CLASSIFICATION

PROJECT EVALUATION SUMMARY (PES) — PART I

Report Control Symbol U-447

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
Roads Improvement	278-0191	USAID/Jordan

4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 80-3 Terminal

☒ XXXXXXX EVALUATION ☐ SPECIAL EVALUATION

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING		7. PERIOD COVERED BY EVALUATION
A. First PRO-AG or Equivalent FY 76-TQ	B. Final Obligation Expected FY 76-TQ	C. Final Input Delivery FY 79	A. Total	$5,430,000	From (month/yr.) February, 1978
			B. U.S.	$4,000,000	To (month/yr.) September, 1980
					Date of Evaluation Review Aug.-Sept., 1980

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
1. Ensure that baseline data are available and means for collecting follow-up data needed to evaluate projects are available or included in project design.	USAID staff	Continuing

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

- ☐ Project Paper
- ☐ Financial Plan
- ☐ Logical Framework
- ☐ Project Agreement
- ☐ Implementation Plan e.g., CPI Network
- ☐ PIO/T
- ☐ PIO/C
- ☐ PIO/P
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

- A. ☐ Continue Project Without Change
- B. ☐ Change Project Design and/or ☐ Change Implementation Plan
- C. ☐ Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

Rex Cline, Engineer

12. Mission/AID/W Office Director Approval

Signature

Typed Name: Edgar C. Harnell

Date: 1/23/80

AID 1330-15 (3-78)

ROADS IMPROVEMENT PROJECT

II. Summary

This is the terminal evaluation of the Roads Improvement Project authorized in the Transition Quarter (FY 1976). An interim evaluation was submitted in February 1978 (TOAID A-9) which recommended revising the logical framework matrix. No copy of such revision is available at USAID/Amman.

The Roads Improvement Project consisted of patching and overlaying, with 5 cm of asphalt paving, stretches of the following primary highways:

(a) Route 15 (Desert Highway - km 135-215)	80.0 km
(b) Route 70 (Marka - Um-Hiran)	18.5 "
(c) Route 15 (Amman - Sweileh)	7.5 "
	106.0 km

Additionally, the Project was to upgrade, to the "improved highway" standard, the following (mostly rural) road segments:

(a) Route 57 (Ma'an - Wadi Musa)	10.0 km
(b) Route 30 (Mafraq - H5)	26.0 "
(c) Route 26 (Sweileh - Fuheis)	5.6 "
	41.6 km

Finally, the project financed a 4-km extension of Route 65 along the Dead Sea which is being incorporated into Sweima -Safi road, a 13 km segment of Route 11 northward from Hashemiya of which 8 kms was a new relocation, and conversion of 3.7 kms of Routes 26 (Amman - Wadi Seer) from a two-lane to a four-lane primary highway. 75 percent of the work was complete at the time of the 1978 evaluation. All nine sub-projects were completed and in use by June 1980.

Total estimated project financing was $5.43 million, of which $4 million was reimburseable by AID. As of June 30, 1980, the terminal date for disbursement, all loan funds had been disbursed or requested for disbursement. Disbursements were made in accordance with a modified Fixed Amount Reimbursement (FAR) procedure keyed to the completion of specific subproject segments.

Assessing project achievements as defined by the PP is difficult due to lack of data (e.g., accidents on the individual road segments and vehicle user costs) and the absence of a current "log frame." In future projects care must be taken to ensure that baseline and follow-up data needed to assess the project will be available. If necessary, consideration should be given to financing such data gathering.

The Road Improvement activity was designed as project assistance but was part of an effort to move the Jordan assistance program away from Budget Support toward a project-specific orientation. This project had elements of both types of assistance since the GOJ in its request for assistance specifically desired AID to support projects contained in its Five-Year Plan but which could be implemented in a manner so as to support the GOJ budget. Thus, evaluating project impact is more complicated than it otherwise might be for solely project-type activities.

The project purpose as stated in the PP is "to assist in financing improvements to 174 km of roads comprising nine sub-projects." The project goal, per the PP, is to contribute to "(a) more efficient and less costly availability in the market of both imported and domestically produced goods and (b) more efficient and more profitable export operations." Per the above the road improvements specified in the PP were made (reduced to 168.3 km, see page 11), and the GOJ has given attention to needs for road maintenance albeit with some follow-up by the USAID. Demonstrating goal achievement is more problematical as indicated below.

