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STAFF APPRAISAL REPORT

HASHEMITE KINGDOM OF JORDAN

A TELECOMMUNICATIONS PROJECT

May 18, 1988

**Industry and Energy Operations Division, Country Department III
Europe, Middle East & North Africa Region**

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CURRENCY EQUIVALENTS

Currency Unit	=	Jordanian Dinar (JD)
US\$1.0	=	JD 0.33
JD1.0	=	US\$3.00

FISCAL YEAR

Government and TCC: January 1 - December 31

WEIGHTS AND MEASURES

Metric System

ABBREVIATIONS AND ACRONYMS

ARABSAT	-	Arab Satellite Organization
DEL	-	Direct Exchange Line
DGP	-	Directorate General of Posts
ICB	-	International Competitive Bidding
INTELSAT	-	International Satellite Organization
ITU	-	International Telecommunications Union
NISC	-	National and International Switching Center
OSP	-	Outside Plant
PCM	-	Pulse Code Modulation
PIP	-	Project Implementation Plan
PIU	-	Project Implementation Unit
RLU	-	Remote Line Unit
SPC	-	Stored Program Controlled
TCC	-	Jordan Telecommunications Corporation
UNDP	-	United Nations Development Program

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This report is based on the findings of an appraisal mission that visited Jordan in February-March 1988, comprising Messrs. Mohsen Khalil (Senior Financial Analyst), Gerald Buttex (Principal Telecom Engineer) and David Lomax (Principal Telecom Specialist).

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MAP: IBRD No. 20903 - Jordan

JORDAN

JORDAN TELECOMMUNICATIONS CORPORATION (TCC)

A TELECOMMUNICATIONS PROJECT

LOAN AND PROJECT SUMMARY

Borrower: Jordan Telecommunications Corporation, TCC.

Guarantor: Hashemite Kingdom of Jordan.

Loan Amount: \$36 million equivalent.

Terms: 17 years, including 5 years of grace, at standard variable interest rate. TCC will bear the foreign exchange and interest rate risks, and pay a 1% guarantee fee to the Government.

Project Objectives: The main objectives of the project are to: (a) formulate and implement reforms to improve the overall policy framework for the commercialization of the telecommunications sector and TCC; (b) expand network capacity, improve service quality, increase geographic coverage and introduce new value-added services; (c) strengthen TCC's capacity to develop and implement competitive strategies for procurement, financing and system planning; (d) help the Government and TCC to revise telecommunications pricing policy and tariffs to reflect changes in the cost structure resulting from growth and technological change, and to adjust for shifts in market demand due to changes in Jordan's economic conditions and prospects; and (e) support TCC in conducting a review of its organizational structure, upgrading its management systems using modern information technology, and implementing a human resource development program in technical, financial and management areas.

Project Description: The project, which covers TCC's entire revised 1988-92 telecommunications investment program, comprises: (a) about 190 manmonths of consultancy services for sector restructuring and institutional development, particularly in the areas of organization and management, personnel and human resource development, accounting and finance, procurement and inventory management, management information systems and tariffs; (b) switching equipment for an additional 213,000 lines; (c) associated local networks and subscriber plant for the connection of about 235,000 new subscriber lines; (d) additional microwave and cable transmission links; (e) a new national and international switching center (NISC); (f) a new satellite earth station; (g) computer systems; and (h) ongoing works still to be completed, principally 30,000 lines of switching equipment and retained consultants to assist TCC in project planning and implementation. By end 1992, the project is expected to satisfy 82% of expressed demand and to provide a coverage ratio of 12 lines per 100 inhabitants.

Project Benefits
and Risks:

The project will benefit most sectors of Jordan's economy. In particular, it would help the Government and TCC to enhance the efficiency and productivity of the telecommunications sector which should reduce investment and operating costs and increase resource transfers to the Government; achieve sector commercialization and institution building of the operating entity; expand geographic coverage and improve service quality; spread the benefits of development to rural areas; develop the information infrastructure for the services sector; and contribute to employment creation. The main risk is the potential for delays in the identification, formulation and implementation of sector and institutional reforms. The Government, the Bank and TCC have agreed on appropriate action programs and on a monitoring system to ensure effective implementation. The conviction and commitment demonstrated by the Government and TCC to the proposed sector restructuring and institutional development plans indicate that this risk is manageable. There is also a risk that demand may grow more slowly than anticipated. The project, however, has been designed to allow for adjustments during implementation to reflect realized demand.

Estimated Costs:

ITEMS	-----US\$ Million Equivalent-----		
	Local	Foreign	Total
I. <u>ONGOING WORKS</u>	10.5	17.7	28.2
II. <u>NEW WORKS</u>			
Switching	5.1	48.9	54.0
Transmission	8.7	23.4	32.1
Local Networks			
-Cables & Heavy Equipment	2.7	48.0	50.7
-Construction & Installation	56.7	37.2	93.9
Buildings	6.3	1.2	7.5
Computer Systems	-	2.1	2.1
Technical Assistance	-	3.0	3.0
Nat/Int Switching Center	0.3	2.7	3.0
Satellite Earth Station	0.6	3.0	3.6
Subscriber Installations	3.6	14.4	18.0
<u>Total Base Cost</u>	<u>84.0</u>	<u>183.9</u>	<u>267.9</u>
<u>Contingencies</u>			
Physical	7.5	13.5	21.0
Price	12.9	8.1	21.0
<u>TOTAL NEW WORK COSTS</u>	<u>104.4</u>	<u>205.5</u>	<u>309.9</u>
<u>TOTAL PROJECT COSTSa/</u>	<u>114.9</u>	<u>223.2</u>	<u>338.1</u>

a/ TCC pays no taxes or custom duties.

Fin cing Plan:

	-----US\$ Million Equivalent-----		
	Local	Foreign	Total
NEW WORKS			
IBRD	-	36.0	36.0
TCC	104.4	38.4	142.8
Export and Mixed Credits ^{a/}	-	79.2	79.2
Credit tied to procurement ^{b/}	-	5.7	5.7
Other Financing ^{c/}	-	46.2	46.2
Subtotal	104.4	205.5	309.9
ONGOING WORKS			
TCC	10.5	-	10.5
Existing Loans ^{d/}	-	17.7	17.7
Subtotal	10.5	17.7	28.2
Total Costs	114.9	223.2	338.1

a/ Export and mixed credits to be offered in conjunction with price and terms bidding.

b/ French and Japanese financing for tied procurement for proprietary items.

c/ Cofinancing for local networks, which will be partly financed by the Bank.

d/ Japanese Protocol No. 4 and a Swedish soft loan.

Estimated Disbursement:

Bank FY	-----US\$ Million Equivalent-----					
	1989	1990	1991	1992	1993	1994
Annual	2.5	8.3	10.5	8.2	4.7	1.8
Cummulative	2.5	10.8	21.3	29.5	34.2	36.0

Economic Rate of Return: 31%

Map: IBRD 20903 - JORDAN

JORDAN

JORDAN TELECOMMUNICATIONS CORPORATION (TCC)

A TELECOMMUNICATIONS PROJECT

I. INTRODUCTION

1.01 The Government of the Hashemite Kingdom of Jordan has requested Bank assistance in financing the development of the country's telecommunications sector. Principal project objectives are focussed on reforming the regulatory and financial framework for the telecommunications sector; restructuring the implementing agency to function as a commercial entity with administrative and financial autonomy; improving its operating efficiency and profitability to reduce costs and maximize resource transfers to the Government; upgrading its technical, operational and managerial capabilities; and expanding the country's telecommunications network and increasing its geographic coverage. This will be the Bank's first lending operation in this sector in Jordan.

1.02 The estimated cost of the project is JD 112.7 million (US\$338.1 million) with a foreign exchange component of JD 74.4 million (US\$223.2 million). TCC will finance JD 51.1 million (US\$153.3 million) from net internal cash generation, including JD 38.3 million (US\$114.9 million) in local expenditures. The Bank would finance US\$36.0 million of foreign costs for underground cables and associated equipment for local networks, as well as for technical assistance and computer equipment. Financing for switching and transmission equipment (US\$84.9 million) will be secured through price and terms bidding with the exception of US\$5.7 million, which will be financed under tied procurement for extension of existing equipment.

II. THE TELECOMMUNICATIONS SECTOR

Sector Organization

2.01 Authority for public telecommunications and postal services is vested in the Ministry of Communications. The Jordanian Telecommunications Corporation (TCC), a fully Government-owned entity, is a semi-autonomous public agency in charge of the provision and operation of domestic and international telecommunications services. TCC has the monopoly of public telecommunications services: telephone, telex, telegraph and all other media of transmission, such as data and television. TCC also formulates sector policy and regulation and proposes tariffs which require approval by the Council of Ministers. Jordan has no domestic telecommunications manufacturing industry. Postal services are separately operated by the Ministry of Communications' Directorate General of Posts (DGP).

