

1. PRIORITY AND RELEVANCE

This project is designed to relate directly to and complement the existing AID-financed \$3.0 million FY 75 project for Eastern ORD Integrated Rural Development. The Project Paper for the existing project identified inadequate road infrastructure in E/ORD as a major limitation to farmer productivity, both with respect to collection of produce and supply of the means of production to farmers in this region.

In addition, the Upper Volta DAP, in the Section on possibilities for useful AID interventions, recommends among other activities, "road building to increase the productive capability of the rural sector".

During its field trip to Fada, the PRP team was struck by the poor condition of the rural roads at least one month after the end of the rainy season and the difficulty with which numerous villages lying off the Fada-Bilanga road are reached. This road itself, which is also the main road north to Bogande is so badly washed out in places that it virtually disappears at several points just north of Fada. It is obvious even to the casual visitor that the condition of this road and other village roads is a serious impediment to rural development and agricultural productivity in this important and potentially high-yielding area.

Thus the purpose of this project is a) to upgrade the rural road network in E/ORD which is currently recognized as a major obstacle to development and b) to increase small farmer income by providing almost all-year market access (except for a relatively brief period during the height of the rainy season). Roads selected under the project include the E/ORD highest priority road and two others which cross some of the intensive areas covered by AID's Integrated Rural Development Project.

Attainment of the project purpose will contribute directly to the sector goal of upgrading quality of life and economic well-being of the rural population of the area covered by the E/ORD.

2. PROJECT DESCRIPTION

The outputs to be achieved by this project are the construction of at least three high priority village roads located in the Eastern ORD of Upper Volta. Limiting the project to just three rural roads totaling 154 km was necessary to stay close to the current project planning figure of \$1.5 million, reduced by AID/W from \$3.6 million in the PID. With allowance for inflation, this amount is exceeded somewhat. Moreover, the design team recommends that if Africa Bureau availabilities permit it, the amount of the project be increased to permit other tertiary roads which are also

high priority and can be completed at relatively low marginal cost. Specifics on this point are included at the end of this Section.

Components to be financed under the project are as follows:

a) approximately 20 pieces of earth-moving and road building equipment to equip one road brigade. The following list is tentative and is subject to minor modification at the time of the PP. Prices are estimated in Section 7, Financial Plan.

Proposed Equipment List for Highway Brigade

2 bulldozers D6 with rigger and blade
2 motor graders (Cat 112 or similar)
2 front end loaders (Cat 920 or similar)
1.33 M3 capacity
1 industrial Tractor 50 HP
2 self-propelled Roller, 20T (4,5 M3 capacity)
4 dump trucks (4.5 M3 capacity)
2 water wagons 10 M3 each
1 service truck
1 fuel truck
1 motor pump 40 M3/hr
1 pick truck

b) operating costs of construction of the three proposed roads, including fuel, spare parts, tires, batteries, equipment maintenance and operating overhead, but excluding salaries of brigade personnel (operators and laborers).

c) salary and support cost of one full-time expatriate project manager (road engineer).

Description of proposed roads - In consultation with the E/ORD Director and staff, the PRF design team proposes three roads for financing under this project. Additional roads are also tentatively listed in the event supplementary financing becomes available. The proposed roads in order of priority are:

A. Fada N'Gourma-Bilanga road.

This is a 72 km secondary road, extending essentially in a north-south direction. It is E/ORD's top priority for road construction serving at least 45 villages with a population of about 22,500. The existing alignment comprises a track which over considerable distances does not show any signs of having been improved. In other places the original alignment has been transformed into a channel-like depression below the surrounding natural terrain. The improved road will largely follow the existing alignment, deviating from it mainly in those cases where some more of the depressions will have to be bypassed.

The soil consists largely of sandy silts, with some admixtures of clay in the lower elevations. Outcrops of rocks or lateritic gravel occur rather infrequently. As mentioned earlier, the present facility is in very poor condition with no fills or wearing surfaces in evidence, thus subjecting the road to progressive deterioration. There are very few

drainage structures, particularly near the southern end of the road. There are some paved fords (Irish bridges) in existence, which can be made usable at relatively small expense. However, much more is needed in the way of drainage structures since the alignment crosses numerous water courses (a total of 11), sometimes with considerable catchment areas. The terrain is flat and has little permeability, which adds to the need for flood protection of the road.

Since this will be a secondary road and eventually a through road connecting Fada N'Gourma and Bogande, the following standards are proposed:

width of roadway	5.00 m
cross slope of roadway	3%
side slopes of cuts and fills	3 (horiz.): 2 (vert.)
thickness of laterite surfacing	10 cm in fill areas 15 cm in all other cases
total height of road embankment	0.20 m to 1.00 m, depending on drainage conditions

The team's engineer has made a preliminary estimate of 139,250 m³ of earthwork and 53,500 m³ of surfacing for this road. Based on prior experience it is assumed that the brigade can produce 720 m³ per day with the construction period estimated at a minimum of 268 working days. This suggests that the road can be completed in slightly less than two September-June working seasons.

B. Ougarou-Nasseugou Road

This 30 km tertiary road would be essentially a new road passing through an area of rich soil and serving a current population of about 3,000. There are only a few tracks in existence, which could coincide with a proposed road alignment. There are numerous small watercourses which would have to be intersected and some lying areas which may be water-logged or swampy during part of the year. Other sections of the alignment may cross sand dunes, which would require extensive work on removal of the sand and replacement with more suitable embankment material. Alternatively, a new alignment may be feasible to avoid the marshland.

The following standards are proposed for this tertiary road:

width of roadway	4.00 m
Min. height of embankment	0.20 m
Laterite surfacing	none
Drainage structures: paved foros and 80 cm diameter CM pipe culverts	
side slopes:	1.5 (horiz.):1.0 (vert.)
average height of embankment	0.30 m

The team's engineer tentatively estimated that this road will require approximately 40,000 M³ of earthwork.

Assuming the brigade splits and works on both tertiary roads simultaneously, construction time of above five months is estimated (less than one work season).

C. Diabo-Comin Yanga Road

This is a 50 km tertiary road serving directly or indirectly 75 villages with a population of about 15,000. The existing alignment runs along the crest dividing two watershed areas which is an indication that no drainage problems of any magnitude will probably be encountered. However the presence of clay in the soil has been reported.

