

1. DEFINITION OF DESIGN AND CONSTRUCTION STANDARDS

- 1.1. The consultants will obtain from the General Roads Directorate (GRD) the applicable design standards. The Consultant must check that these conform to European geometric, structural and traffic standards and apply them to the assessment of alternative routes and the construction specifications.
- 1.2. The design criteria and the proposed standards shall be reviewed and checked against projected traffic flows as part of this Study.

2. TRAFFIC ANALYSIS

- 2.1. The Consultant will make maximum use of available data, road condition surveys, technical studies and documents provided by General Roads Directorate as well as the data from any other studies conducted recently by other agencies. It is the Consultant's responsibility to ensure that there is sufficient current data available for competent traffic predictions to be made. If the Consultant is of the opinion the data is inadequate, then he must advise the PIU Secretariat and take direction.
- 2.2. The traffic forecasts should be projected for 20-year period commencing in 2001 and trends should be evaluated for different development scenarios. It is important to establish the detailed forecast for years 2004 and 2009 to compare and be compatible with the relevant figures produced in the last five years by the GRD.
- 2.3. It is clear that with the completion of the improvement of the North – South Corridor there will be continued significant growth in traffic, particularly of heavy vehicles using this trans-Albanian route. Due account must be taken of the government's growth predictions.
- 2.4. The analyses must be based on four categories of traffic:
 - passenger cars,
 - light commercial vehicles,
 - heavy commercial vehicles, and
 - buses.

Average traffic speeds will be estimated by means of speed-flow relationship

- 2.5. The traffic data, analyses and conclusions must be discussed with the GRD's Transport Economist, who may seek advice from the Traffic Police. Their recommendations must then be taken into account and their approval for the proposed road development and traffic management incorporated into the reports.

3. ALIGNMENT

- 3.1. The Description of Services makes clear that the General Roads Directorate has decided that the following two sections of road are to be retained and upgraded:
 - Lezhë – Balldren, and
 - Vau Dejes – Bacellek Bridge.

Roadside property developments dictate that alterations to the horizontal and vertical alignments will be limited although due account has to be taken of meeting the defined geometric standards.

- 3.2. It is the centre section of the Lezhë – Shkodra road that requires most investigation. The existing road from Balldren to Bushat has, where it runs at the foot of the Kakarriqi Mountain, poor geometrics, both horizontal and vertical. A limited topographical survey will be essential to define the exact characteristics of the road between Balldren and Bushat so that the necessary assessments and calculations may be made.
- 3.3. For Alternative 3 the first length runs through Balldren, and then a smaller village, using the existing narrow road before striking north across the fields and crossing the Gjadri River. After that it travel over cultivated fields parallel to the military airfield and joins the existing Lezhë – Shkodra road at Vau Dejes.
- 3.4. The presence of a restricted military area constrains the location of the road in its vicinity but the routing must take due account of the irrigation channels and drainage structures.
- 3.5. The General Roads Directorate is currently upgrading some of the secondary roads in the area. The Consultant must consult with the General Roads Directorate on this matter to ensure proper account is taken on the impact of any proposed changes to the intended new facility.
- 3.6. When assessing route alternatives and design options the Consultant must liaise with national and local planning authorities to ensure that provision is made for safe access to any existing or future developments. These must include industrial, commercial or private building development in areas adjacent to the alternative routes, and access off the Alternative 3 road to the airfield complex.
- 3.7. The Consultant should pay special attention to any existing road sections to be upgraded requiring or benefiting from limited realignments that may be designed to by-pass residential areas as far as this is feasible, and should carefully assess the costs and benefits of such realignments
- 3.8. Any alignment changes to improve the suggested new route, Alternative 3, should be based on sound technical, financial or environmental bases.
- 3.9. Contacts and liaison with municipal authorities will be indispensable.

4. PAVEMENT EVALUATION

- 4.1. It is intended to incorporate parts of the existing pavements into the upgraded road when practicable, so a thorough evaluation must be undertaken to assess the bearing capacity of existing pavement. Coring should substantiate visual inspection for feasibility purposes and a deflection survey at selected locations must be done. The Consultant will prepare a simple road inventory, which will fully illustrate all relevant data relating to rehabilitation or reconstruction, including pavement distress where applicable.
- 4.2. Special attention must be paid to that length of the existing road running at the foot of the western side of Kakarriqi Mountain. There is evidence of a range of sub-surface problems and these will need detailed investigation and analysis.
- 4.3. A factor central to the possible use of the existing asphalt layers in the road pavement of those sections to be retained and upgraded will be the condition,

composition and stability of the material, the shape of the surface and its roughness.

- 4.4. It is expected that freight traffic will increase at a greater rate on this road than the average for Albania. Due account of this must be taken in the pavement design for this road.