Demand for Service

2.02 As of end 1987, there were about 203,000 telephone direct exchange lines (DELs) in service and a waiting list of 85,000 registered applicants; implying that only 70% of expressed demand was satisfied. In addition to expressed demand, TCC estimates a suppressed demand of about 15,000 DELs in areas without service or with no present service expansion possibility. Thus, total demand is estimated at 303,000 DELs, with a 67% demand satisfaction. Demand for telephone service is expected to grow at about 10% per year over the 1988-1992 period. Demand projections are reasonable and based on the forecasting model generally used in the telecommunications industry. During 1983-87, which marked the beginning of the economic downturn in Jordan, expressed demand (with no consideration for latent demand) grew at 12% annually. Details regarding the demand study are given in Annex 1. By project completion in 1992, supply would meet 82% of projected demand with a capacity utilization of 80% and a telephone density of 12 DELs per 100 inhabitants.

2.03 The project implementation would include several safeguards against overinvestment in the likely event that demand grows at a lower rate than anticipated. The project has been designed to allow for adjustments during implementation to reflect realized demand. Project resources can be redistributed to adjust for any supply/demand imbalances among regions. Moreover, the project implementation schedule can be extended to reflect actual growth patterns of total demand. For example, if demand grows at only 6% per annum and subsequently the project implementation is extended until 1994, planned supply would meet 88% of demand in 1994 with a capacity utilization of 80%, which is acceptable.

Access to Service

2.04 Telephone density in Jordan as of end 1987 was about 7 DELs per 100 population, which compares well with countries of comparable GNP per capita (e.g. Syria 5.2, Malaysia 6.5, Costa Rica 9.0). Existing telecommunications services are concentrated in the urban areas; 63% percent of DELs in service are concentrated in the greater Amman metropolitan area which has only 41% of the population (Table 2.1 and Annex 2). About 270 towns and villages out of a total of about 850

Table 2.1: ACCESS TO TELEPHONES
(As of December 31, 1987)

AREA	POPULATION %	EXCHANGE CAPACITY %	DELS PER 100 POPULATION
Amman	41	63.2	10.9
Zarka	16	9.2	4.1
Irbid	9	8.2	6.3
Salt	4	3.1	4.1
Mafraq	4	1.8	3.2
Dair Abu Said	4	0.9	1.7
Rest of Country	22	13.6	4.4
Total/Average	100	100.0	7.1

population centers in the country are provided with automatic telephone services covering 88% of Jordan's total population. Some 380 population clusters are provided with service by semi-automatic manual exchanges. Telex service is primarily used for public administration and international business and is concentrated in the capital city (90%). This service is being superceded by facsimile and data transmission. For this reason, and because the existing telex network has a low capacity utilization (65%), TCC is not planning any further telex expansion. Subscriber trunk dialing and international dialing is available to 90% of the subscribers who have direct access to over 50 countries. Automatic telex service is available to all subscribers.

Usage of Service

2.05 In the Greater Amman metropolitan area, 20% of telephone DELs are for business, 9% for Government, and 71% for residential premises. Depending on the exchange area, the percentage of DELs for business purposes varies from 58% in the city center to a low of 15% in the suburban areas. Although statistics are not available for the rest of the country, experience suggests a higher percentage of telephones for business outside the capital city. In terms of revenue, distribution by user group cannot be estimated because current billing does not differentiate between business and residential telephones.

Existing Facilities and Quality of Service

2.06 Under the previous Sectoral Plan 1981-1985, a major improvement and modernization of Jordan's telecommunications facilities was achieved following the introduction of digital technology in the area of stored program controlled (SPC) switching, radio microwave links and cable

transmission. The digitalization of the telecommunications network has many operational advantages for the customers as well as for the operating entities. Digital equipment is produced at relatively low costs with much higher performance/price ratios than the previous analog technology. Moreover, digital technology has the capability to provide cost/effective data and other value-added services, which are today essential for managing modern business information networks. Access to international business information networks and data integration are highly facilitated with an infrastructure of digital telecommunications networks. Digitalization allows easy integration of the national network and the extension of telephone and data services to rural areas.

2.07 Presently, 68% of the existing telephone exchange capacity is made of electronic digital SPC equipment. With an installed capacity of 329,000 telephone exchange lines and about 203,000 DELs in service, exchange capacity utilization averages 67%, which is low but acceptable for a rapidly expanding network and provides lead time for further extensions. The national backbone of the long distance transmission network consists of microwave routes (Map IBRD No. 20903), which link Jordan's long distance network to Iraq and Syria. The national and regional long distance network is being complemented by digital microwave transmission links. International service is provided through two Standard A satellite earth stations working with the Atlantic and Indian Ocean INTELSAT satellites and one small earth station working with the ARABSAT satellite system. Likewise, telex service is fairly well developed, with about 2,600 connected lines and a capacity of 4,000 lines.

2.08 With the recent introduction of state-of-the-art digital technology in switching and transmission, the percentage of unsuccessful long-distance call attempts due to system malfunctioning and congestion has dropped to as low as 1.0%; a service quality performance that is matched only in industrialized countries. However, a sizable 25% of unsuccessful calls are caused by subscribers' misdialing (12% dialing of non-existing codes or numbers, 24% incomplete dialing). This may be largely due to outdated telephone directories and inaccessible information services.

2.09 Like most other developing countries, the development of outside plant, which includes local cable networks and subscriber installation, lags behind other components of the network in terms of capacity, quality and maintenance. Fault rates of about 60 per 100 lines per annum are reported (a reasonable target would be 10), which clearly indicates the scope for improvement in maintenance of cable networks and subscriber plant as well as in the quality of repairs. Improvement of maintenance and repair capability and restoring the balance of investment between outside plant and other parts of the network is one of the principal tasks to be undertaken under the project. Basic data on existing facilities are available in Annex 3.

Sector Goals and Strategy

2.10 The Government's declared objectives for the telecommunications sector, as stated in the Five-Year Plan (1986-90), are to:

- (a) restructure the telecommunications sector along commercial lines in accordance with the national socio-economic objectives;
- (b) restructure TCC to function as a commercially-oriented entity with full autonomy;
- (c) rationalize TCC's organizational structure and upgrade its operational and management capabilities;
- (d) expand telecommunications services to meet unsatisfied demand and to increase geographic coverage;
- (e) automate rural telephony and improve both regional and international services;
- (f) enhance network quality and reliability; and
- (g) introduce specialized and new value-added services.

2.11 To substantiate the above goals, TCC's revised 1988-92 Investment Program (para 3.01) aims at increasing installed exchange capacity from 329,000 lines to 513,000 lines, i.e., an average growth rate of 10.0% per year. Over the same period, the number of connected DELs would increase from 203,000 to 400,000 lines, or 14.5% per year. The goal of the planned system expansion is to meet 82% of unsatisfied demand (para 2.02) while increasing geographic coverage to rural areas (para 3.01). To meet the policy and institutional goals, TCC will undertake a sector restructuring study and an institutional development plan under the proposed project (paras 4.04 and 4.18). TCC has already retained consultants to assist in strengthening its project planning, design and operations management functions and in training technical staff (para 4.08).

Sector Constraints

2.12 In the past few years, TCC has sustained a 19% annual growth in connected telephone lines and has tripled its gross fixed assets while experiencing almost a full transition into new digital technology (paras 5.06 and 2.06). The recent rapid network modernization and growth of TCC, however, has not been accompanied by a comparable program for improving sector policies, and for upgrading TCC's organization, manpower skills and management systems. Most project development has been carried out through turnkey contracts with procurement tied to bilateral financing, resulting in high expansion costs (para 4.08). Investment planning, project design, management and supervision have been performed by outside consultants (para 3.16). TCC is also constrained by the Government's administrative and financial procedures and lacks the autonomy to function as an efficient commercial entity (para 4.02). In addition, its present structure is highly centralized and lacks the management characteristics and certain basic functions of a commercial entity (para 4.05). Tariff levels and structure also have many discrepancies and need to be refocused to meet socio-economic objectives, economic costs of services and demand patterns (para 6.06).

2.13 Given the past rapid growth and modernization of Jordan's network, major sector reforms and considerable strengthening of TCC's operations and management capabilities are needed to enable sustained and more efficient sector development. Three main areas of concern stand out; namely, (a) the structure of the sector, (b) TCC's requirements for financial and administrative autonomy, and (c) TCC's organizational structure and management systems. These areas have been studied thoroughly during appraisal and will be addressed and tackled during project implementation in the framework of a sector commercialization plan and an institutional development plan formulated and agreed upon by the Government, the Bank and TCC (paras 4.04 and 4.18). Both plans form an integral and essential part of the project. The institutional development plan will also involve a study for revising and adjusting telecommunications pricing policy and tariffs.

Rationale for Bank Involvement

2.14 With the trend towards globalization and the parallel growth in the use of information systems in world economy, the development of a modern telecommunications network in Jordan is of great importance in linking the country's manufacturing and service sectors to international markets. The rational development of the telecommunications sector can be instrumental in increasing domestic resource mobilization and alleviating infrastructure constraints, especially with regard to establishing small and medium scale industries and to spreading the benefits of development to Jordan's rural areas, both of which figure prominently in the Government's Five-Year Plan. In particular, the dominant services sector, which accounts for about 60% of GDP, depends critically on effective communications and modern business data/information services. Jordan can play a key role in the modernization of the Region's business information and management systems provided that the development of its educational programs and business sectors are linked to that of advanced information and communications systems.