The standards for this road will be the same as specified above for the Ougarou-Nossougou Road. Assuming simultaneous construction with that road, construction time is estimated at about eight months.

If additional funds can be made available, the PRP team recommends that other relatively short, low-cost high-priority tertiary roads in E/ORD be considered for construction. Among these include:

Balga - Tantiaka - 12 km

Piéga - Guieri - 25 km

Comin Yanga - Sakango - 15 km

Comin Yanga - Yonde - 25 km

Namounou - Tambaga - 15 km

Namounou - Yokri - 22 km

If financing the construction of any of these roads appears possible based on an increase in project budget, detailed cost estimates could be made at the time of the PP.

3. AID AND OTHER RELEVANT EXPERIENCE

AID has had extensive worldwide experience in the construction of rural roads, including feeder roads, access roads, farm-to-market roads, etc. Of all of the road projects in West Africa recently financed by AID, perhaps the rural roads project in Liberia is the closest to this one. Also the Kumba-Mamfe road in Western Cameroon, although it is a point-to-point road built primarily to connect two important provincial towns and as a through road serving all of north-west Cameroon, is relevant to this project in that it was built entirely by force account by the Cameroon Government Dept. of Public Works and is regarded as a successful example of that method of construction.

In Upper Volta, several road projects have been undertaken under World Bank (IDA) loan. The IDA-financed Projet-Coton rural roads construction in the Bobo-Dioulasso and Dedougou ORDs referred to several times in this paper, offers an excellent model for construction of rural roads by work brigade with equipment financed by external aid.

In general, since this is a relatively straight-forward rural road construction project to complement an integrated rural development program, there is no reason to anticipate major conceptual difficulties in project design.

4. BENEFICIARY

The direct beneficiaries of this project will be the rural population of Eastern ORD in villages served by the roads.

Since most of these people are engaged in farming, the roads will provide a ready means of moving produce to Fada to be marketed there or transported elsewhere in country via the Fada-Ouagadougou road. Under present conditions, the roads in question are completely impassable throughout the rainy season (four months) and passable only with difficulty in many places all year. There are numerous places where the roadway has been washed away and ruts are so deep that ox-carts cannot pass.

The two tertiary roads proposed under this project, the Ougarou-Nassorgou road and the Diabo-Comin Yanga road are both in intensive areas covered by AID Eastern ORD Integrated Rural Development Project. Improvement of these roads will closely complement the other AID-financed assistance to these areas. The other road to be financed under this project, a secondary link between Fada and Bilanga, is in an intensive area of the FAO-UNDP assisted Integrated Rural Development Project and is the ORD top priority for road construction because it passes through or near 45 villages with a population of about 22,500 and because of the important agricultural production in this area, including sorghum, millet, rice, peanuts and garden market vegetables (maraichage). Producers of these crops will be the main immediate benefactors of the roads. Since farmers are now holding back on production

because of marketing difficulties aggravated by current road conditions, they would be induced to produce more both to sell and for consumption in the local area, thus raising income levels for the farmer and benefiting the whole community indirectly through increased economic activity.

The roads are seen as an entirely positive entity in the social sense. They will have no adverse environmental effect and no segment of the local population will be harmed by them. Even near-by villages not traversed by the roads will benefit. The ORD Project Manager believes that certain villages even half a day's walk away from the new roads will greatly improve their ability to market their produce.

Since village women are actively engaged in agriculture, including the harvesting and marketing of their crop, the road will aid them directly and materially, by markedly reducing farm to market delivery time. Since much of the market deliveries are made by women, the presence of the new roads will be a major labor-saving factor, and they will also permit a general increase in mobility of village women.

5. FEASIBILITY ISSUES

Economic Feasibility Issues

Although no attempt was made at this stage to perform a cost-benefit analysis or to calculate an internal rate of return, the PRP team formed the impression that the proposed roads would be economically feasible based on their potential value to the rural population as a stimulant to agricultural growth and their relatively low cost, especially with respect to the planned tertiary roads. The Fada-Bilanga road will be built to secondary road standards (see Section 2, Project Description), accordingly at greater cost per kilometer than the tertiary roads (approx. \$10,000 per km vs approx. \$5,000 for tertiary roads, not including amortization of equipment). By comparison, the IBRD estimates per km construction costs of its IDA-financed rural roads in Upper Volta at about \$7-8,000 per km, including amortization of equipment.

A large share of project funds (at least \$667,000 and probably at least 8% more with inflationary price increases) will be spent for road-building equipment. Although all of this equipment will be needed to construct the roads, its useful life should exceed the period needed to construct the roads planned under the present project. The equipment has an estimated life of 8-10,000 working hours, of which an estimated 5,000 hours will be consumed in the construction of these three roads. The present size of the project is

limited only by the amount budgeted for the project from AID. If this amount can be increased, the PRP team favors adding additional high-priority tertiary village road, whose marginal construction cost would be relatively low, thus increasing the economic feasibility of the project as a whole, i.e. more miles of roads built for the same capital investment costs.

If no further AID funds can be made available, ORD or SERS* would endeavor to use the equipment for its remaining life on other priority rural roads, However without external support for operating budget, it is doubtful that the ORD could proceed in a timely fashion. The ORD continues to seek other external aid to finance additional rural road construction, especially operating costs. SERS, because of its IDA financing has more assured prospects of having operating funds available for construction and maintenance.

Technical Feasibility Issues

The most important technical feasibility issues involves the proposed standards of the roads, which in turn directly affect the period of construction and estimated operating costs. Road standards proposed in this paper are

* Service d'Entretien des Routes Secondaires. Two options involving construction by ORD or SERS are discussed in Section 8, Implementation Plan.

those which in the opinion of the PRP team and the E/ORD Director constitute the minimum requirements to provide satisfactory access and mobility of the affected rural populations at all times of the year except the height of the rainy season. Standards are similar to those employed in the IDA-financed rural roads project in Bobo-Dioulasso. The PRP team visited one of these roads now under construction and traversed another completed two years ago which remains in excellent condition. In establishing standards and cost estimates for construction of the Fada-Bilanga road, the design team engineer was also guided by the recommendations of the Mecchi-Valle report, prepared by an Italian engineering firm in August 1975 for the U.N. Sahelian Office. It is the team's belief that the proposed standards and the estimated periods of construction are reasonable for actual conditions in E/ORD. The team was very mindful, however, of the danger of recommending sub-standards roads, which would be washed away or develop serious maintenance problems after one or two rainy seasons. Confirmation that the proposed standards are sufficient can be made only after a detailed examination of all proposed roads by a team of REDSO engineers, which limitations of time and staff prevented at the time of the PRP.

