AZERBAIJAN REPUBLIC
MINISTRY OF TRANSPORT
ROAD TRANSPORT SERVICE DEPARTMENT

IDA Credit 3517 – AZ
TECHNICAL ASSISTANCE FOR TOVUZ BYPASS

ENVIRONMENTAL AND SOCIO-ECONOMIC ASSESSMENT

FINNROAD

Baku, August 2005
EXECUTIVE SUMMARY

Brief Project Description

Introduction
The Government of Azerbaijan (GoA) has obtained a Credit (No. 3517-AZ) from the International Development Association (IDA) of the World Bank Group towards the cost of the Azerbaijan Highway Project, which rehabilitates the Ganja-Gazakh road section. The GoA intends to apply a portion of the proceeds of this Credit to construct a bypass around Tovuz town. This bypass is a section of the existing east-west corridor between Baku and Tbilisi and as such an integral part of the TRACECA\(^1\) which links Europe to Asia.

Traffic is predicted to rise at an annual rate of 6% on the TRACECA. The existing 5 km road through Tovuz town and the steep grade of the road before and after the bridge are assessed as potential future bottlenecks and safety risks. The proposal for a new bypass for Tovuz has been made to mitigate these risks and because there is no scope to upgrade the road through the town to a Category 1 standard due to the infrastructure conditions inside Tovuz.

The construction of a bypass for Tovuz will relieve its inhabitants from transit traffic, which constitutes the major part of the present traffic load, thereby improving road safety and reducing nuisance through noise, fumes and dust.

The feasibility of this development is being assessed through: (i) an analysis of alternatives in terms of engineering and economics, and (ii) an environmental and social assessment. A key output of this feasibility study is the recommendation of a ‘Preferred Solution’ for detailed engineering. The objective of this Environment Assessment report (EA) is to contribute to a solution that shall be economically efficient, environmentally sound and designed according to international standards.

Alternatives
Two alternate corridors for a northern detour of Tovuz town have been compared and assessed in this EA.

- Alternative 1 has a total length of 14.1 km and does not require any resettlement or destruction of infrastructure. It rejoins the M 1 to the northwest of Jalilli on the boundary of the Agstafa District.

- Alternative 2 is about 10.4 km long and also does not require any resettlement. After splitting from the common corridor with Alternative 1, Alternative 2 turns in a

\(^1\) Transport Corridor, Europe, Caucasus, Asia
western direction, then runs to the south-west between Jallilli and Duz-Jirdahan and connects to the M1 in the south-east of Jalilli.

A 3rd Alternative was eliminated from further consideration in the early stages of the study because the required design parameters for a Category 1 road could not be met.

The existing road through Tovuz cannot be widened or upgraded to the planned future standard design for the M 1 and as a result the ‘without-project scenario’ cannot be recommended for consideration either.

**Main Environmental Impacts**

The potential direct physical impact that any of the 2 alternatives may entail is expected to mainly take place inside the boundaries of the future ROW (2 x 30 m from the centerline). This area shall be acquired for the implementation of the Project, not only to allow for the construction of the 2 lane bypass but also to allow for the future upgrading of the road to a 4 lane standard. In the area of the future bridge over the Tovuz Chay the direct physical impact will affect a wider corridor due to cuts on the river bank. Additional direct and indirect physical impacts outside of this ROW will result from the siting and operation of the contractor’s yard/worker’s camp, material extraction and transport from the borrow pits.

Regarding the human environment, the socio-economic implications of road construction in the two alternative study corridors may be severe due to the need to acquire and overbuild large areas of private agricultural land that presently generate reliable income for many families of Tovuz and the surrounding villages. With respect to other aspects of the human environment, both study corridors are generally assessed as moderately sensitive to the siting and operation of a new road.