2.15 The Bank's proposed support for telecommunications in Jordan is a key component of a broader Bank strategy designed to assist the Government to diversify the country's economy, promote exports through policy improvements and increased emphasis on the productive sectors and to strengthen the infrastructural base and institutional framework for improved economic efficiency and international competitiveness. Jordan's economy, particularly the dominant services sector, is highly dependent on effective communications and data/information services. The Bank worked closely with TCC to review the telecommunications investment program in the context of the current Five-Year Plan (1986-90) and the increasingly tight budgetary and resource constraints within the Jordanian economy, and considers that the proposed allocation to telecommunications and its approximate 5% share in total investment is appropriate, particularly given the expectation of high economic and financial returns from these investments.

2.16 The Bank supports the Government's objectives in the telecommunications sector. Through this first telecommunications lending operation in Jordan, the Bank would play a major role in assisting the Government to: (i) improve the policy and institutional framework for the efficient long-term development of the telecommunications sector; (ii) implement a realistic investment program consistent with resource availabilities that would improve services and expand geographic coverage, especially to isolated rural areas; (iii) mobilize competitive financing resources for the program; and (iv) devise and carry out a program for the commercialization of the telecommunications sector and TCC's operations. The Bank has already been instrumental in helping TCC to rationalize its investment program and improve its procurement processes and their cost effectiveness. During project implementation, the Bank would continue these efforts and would help the Government to address critical sector issues and implement policy actions.

III. THE PROJECT

Project Objectives

3.01 The project would provide for balanced and integrated development of telephone facilities for the urban and rural areas. Telephone concentration in the Greater Amman area would decrease from its present level of 63% to 56% in 1992. Automatic rural telephone services would be extended to 62 new villages, or 82% of all towns and villages, covering 98% of the total population. The revised program projects a 14% annual growth of connected subscribers which would meet about 82% of projected demand for 1992, a marked improvement over the current situation (67% demand satisfaction). This planned growth rate seems reasonable and consistent with TCC's past performance, which averaged an annual rate of 19% during the period 1982-86. Furthermore, under the project, the installation of the backbone national and regional long-distance networks will be completed in 1990.

3.02 Besides network expansion, the project aims at improving TCC's operating efficiency and profitability by reducing its operating and investment unit costs and at maximizing the contribution of the telecommunications sector to the country's economic strategy, especially with regard to efficient mobilization of domestic resources and employment creation. The main sector and institutional objectives of the project are to:

- (a) assist TCC and the Government to formulate and implement, within an overall policy framework, sector reforms for the commercialization of the telecommunications services in Jordan and to allow TCC to function as a business operating entity;

- (b) strengthen TCC's capacity to develop and implement coordinated strategies for procurement, financing and system planning that would help to reduce investment costs, especially in light of the Government's decision to move away from turnkey contracts and procurement tied to bilateral financing to international competitive bidding;
- (c) help TCC and the Government revise telecommunications pricing policy and tariffs to reflect the national macro and socio-economic policies, changes in the cost structure resulting from growth and technological change and to adjust for shifts in market demand resulting from changes in Jordan's economic conditions and prospects; and
- (d) support TCC in conducting a comprehensive review of its organizational structure, upgrading its management systems using modern information technology, and implementing a human resource development program in technical, financial and management areas.

3.03 The project represents TCC's revised 1988-92 investment program, and provides in addition, technical assistance for sector restructuring and institutional development. TCC's investment program has been drawn-up on the basis of the Government Five-Year Plan (1986-90). Because of delays in implementation, TCC had to revise the original 1986-90 program and extend its implementation to 1992. On this basis, a more realistic and achievable telecommunications investment program for the period 1988-92 was finalized and agreed upon during project appraisal. During negotiations, assurances were obtained that TCC will: (i) consult with the Bank before introducing any major changes in its investment program, which in the aggregate would involve more than 10% of the total amount of investments planned for the five-year program; and (ii) ensure that no such changes will be introduced unless TCC and the Bank have agreed that these changes are justified [para 7.01 (a)].

Project Description

3.04 In accordance with sector goals (para 2.10), the project comprises three main components:

- (a) ongoing works carried over from 1985 which include the expansion of existing telephone exchanges by about 30,000 lines; providing 12,000 lines of initial capacity in areas previously without service and constructing associated outside plant, and installing regional transmission routes (microwave and optical fibre cable) which would form the backbone of Jordan's long distance network connecting it with the Egyptian, Saudi-Arabian and Syrian networks.
- (b) new works which cover the provision and installation of:

- (1) 213,000 lines of telephone switching equipment of which 27,000 lines are met through redeployment of existing equipment. That includes:
 - establishment of 14 new primary centers and 76 small stand alone exchanges or concentrators with a total capacity of 170,000 lines;
 - extension of 4 primary exchanges and 31 small switching nodes by 25,000 lines; and
 - creation of 27 new switching nodes to be connected to existing primary exchanges with a total capacity of 18,000 lines.
 - (ii) associated local networks and subscriber plant for the connection of 235,000 new subscriber lines in 620 cities, towns and villages. This includes 12,000 lines for which the exchange capacity exists from the previous investment program;
 - (iii) 61 digital microwave links, 29 optical fiber junctions and 37 pulse code modulation (PCM) cable systems to provide for transmission links within multi-exchange areas and between primary exchanges and corresponding switching nodes;
 - (iv) a new national and international switching center (NISC) with a capacity of about 5,500 circuits;
 - (v) replacement of a satellite earth station antenna for international traffic via INTELSAT; in addition to
 - (vi) consultancy services for sector restructuring and institutional development (paras 4.04 and 4.18); and
 - (vii) acquisition and development of computer systems based on recommendations of the studies included under (vi) above; and
- (c) provision for future works relating to the next investment program that would presumably start in 1992 before the completion of the proposed 1988-92 program.

Details of physical components are given in Annex 4 and illustrated in Map IBRD 20903. TCC's organization and the studies to be financed under the project's technical assistance are discussed in Chapter IV.

Project Cost

3.05 The total project cost is estimated at JD 112.7 million (US\$ 338.1 million) with a foreign exchange component of JD 74.4 million (US\$ 223.2 million). This includes ongoing works (US\$28.2 million) which are financed under existing bilateral credit agreements. The estimated cost of new works is JD 103.3 million (US\$ 309.9 million) of which the foreign exchange component is JD 68.5 million (US\$ 205.5 million). Detailed project costs are in Annex 5 and summarized in Table 3.1.

TABLE 3.1: PROJECT COST SUMMARY

Item	ESTIMATED COST						
	JD Million			US\$ Million			%
	Local	Forex	Total	Local	Forex	Total	
<u>I. ONGOING WORKS</u>							
JPL-4 Project ^{a/}	1.8	3.5	5.3	5.4	10.5	15.9	56.4
Consultants	1.7	2.4	4.1	5.1	7.2	12.3	43.6
TOTAL ONGOING WORKS	3.5	5.9	9.4	10.5	17.7	28.2	100.0
<u>II. NEW WORKS</u>							
Switching	1.7	16.3	18.0	5.1	48.9	54.0	20.2
Transmission	2.9	7.8	10.7	8.7	23.4	32.1	12.0
Local Networks							
-Cables & Heavy Equipment	0.9	16.0	16.9	2.7	48.0	50.7	19.0
-Construction & Installation	18.9	12.4	31.3	56.7	37.2	93.9	35.1
Buildings	2.1	0.4	2.5	6.3	1.2	7.5	2.8
Computer Systems	0	0.7	0.7	0	2.1	2.1	0.7
Technical Assistance	0	1.0	1.0	0	3.0	3.0	1.1
NISC Transit Center	0.1	0.9	1.0	0.3	2.7	3.0	1.1
Satellite Station	0.2	1.0	1.2	0.6	3.0	3.6	1.3
Subscriber Plant	1.2	4.8	6.0	3.6	14.4	18.0	6.7
BASE COST	28.0	61.3	89.3	84.0	183.9	267.9	100.0
Physical Contingency	2.5	4.5	7.0	7.5	13.5	21.0	7.8
Price Contingencies	4.3	2.7	7.0	12.9	8.1	21.0	7.8
TOTAL NEW WORKS	34.8	68.5	103.3	104.4	205.5	309.9	115.6
TOTAL PROJECT COSTS	38.3	74.4	112.7	114.9	223.2	338.1	-

^{a/} A project for network expansion financed under the 4th Japanese Protocol with the Jordanian Government.

3.06 The project costs reflect estimated early 1988 prices based on TCC's experience with contracts relating to ongoing works and those signed for goods under previous projects, with adjustments taking into account actual trend in international prices for telecommunications equipment and in local prices for civil works in Jordan. The project estimates are reasonable. TCC is exempt from payment of custom duties on imported goods and pays no taxes.

Contingencies

3.07 Physical contingencies are 5% for switching and transmission equipment, 7.5% for local networks and subscriber installations and 10% for buildings. Foreign price contingencies are based on estimated annual foreign cost increases of 1% from 1988 to 1990 and 3.5% thereafter. Local price contingencies reflect an estimated annual increase in local costs of 3% in 1988 and 5% thereafter.