This survey is tentatively scheduled for late January or early February prior to the beginning of the drafting of the PP. It should be understood that at that time the engineers may recommend slight to moderate increases in standards, affecting the volume of earth-work and perhaps the number and type of drainage structures.

Regarding method of construction, experience has indicated that the construction of rural roads in Upper Volta employing independent road brigades and modern imported road-building equipment is a technically efficient procedure. It is recognized that the equipment list proposed for financing renders this project relatively capital-intensive. The justification for this is that these roads are needed as soon as possible, and this is the most effective and fastest way to build them. A more labor-intensive formula using less equipment would inevitably require more construction time and might ultimately cost more especially if postponed productivity increases by farmers are taken into account. From the standpoint of employment generation resulting from labor-intensive methods, Fada is not a labor surplus area and it is expected that most of the brigade will have to be recruited from outside the region in any case. An employment-generating effect should be achieved, however, especially

in the agricultural sector after the roads have been completed based on anticipated increase in production encouraged by better market access roads.

Another technical feasibility issue is the capability of both the E/ORD and the SERS to handle all aspects of construction. This question is treated in detail in Section 8, Implementation Plan. E/ORD personnel lack experience in managing a road-building project and SERS, which will not be operational until June 1976, is an unknown quantity. However, the PRP team has proceeded on the assumption that a competent brigade can be recruited and effectively managed as in the case of the very similar IDA-financed rural road project in Bobo-Dioulasso, discussed elsewhere in this paper, and other successful road brigade enterprises in Upper Volta.

Financial Feasibility Issues

Section 7, Financial Plan contains current cost estimates for the project. These will be refined in the PP, based on the results of an engineering survey of the proposed roads to be performed by REDSO early in 1976. As noted under technical feasibility issues above, any recommendations for up-graded standards would tend to increase both operating costs and estimated construction time, thereby exceeding the cost estimates currently in

the Financial Plan. The general effect of price inflation is of course uncertain but a standard annual factor has been added in for this purpose (8% for equipment and 5% for labor).

AID-financial project costs include operating budget covering fuel, spare parts, tires, batteries and equipment maintenance. This support is essential and without it the GOUV could not afford to undertake the project. Based on tentative assurances from TP and ORD officials, the PRP has made the assumption that personnel salary costs of the brigade will be borne by the GOUV (E/ORD and SERS). The team believes this to be reasonable and appropriate and will continue to press for this financial arrangement during the negotiations at the time of the PP preparation.

6. OTHER DONOR COORDINATION

United Nations

1. UNDP/FAO is sponsoring a parallel project to AID's in E/ORD in Integrated Rural Development. This 5-year \$2.1 million project will be operational in 1976, using a similar approach to the AID project, but operating in different intensive zones from the AID project. One road proposed for financing in this PRP, the Fada-Bilanga road,

will serve one of the intensive zones of the UNDP/FAO project.

Several of the inputs of the latter activity have a direct bearing on the proposed AID road project, including:

- a) \$28,500 in equipment for a garage and vehicle maintenance workshop;
- b) one landrover for mobile repair service;
- c) one mechanic for 2 years as a trainer and repairman for light maintenance.

2. ILO is planning a \$327,000, 3-year technical assistance project in E/ORD beginning in July 1976, to be financed by the Norwegian aid program. Emphasis will be on rural roads, wells and water resources, and other infrastructure such as development of rural stores. Two experts will be provided for three years (\$200,000) and technical materials (\$127,000). One of the experts was scheduled to be an engineer but in view of the fact that the AID-financed project manager will be an engineer, ILO now plans to choose another technical specialty in order to avoid duplication.

In addition ILO may implement a small Swiss-financed TA project in E/ORD in supervision of construction and equipment maintenance.

World Bank (IDA)

IDA has made a loan to finance the Upper Volta Rural Development Fund, a portion of which is tentatively programmed

to finance construction of the Fada-Comin Yanga in E/ORD. If built this road would form the third side of a triangle with the Diabo-Comin Yanga road proposed for AID financing in this project and the existing Fada-Koupela road, which is expected to be paved with FED assistance beginning in September 1976.

A new IDA loan for \$7.5 million for the construction and maintenance of rural roads in Upper Volta has been authorized. Although most of the 1,200 km of roads to be improved have not yet been identified, it is expected that the project will concentrate in the Western part of the country. However, of direct relevance to the E/ORD project is the fact that the IDA loan will include a provision for technical assistance to SERS (two engineers and an accountant) to strengthen SERS' operational capabilities and to train Voltaic supervisors.

The E/ORD is very much aware of the need to coordinate various firm and prospective foreign donor inputs of assistance. An informal coordinating committee has been formed comprising the ORD Director, Mr. Thiombiano, the AID project manager, Mr. Luche and the FAO project manager, Mr. Novarrez. Efforts are being made to integrate all foreign TA inputs into the ORD's organizational structure to avoid duplication, overlapping and competition.

7. FINANCIAL PLAN

As stated in the project description, AID will finance the equipment costs of one full road brigade; operating costs of construction; and the costs of one full-time expatriate project manager (road engineer).

Since the equipment will be provided as a package for the road program and since it will continue to be used on other E/ORD roads after the completion of the AID project, the cost of equipment is considered separately from other construction costs such as operating expenses, labor costs and material costs for earthwork and drainage structures. Total construction costs for each road have been estimated net of amortization of equipment. Cost estimates for purchase and operation of equipment are as follows:

<u>Proposed equipment List for Highway Brigade</u>		<u>Purchase Price</u> <u>delivered to Fada</u> <u>U.S. Dollars</u>
2 bulldozers D6 with ripper and blade		173,600
2 motor graders (Cat. 112 or similar)		167,200
2 front end loaders (Cat. 920 or similar) 1.33 M3 capacity		80,500
1 industrial Tractor 50 HP		16,000
2 self-propelled Roller, 20 T (4.5 M3 capacity)		77,400
4 dump trucks (4.5 M3 capacity)		49,100
2 water wagons 10 M3 each		55,200
1 service truck		16,700
1 motor pump 40 M3/hr		2,800
1 pick truck		5,000
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Total in 1975 prices		\$667,000
+ 8% est. inflation in 1976		\$720,000

Estimates by the PRP team engineer tentatively put net operating costs at about 280,000 CFA (\$1,275) per day for the above equipment. This figure excludes amortization of equipment, but includes fuel, spare parts, tires, batteries, etc. A refinement of this figure will be made at the time of the PP and it should be recognized that estimates for operating costs could increase, especially if road standards higher than those presently contemplated, are utilized. This possibility is discussed separately in the Section under Technical Feasibility Issues.