**Impacts during Construction**

The bypass will be constructed as a “class 2” road with two lanes of single carriage way with the following parameters:

- the maximum total width of the road is 15 m in compliance with the parameters of the Ganja-Gazakh road, the rehabilitation of which is underway
- lanes width is 7.5 meters (2x3.75 m)
- the maximum shoulder width is 7.5 m (2x3.75 m) of which 4 meters (2x2 m) will be paved with asphalt concrete
- the cross fall of the lanes is 2% and of the shoulders is 4%

Bypass construction includes the construction of bridges over the Tovuz chay river and an irrigation canal. The width of the road on the bridges would be 11.5m, of which: 7.5m (2x3.75) are lanes, 1m (2x0.5) are shoulders and 3m (2x1.5) are walkways.

The construction of the road is planned to be finished within two years. During the construction period activities such as site preparation, construction of bridges and culverts, borrow pits operations would cause direct and indirect impacts on the environment. In order to identify and manage these impacts the Environment
Management Plan (EMP) has been developed. The potential impacts associated with the construction and then management is summarized briefly below.

According to current construction practices and norms, the total workforce for the bypass construction is expected to be around 150 people. The number of non-local engineers and professional workers is expected to be between 40-50% with the rest of the workforce being hired among the local population. To accommodate the outside workforce, the contractor should establish a work camp. The contractor's work camp would include living and eating areas for the non-local workforce, equipment storage and servicing sites, as well as material stockpiles. If improperly designed and operated, work camps can create pollution and environmental hazards through sewage, garbage and vermin; be a source for spills from the operation and servicing of construction equipment; and induce pressure on scarce local limited resources (e.g. drinking water). With respect to the operation of the work camp, prior to the construction, the contractor shall submit for RTSD’s approval a plan and description of his work camp and proposed measures to avoid or reduce adverse environmental impacts resulting from its installation and operation. These measures shall be fully compliant with the provisions of the construction norms. The storage, transportation and use of large quantities of diesel, fuel and other petroleum products may cause chronic oil product pollution, entailing the impairment of groundwater aquifers and surface water. This is specifically relevant where construction takes place in and over rivers and streams. To mitigate such impacts the contractor should comply with the Ministry of Environment and Natural Resources’ (MENR) requirements and instruct its workforce accordingly.

Site preparation will entail the stripping and temporary storage of about 74,000m³ of topsoil. Depending on the individual location, this may bring about the risk of erosion of exposed ground or topsoil and can also cause increased water runoff and siltation of watercourses. Large quantities of materials taken from cuts, such as on the approach to the Tovuz valley, could lead to erosion and the siltation of the river having an adverse affect on aquatic ecology if not properly disposed of immediately after extraction. Without proper management excess material may also lead to the loss of agricultural land, impairment of the biological environment and/or disfigurement of the landscape. To reduce the above-mentioned impacts, the Contractor should reduce the area of ground clearance, minimize the use of borrow pits due to cutting requirements for the bridge construction, and replant disturbed areas.

Heavy machinery moving around the construction corridor can create soil compaction, which may harm the soil’s further potential as farmland and impair drainage. The Contractor should minimize potential adverse impacts related to site preparation through the implementation of such protection measures as creation of temporary accesses or temporary removal of topsoil for the time of construction.

Borrow pit operations if poorly managed could lead to chronic erosion and siltation of the adjoining land, and thus have substantial environmental impacts on soil, water and the natural environment. This could disfigure the landscape, if rehabilitation is neglected or not properly implemented. Material transport from these sites may cause nuisance to settlements in the vicinity of haulage routes through dust, noise and material spillage. In
accordance with local legislation the Contractor will establish a rehabilitation plan for each borrow site, to mitigate such impacts.

During the construction of bridges and culverts the runoff pattern of surface waters could be impaired and water quality affected due to an increase in the silt load. Embankments and construction materials (fill, gravel and sand) could be washed out by rainwater and contribute to the siltation of channels or the river. To minimize the risk of siltation on the Tovuz Chay bridge construction works shall be confined to the period between June and December. The discharge of sediment-laden construction water (e.g. from areas containing dredged spoil) directly into surface water will be forbidden.