Project Financing

3.08 The proposed Bank loan of US\$36.0 million (Table 3.2) would help finance underground and aerial cables, wires and heavy material for the construction of outside plant as well as consultancy services and computer systems. TCC would generate internally sufficient funds to finance all local costs and 18.7% of foreign costs (para 5.13), corresponding to a total contribution of US\$153.3 million. Ongoing works (US\$17.7 million) and the procurement of new proprietary equipment (US\$5.7 million) would be financed through available bilateral credits. TCC intends to seek US\$79.2 million financing in export and mixed credits to cover switching and transmission components. Experience from other telecommunications projects indicates that such financing is available in ample amounts. Therefore, this financing source can be considered reasonably assured. This leaves a gap of about US\$46.2 million for local networks for which export credits are not typically available. For this component, the Government and TCC intend to seek bilateral/regional funds.

3.09 During negotiations, assurances were obtained that the loan would be declared effective only after TCC has secured cofinancing agreements, satisfactory to the Bank, in an aggregate amount of US\$46.0 million to finance local networks [para 7.02 (a)]. Furthermore, an agreement was reached that TCC shall finalize procurement and cofinancing agreements, in an aggregate amount of about US\$80.0 million, to finance switching, transmission and other project components to be procured under price and terms bidding before June 30, 1989 [para 7.01 (b)].

TABLE 3.2: FINANCING PLAN
(US\$ Million)

	Foreign	Local	Total	%
<u>New Works^{a/}</u>				
IBRD	36.0	-	36.0	11.6
TCC	38.4	104.4	142.8	46.1
Price and Terms ^{b/}	79.2	-	79.2	25.6
Credit tied to procurement ^{c/}	5.7	-	5.7	1.8
Other Financing ^{d/}	46.2	-	46.2	14.9
Subtotal	<u>205.5</u>	<u>104.4</u>	<u>309.9</u>	<u>100%</u>
<u>Ongoing Works</u>				
TCC	-	10.5	10.5	37.2
Existing Loans ^{e/}	<u>17.7</u>	<u>-</u>	<u>17.7</u>	<u>62.8</u>
Subtotal	<u>17.7</u>	<u>10.5</u>	<u>28.2</u>	<u>100%</u>
Total Costs	<u>223.2</u>	<u>114.9</u>	<u>338.1</u>	

a/ Estimated costs of new works include physical and price contingencies of 15%.

b/ Export and mixed credits to be offered in conjunction with price and terms bidding.

c/ French and Japanese financing for tied procurement.

d/ Cofinancing arrangements for local networks, which will be partly financed by the Bank.

e/ Japanese protocol No. 4 and a Swedish Soft Loan.

Procurement

3.10 A detailed description of the packages of goods and services to be procured under the project is presented at Annex 6. Procurement arrangements for the new works are summarized in Table 3.3 below:

TABLE 3.3: PROCUREMENT ARRANGEMENTS
(US\$ Million)^{a/}

Project Component	ICB ^{b/}	Price & Terms ^{c/}	Neg. Contrd ^{d/}	Local Procur.	Other ^{e/}	Total
a. Switching	-	49.2	5.7	-	-	54.9
b. Transmission	-	23.7	-	-	-	23.7
c. Local Networks						
- Materials	49.2(22.8)	-	-	8.2	-	57.4(22.8)
- Construction & installation	112.2	-	-	-	-	112.2
d. Buildings	-	-	-	9.2	-	9.2
e. Computer Systems	2.4(2.4)	-	-	-	-	2.4(2.4)
f. Consultants	-	-	-	-	3.3(3.3)	3.3(3.3)
g. Nat/Int Switching Center	-	3.0	-	-	-	3.0
h. Satellite Station	-	3.3	-	-	-	3.3
i. Subscriber Plant Total	<u>7.5(7.5)</u> <u>171.3(32.7)</u>	<u>8.4</u> <u>87.6</u>	<u>-</u> <u>5.7</u>	<u>-</u> <u>17.4</u>	<u>-</u> <u>3.3(3.3)</u>	<u>15.9(7.5)</u> <u>285.3(36.0)</u>
Percent	60.0%	30.7%	2.0%	6.1%	1.2%	100%
Percent of Bank Loan	90.8%				9.2%	

Note: Figures in parentheses represent amounts to be financed by the proposed Bank Loan.

a/ Including contingencies; excluding US\$24.6 million equivalent for local expenditures covering local transport, TCC work force and force account.

b/ Bank financed components will be subject to the Bank Procurement Guidelines.

c/ International bidding with financing proposals.

d/ Negotiated contracts for extension of existing equipment.

e/ Bank Guidelines for the use of Consultants.

TCC's strategy is to procure the bulk of the network expansion under the proposed project through open tenders. TCC will undertake international competitive bidding, in accordance with the Bank's Guidelines, for the procurement of the following: (a) cables and heavy material required for the construction of local cable networks. This procurement package will be partly financed by the Bank under cofinancing arrangements with sources to be identified (para 3.09); (b) wiring for the network subscriber plant (US\$7.5 million); and (c) computer systems (US\$2.4 million). The Bank's guidelines would also be applied for the selection of consultants for the technical assistance component (US\$3.3 million). In the case the Loan is reallocated to be used for financing part of the construction and installation of local networks at an estimated total cost of US\$112.2 million, local manufacturers of ducts and man-hole covers would receive preference of 15% or the import duty, whichever is lower.

3.11 International bids including financing offers (price and terms) would be invited for the provision and installation of local, long-distance and transit switching, microwave links, cable and optical fiber transmission, satellite earth station antenna and subscriber telephone installations for a total sum of US\$87.6 million. Extensions of certain proprietary exchanges and transmission stations, estimated to cost about US\$5.7 million, will be arranged through direct negotiations with existing suppliers. Although the project components mentioned under this paragraph will not be financed by the Bank, they do constitute an integral part of the project and are critical to project implementation and its overall performance. Hence, procurement, financing and implementation of all the project components should be closely coordinated.

3.12 Construction of technical buildings estimated to cost a total of US\$9.2 million would be carried out under local bidding procedures advertised locally in accordance with the Government local procurement procedures.

Contract Review

3.13 Prior Bank review of procurement documentation would be required for the eight contracts (all of them larger than US\$1.0 million) for goods to be procured under ICB in accordance with Bank's Guidelines. Related bidding documents for these contracts have already been reviewed and cleared by the Bank and bid invitations issued. Prior Bank clearance will also be required for the short list of consultants, terms of references, letters of invitation, as well as for evaluation of proposals and contracts award, in accordance with Bank's Guidelines for the use of Consultants. To ensure that the sector commercialization and institutional development plans are carried out in accordance with the agreed action plans (Annex 12), it has been agreed by TCC during negotiations that letters of invitation to a short list of qualified consulting firms, approved by the Bank, will be issued by end May and contracts awarded in September 1988.

Disbursements

3.14 Disbursements for all contracts (partially or totally) financed by the Bank would be made against fully documented withdrawal applications. The estimated disbursement schedule for the project, based on the Bank profile for all sectors in Jordan, is shown in Annex 7. The loan will be closed on December 31, 1993. Proposed disbursements by category are shown below (Table 3.4):

TABLE 3.4: DISBURSEMENT OF PROPOSED LOAN

Category	Amount US\$ Millions	Percentage Financed
1. Cables, wires and heavy material associated with local networks	27.05	100% of the CIF cost of directly imported goods; 100% of ex-factory cost of locally manufactured goods procured through ICB; and 80% of local expenditures.
2. Computer systems	2.15	100% of foreign expenditures and 80% of local expenditures.
3. Consultants	3.00	100% of foreign expenditures and 90% of local expenditures.
4. Unallocated	3.80	
Total	<u>36.00</u>	

The loan made to TCC will be at the standard variable rate for 17 years including 5 years of grace and guaranteed by the Government. TCC will bear the foreign exchange and interest risks, and pay to the Government a guarantee fee of 1% per annum of the principal amount of the Loan outstanding from time to time.

3.15 To facilitate timely project implementation, TCC would establish, maintain and operate, under terms and conditions satisfactory to the Bank, a Special Account in US dollars to which the Bank would make an initial deposit equivalent to about US\$3.0 million. The Special Account would be replenished against withdrawal applications when the undisbursed balance of the account falls below an amount equal to 50% or less of the amount of the Special Account. Withdrawal applications would be supported by appropriate documentation. The Bank would be provided annually with an audit report of the Special Account [paras 4.14 and 7.01(e)].

Project Implementation

3.16 During the implementation of the previous 1981-1985 sectoral plan, TCC made extensive use of turnkey contracts that were planned by engineering consulting firms. Now, TCC is gradually building in-house

capabilities in the areas of engineering, investment planning, detailed project design, procurement, project management and supervision. The planning and the detailed design of the project, as well as the preparation of bidding documents, is the result of close cooperation between TCC and the retained engineering consultants, who are also helping TCC to organize project management and supervision and to improve network operations, maintenance and customer services. Switching and transmission equipment will be installed by the respective suppliers. Construction of technical buildings, manholes, and cable ducts will be carried out by local private contractors. Installation of underground and aerial cables and associated equipment, procured separately by TCC, will be installed by local private contractors with the support of foreign suppliers. With the exception of installations in large new buildings that will be carried out by private local contractors under TCC's supervision, TCC staff will install most of the new subscriber plant. Overall project management, coordination, supervision and follow-up of various contractors' involvement, as well as acceptance tests will be carried out by TCC staff.

