system for calculating freight and passenger flows over its transport network on the basis of grids (matrices) of the connections between network nodes. For forecasting, use is made of statistics and forecasts for factors that affect demand for transport services, as well as of the relationship between those factors and transport demand. A variety of computerized calculation and modelling techniques have been developed.

The main reasons for difficulty in forecasting freight and passenger flows are that too little is known about a number of important relationships that affect traffic volume and indicators and that data about the prospects for the Russian Federation's social and economic development and the expansion of its foreign ties is sometimes unreliable or non-existent.

To mitigate the adverse effects of these shortcomings, calculations are made for a variety of traffic-growth scenarios.

When international routes are concerned, it is important that all the countries involved employ uniform, mutually agreed scenarios in determining the growth of international traffic along them. Each country can independently determine its domestic traffic using its own source data.

3.4. The process and parameters of cost-benefit analysis

Questions relating to the methodology for analysing and comparing engineering choices have always been given close attention in the Russian Federation. As stated above, in addition to the standard Methodological Instructions for assessing capital-investment efficiency, there exist for all modes of transport methodological guidelines establishing the procedure for making calculations, the boundaries of the calculation (appraisal) period, the discount rates and other necessary norms. The following responses can be given to the questions raised concerning the values of the appraisal period, the discount rate and the cost structure.

In practice, the Russian Federation recommends that cost-benefit analysis and comparison be carried out relative either to a reference year identified in the methodological instructions (for facilities with a long service life, this is usually the tenth year of operation) or to the total cost for the appraisal period of 20-25 years.

There is no point in making an analysis for a longer period: firstly, because costs at a remote time horizon are low, and secondly, because data for more than 20-25 years ahead are difficult to obtain and unreliable. For these reasons, extension of the appraisal period to 30 years, as recommended for TINA, would not make appraisals any more trustworthy. It would be more useful to include in the calculations the residual value of fixed assets after a more limited period.

The discount rate used in the Russian Federation during the final years of the planned economy was 12%.

There are, of course, many factors that determine what constitutes an appropriate discount rate. They include the total amount of capital earmarked for use during the period under consideration. That being so, the discount rate to be recommended for use in analysis should be one that meets the requirements of international financial organizations. Calculations could, for example, be made at a variety of discount rates within a range agreed with such organizations.

The investment cost structure recommended in the TINA documentation seems acceptable.

However, cost-benefit analysis for the kind of projects now being discussed should cover not only investment for project implementation (including design work and the holding of competitive auctions for construction contracts), but also the costs of procuring the vehicles needed to carry the projected amount of traffic. Such costs, like the other components of the total expenditure, should be determined both for existing and for forecast conditions.

The Russian Federation includes in recurrent (annual) costs for the carriage of freight and passengers the costs of maintaining and repairing the vehicles used and the maintenance and repair facilities themselves, together with expenditure directly on the performance of the journeys, comprising the cost of fuel, energy and other consumables, vehicle depreciation costs, wages and materials handling costs.

The methods that have been devised for determining recurrent (annual) costs give quite accurate results. The soundest results are obtained by using a system of indicators based on the principle of division of the costs into those connected with fuel and energy consumption

("energy costs") and those connected with the expenditure of time ("time costs"). With this system, allowance can be made for all the particularities of infrastructure conditions, vehicles used, operating schedules and other relevant factors.

In practice, it is more convenient to use other methods based on standard costs per unit of distance travelled by vehicles or per unit of carriage (ton-kilometre, passenger-kilometre) in a variety of conditions.

Such methods and standards have been developed for all modes of transport and are widely employed in feasibility studies. They are similar to the methods mentioned in the TINA documentation.

The third element taken into account in project cost-benefit analysis in the Russian Federation is the "non-transport effect" mentioned above. It reflects the various positive effects that improving transport links has in the production, social and other spheres and encompasses a larger set of factors than the concept of "user benefit" recommended as a component of analysis in the TINA documentation.