During construction, heavy metals, oils, toxic substances, and debris from construction traffic and spillage may be absorbed by soils at the construction sites and carried with runoff water to the river and other water sources. A further source of surface water pollution may be the cleaning of construction vehicles and equipment in the river or leakages from machinery or engines that are not properly maintained or controlled. A run-off control plan shall be developed by the construction contractor which focuses on managing potential problems at source, this will include as a minimum provisions for managing run-off from vehicle washing; the containment of fuels, chemicals and waste stored on site; measures to control spillage during vehicle refueling; the use of tarps on vehicles transporting materials; and the prompt clean up of spills.

Degradation of air quality is likely to result from various sources like exhaust emissions from the operation of construction machinery, and fugitive emissions from aggregates, concrete, and asphalt plants. Dust will be generated on the haul roads, unpaved roads, exposed soils, and material stockpiles. Mitigation of these impacts will be achieved by implementing a special program that will be prepared prior to the beginning of the construction. The program would include such remedial measures as strict technical control of construction machinery on emission standards, avoiding traffic congestions, and watering of unpaved local roads.

Road construction will require the use of heavy machinery and thus entail high and sustained noise during equipment operation. Where construction takes place in the neighborhood of human settlements the temporary adverse impact on human welfare cannot be totally avoided. It will, however, be reduced through (i) the restriction of working hours to between 0600 to 2100 hours within a 500 m distance of the adjoining settlements; (ii) strict enforcement of a maximum noise level of 70 dBA in the vicinity of the construction site; and (iii) ban of improper functioning machinery that causes excessive noise pollution from the construction sites.

Impacts during Operation

In comparison with the construction period, an environmental impact of the road during its operation period is considerably lower. But such impacts, as increased air and water pollution, traffic accidents and injuries, noise and roadside litter would have the potential effect on the environment, directly and indirectly. In order to identify and manage these impacts the Environment Management Plan (EMP) has been developed.
During operation run-off water associated with rainwater or melting snow that washes off roads, bridges, and other impermeable surfaces can lead to deterioration in water quality. As it flows over these surfaces, water picks up dirt and dust, rubber and metal deposits from tire wear, antifreeze and engine oil that has dripped onto the pavement, pesticides and fertilizers, and litter. These contaminants can be carried into the river, soils and other shallow aquifers. To manage these issues the Contractor engaged to support RTSD will develop a spill management plan for responding to oil or chemical spills during operation, and will ensure that adequate hands-on training is provided to RTSD for the implementing this plan. A spill contingency plan for cleaning up hazardous and toxic materials (i.e. oil, fuel, toxic substances) has already been recommended in the frame of Initial Environment Examination of the Yevlax-Ganja Road Rehabilitation Project. In case it would not be realised, the Road Transport Service Department’s (RTSD) Ecology and Safety Sector (ESS) ESS should develop such a plan when the present Project comes into implementation. In the approach to the bridge over the Tovuz Chay to mitigate such risks it is also proposed to enhance safety by providing specific signals at reasonable distances from the bridge, including speed reduction signals if needed.

Detailed calculations on the impact of road operations on air quality have not been made in this present study. But taking into consideration the fact that in the frame of Yevlax–Ganja Road Rehabilitation Project this calculations were done and the area of research, the traffic intensity is almost the same, reference was made to the available data which provides some figures on the issue. According to calculations of the ‘worst case pollutant concentrations’ (CO, PM and NO\textsubscript{2}) on selected sections (‘Yevlax bypass to Ganja bypass east’ and ‘Ganja bypass’) it is predicted that air quality in general will be in compliance with the national ambient air quality standards. At the same time, it is highly recommended that the RTSD carry out long-term monitoring to follow-up on the development of emission concentrations along the new road.

**Socioeconomics Impacts**

In general, the new bypass is clearly preferred by the local people and also accepted by the people who will lose their agricultural lands against compensation.