3.17 TCC's present organization is not yet tailored to deal on a permanent basis with the requirements of project planning, design, implementation and commissioning of a substantial expansion program. For its 1988-92 investment program, TCC has set up an ad-hoc Project Implementation Unit (PIU) headed by a Project Director reporting to the Director General, who has the overall responsibility for project implementation. The PIU is designed to serve as an interim organizational set-up for the duration of the project to carry out TCC's investment program effectively and to develop in-house capabilities in all aspects of project development (through on-the-job training and teaming with retained consultants) so as to reduce TCC's reliance on turn-key contracts and foreign expertise. As to the future integration of the functions of this unit into the organization and the optimal set-up for undertaking large-scale investment programs, this will be explored under the project's management studies in the framework of TCC's proposed institutional development plan (para. 4.18).

3.18 The project implementation plan (PIP), including the project organization, implementation schedule and manpower requirements is described in Annex 8. The plan takes into account TCC's available resources and those of the retained consultants. The PIU's director will be assisted by selected project managers with the support of the retained engineering consultants. Those managers, and other technical staff, for the PIU have to be identified, from within TCC or the outside, provided with the proper training, assigned project responsibilities and ultimately reintegrated permanently into the organization. According to the implementation schedule, additional recruits from outside TCC will have to be employed, trained by the Telecommunications College and then put on the job not later than 1990. Hence, TCC should immediately proceed with the necessary recruitment arrangements given the existing administrative constraints for hiring additional staff (para 4.02). TCC has to employ or assign from within to the PIU 36 staff in 1988 and 12 staff in 1989. During negotiations, assurances were obtained that TCC will maintain the

Project Implementation Unit until project completion and will employ or assign additional staffing and resources, according to agreed targets, to ensure effective project implementation [para 7.01(c)].

Performance Monitoring

3.19 TCC's overall performance during project implementation will be monitored by means of selected performance indicators relating to technical, operational and financial performance, subscriber connections, service quality, and staffing (Annex 9). Continuous monitoring of project physical implementation as well as TCC's operational and financial performance and efficiency will assist TCC in improving its management and allow timely corrective actions to be taken, when necessary. TCC will prepare annually for Bank review a comparative analysis of its actual performance against the target indicators. During negotiations, assurances were obtained that TCC will present performance targets for 1990 and each subsequent fiscal year for joint review with the Bank by October 31 of previous year, review progress with the Bank not later than June 30 of each year, and take all necessary corrective actions [para 7.01(d)]. While the targets for later years are indicative, those for 1989 were agreed by TCC during negotiations.

IV. THE IMPLEMENTING AGENCY^{1/}

Sector Commercialization

4.01 TCC was established in 1971 as a semi-autonomous Government-owned corporation. A ten-member Board of Directors, chaired by the Minister of Communications, is responsible for TCC policy and administration. TCC's Director General, who is appointed by the Council of Ministers, is also Deputy Chairman and Chief Executive in charge of TCC's management and operations. There is no private sector representation on the Board. The Law allows for two Board Members from the private sector appointed by the Government, but those have been instead selected from the academic field. The effectiveness of the Board is very much dependent on the Chairman, who has the main authority to call for Board meetings.

4.02 Although TCC has the legal statute of a financially and administratively autonomous entity, it remains truly a public sector institution governed by the Civil Service By-Law and fiscally tied to the Government General Budget for both investments and operating expenditures. TCC's present Corporate Law grants the entity management and control

^{1/} At present, TCC represents the commercial telecommunications sector in Jordan. For development purposes, however, TCC and the sector should be differentiated because of the potential participation of the private sector, in case of commercialization, in the provision of telecommunications services in Jordan.

authority of its own financial resources and the freedom to deposit its funds in commercial banks (Law 29-1971, Articles 14 and 15). But in practice, TCC has no treasury function (para 4.13), nor has it control over its profits. Its major account is with the Treasury with minor accounts for operating cash and for settlement of contract retentions with the Central Bank of Jordan. Administratively, TCC lacks the authority to adjust salaries to changing market conditions and cannot freely hire and dismiss staff. In procurement, TCC is subject to the Government administrative procedures which are reportedly time consuming and ineffective.

4.03 While the telecommunications sector is commercial in nature, its operating entity is constrained by the public administrative and financial regulations and procedures. The Government and TCC recognize the urgency for introducing major reforms to optimize the overall policy and institutional framework for the telecommunications sector. The objectives are to increase TCC's efficiency and productivity, maximize resource transfers to the Government and enhance the sector's contribution to the economy as a whole. Considering TCC's previous performance and potentials; organizational, operational, financial and personnel capabilities and limitations; and the overall sector development stage and needs, the Government has decided to give priority to sector commercialization as a necessary step towards privatization. This would imply restructuring TCC as a fully autonomous, administratively and financially, Government-owned corporation governed under private law.

4.04 The prospects of setting up TCC as a fully commercial enterprise raise important issues regarding competition and regulation. For instance, there is the question of whether TCC should continue to have a monopoly over all public telecommunications services, or whether some of these should be opened up to competition. Services such as data networks, mobile telephone and paging, which are not subject to large economies of scale, may be provided efficiently by private firms. This would enhance private sector participation in telecommunications, mobilize new resources for investment, improve responsiveness to specialized business demands and free TCC to concentrate on the task of developing and efficiently operating, maintaining and managing the national infrastructure of basic telecommunications facilities. Another major policy concern regarding sector restructuring is that of resource transfer between the sector and the Government. This will eventually require policy decisions regarding tariffs, taxation of TCC and TCC's financial structure. Furthermore, relationships and role interplays between the Government, TCC and the private sector need to be examined. A sector restructuring plan has been formulated with the help of the Bank. During negotiations, assurances were obtained that TCC will carry out the study of the restructuring plan and the Government will take all necessary measures to facilitate its implementation (paras 4.20 and 4.22).

Organization and Management

4.05 A basic organization chart of TCC is at Annex 10. The existing structure reflects a highly centralized functional/regional organization

biased towards operation with less emphasis on corporate planning and business development. There is no clear demarcation of operational responsibilities between headquarters and regions. In most cases, headquarters' responsibilities extend beyond policy and planning to management and control of some field operations and maintenance functions. Such a situation becomes unmanageable as the network continues to grow at its projected rate. A clear delineation between the central and regional responsibilities will be required preferably with operational and technical authorities decentralized to regions.

4.06 TCC is not organized and managed as a business. Its present structure does not have the management characteristics of a commercial telecommunications entity and it lacks some important functions, such as treasury, corporate planning and marketing. Managerial accountability is limited; service performance, financial performance, manpower and overall productivity of major organizational units and services are not regularly monitored. The existing structural linkages among the various functions are loose and should be reinforced to enhance TCC's ability to manage growth, technological change, innovation and integration of new services. Its management functions need to be strengthened through the introduction of new skills and modern systems using information technology.

4.07 In general, in order to improve TCC's operating efficiency and profitability two principle interrelated requirements stand out: (i) to provide TCC with the autonomy of a commercial entity; and (ii) to develop and implement a comprehensive organizational and management improvement program.

Planning and Operations Management

4.08 In the past, most project development has been carried out through turnkey contracts in the framework of bilateral credit agreements. Investment planning has been done with substantial assistance from retained consultants, while system design and engineering have been mostly done by the equipment suppliers. The above approach had been associated with high expansion costs. For the 1988-92 investment program, TCC has decided to follow competitive procurement and untied financing strategies in order to reduce its investment costs and its dependence on foreign contractors. This would require TCC to strengthen its in-house planning, design, engineering, procurement and supervision capabilities, as well as build up experience in technical, commercial and financial aspects of international competitive bidding. For this purpose, TCC has recently retained consultants to help on all the above functions. To ensure effective transfer of know-how and on-the-job training, TCC staff are teamed with consultants in working groups in the various disciplines of network planning, system design, service operations, maintenance and customers' services. The experience in the planning and design of TCC's 1988-1992 investment program has been encouraging; TCC staff contribution has been substantial. The same approach is being carried over to other functions, in particular to procurement, project implementation and supervision.

Staff and Training

4.09 As of December 31, 1987, TCC employed about 3,300 staff or about 17 staff per 1,000 DELs, which compares well with newly industrialized countries (Brazil 15; Singapore 16; Portugal 17). This staff ratio has been achieved, however, without TCC's participation in project preparation and implementation. In view of the future expansion of Jordan's network, TCC will have to hire additional staff, particularly telecommunications engineers and technicians but also qualified managers in operations, accounting, finance, and other business areas. At project completion, TCC expects to have 4310 staff with a staff ratio of 11 per 1,000 DELs. Hiring and training additional staff to meet the project requirements also pose a real challenge to TCC, and it appears obvious that the present administrative constraints to recruitment will have to be relieved for TCC to cope with future requirements. TCC lacks a personnel management system with a formalized performance evaluation system and criteria, as well as a manpower development plan consistent with operations and management requirements of network expansion and sector development.