III. Evaluation Methodology

This document presents the findings of the terminal evaluation of the project conducted by USAID engineering and social science staff. Data on specific roads and road segments for the evaluation were collected from reports of site visits by USAID personnel and pre-project traffic counts included in the Project Paper. Ministry of Public Works (MPW) traffic count records for the year 1979 referred to entire road lengths rather than to the AID-funded road segments. Accident rates, normally a relevant index of road safety conditions, have not been consulted for two reasons:

(a) Accident rates are not available for specific segments of roads, but only in aggregate for the entire country.

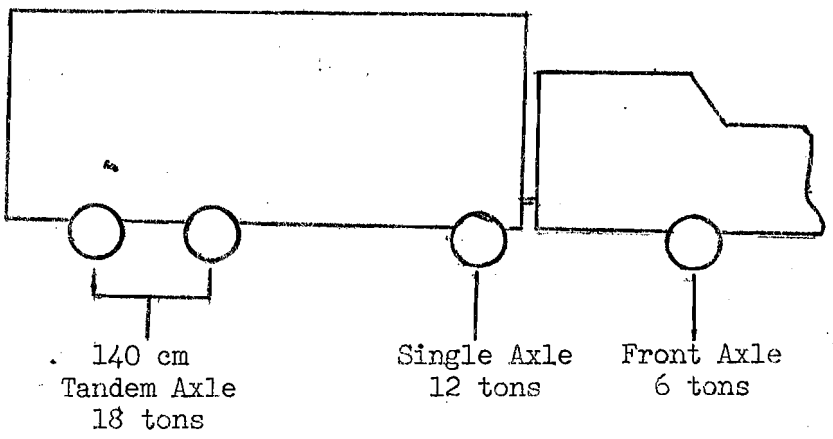
(b) Failure of road surfaces and dangerous operation, both due to overloading of heavy vehicles, have distorted the relationship between road improvement to agreed-on specifications and improved road safety conditions.

Additionally, Mission staff have reviewed various project documents including the PP and the interim evaluation (78 TOAID A-9) covering the period August 1976 to December 1977. While the latter states the logical framework was to be revised, no copy can now be found. The PP narrative does include some statements related to "log frame" components, but these are contradictory and incomplete; for example, the purpose cited above is referred to as the goal at one point in the PP.

The PP specified annual technical evaluations (to be focused on work progress) and an evaluation one year after project completion. The latter was to report on traffic utilization of the improved roads and on maintenance status in order to identify GOJ maintenance needs and any structural failures. Traffic counts taken on all sub-projects were to be helpful in assessing traffic generation. Lacking data on many of these elements, it is difficult to conduct a well-rounded evaluation.

IV. External Factors

A factor external to planned road improvements has distorted the effect of those improvements: overloading of heavy vehicles. Gross overloading of trucks has been a common condition of the Jordanian transport system. Alarmed by rising accident rates and the deterioration of road surfaces due to the overloading, the Government enacted, in 1978, a law stipulating the following maximum tonnage-per axle.



Following enactment of the law, however, the GOJ permitted truckers 18 months during which they were to increase the number of axles per vehicle to comply with the new ruling. The MPW pledged to begin enforcement of the weight-limit law, effective September 1, 1980.

To this end, eight (8) portable scales have been purchased by the MPW and a crew from the Ministry's Maintenance Department has been trained to operate them. Legal aspects of the operation will be handled by the police. The present penalty is set at JD 5 per excess ton.

In addition, the GOJ has been exploring the possibility of international agreement on allowable tonnage-per-axle to resolve the problem of overloading of trucks originating in other countries.

The importance of these proposed agreements can be seen in the fact that the movement of goods through Jordan (transshipments) increased by 236 percent between 1972 and 1976, from 137,000 to nearly 460,000 tons annually,[1] representing a growth in the proportion of transshipments to all international goods movement (including imports and exports) from 12.6 to 27.1 percent.

It is expected that the conclusion of international agreements and the enforcement of national laws governing weight-limits-per-axle will combine with improved road conditions to contribute significantly to road safety conditions in Jordan.