5. ASSESSMENT OF WORK QUANTITIES & COST

- 5.1. Geometric and geotechnical surveys of the common sections of the existing road will establish its salvage value and what has to be done to achieve the defined standards of the upgraded facility, and this is especially so when assessing Alternative 1.
- 5.2. The Consultant will, as proves necessary, undertake a centre line design based on the data that was provided or obtained from his field studies. He may propose improvements to the routing, or the realignment of any sections of the Lezhë – Shkodra road. If this is so, an explanation of the technical, environmental and financial reasons must be provided. The financial implications of any proposed changes must be quantified in a revised cost estimate for the common sections as well as Alternative 1 and 3.
- 5.3. Emphasis must be given to a critical review of the proposed Alternative 3 river crossings to ensure these are at cost-effective locations and it will be essential for adequate bridge protection and river training measures to be included in the design, Bills of Quantities and cost estimate.
- 5.4. Those sections where the use the existing road is favoured or essential will require a geometric and structural review with explanations of the alternative solutions for pavement type, bridge and drainage works. Typical cross-sections shall be prepared for each particular road section with variable geometric and structural characteristics and included in this report.
- 5.5. The Consultant shall ensure that due attention is paid to road-side and sub-soil drainage as well as safety, and that the quantities and costs for this have been taken account of in the Bills of Quantities and estimate of construction cost.
- 5.6. The remarks above apply in equal measure to those works and costs consequent to the Environmental Impact Assessment.
- 5.7. The economic analyses will require cost estimates appropriate to each common section, Alternatives 1 and 3, as well as any options to the already completed designs that are worthy of consideration.
- 5.8. The construction costs should be based on realistic unit prices derived from the ongoing construction works in the north of Albania by international contractors, it must include provision for the relocation of any services and include a contingency sum based on perceived risk.

6. ECONOMIC STUDY

- 6.1. The study shall justify the benefits of the improvements proposed for the upgraded Lezha - Shkodra Road. The economic analyses should be based on an evaluation of investment costs and quantifiable benefits. The cost of improvements shall be based on local market prices for relevant components of construction costs i.e. labour, materials and equipment. Account will also

- be taken of the estimated mitigation costs produced in the Environmental Impact Assessment report in the cost/benefit analyses produced.
- 6.2. Included in the study must be a calculation of the area of land and property that must be expropriated, so that the cost of this estimated. The GRD will provide information on the prevailing compensation rates for land and the different types of buildings.
 - 6.3. When the upgrading of the existing road sections is evaluated the Consultant will take into account that the existing earthworks, drainage structures, bridges and pavement should be incorporated as far as possible into the upgraded facility. Hence, it is hoped the works will concern mainly road and widening of bridges', and limited realignments and bypasses that prove justified.
 - 6.4. The possibility of alternative design standards, road alignments and stage construction should be investigated, taking into consideration construction and maintenance costs and relevant economic rates of return.
 - 6.5. The estimate of future benefits should principally rely on vehicle operating costs' savings. The average Vehicle Operating Cost of the Lezha - Shkodra Road with and without the road reconstruction or improvement will be estimated using the HDM-III method of the World Bank, or other equivalent methodologies as applicable. The benefits accruing in a 20-year period should be shown in the form of the Internal Rate of Return (IRR).
 - 6.6. It is anticipated that the Consultant will carry out sensitivity analyses examining the impact of improvements of basic road parameters upon the results. Costs and benefits should be expressed in constant prices (base year price).
 - 6.7. The Consultant shall carry out a comparison of proposed alternatives. Different Maintenance strategies involving rehabilitation (reconstruction and overlay) may be considered and the HDM-III model will identify the optimum one.

7. FEASIBILITY REPORT

- 7.1. The report will contain the techno-economic and financial analyses. It will include preliminary geo-technical aspects, hydrological evaluations, pavement condition data, alternative alignments, and preliminary design including the plan/profile of the road options (1:10000 scale). Typical cross-sections as well as tabulated results of quantities and cost estimates will form part a central part of the report.
- 7.2. It will be first prepared in initial draft for the General Roads Directorate (Technical Department) to review, two copies each in Albanian and English.
- 7.3. On receiving the comments and suggestions of the General Roads Directorate the Consultant will prepare and submit bound sets of the final draft report, one in Albanian and three in English. The latter will be sent to the funding agency for review and comment.
- 7.4. On receipt and incorporation of any comments or requirements from the funding agency, provided via the GRD, the Consultant shall make the final amendments and then submit his final Feasibility Study report and supporting documents relevant to the complete findings of the assignment. Any

diagrams will be incorporated into the report. There must be four reports in Albanian and four in English, and four copies each of the associated plans, drawings etc. not incorporated into the report.

- 7.5. In addition, the Consultant shall provide the General Roads Directorate with a disk copy of the report in both languages, which shall have been prepared using MS Office software. All original drawings, which shall be in AO, A1 or A3 size, are the property of the General Roads Directorate and will be supplied with the final report.