4.10 Current training arrangements for engineers and technicians are satisfactory. TCC ensures specialized staff training through its Telecommunications College in Amman, which is an intermediate college that grants a diploma of telecommunications engineering after a university bachelor's degree. An important feature of the College is the in-service technicians program, which aims at enabling the engineers and technicians to cope with new technological developments. The College is well-organized and has adequate faculty resources to cope with TCC's training requirements; but needs to modernize its facilities, upgrade its existing technical training curriculum and introduce certain management courses to train a larger number of staff in modern digital technology and project management. The College is currently undergoing an improvement program of its training capabilities and facilities with the help of the Swedish Telecommunications Training Center (Teleskolan) and ITU (financed by UNDP). TCC seems to have no difficulty securing financing for its training development programs through grants.

Accounting and Financial Management

4.11 TCC operates on a zero-base cash budget, as other Government agencies. Operating and investment expenditures are authorized annually through the Government's budget law. At the end of each fiscal year, the balance of TCC's generated funds less expenditures, is automatically transferred to the Government budget (para 5.03). Investments are subject to the Government's five-year plans. At its own initiative, however, TCC established a parallel system of commercial accounts. Independently audited commercial accounts are available for 1981 up to 1986.

4.12 The accounting function has been recently reinforced by appointing an Assistant Director General for Finance and qualified senior accountants from the private sector. While this represents a major step

towards reorienting and strengthening the accounting practice at TCC, the critical need still exists for the development of a modern computerized analytical accounting system, which would allow TCC to assess the productivity of its organizational units and the profitability of various services in addition to providing managers with key financial information for effective decision making. Presently, the accounting unit does not possess or have access to computer facilities and its procedures are those of a government agency. As part of the institutional development plan, TCC will develop and introduce a modern analytical accounting system (para 4.18 (c)).

4.13 TCC's financial function is not organized and managed as it should be in a commercially-oriented service corporation. The commercial accounts, which are prepared only once a year, are not being used as a regular management tool for either performance measurement, planning or control. TCC had incurred significant exchange losses (para 5.09) because it had neither the authority nor the internal expertise to hedge against foreign exchange risks. Project financing is arranged through the Ministry of Planning. Cash management is non-existent despite the fact that TCC has been a major source of funds, and internal cash generation is expected to further increase during the proposed project period (para 5.13). In order for TCC to function as a business entity, it should develop its own financial management capabilities in addition to effective accounting systems. The question of introducing a treasury function will be explored as part of the sector commercialization and organizational studies (para 4.18 (c)).

External Auditing

4.14 TCC has annual audits of its accounts performed by qualified external auditors, since 1981. In previous years some delays were experienced in the preparation and auditing of TCC's commercial amounts which should be alleviated with the recent appointment of new management (para 4.12). During negotiations, assurances were obtained that TCC will furnish audited financial statements to the Bank, including an audit report of the Special Account, within six months after the end of each fiscal year [para 7.01 (e)].

Data Processing

4.15 TCC does not have its own computer facilities but utilizes instead the computer center of the Royal Scientific Society. Consequently, processing telephone applications and connecting new subscribers lag behind exchange and cable network construction and result in low capacity utilization for some exchanges. Monitoring and reporting data for operations and customer service are fragmented and not regularly collected and processed. Furthermore, the reliance on the services of an external computer center sometimes causes delays in processing telephone bills (issued monthly) and hinders monitoring of payments and accounts receivable. For TCC to be able to modernize its management functions, it should acquire its own computers and have control over the development of

application software systems to ensure relevance to its specific operational and management needs. The project includes US\$2.1 million, to be financed by the Bank, for the acquisition and development of computer systems (para 3.05).

Management Information Systems

4.16 TCC's management reporting is fragmented and there is no formal structure for information flow. The concept of management with information; creating a management data base, organizing data collection, flow and processing to support decision making for operations and management is still a novelty to TCC. The difficulty of developing effective management information systems is compounded with the unavailability of computer resources. A study for the development of an integrated management information system will be conducted in the framework of TCC's institutional development plan (para 4.18 (d)). The objectives and design of such system would be linked to TCC's reorganization plan.

Institutional Development

4.17 In parallel with sector restructuring, efforts should be directed towards the reorientation of the management culture of TCC and streamlining its operational and management functions along commercial lines. The Bank has worked closely with TCC to formulate a comprehensive institutional development plan, which would be undertaken during project implementation, to enable TCC to cope with sector requirements. The main objectives of the above mentioned plan are: (1) to allow TCC to function as an efficient and effective commercial enterprise; and (2) to achieve the objectives of its 1988-92 investment program. Such objectives could be more effectively realized by granting TCC full administrative and financial autonomy. The sector restructuring study and the institutional development plan are closely interrelated and hence should be jointly implemented and well coordinated.

4.18 A number of areas of management studies critical to the institutional building of TCC have been identified, namely:

- (a) organizational structure and business management;
- (b) personnel system and human resource development;
- (c) financial and accounting systems, including the development of a treasury function;
- (d) management information and decision support systems, including computerization of key functional and operational applications;
- (e) procurement and inventory management system; and
- (f) tariffs and pricing policies;

Terms of reference, which have been agreed with the Bank, are listed in Annex 11, and action plans for implementation and review of recommendations are given in Annex 12.

Technical Assistance

4.19 About US\$3.0 million has been allocated within the Loan to cover the full costs of consultancy services on sector restructuring and institutional development. The technical assistance program covers two principle sets of studies: sector reform and institutional development.

4.20 The sector reform studies relate to sector restructuring and tariff studies, which would require the involvement of both the Government and TCC. During negotiations assurances were obtained that TCC will: (i) take all measures necessary to ensure that the sector restructuring and tariff studies shall be completed and a copy thereof furnished to the Bank by July 31, 1989; (ii) carry out a mid-term review of the studies with the Government and the Bank by April 30, 1989; and (iii) following completion of the studies, the Government, the Bank and TCC will exchange views on the studies' recommendations and TCC will, on the basis of said exchange of views, carry out a Sector Reform Program approved by the Government, in accordance with the following schedule: tariff restructuring and adjustment by January 31, 1990, and sector commercialization by July 31, 1990 [para 7.01(f)].

4.21. The institutional development studies focus on improving TCC's organization, management functions and manpower skills. During negotiations, assurances were obtained that TCC will: (i) undertake all studies on institutional development under terms of reference acceptable to the Bank, and in accordance with the implementation schedule at Annex 12; (ii) furnish to the Bank quarterly progress reports and conduct semi-annual reviews with the Government and the Bank on interim results of the studies; and (iii) following completion of the studies, exchange views with the Government and the Bank on the studies' recommendations, and on the basis of such recommendations and exchange of views, prepare a Management Development Program and complete the implementation of said Program by October 31, 1991 [para 7.01 (g)].

4.22 The Government has a key role to play in achieving sector commercialization, and to a certain extent in the institutional development of TCC. Hence, assurances were obtained during negotiations from the Government that it will take all necessary measures for carrying out the Sector Reform Program and the Management Development Program, after exchanging views with the Bank on the studies' recommendations [para 7.01 (j)].

V. FINANCIAL ANALYSIS

Past Performance

5.01 TCC operates on a zero-base cash budget, as other Government agencies. Operating and investment expenditures are authorized annually through the Government's budget law. At the end of each fiscal year, the balance of TCC's generated funds less expenditures, is automatically transferred to Government's budget. Investments are subject to the Government's five-year plans. At its own initiative, however, TCC established a parallel system of commercial accounts. Independently audited commercial accounts are available for 1981 up to 1986.

5.02 Table 5.1 summarizes TCC's financial results during 1982-86. TCC has been a profitable enterprise, capable of sustaining fast growth without recourse to Government funds for either operation or investment, and with reasonable borrowing requirements. On average TCC achieved 28% annual rate of return on net assets in service based on historical value. This is high, partly because TCC pays no income taxes. With an assumed 35% tax rate^{2/}, the average rate of return would drop to 19%, which compares well

TABLE 5.1: TCC - SUMMARY OF PAST FINANCIAL RESULTS
(JD Million)

<u>FY Ending December 31</u>	1982	1983	1984	1985	1986
Operating revenues	16.9	27.4	32.7	40.0	42.0
Operating expenses	8.1	8.5	11.2	16.4	16.0
Operating income	8.8	18.9	21.5	23.6	26.0
Net income ^{a/}	8.0	17.6	18.6	20.5	18.5
Net transfers to (from) Government	1.9	(4.7)	2.8	5.3	13.3
Rate of return(%) ^{b/}	20	41	38	24	19
Net internal cash generation(%) ^{c/}	62	62	62	12 ^c	89
Operating ratio(%)	48	31	34	41	38
Current ratio	2.3	1.9	1.6	2.2	2.0
Debt/Debt+Equity(%)	24	27	32	35	41
<u>Current (JD)</u>					
Revenue/DEL	200	278	281	285	250
Direct Cash Operating Cost/DEL	76	67	71	80	62
<u>Constant (1986)</u>					
Revenue/DEL	224	297	290	285	250
Direct cash operating Cost/DEL	85	72	73	80	62

a/ Operating income less interest, write-offs for bad debt and obsolete stock.

b/ On average net fixed assets in service.

c/ As a percentage of construction requirements after payment of debt service.

2/ The corporate income tax structure in Jordan is progressive with a 35% ceiling.

with other telecommunications enterprises in the developing world. Assets were last revalued in 1976, but this does not materially change the conclusion because TCC's assets are likely to be overvalued. Until recently TCC had mainly relied for expansion on turnkey contracts financed through tied and bilateral credits which resulted in high investment costs.