The main factors taken into account in the non-transport effect are connected with the reductions in trip cost and duration that result from the improvement of a transport link. Reducing trip cost and duration promotes production growth and population mobility and helps to cut economic development and social-welfare costs and the losses associated with the time passengers and goods spend en route, lessen the environmental impact of transport and improve living conditions.

Not all of these benefits of implementing investment projects can be assessed in monetary terms, but the objective is to take them into account as fully as possible in decision-making.

The nature of the non-transport effect to be examined depends heavily on the nature of the journeys to be effected over transport links and on those links' place in the national transport infrastructure.

It would clearly be advisable to study the non-transport effect of improvements (reductions in trip time and cost, broadening of scope) in international traffic.

To confine oneself to assessing "user benefit" is to reduce the efficiency of investment projects.

The principles for the sound design of transport networks require that measures to improve networks should, as a rule, be chosen and examined not in isolation but in conjunction with one another, in the context of schemes for the development of networks sections and routes that consider not only the nature of the measures, but the order in which they should be carried out. That remark is entirely applicable to investment projects and particularly important in the case of sections and routes of trunk networks (including international links).

Guidelines on appraising the efficiency of investment projects should, therefore, address the issues of interaction between the partners along routes and of the elaboration of sufficiently long-term schemes for the development of routes, where such interaction is of relevance.

Annex 1

STRATEGIC ENVIRONMENTAL ASSESSMENT IN CIS COUNTRIES QUESTIONNAIRE

The objective of this questionnaire is to collect information from experts in CIS countries in order to compare the European Union's approach to Strategic Impact Assessment of transport infrastructure plans with current practices and priorities in their respective countries.

This information should provide the basis:

- To elaborate a list of main aspects of SEA that are relevant for CIS countries.
- To check data availability in these countries.
- To compare CIS experience with the methodological considerations proposed by the EU's SEA handbook.

The questions proposed mainly concern the contents of the executive summary and part III (Assessment of global, regional and local impacts), of the European Commission's Manual on Strategic Environmental Assessment of Transport Infrastructure Plans (draft version of February 1999).

1. MAIN ASPECTS OF SEA

The main aspects of SEA are described in the executive summary of the manual. They refer to the principles of SEA, and the decision-making process. Please, compare the manual's approach with current approaches and priorities in your country, with particular attention to the following issues:

- SEA as a bridge between sectoral transport policies and overall sustainability. To what extent has your government identified overall environmental objectives? What are the main implicit/explicit environmental objectives of the government's policy?
- Effective communication with other agencies and with the public. Please, describe the usual formal and informal consultative procedures undertaken by the Ministry of Transport with other agencies and with the public during the preparation and implementation of transport plans and programmes.
- Formalisation of transport policies. Are transport policies explicitly formalised in documents (plans, programmes…)? Which are the main characteristics of these documents (objectives, scope, preparation, approval procedure…)? To what extent are environmental considerations being included in them?
- The decision-making process. To what extent is the decision-making process on transport infrastructure opened to other agencies and to the public? At what stages are/could be environmental considerations taken into account?
- Monitoring of implementation and effects of transport plans. Describe the monitoring system for the implementation of transport plans. Describe the effects/indicators that are receiving more attention.

2. DATA AVAILABILITY

Part III of the manual (chapters 12, 13 and 14, attached) summarily describes the impact assessment to be undertaken under SEA. Please, indicate to what extent are data (and/or experts' judgement) available in your country to undertake the analysis described for:

- Traffic forecasts
- Global and regional impacts.
- Local impacts
- Are there any other relevant impacts that are/should be taken into consideration in your country at this stage?

3. COMPARISON OF THE EU'S SEA HANDBOOK WITH CIS EXPERIENCE

According to your experience, what are the main differences and similarities among the handbook's approach and current practices in your country for the assessment of the environmental impacts of transport plans and programmes?