V. Project Description and Achievements

a. Project Description

The road improvement sub-projects contained in the project were originally identified by the Department of Highways of the MPW. They were accepted by the National Planning Council (NPC) and included in the Five-Year Plan. In identifying sub-projects, the MPW gave primary consideration to those projects which could significantly contribute to goals of the GOJ's Five Year Plan, i.e., to expand the network of international primary and secondary roads with emphasis on those servicing development projects and trade and transit activities and to keep the road network in the Kingdom in good repair and ensure public safety through continual maintenance and improvement. All of the sub-projects involved the upgrading of existing roads in both rural and urban areas. The type of upgrading varied among the sub-projects, e.g., widening by several meters, resurfacing with an asphalt overlay, and the realigning and completing construction of a road to replace an existing track. Construction was done by contractors under MPW supervision and by the Ministry under force account.

The project consisted of patching and overlaying approximately 106 kms of primary highways with 5 cm of hit-mix asphalt, the upgrading of approximately 41.6 kms of rural roads to "improved highway system" standards, a 4-km extension of Route 65 along the Dead Sea, upgrading and relocating a 13 kms section of Route 11 northward from Hashimiya, and converting 3.7 km of Route 26 from a 2-lane into a 4-lane primary highway.

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[1] Wilbur Smith and Associates, for the Hashemite Kingdom of Jordan. Master Road Plan, 1979-82, P. 13.

b. Project Purpose Achievement

The purpose statement quoted above may be viewed more as a statement of total projected outputs or, alternatively, as the means to achieving some end. Improvements in roads transportation may frequently be assessed in terms of the following four criteria:

(1) Vehicular transit time reduced,
(2) Vehicle operating and maintenance costs reduced.
(3) Road safety conditions improved.
(4) Transport contribution to GDP increased.

Given the time and data constraints involved, it was not possible for the evaluation team to assess the first two indicators vis-a-vis the nine road improvement sub-projects. However, from the fairly good condition of 6 roads and the fair condition of the remaining 3 observed by USAID engineers, some savings in time, as well as in vehicle operating and maintenance costs, may be assumed.

An index of the continuing improved condition of the same roads exists in road maintenance costs for two heavily traveled roads:

MAINTENANCE COSTS

Road Site	Pre-project in JD per km per yr.	Post-project, in JD per km per yr.
Mafraq -H5	200	20
Desert Highway	400	150

The clear reduction in road maintenance costs per km (current costs are 10 percent and 37.5 percent, respectively, of the original levels) is an indication that subject roads are now, and are being kept, in significantly better condition than before project improvements. Since vehicle speed is dependent on road conditions, significant improvement of road conditions may be expected to reduce transit time significantly. Since vehicle operating costs are also related to road conditions, significant improvements should be reflected in significantly reduced costs.

The third objectively verifiable indicator of progress is an improvement in road safety conditions. This improvement would presumably have appeared as a reduction in the accident rate over a given road after execution of the project. Use of accident rates as an index of road safety conditions has proven problematic because of heavy vehicles discussed above under the heading "External Factors." While the average official weight limit per axle is

9 tons, some trucks carry up to 20 tons per axle. In addition to rendering vehicles unwieldy, top heavy and liable to overturn, such overloading tends to damage the road surface through poor distribution of transported weight, thus increasing the need for expensive maintenance and compounding the probability of accidents occurring.

The GOJ National Planning Council's Five Year Plan for Economic and Social Development, 1976-1980 called for a 12 percent annual growth rate in Gross Domestic Product (GDP). The obvious transport implications of that target (the fourth indicator) were seen to include increased personnel travel for work purposes and increased transport demands for raw materials and finished goods.

For the purposes of this evaluation, a comparison of numbers of (a) passenger and (b) heavy vehicles (trucks) using project funded roads before and after improvement will serve as a very rough index of the increased contribution of sub-projects to the Jordanian GDP.