The World Bank Mission has completed an economic analysis for the Tovuz bypass and found it to have a good socioeconomic justification and a high economic rate of return. The total construction cost estimate for the Tovuz bypass with recommended Alternative 2 and ‘high’ elevation bridge over Tovuz Chay river is about $10.0 million. The results of Highway Development and Management (HDM-4) economic analysis method used by the World Bank shows that Economic Internal Rate of Return (EIRR) is equal to 15% and therefore the investment is economically feasible. Better, faster and safer road transportation is expected to improve local economics, especially agricultural trade. The volume of trade is expected to grow and have a positive impact on the national economy. The permanent loss of agricultural land will have negative impacts on agricultural production, but the impacts are not severe at the macro level. Some shops have benefited

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2 ENGCONSULTANT Ltd. : Yevlax-Ganja Road Rehabilitation Project. IEE, Final Report. January 2005
from transit traffic, but they mainly depend on local customers, and impacts at the macro level are insignificant and not very deep on the local level.

About fifty hectares of land, which is owned by more than 200 families, are needed for the new road, and this land will be lost permanently. About 2.0% additional land will be temporarily used during the road construction. These lands are owned by private households and villages. The lands lost are used for crop and vegetable cultivation and for animal grazing. Presently, it is not known how many households are economically dependent solely on agricultural income, and would lose livelihood due to the project. If the lost lands are compensated by new agricultural land, the impacts on agricultural output are temporary, as they are in the case when the lands are lost only for construction.

The World Bank policy requires that if involuntary land taking and resettlement become necessary, a clear plan for compensating and assisting displaced persons be prepared by the borrower. According to this policy the Land Acquisition Plan is to be prepared during the Project detailed design phase.

The present local roads will stay, although during reconstruction they will go under the highway. This will give independent movement possibilities to farm equipment and animals. Additionally some new underpasses will be needed for flocks of sheep and cattle, at least one between the present roads to the northern villages as well as either sides of the new bridge over Tovuz River which are used as pasture lands. The number and the locations of these safe passages should be determined during detailed design and negotiated together with local farmers.

The present narrow but heavily trafficked road is causing many social and safety problems and inconveniences to the local people. In the town, one of the biggest complaints relates to traffic noise. The other major complaint is about accidents associated with heavy transit traffic routing through the town. The safe movement especially of the school children was the biggest concern. Traffic accidents can be expected to be less on the old road, while the new good road allows the use of high speeds which may increase the risk of accidents in the vicinity of the settlements. This necessitates speed limit regulations along the bypass and constructions of traffic circles or two level crossings with the local roads.

With a new road, the noise level in Tovuz city will decrease, improving living conditions. If the transit traffic is moved out of the town, the present road through Tovuz could be improved to better serve the local population and their needs by constructing better and wider sidewalks and possibly planting trees, or other ways to create aesthetic and safe environment suitable to the Silk Road.

**Capacity Development and Training**

RTSD and particularly its ESS will have to perform various environmental management tasks that are in the frame of the present Project, and according to their official mandate. Just 2 out of 5 staff members of this newly established sector in the RTSD are directly responsible for environmental issues. However, they do not have the appropriate
background knowledge or practical experience to perform this task. The same applies at the district level where no staff are yet available to carry out various environmental management tasks.

For this reason, capacity development and training will be required to implement the present Project in accordance with the relevant national and World Bank (WB) standards, and to start forming a functioning, effective and efficient ESS in the RTSD that can independently carry out the implementation and monitoring of environmental management plans. To this regard, it is recommended that an external advisor to the ESS is engaged to practically support the ESS in their various day-to-day tasks throughout the construction phase and provide concrete hands on training on environmental management in road construction and operations. As a further step the ESS could then, on their part, provide training to the future District staff of the Road Operations Division, to perform routine environmental monitoring during the operational phase of this and other projects.