Personnel Costs

Following is an estimate of personnel costs, based on existing pay scales for the IDA-financed road project in Bobo-Dioulasso. A work year of 200 work days is assured for this calculation (which takes account of the rainy season shutdown).

<u>Personnel</u>	<u>No.</u>	<u>Road Brigade Salaries and wages</u>		<u>Cost Annual</u>	<u>Daily</u>
		<u>Annual</u>	<u>Daily</u>		
Project Manager	1	7,200,000	36,000	7,200,000	36,000
Brigade foreman	1	379,389	1,897	379,389	1,897
Equipment operator	7	337,035	1,685	2,359,245	11,795
Truck Drivers	10	316,549	1,583	3,165,490	15,827
Lt. Vehicle Drivers	2	241,103	1,025	482,206	2,411
Laborers	4	144,529	723	578,116	2,891
Timekeeper	1	262,180	1,310	262,180	1,310
Warehouseman	1	262,180	1,310	262,180	1,310
Total cost of personnel in CFA				14,688,806	73,418

Of the above personnel costs, only the expatriate Project Manager and non-permanent (daily-hire) labor will be funded by AID under this project. It is expected that equipment operators will be funded by SERS under option No. 2 (discussed in Section 8, Implementation Plan) and hired and paid by ORD under option No. 1.

Mobile Brigade for Equipment Repair

This service is essential for the proper functioning of the equipment and will operate independently of the highway brigade. It will include rental of a lowboy truck for the transportation of a truck-propelled equipment, as well as contracting for the specialized personnel needed for repair work. The Caterpillar agent in Ouagadougou, Manutention Africaine, could provide these services under contract. This possibility is discussed further under the heading of maintenance in the following section, Implementation Plan. The cost breakdown of this brigade is estimated as follows:

<u>Equipment</u>	<u>Daily cost in CFA</u>
1 6T Truck	11,215
1 Lowboy	10,693
Repair Equipment	5,000
Total CFA	26,908 per day

<u>Personnel</u>	<u>Annual Salary</u>	<u>Daily Salary</u> (200 day/yr.)	<u>Daily Cost</u>
2 mechanics	489,924	2,500	4,900
2 Asst. mechanics	337,035	1,685	3,370
1 electrician	337,035	1,685	1,685
2 drivers	316,549	1,583	3,166
1 clerk/timekeeper	262,180	1,311	1,311
Total CFA			14,442/day

Overhead

Regardless of whether the brigade is administered by SERS or by ORD, a certain amount of overhead cost has to be assumed for the management of the works. This expense is estimated at 7.5% of the equipment operation cost and at 20% of salaries and wages.

It should be noted here, that if SERS is in charge of the brigade, it is willing to absorb overhead costs, which thus would not have to be charged to the project. On the other hand, if the brigade is managed by ORD, this cost will definitively have to come out of project funds.

Logistic Support

In addition to the foregoing, a certain sum has to be laid aside for temporary housing and transportation of the brigade personnel and for similar field expenses. An estimated 3% of the gross operating cost of the brigade should be assigned to this item.

Cost Estimates of Roads (exclusive of equipment purchase and amortization)

Fada - Bilanga Road

	<u>Amt if M3</u>	<u>\$ cost if by ORD</u>	<u>\$ cost if by SERS</u>
Earthwork			
Fill	139,250		
Surfacing	53,300		
Total earthwork	192,550	542,000	455,000
Drainage Structures, material and labor		200,000	160,000
Total in 1975 prices + inflationary increases (est. 5% p.a.)		742,000	615,000
Total in 1977 prices		\$818,000	\$678,000

Ougarou - Nassougou Road

	<u>Amount in M3</u>	<u>\$ Cost if by ORD</u>	<u>\$ Cost if by SERS</u>
earthwork	40,000	113,000	95,000
drainage structures		42,000	38,000
Total in 1975 prices + inflationary increases (est. 5% p.a.)		155,000	133,000
Total in 1977 prices		\$171,000	\$147,000

Diabo - Comin Yanga Road

	<u>Amount in M3</u>	<u>\$ Cost if by ORD</u>	<u>\$ Cost if by SERS</u>
earthwork	66,750	188,000	158,000
drainage structures		52,000	44,000
Total in 1975 prices + inflationary increases (est. 5% p.a.)		240,000	202,000
		\$265,000	\$223,000

Summary of Costs

	<u>in 1975 prices</u>		<u>in 1976 prices*</u>	<u>in 1977 prices</u>	
	ORD	SERS		ORD	SERS
Equipment	667,000		720,000	-----	
Fada-Bilanga	742,000	615,000	-	818,000	678,000
Ougarou- Nassougou	155,000	133,000	-	171,000	147,000
Diabo-Comin Yanga	240,000	202,000	-	265,000	223,000
Total Project Costs	\$1,804,000	\$1,617,000	-	\$1,974,000	\$1,768,000

* All equipment to be ordered in 1976.

8. IMPLEMENTATION PLAN

At this stage in project planning the question of which GOUV agency will be primarily responsible for undertaking actual road construction remains open. Two major options have been agreed upon by the design team and GOUV officials involved in planning the project:

Option No. 1 - The Eastern ORD would be entirely responsible for implementation of the project both with respect to management and administration as well as actual construction. Under this option the road brigade equipment financed under the AID grant would be provided directly to the Eastern ORD. Also the expatriate project manager (road engineer), to be financed by the AID grant would be responsible to the ORD Director, as would the road brigade foreman, who would be a Voltaic. Personnel for the road brigade would be employed directly by the E/ORD in the same manner as the road brigade for the Projet-Coton roads in the Bobo-Dioulasso and Dedougou ORDs. The approximately 26 brigade personnel required, based on the present equipment list, include brigade foreman, seven equipment operators, ten truck drivers, two light vehicle drivers, four laborers, one timekeeper and a warehouseman (see table on Road Brigade salaries and wages in Section 7, Financial Plan).