5.03 During 1982-86, TCC financed about 63% of investments for expansion from internally generated funds (after debt service) and was able to make payments to the Government equivalent to about 28% of net income. The rate of transfers to the Government by TCC falls short of the average corporate tax rate in Jordan. But this does not alter the profitability picture of TCC since it has maintained a debt leverage ratio lower than 40%, implying that most of TCC's generated cash flow has been retained for investment.

5.04 As a measure of TCC's efficiency, direct cash operating cost per DEL had been maintained at 25% of revenue per DEL, which is satisfactory. Revenue per DEL in real terms remained almost the same until 1986, after which telephone usage started slowing down with the economy. Operating ratio had been consistently below 40% with personnel costs accounting for 60% of total operating expenses.

5.05 As of end 1986, the breakdown of TCC's total telephone revenues was as follows: (a) international services (71%); (b) installation fees (12%); (c) rental fees (12%); and (d) local calls (5%). International revenues have so far constituted the bulk of telephone revenues but are likely not to increase as in the past due to economic downturn in neighbouring countries and return of many Jordanian workers from abroad. Revenues from local calls have been minimal because subscribers have been entitled to 1,000 free local calls whose charges are presumably included within a rental fee of JD 27 per DEL. Beginning 1987, the number of free calls was increased to 2,000 and international rates were decreased on average by 28%. Subscription rates are quite high averaging JD 130 per DEL. Telex revenues as a percentage of total operating revenues have declined from 31% in 1982 to 15% in 1987 reflecting the slowdown in economic activities and change in technology. The above financial performance results demonstrate clearly major discrepancies in the tariff structure which need to be reviewed and adjusted to reflect actual economic costs and demand patterns (discussed in detail in para 6.06).

TABLE 5.2: TCC - BALANCE SHEETS
(JD '000)

FY Ending December 31	1982	1986
ASSETS		
Gross Fixed Assets	53189	159274
Less: Acc. Depreciation	10740	25114
Net Fixed Assets	<u>42449</u>	<u>134160</u>
Work in Progress	16888	24407
Long-term Investments	2492	3811
CURRENT ASSETS:		
Cash	531	2437
Accounts Receivable	6014	27974
Less: Doubtful Accounts	375	2000
Net Accounts Receivable	<u>5639</u>	<u>25974</u>
Other Debtors	38	138
Inventory	<u>1629</u>	<u>2054</u>
Total Current Assets	<u>7837</u>	<u>30602</u>
TOTAL ASSETS	<u>69666</u>	<u>192980</u>
LIABILITIES		
Equity:		
Government's Contribution	42308	46964
Retained Earnings	<u>6104</u>	<u>56079</u>
Total Equity	<u>48412</u>	<u>103046</u>
Debt Outstanding:		
Long-term Debt	15324	72021
Current Liabilities:		
Cur. Portion of LT Debt	802	7437
Suppliers	1782	4789
Contract Retentions	293	2146
Accrued Expenses	<u>458</u>	<u>893</u>
Total Current Liabilities	<u>3335</u>	<u>15266</u>
Reserves & Other:		
Sub/cont to projects	811	762
Subscribers Deposits	884	1556
Indemnity Reserves	<u>900</u>	<u>330</u>
Subtotal	<u>2595</u>	<u>2648</u>
Total Liabilities	<u>21254</u>	<u>89934</u>
TOTAL EQUITY & LIABILITIES	<u>69666</u>	<u>192980</u>
Current Ratio	2.35	2.00
Debt/Debt + Equity	0.24	0.41

Present Position

5.06 Table 5.2 shows the balance sheet as of December 31, 1986 and that of 1982 for comparison. The figures show that gross fixed assets tripled in value over a four-year period which reflects TCC's very rapid expansion. By contrast, the debt/debt+equity ratio had only increased from 24% to 41%, implying that TCC had self-financed a good portion of its investments. The current ratio of 2.00 is satisfactory provided TCC's receivables are solvent (para 5.08). Current assets consist almost entirely of accounts receivables (85%). Accounts payable consist mainly of amounts payable to suppliers/contractors and current portions of long-term debt.

Accounts Receivable

5.07 Telecommunications accounts receivable as of end October 1987, were an estimated JD 21 million (or 7 months of billing), of which JD 1.2 million were attributed to telex services. Government's share was a mere JD 1.6 million reflecting no serious Government arrears problem. A preliminary accounts receivable aging schedule (Table 5.3) shows that receivables accumulated during 1987 correspond to 25% of billing (3 months), which is reasonable. This figure is mostly due to delays of up to 3 months in the issue, distribution and accounting of telephone bills of the Regions. The problem is less acute in the Greater Amman area where TCC follows a monthly billing cycle and where the collection rate in 1987 had been 85-90%.

TABLE 5.3: TCC - ACCOUNTS RECEIVABLE AGING SCHEDULE
(JD '000)

<u>Year</u>	<u>Public Telephones</u>	<u>Private Telephones</u>	<u>Telex</u>	<u>Total</u>
1985	578	2,598	168	3,344
1986	364	3,765	196	4,325
1987 (up to 11/1)	628	8,761	703	10,092
Subtotal	<u>1,570</u>	<u>15,124</u>	<u>997</u>	<u>17,761</u>
Disconnected Lines	-	<u>2,949</u>	<u>180</u>	<u>3,129</u>
TOTAL	<u>1,570</u>	<u>18,073</u>	<u>1177</u>	<u>20,890</u>

5.08 Accounts receivables of 1986 and before (JD 10.7 million) make up over 50% of total receivables, which represent a serious financial concern for TCC. Beginning in 1988, TCC has started implementing new billing and

collection procedures which have already produced favorable results. It is estimated that at least 50% of receivables prior to 1987 will be collected under the new procedures. TCC will have to determine the degree of solvency of whatever remaining unpaid bills and decide on appropriate write-off policies. Up to end 1986, TCC has written off JD 2 million worth of bad debt. Further write-offs will be necessary to account for uncollectable bills, most of which correspond to business closures caused by the slowdown of the economy in Jordan and in neighboring oil countries. During negotiations assurances were obtained that TCC will furnish to the Bank, by end December 1988, a detailed aging schedule of accounts receivable and will implement a plan, satisfactory to the Bank, to provision for all outstanding bad debt over the project period [para 7.01(h)]. For the purpose of financial projections, it was conservatively assumed that the whole JD 10.7 million that date back to 1986 and before would be written off to arrive at a receivables level of 90 days of billing in 1992.

Foreign Exchange

5.09 TCC's exposure to foreign exchange fluctuations has been drastic over the past few years. The previous investment program had been financed mainly through bilateral and mixed credits denominated in Japanese Yen and French Francs. The appreciation of both currencies vis-a-vis the Jordanian dinar has caused major losses in current accounts and expenditures as well as inflating TCC's outstanding long-term debt. The cumulative foreign exchange losses during 1982-86 were JD 4.7 million and the value appreciation of long-term debt was JD 12 million. The exchange losses have been absorbed by TCC although it has been the responsibility of the central monetary authorities to manage TCC's foreign exchange exposure as part of the country's overall cash and debt management. If TCC is to become financially autonomous and managed as a business entity, it would have to develop its own in-house treasury capabilities in order to hedge against future exchange risks and manage effectively its cash and debt portfolios (paras 4.04 and 4.18).

Future Performance and Finances

5.10 There are three main factors that distinguish past financial results from future performance. First, future investment unit costs are expected to decrease substantially (almost by half what was incurred during the previous program) as TCC shifts towards more competitive procurement and financing strategies. Second, the expected change in Jordan's economic structure is likely to cause major shifts in demand patterns and levels for telecommunications services. Operating revenue per DEL is expected to drop in nominal terms from JD 250 in 1986 to JD 212 in 1989 and then remain at the same level until 1992. Third, TCC is expected to maintain, and even enhance, its efficiency by lowering its direct cash operating cost in nominal terms from JD 60 per DEL in 1987 to JD 55 per DEL in 1992. This would be achieved through a reduction in staffing per subscriber line and increasing staff productivity with the use of new digital technology. The

net result would be an increase in overall internal cash generation (para 5.13). Key projected financial indicators are summarized in Table 5.4.

5.11 Forecast financial statements for FY 1987-1992 are in Annex 14. Financial figures for previous years are included for comparison. Notes and assumptions are in Annex 14. For analysis purposes, tariffs are maintained at 1987 levels during the project period and telephone and telex traffic per DEL are assumed to decrease.