	Road Length kms	Civilian Light Vehicles 1976	Civilian Light Vehicles 1979	Civilian Heavy Vehicles 1976	Civilian Heavy Vehicles 1979
Rte 15 (Desert Highway)	80	553	1500	1027	1708
Rte 70 (Marka-Um Hiran)	18.5	1162	2263	498	3502
Rte 15 (Amman-Sweileh)	7.5	7016	--	1754	Very heavy traffic
Rte 11 (Rihab Hashimiyya)	13	90	248	30	51
Rte 57 (Ma'an-Wadi Musa)	10	140	272	140	38
Rte 26 (Amman-Wadi Seer)	3.7	5156	19068	1289	1020
Rte 65 (Sweima-Dead Sea)	4	140	--	60	--
Rte 30 (Mafraq-H5)	26	785	724	785	158
Rte 26 (Sweilih-Fuheis)	5.6	870	2029	580	508

c. Status of Individual Road Segments

1. Route 15 (the Desert Highway). Since this is the principal route linking Amman, Northern Jordan, Iraq and Syria with Aqaba, the country's only seaport, it can be assumed that improvements will be reflected in lower transport costs, reduced vehicular transit time, and lower vehicle operating costs which, in turn, contribute to reduced prices for consumers and to a more competitive export situation.

Road surface failures on the Desert Highway segment funded under this project induced USAID to call in a road surface expert who found the primary cause of pavement slippage to be the large number of extremely overloaded trucks which were overstressing the pavement and causing the bond between the old and new pavement courses to break (Communications from A.B. Cornthwaite, P.E., to Director, USAID/Amman, 23 July 1977). USAID subsequently determined that pavement failure was also due to inaccurate functioning of the contractor's aged asphaltic concrete batching plant and inadequate preparation of the old surface. In the interests of timely completion of the sub-project to agreed-on specifications, an unacceptable 25-km section of the Desert Highway was deleted from the original 105 km proposed in the PP in exchange for additional improvements to the Mafraq-H5 Road. (Note: USAID understands that the MPW has repaired these 25 km's as part of their routine maintenance program.)

2. Marka - Um Hiran. The increase in the volume of traffic -- notably commercial traffic -- over this beltway which skirts Amman suggests that cheaper, quicker transport has been provided

TRAFFIC COUNT

	1976	1979	% Increase
Light vehicle	1162	2263	94.8
Heavy vehicle	498	3502	603.2

3. Amman-Sweileh. This 4-lane section of Route 15 links the population centers of Amman and Sweileh, a city which has grown seven times its original size during the period of 1961-79. Figures on traffic increases over this road were not available from the MPW. However, it is known to be a major artery transporting persons to and from work, as well as goods to and from the capital.

4. Route 11 (Rihab-Hashimiya). Between these two villages 13 km of road were widened, aligned, and given a seal-coat. While the road is in need of some maintenance, it has facilitated transport of agricultural produce from the neighboring region to Amman.

Such products now include: poultry, olives, wheat, cucumber, watermelon, grapes, corn, squash, tomatoes and okra. Before the construction of the road, traffic went from Rihab to Zarqa/ Amman via Mafraq. With completion of this section, the travelling distance is decreased by about 40 km.

5. Route 27 (Ma'an - Wadi Musa). The 10 km of road upgraded to secondary standards under this segment has seen an increase in tourist traffic during a three-year period. A traffic count executed by the MPW during the 1979 tourist season showed a substantial increase in light traffic:

	1976	1979	% Increase
Light Vehicles	140	272	94.3
Heavy Vehicles	140	38	

This road is to promote tourism at Petra which is not a commercial center. We believe that the decrease shown in the heavy traffic is inaccurate. Perhaps the 1976 figures of the heavy vehicles are erroneous or the traffic count might have been taken at Ma'an - Wadi Musa Junction which includes the traffic bound to various towns of the whole area and not particularly to that portion passing over the subject road.

6. Amman - Wadi Seer. The widening of this highway from 2 to 4 lanes and the construction of three traffic circles and a divider median has connected Amman with the main road to the central Jordan Valley, as well as to a main artery (Wadi Seer-Sweileh) connecting with the Northern Jordan Valley and escarpment. The traffic count shown on page 6 indicates an increase in the light traffic and a decrease in the heavy traffic. Light traffic increased because the completed road is a short segment connecting a major part of Amman with the roads network of the neighboring vicinity. Heavy traffic decreased because traffic was diverted to the outer ring road.