Regarding payment of brigade personnel, this would basically be the responsibility of the ORD under this option, but preliminary indications are that technical personnel (i.e. the brigade foreman) could be provided and financed, perhaps on a secondment basis, to ORD by the TP's SERS (see description of SERS under Option No. 2). The ORD would provide and finance the equipment operators, the truck drivers, the laborers and the two clerical personnel. ORD could recruit these personnel directly from among Voltaic workers returning from Ivory Coast owing to a decline in timber exploitation in that country. Present indications are that workers with experience in operation of heavy equipment are available from this source. It is therefore not considered necessary at this stage to provide for training of equipment operators from the project funds, nor would AID funds finance the salary costs of brigade personnel. Under this option basic road design would be undertaken by the Project Manager/Engineer in accordance with standards approved by the Dept. of Public Works (TP). SERS could provide consultant services to ORD as requested.

Option No. 2 - Eastern ORD would retain overall administrative responsibility for the implementation of the project, but actual construction would be by force account by a newly created arm of the Ministry of Public Works

(Travaux Publics) called the Service d'Entretien des Routes Secondaires (SERS). This new unit to be operational in June 1976, will be charged with both construction and maintenance of secondary roads throughout the country and will be staffed by TP personnel. It is expected to be more efficient than the existing TP road building operation because of improved administration and coordination resulting from the creation of a high-level Inter-Ministerial Technical Committee which among other functions would reduce delays by resolving policy disputes and conflicting priorities.

Under this option, the SERS would furnish and fund technical personnel for the road brigade, except for operators and laborers, whom ORD would hire, and for the AID-funded expatriate project manager. The equipment to be financed by AID under the project would be provided to SERS, which would also be responsible for equipment maintenance. After project completion SERS would retain the construction equipment on condition that it would continue to be used exclusively in E/ORD.

SERS would undertake all aspects of construction as well as preparation of design documents for the roads, including both earthwork and drainage structures. The construction phase to be performed by SERS under this option includes clearing, fill construction, surfacing (where appropriate), ditching and construction of drainage structures.

The PRP team engineer observed that the construction of drainage structures involve somewhat different technical skills and management approach from that of earthwork operation. Drainage structures for this project would include the construction of box culverts (actually reinforced concrete slabs on stone masonry abutments), the placing of corrugated metal or concrete pipe culverts and the construction of paved fords (sometimes referred to as dips, Irish bridges, or rapiers). The share of these structures, in the overall cost of the roads under study, amounts to about 13%.

The REDSO engineer recommended consideration of the use of private local contractors for drainage structures instead of relying on the ORD or SERS brigade. Upon investigation, however, it developed that other road brigades in Upper Volta have built drainage structures with satisfactory results, and TP personnel have also had relevant experience. Moreover, a cursory check did not reveal any local contractors with experience in drainage structures. The PRP team concluded, therefore, that the road brigade would be capable of executing drainage structures satisfactorily, provided they are properly designed. If SERS undertakes the construction of the roads, SERS engineers can also design the drainage structures. If ORD implements the project without SERS, the PRP team believes that the

expatriate project manager/engineer can design the small number of relatively simple drainage structures required.

Maintenance

If ORD undertakes construction, it will rely first on its own limited equipment repair facility, to be strengthened by an expatriate mechanic and some garage equipment under the UNDP/FAO E/ORD development project. Also, the existing AID E/ORD Integrated Rural Development Project provides for three men to be trained in each of the next three years in road equipment operation and repair and construction techniques at the Entente Fund sponsored and AID assisted Regional Roads Maintenance Training Center in Lome, Togo (CERFER).

For equipment maintenance beyond E/ORD's capacity, ORD will rely on Manutention Africaine, the local Caterpillar Tractor agent in Ouagadougou, who has served the road brigade in Bobo very effectively. Costs not covered by warranty will be paid from project operating expenses.

If the SERS undertakes construction, it will be responsible for all equipment maintenance as one of its prime functions, using the ORD garage and the Caterpillar agent as appropriate. In this case it is assumed that maintenance costs would be paid by the SERS budget, but any amounts chargeable to ORD would be paid by the operating budget.

Regarding maintenance of the roads themselves after completion, this will be the responsibility of SERS under either option, as part of its nationwide responsibilities. Specific language providing for future road maintenance should be inserted into the Project Agreement.

Project Management Capabilities - Irrespective of whether ORD or SERS is charged with actual road construction, E/ORD will retain overall administrative responsibility for the project and control of the operating budget. Thus, under either option, E/ORD would be considered the GOUV implementing agency for this project. The E/ORD director would be the central GOUV official involved in decision-making for the project. He would rely on the technical judgment of the expatriate project manager, who would report directly to him, even if the construction is undertaken by SERS.

In evaluating the capabilities of both the ORD and the SERS to implement this project, some caution must be expressed. The E/ORD has had no previous institutional experience in undertaking road-building projects, nor have members of the present ORD staff. Thus the recruitment of the competent and experienced people, especially the expatriate project manager and brigade foreman, as well as construction personnel, is critical to the success of the project. Despite this uncertainty, one can be reassured

by the successful experience of road brigades in other ORDs especially in the Projet-Coton in Bobo-Dioulasso, which is staffed entirely by operators hired directly by the project.

In the case of SERS, this is a new organization which has yet to prove itself, even though it is backed by the resources of the Travaux Publics. Given the TP's past reputation for slowness and high cost work, the E/ORD Director, Mr. Thiombiano, has expressed a certain reluctance to turn the responsibility for construction over to SERS. This feeling is reinforced by the E/ORD's natural desire to maintain full control over the project. However, an important factor in Mr. Thiombiano's judgment of SERS involvement is SERS ability and willingness to provide and finance competent and experienced personnel for the brigade. Once it becomes clear that this condition can be fulfilled, it is likely that the ORD's hesitation about SERS participation would be alleviated.