What developments do you expect for the future in your country's approach to the Strategic Environmental Assessment of Transport Plans and Programmes, particularly in the following fields?

- Identification of global environmental objectives.
- Objectives of transport policies and plans.
- Definition of a legal framework and methodological guidelines for SEA.
- Forecasting methods of impacts of transport policies and plans.
- Setting target values for environmental impacts (such as noise or emission levels).
- Definition of accessibility indicators and establishment of accessibility thresholds as a transport policy goal.

Annex 2

SOCIO-ECONOMIC COST BENEFIT ANALYSIS

DRAFT QUESTIONNAIRE

1. OBJECTIVE

To compare the TINA appraisal guidance "socio-economic Cost Benefit Analysis" with current practices and needs in the CIS (TRANS/WP.5/26, para.29). This comparison should serve as a basis for the development of recommendations to the PETrCs' Steering Committees (TRANS/WP.5/26, para.21).

The questions proposed refer to the following topics:

- The purpose and objectives of socio-economic cost benefit analysis.
- Data needs and data availability.
- The CBA process and CBA parameters.
- Disaggregation of results.
- Other comments.

2. PURPOSE AND OBJECTIVES OF SOCIO-ECONOMIC COST-BENEFIT ANALYSIS

- Has your government elaborated a comprehensive list of rail and road transport infrastructure projects in the Pan-European Transport Corridors affecting your country?
- Which are the standard target parameters chosen for these road and rail projects (e.g.: design speed, level of service, capacity…)? On which grounds have these parameters been selected?
- Have different improvement alternatives been developed for these projects? (From rehabilitation to different upgrading levels).
- Does usual project definition in your country cover the questions contained in table III.1 (annex 3)? Which items do you consider not to be relevant? According to your experience, are any items not included there also important for project definition?

3. DATA NEEDS (REFERS TO ANNEX 1 OF THE TINA DOCUMENT)

- Please, compare the contents of the appraisal framework (table 3.1, page 8) with current practices in your country. Which part of the information therein defined is usually considered/not considered in your country? What other information is relevant for decision-making in your country?

- To what extent do you consider the data (described in annex 1) necessary for project assessment? To what extent is that information already used/available for transport projects in your country?
    - Network description.
    - Current traffic levels. Origin-destination matrix.
    - Historical data and forecasts of key external factors influencing travel demand (population, income, car ownership, regional (land use) planning data, fuel prices…).
    - Actual relationships between external factors and travel demand (i.e. quantitative relationships between population, income, etc. on one side and travel demand on the other).
- Modelling and forecasting. Please, briefly describe what are the main problems you are finding while using existing transport models to forecast future travel demand.

4. THE CBA PROCESS (FIGURE 4.1, PAGE 15)

Please, comment on the input parameters required for the CBA process. To what extent the values suggested by the manual should be modified to take into account the particular conditions in your country?

- What values do you consider to be reasonable for (table 4.3, page 19):
    - Discount rates.
    - Operating period.
- Investment costs. To what extent is the approach outlined in page 19-22 applicable to the conditions in your country to assess:
    - Investment costs
    - Maintenance costs
    - Operating costs.
    - Operator's revenues
- Users' benefits (pages 23-24). To what extent can users' benefits be identified, evaluated and converted into monetary units according to data available in your country? Could national figures be developed on (annex IV: box IV.1 and table IV.2):
    - Value of users' time?
    - Value per accident and per casualty?
    - Values for vehicle operating costs?
- In your opinion, to what extent the "sensitivity analysis" proposed in chapter 5 could compensate for the uncertainties derived from lack of data?

5. DISAGGREGATION OF RESULTS

According to your experience on data availability in your country, to what extent could benefits and costs be disagregated to take into consideration impacts on particular social groups and/or geographical areas? (See annex III, particularly table III.4).

6. OTHER COMMENTS

Please, comment on the main differences between the TINA methodological approach and current practices in your country. Which are their respective potentials and limits to assess transport infrastructure projects?