7. Route 65 (Sweima - Dead Sea). This segment is integrated with the GOJ general development plan in two ways:

(a) The road will carry visitors to the tourist facilities being constructed at the Zarqa - Ma'in Hot Springs, and

(b) The road is being extended to connect with the Mazra - Aqaba Road, to the South, and the Yarmouk-Dead Sea Road to the North, to complete a road running from the Syrian border to the port of Aqaba. Assessment of the full impact of this stretch of road should await the completion of these related projects. (Recent traffic count figures are not available for this sub-project.)

8. Route 30 (Mafraq-H5). Since the completion of the Azraq-H5, the main purposes served by this road are those of:

(a) A farm-market link;
(b) A means of access to services for nearby villages; and
(c) A conduit for traffic between Jordan and Iraq.

The Project Paper envisioned that the improved Mafraq-H5 segment (augmented to 26 km in exchange for a rejected section of the Desert Highway) would "serve the near term until the Azraq-H5 road is completed and will give better transportation to the towns near the Syrian border." Traffic figures demonstrate that this has occurred; commercial traffic has declined because most use the completed Azraq-H5 road which is of a primary standard. Light passenger vehicles continued to use it with only an 8 percent decline.

	1976	1979
Heavy Vehicles	785	158
Light Vehicles	785	724

9. Route 26 (Sweileh-Fuheis). In addition to providing better access to services for residents of the town of Fuheis, this road links the Salt-Amman Highway with Jordan's only cement factory, located in Fuheis itself. Given the volume of construction ongoing in the country, this road makes an important contribution to the economy.

	1976	1979
Heavy Vehicles	580	508
Light Vehicles	870	2029

The decline of the commercial traffic is mostly due to transporting cement in bulk form rather than in bags. Passenger travel has increased 233 percent over a 3-year period. Commercial transport is safer and quicker as a result of partial re-alignment and resurfacing of the road, the importance of which increases with the growth of non-commercial traffic.

VI. Beneficiaries

To attempt to identify the Beneficiaries of this Project as particular social groups is difficult. As the Project consisted of upgrading existing roads, the primary Beneficiaries are all those persons and entities who were benefitting from the previously existing roads. The utility

of these roads may be safely assumed to have increased for all such individuals.

Beneficiary identification is further complicated by the fact that this Project financed improvements to "segments" of Jordan's network of primary and secondary roads. Therefore, benefits have accrued to all elements of the network.

VII. Lessons Learned and Special Comments

Although previously mentioned, emphasis should be placed on the transitional nature of this Project, i.e., USAID's move from Budget Support to Project Assistance. The Project took as its basis a GOJ Five-Year Plan from which segments were selected for AID-financing by a modified Fixed Amount Reimbursement (FAR) method. Utilizing the Five-Year Plan as the Project rationale was akin to Budget Support, while FAR financing for specific segments introduced aspects of AID Project Assistance.

The Project again demonstrated that the FAR method of financing is an effective development tool where in-country materials and services are utilized. AID and the Cooperating Country were more appropriately involved in planning the implementation and financing than might be implied by the narrower project description. In a number of instances, as the detailed design of some segments proceeded, the amount of work and type of roadway increased costs significantly beyond what had been established for each fixed amount reimbursement. As a result of the joint and cooperative nature of the FAR method, the GOJ provided necessary additional funds in a timely manner.

The problems encountered with the Desert Highway portion of the Project, and our initiating the reduction of the FAR amount for that highway, resulted in the MPW (Ministry of Public Works) investigating paving problems in general. While not all problems are solved, it is our judgment that progress is being made which will effectively lead to longer lasting roadway surfaces, e.g., enactment of legislation limiting load weight has reduced at least one contributing factor to poor roadway surfaces.

The lack of data to measure achievements is directly linked to the transitional nature of the Project. The support of the Five-Year Plan did not presuppose existence of baseline data with which to measure any subsequent change for road segments to be AID-financed. As previously indicated, national achievements can be measured, but this does not provide means for standard project assistance evaluation. The presentation of further data is not practical because:

a. sufficient data is not readily available, and

b. to obtain the data would be so time-consuming and costly that its value would be overshadowed.

Overall, the Mission is fully convinced that AID funds were effectively utilized to further AID objectives in Jordan and that the GOJ recognizes this as having been a most beneficial project.