The two options of using the ORD itself or the SERS to undertake construction were discussed with Mr. Salia Sanon, the Permanent Secretary of the Coordinating Committee for Rural Development, to whom all the ORD Directors report. Mr. Sanon is also a member of the Interministerial Technical Committee, a coordinating body which assigns priorities to the SERS for execution. Since he is involved at the policy level with both organizations, his views were considered as

important and impartial. Mr. Sanon expressed sympathy with Mr. Thiombiano's desire to have E/ORD execute the entire project. He acknowledged that in the past TP's performance has been somewhat uneven and that SERS is as yet an unknown quantity. He added, however, that once it becomes evident that SERS is going to work out, there will be every reason to use it for activities such as this, instead of individual brigades run by the ORDs. Mr. Sanon noted that SERS is scheduled to be operational by June 1976. By the end of that year, he believes it should have performed enough work on which to base an assessment of its initial effectiveness. At that point, Mr. Sanon believes, enough time will remain to make the decision of whether to use the SERS or the ORD itself as the construction agent, well ahead of the planned start of construction in September or October of 1977. It should be noted that a portion of the forthcoming World Bank (IDA) loan to Upper Volta will finance technical assistance (two road engineers and an accountant) to SERS to strengthen its operational capabilities.

The problem with postponing this important implementation decision until at least the end of 1976 is that it will still remain an open question after the preparation of the PP, normally considered the appropriate place to determine the final implementation plan from among possible options proposed in the PRP. Unfortunately, present

scheduling of the PP preparation (March-April 1976) is before SERS becomes operational, so that the PP team will have no opportunity to assess SERS's actual performance. In view of this timing problem, the PRP team recommends that the PP design team review the options with GOUV officials from E/ORD and TP to determine whether a basis for final selection can be at that time made. If the GOUV and the PP team decide to keep the issue open, the PP can refine the options and indicate that a final decision will be made prior to execution of the Project Agreement.

9. PROJECT DEVELOPMENT SCHEDULE

Following AID/W review and approval of the PRP it is expected that next stage of design, the Project Paper, can be undertaken largely with interval AID staff resources. A suitable Project Design Team for the PP would include a design officer from CDO/Ouagadougou, REDSO/WA or AID (AFR/DS); a road engineer from REDSO/WA; a rural development specialist from CDO/Ouagadougou or under contract, and a transport economist. The latter two team members would be needed to undertake, respectively, a social and an economic analysis of the effect of the roads in the context of the Eastern ORD Integrated Rural Development Program. The CDO Project Manager for Eastern ORD would participate to the maximum extent possible, but it appears likely that services of a rural sociologist would be valuable on a part-time basis, either from REDSO/WA, if available, or through one of AID's indefinite

quantity contracts (IQC). The services of a transport economist under IQC are also recommended. Based on past experience, the Abidjan office of Louis Berger International would probably be able to provide a suitable transport economist to determine economic feasibility of the roads selected.

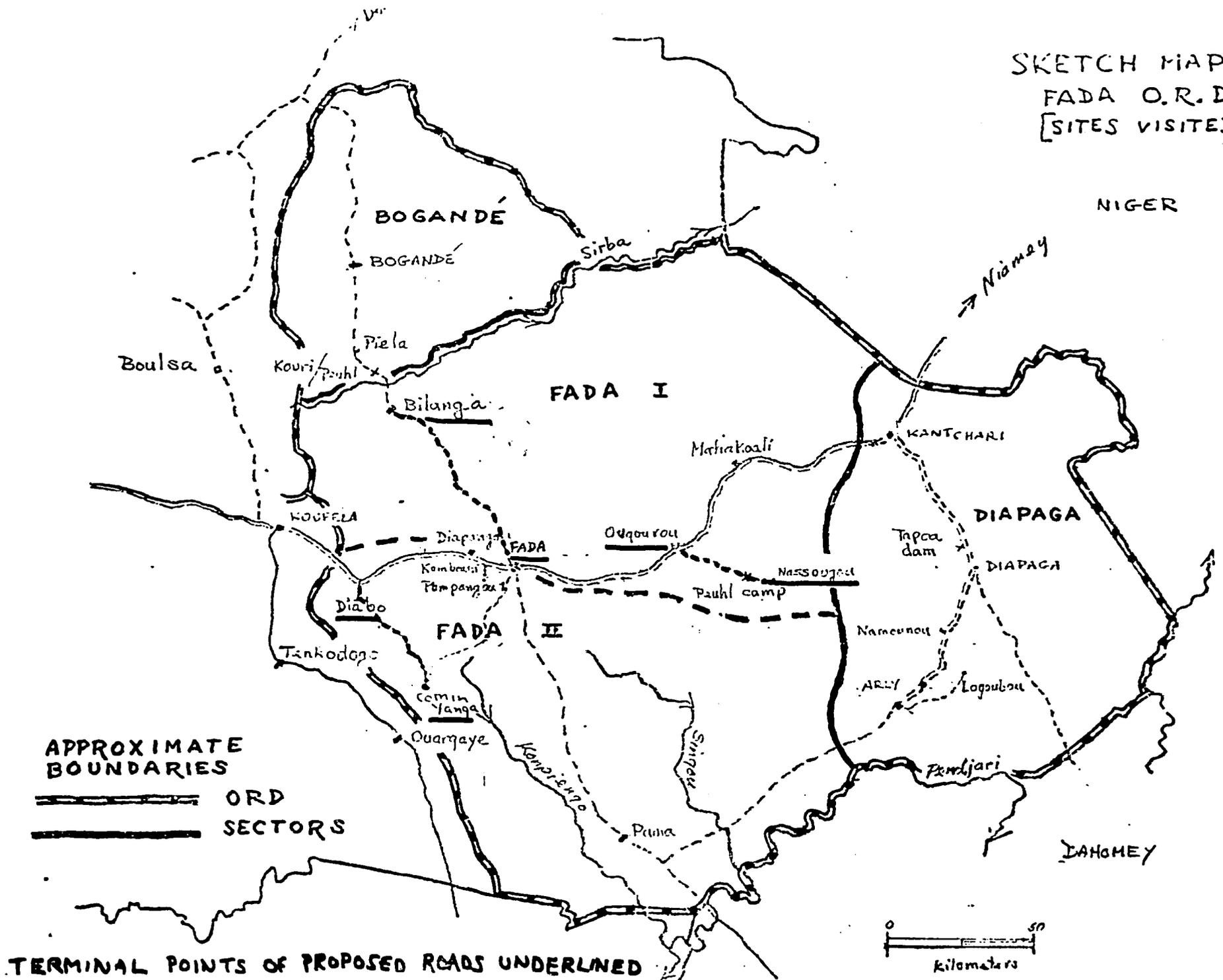
Following is the tentative schedule for project development:

- submission of PRP to AID/W December 12, 1975
- AID/W review and approval January 31, 1976
- REDSO engineering survey of roads February 1976
- PP team in Field March-April 1976
- submission of PP to AID/W May 1976
- AID/W Review July 1976
- Project authorized October 1976
- Project Agreement executed December 1976
- Execution of purchasing contract on
equipment February 1977
- Arrival of equipment September 1977
- Construction begins at end of rainy
season October 1977

Composition of PRP Field Team

Country Development Officer - J.A. Hoskins, CDO/Ouagadougou
Design Officer - E.M. Gilbert, REDSO/WA
Engineer - F.W. Bergier, REDSO/WA
Rural Development Specialist - T.C. Luche, CDO/Ouagadougou

SKETCH MAP
 FADA O.R.D.
 [SITES VISITED]



TERMINAL POINTS OF PROPOSED ROADS UNDERLINED

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(This is a proto-type form; it can be modified to suit particular projects.)

PRP

SUMMARY COST ESTIMATE AND FINANCIAL PLAN
(US \$ 000)

Source →	AID**		Host Country		Other(s)+		Total
	FX	LC	FX	LC	FX	LC	
Use* ↓ Assuming high option constructive by ORD							
Fada-Bilanga Road	268	742	-	65			
Ougarou-Nassougou	67	155	-	15			
Diabo-Comin Yanga	112	240	-	25			
Residual Value of Equipment(a)	220						
Inflation factor Contingency (b) per annum	8%	5%		5%			
Total	720	1,254	-	116			

* List major project elements (inputs).

**Under AID separately list in columns loans & grants; in all cases have a column showing Total AID.

+ May be used for non-AID; e.g., HIG, P.L. 480 Title II, etc., furnished by the United States outside of AID appropriated funds. Where other donors are involved a separate column should be added for each significant donor.

a) It is estimated that only about two-thirds of the equipment costs will be amortized on construction of the three planned roads. A residual value will remain which can be applied to construction of other rural roads in E/ORD.

b) 1 year inflation factor assumed for FY costs (equipment)

2 years inflation factor assumed for LC costs (operating expenses)

Part I

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COSTING OF PROJECT OUTPUTS/INPUTS
(In \$000 or equivalent)
-- PRP --

New

Rev # _____

Project # _____ Title: Eastern Rural Road Construction

Project Inputs	Project Outputs				TOTAL
	#1 E-R	#2 O-N	#3 D-LCV	#4 C	
Summary of Total Project Costs					
Road Equipment ^{a/}	289	72	121	238	720
Project Manager ^{b/}	80	15	25		120
Operating Expenses	736	157	241		1,134
Total	1,105	244	387		\$ 1,974

a/ Inflation factor of 8% has been added to equipment costs.

b/ In financial plan in text, cost of project manager in subsumed under operating expenses.

c/ Estimated residual value of equipment after construction of proposed roads.

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INCREMENTALLY FUNDED PROJECTS

PROJECT SUMMARY---AID APPROPRIATED FUNDS

(in \$000 or equivalent)

Country UPPER VOLTA PRP New X Rev. # Project # Title Eastern ORD Rural Road Construction

Cost Components	BUDGET YEAR		
	Direct Aid	Contract Other Agency	Total
US Technicians	-0-	120 ^{a/}	120
Participants	-0-	-0-	-0-
Commodities	720	-0-	720
Other Costs	1,134	-0-	1,134
Total	1,854	120	\$ 1,974

NOTE: This table is required for the Congressional Presentation. Enter projected obligations for all cost components proposed for funding from AID appropriated funds for the budget year.

a/ Assumes Project Manager for three years

LOGICAL FRAMEWORK
FOR
SUMMARIZING PROJECT DESIGN

Est. Project Completion Date 1979
Date of this Summary November 1975

Project Title Eastern ORD Rural Roads

		NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
MANAGEABLE INTEREST	If Inputs, Then Outputs	<p>Program Goal: The broader objective to which this project contributes: To upgrade the quality of life and economic well-being of the rural population of the area covered by the Fada N'Gourma ORD.</p>	<p>Measures of Goal Achievement: Impact on E/ORD region of improved transport infrastructure and signs of positive economic and social effect on population of affected villages.</p>	<p>National accounts' and statistics on economic activity and income by ORD region.</p>	<p>Concerning long term value of program/project: GOUV will continue to support ORD organization concept and will continue to devote sufficient budgetary and human resources to Eastern ORD. USAID assistance to Eastern ORD in integrated rural development will continue.</p>
	If Purpose, Then Goal	<p>Project Purpose: a) to upgrade the rural road network in E/ORD which is currently a major impediment to development; b) to increase small farmer income by providing almost year-round market access (except for height of rainy season).</p>	<p>Conditions that will indicate purpose has been achieved: End of project status. a) Farmers are provided incentive to increase cereal and peanut production by existence of evacuation roads. b) Farmers earn greater cash income which raises general level of economic activity in affected villages.</p>	<p>Data collection by E/ORD on agricultural production and farm income levels.</p>	<p>Affecting purpose-to-goal link: Availability of reliable rural roads in areas of high intensity ORD activity will stimulate increased agricultural output (millet, sorghum, rice, peanuts) because of improved marketing opportunities for farmers.</p>
	If Output, Then Purpose	<p>Outputs: a) construction of Fada-Bilanga secondary road; b) construction of Ougarou-Nassougou tertiary road; c) construction of Diabo-Comin Yanga tertiary road.</p>	<p>Magnitude of Outputs necessary and sufficient to achieve purpose. a) 72 km secondary road, 5 meters width, 10-15 cm laterite surface. b) 32 km tertiary road, 4 meter width, 20 cm earth embankment with paved fords. c) 50 km tertiary road with same standards as b.</p>	<p>Operational records of Project Manager and E/ORD and SERS (if involved) Progress and completion reports by contractors for drainage structures. Inspections by REDSO engineer.</p>	<p>Affecting output-to-purpose link: Choice of rural road to be constructed is based on E. ORD priorities and intended to relate directly to areas of concentration by E. ORD, aided by USAID and FAO/UNDP rural development projects. Construction of selected roads to acceptable standards technically feasible within AID grant amount and ORD budget.</p>
	If Output, Then Outputs	<p>Inputs Activities and Types of Resources a) finance road-building equipment for one full road brigade; b) finance operating costs of construction of three roads, including equipment maintenance, fuel, spare parts, tires, batteries, etc. c) finance costs of one expatriate project manager (road engineer).</p>	<p>Level of Effort/Expenditure for each activity: a) road brigade equipment \$667,000 b) estimated cost of Fada-Bilanga Rd. by ORD \$742,000 or by SERS \$615,000 c) estimated cost of Ougarou-Nassougou by ORD \$155,000 or by SERS \$133,000 d) estimated cost of Diabo-Comin Yanga by ORD \$240,000 or by SERS \$202,000. (Above road costs exclude amortization of equipment and are based on 1975 prices. See Financial Plan in text of PRP for provisions for inflation).</p>	<p>AID financing and procurement documents. Financial and operating records of ORD and SERS (if SERS undertakes earth-work).</p>	<p>Affecting input to output link: a) one fully equipped road brigade is sufficient to construct planned roads within 3 years from execution of project agreement (2 work seasons). b) ORD can recruit qualified personnel as operators for brigade. c) Project Manager/Engineer or SERS can design drainage structures (culverts, radiers, etc.) and brigade personnel can implement them.</p>

PROJECT IDENTIFICATION FORM
EASTERN O.R.D. RURAL ROAD CONSTRUCTION

I. Summary of the Problem to be Addressed and the Proposed Response:

The Upper Volta DAP identified feeder road networks as ranking among the most neglected categories of transport infrastructure in the region with the result that even when major administrative centers are accessible, remote rural populations may be completely isolated. The Eastern ORD project includes the provision of a road brigade designed to open up and maintain some access or feeder roads. However, the Fada-Bogande Road which links the administrative headquarters in Fada N'Gourma with the important northern sector of the ORD (Bogande) has deteriorated to the point that it is barely recognizable as a road.

The proposed activity will upgrade/rehabilitate the Fada-Bogande Road and the continuation of this road 72 km north to Tatarke thereby linking Bogande to Fada N'Gourma as well as to the soon-to-be improved national road which connects Dori and Kaya to Ouahigouya as well as to Ouagadougou. The project will also provide for the construction of other roads (primarily feeder or farm-to-market roads) in the Eastern ORD. This activity will not only improve the administrative capacity of the ORD by linking two major sectors, but will also complement Eastern ORD activities designed to increase rural agricultural production by permitting increased marketing/evacuation of agricultural production surpluses as well as timely positioning of agricultural inputs such as pesticides, fertilizer, etc. If a project to exploit phosphate deposits in the Diagoira-Arly section of the ORD proves successful, an improved system for positioning agricultural inputs and marketing production surpluses would have added importance. In addition, an improved road system will improve the capacity to react to health and other emergencies as areas that are now completely cut off during the rainy season would become accessible.

The Upper Volta DAP at page D-31 recommends that attention be given to the development of public works such as road building which are essential to increasing the productive capacity of the rural sector and which at the same time provide dry season employment to young Voltaic workers (many of whom leave the country in search of employment). The need for Upper Volta road improvement has been identified by OLISS/UNSO (Ouagadougou 1192) and in that context, this particular road is of interest to AID/W (State 128992, State 141474). The GOV Ministry of Public Works has requested that at least the Fada-Bogande-Tatarke road be built by Public Works under force account thereby providing the project with a training component.

The Fada-Bogande road has deteriorated to the point that after the first rains, it is impassable, and even in the dry season it includes many detours around road sections which have sunk through erosion by as much as four feet. The trip under the best of conditions can be made

at an average speed of 15 mph. As a result, ORD personnel and others traveling between Fada and Bogande often detour as far west as Pouytenga, a route which nearly doubles the distance between Fada and Bogande (230 km vs 127 km). The road from Bogande to Tatarke is also cut by the early rains of the rainy season.

Should ATD/W approve this project, more detailed discussion with the GOUV Department of Public Works will lead to a specific proposal for upgrading this road. In any case, the road requires considerable earth-works and/or realignment, drainage culverts, and repair to a major bridge north of Bilanga. The cost of upgrading the road will depend largely on the degree of upgrading desired. In addition, it is possible that other donors may be interested in contributing (e.g., FID, FAC, APDB, CIDA, Preves des Hommes). It is recommended that a minimum of \$2,000,000 be devoted to upgrading the Fada-Bogande-Tatarke road to enable year round use. A greater amount would be necessary to upgrade the road to national road standards. The remainder of the requested \$3.6 million will be spent on other feeder and farm-to-market roads in the Eastern ORD.

One of the common shortcomings of the road construction in West Africa is the lack of maintenance capacity once a road is built. As a result, the Country Development Office/Upper Volta is submitting in a separate TID a proposal to contribute to road maintenance capability within the Eastern ORD. This project assumes that such a maintenance capability will be established to ensure that once rebuilt, the roads will not deteriorate as before.

II. Financial Requirements and Plans:

It is recommended that A.I.D. provide \$3,600,000 for the upgrading/rehabilitation of rural roads in the Eastern ORD including the Fada-Bogange-Tatarke road. The level of road improvement may be increased if other donors become interested in participating in this activity.

III. Development of the Project:

The project will be developed in conjunction with the GOUV Department of Public Works and any other interested donors. The services of a IDY engineer from REDSO/MA will be requested to assist in an assessment of the upgrading necessary to make the roads practicable in all seasons. Such IDY assistance will be requested to aid in the preparation of both a IRRP and a PP.

Timeframe

Submission of PID to AID/W	June 30, 1975
AID/W Review completed	August 31, 1975
REDCO/WA Engineer TDY	November, 1975
Submission of ERP	December 15, 1975
AID/W Review completed	February 15, 1976
REDCO/WA Engineer TDY	February-March
Submission of PP	March 31, 1976
AID/W approval	May 31, 1976
Funds obligated	October, 1976

IV. Issues of a Policy or Programmatic Nature:

AID/W should review this project along several lines as discussed in Section I above. Basically, this involves considering the project on its own merits and also considering it as an additional input which will directly complement the Eastern GID project now being implemented. The project is justified along both lines.

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