TABLE 5.4: TCC - FORECAST FINANCIAL PERFORMANCE
(JD Million)

FY Ending December 31	Draft 1987	1988	1989	1990	1991	1992
Operating revenues	43	49	57	65	74	84
Operating expenses	17	28	32	36	40	44
Operating income	26	21	25	29	34	40
Net income	16	16	18	22	26	32
Funds Available to Government	8	14	9	20	25	27
Rate of return(%)	17	14	13	15	17	20
Net internal cash generation(%)	73	258	77	130	152	222
Operating ratio(%)	41	55	57	55	54	52
Current ratio	2.0	2.2	2.1	2.0	2.2	2.2
Debt Service Coverage ratio	2.3	2.8	3.1	3.4	3.8	4.5
Debt/Debt+Equity(%)	45	44	45	46	48	47
Receivables (days)	270	210	180	150	120	90
Operating Revenue/DEL (JD)	217	221	212	212	212	212
Direct Operating Cost/DEL (JD)	60	60	59	57	55	55

5.12 Despite substantial investments during the project period, almost doubling network size, the financial indicators would remain satisfactory. The operating ratio would stabilize at around 55%. Rate of return on net fixed assets in service would decrease in the project's early stage because of anticipated decline in international revenues, but then would increase to 20% in 1992. Debt service coverage would be adequate at over 3.0 times. The debt/debt + equity ratio would remain at less than 50%, with the assumption that TCC would only retain the minimum funds required for maintaining a current ratio above 2.0 times. During the project period, TCC would generate cash flow in excess of internal financing requirements, available for transfers to the Government, equivalent to 85% of net income.

5.13 Sources and applications of funds during the project implementation period are summarized in Table 5.5. TCC's projected capital

structure and the corresponding funds flow were based on the proposed project financing plan (para 3.08). Interest rates and terms for the cofinancing component were considered to be comparable to those of the Bank. Interest rates for export and mixed credits were conservatively estimated at 5.0%. Under the above assumptions, TCC would achieve an internal cash generation averaging 145%, thus exceeding construction requirements by a considerable margin.

TABLE 5.5: TCC - FORECAST SOURCES AND APPLICATIONS OF FUNDS (1988-92)
(JD Million)

	JD (mln)	US\$(mln)	Percent
<u>SOURCES</u>			
Internal Cash Generation	239	717	103
Less: Debt Service	68	204	29
Net internal cash generation	<u>171</u>	<u>513</u>	<u>74</u>
Borrowings:			
- Proposed IBRD	12	36	5
- Other external borrowings	48	144	21
Subtotal	<u>60</u>	<u>180</u>	<u>26</u>
TOTAL SOURCES	<u><u>231</u></u>	<u><u>693</u></u>	<u><u>100</u></u>
<u>APPLICATIONS</u>			
Construction requirements			
- Proposed Project	112	336	48
- Preinvestments	5	15	2
Subtotal	<u>117</u>	<u>351</u>	<u>50</u>
Change in working capital	17	51	7
Change in L-T investments	1	3	1
Funds available for Government	<u>96</u>	<u>288</u>	<u>42</u>
TOTAL APPLICATIONS	<u><u>231</u></u>	<u><u>693</u></u>	<u><u>100</u></u>

Hence, TCC should be able to finance all local costs relating to its investment program, including indirect foreign exchange, and make transfers to the Government of JD 96 million. During negotiations, assurances were obtained that TCC will achieve a net internal cash generation not less than 50% of investment expenditures on a moving three year average basis in any one year during the project implementation period [para 7.01 (i)].

VI. ECONOMIC ANALYSIS

Benefits

6.01 Benefits from the proposed project will reach most sectors of Jordan's economy and will be felt throughout business and Government. A direct benefit would be increased efficiency and productivity of the telecommunications sector, achieved through sector commercialization and institution building of the operating entity, which should reduce investment and operating costs and increase resource transfers to the Government.

6.02 For business, improved telecommunications will enhance management efficiency, improve coordination of economic activities and so facilitate increased business productivity. This will provide invaluable support to initiatives to strengthen Jordan's economic growth through developing a wider industrial base for export-oriented goods and technical services. In particular, stimulation of the financial intermediary sector and other segments of the services sector is highly dependent on the availability of modern and efficient information and communications systems (para 2.14). The expansion and improvement of telecommunications services will directly and indirectly assist in absorbing the returning emigrant workers and in creating new employment (TCC is expected to add 1000 employees during project implementation) for a growing population characterized by excess supply of university graduates.

6.03 For rural communities, improved access to service would facilitate integration of rural areas with the rest of the economy, improve the efficiency of production and marketing of agricultural produce, and support the growth of small village-based businesses. Telecommunications would also support the extension and enhancement of health, education, government administration and other services to rural areas, which is a major Government objective.

6.04 For the Government itself, the proposed project would provide three main benefits. First, the project would facilitate improvements in the efficiency of Government administration in a way similar to improvements in business efficiency. Second, improvements in the structure of TCC's tariffs (para 6.06) would improve the efficiency of resource use within the sector through improving the structure of subscriber demand in relation to resource costs. Finally, revenues that would be generated from investments included in the project would mobilize substantial domestic resources for Government at a time of growing budgetary constraints.

Tariffs and Pricing Policies

6.05 Telecommunications tariffs as of end 1987, are summarized in Annex 15. Tariff overall levels are sufficient to provide an operating profit and cash level (para 5.12) to satisfy cash flow and rate of return requirements (paras 3.08 and 6.10) and to transfer funds to the Government while maintaining adequate liquidity positions (para 5.13). Tariffs were

reviewed in 1983, and in early 1987. International tariffs were arbitrarily reduced in 1987 on average by 28% since they were considered high by international standards. This would require an increase of almost 40% in international traffic to make up for the decrease in tariffs. As international calls dominate the revenues of TCC, a detailed demand and usage analysis should have been carried out prior to the tariff level changes.

6.06 The structure of tariffs and the policy for establishing pricing levels have many discrepancies (para 5.05) and should be refocussed towards meeting the national socio-economic objectives, demand and economic costs of services. The current tariff structure provides 2,000 free local calls for up to 6 minutes each. This high level of free calls distorts usage patterns, particularly since there is no analysis of median call length to establish the validity of the six-minute free call duration or the number of free calls. Telephone usage revenues for TCC are heavily distorted towards international services with these being about 90% of total usage revenues, (excluding opportunity values of free calls imbedded in the rental fee). Installation fees, which represent 40% of domestic revenues and 16% total revenues, are a non-recurring annual revenue and are dependent upon network expansion. Following completion of the proposed investment program, network expansion will drop off considerably and heavily reduce this revenue source. Pricing of leased circuits and value-added services is substantially above economic costs, thus adversely affecting demand for specialized services. All of the above, particularly in light of the planned network expansion, implies the necessity for reviewing pricing policies, tariff structure and levels. As part of the institutional development and sector reform, TCC will carry out a tariff study, under terms of reference approved by the Bank, and will agree on the implementation of tariff adjustments necessary for TCC to meet the financial requirements contained in the Performance Indicators (para 4.18 (f)). The study's terms of reference are given in Annex 11.

Fiscal Impact

6.07 There is no formal process of resource transfer from TCC to the Government. TCC pays no customs duties, taxes or dividends; a situation which is liable to change in case TCC is fully commercialized. Nevertheless, TCC is taxed indirectly where all generated funds in excess of internal financing of investment expenditures are automatically retained by the Government at the end of each fiscal year (para 5.03). Transfers from TCC to the Government in the last two years amounted to almost 60% of net income.

6.08 During the project implementation period, TCC is expected to generate a cash surplus of JD 96 million (equivalent to 85% of net income) in excess of investment financing requirements, which can be made available for Government use (para 5.13). What is lacking, however, is a formal policy that would govern resource transfer from TCC and the sector (in case private participation is allowed for the provision of certain specialized services under sector commercialization) to the Government. Such policy

issues as taxation of TCC, TCC's financial structure as a business operating entity, and TCC's fiscal relations with the Government will be tackled in the proposed sector restructuring study (para 4.04).

Least Cost Solution

6.09 The project (para 3.04) represents the least cost solution for providing the service levels planned in using modern digital technology already introduced in the telecommunications network. The timing and dimensioning of various elements in the system as well as the design and comparisons of alternative network configurations are the result of careful studies made by TCC in close cooperation with retained engineering consultants. These technico-economic studies are based on world-wide recognized engineering practices.

Return on Investment

6.10 The internal financial rate of return on TCC's 1988-92 investments is 25% (Annex 16). The quantifiable economic rate of return is about 31%. These estimates understate total project benefits, since they do not take into account the total consumer surplus or the substantial secondary benefits accruing to the economy from improved telecommunications.

Risks

6.11 The project's main risks are the potential delays in the identification, formulation and implementation of sector and institutional reforms. The Government, the Bank and TCC will agree on appropriate action programs and on a monitoring system to ensure effective implementation. The conviction and commitment demonstrated by the Government and TCC to the proposed sector restructuring and institutional development plans indicate that this risk is manageable. On the physical side, there are no unusual risks associated with the project. With the help of experienced consultants, the project has been adequately planned and the inputs required for various project components have been properly determined and timed. The same consultants have been retained to assist in project implementation, improving operations management and in training. Staff requirements for project implementation and network operations have been defined, agreed by the Bank and are expected to be available as required. Invitations to bid for goods to be financed by the Bank have been issued. Tender documents for the other main components of the project, namely switching and transmission, have been reviewed by the Bank and are expected to be issued before Board presentation. Potential cofinanciers have been identified and negotiations are underway. One source of uncertainty may be due to slower economic growth in Jordan than anticipated and its potential impact on demand patterns and levels for telecommunications service (para 2.03). Another source of risk may arise out of delayed physical implementation due to delays in the execution of buildings, civil works,

and/or installation of plant and equipment. A sensitivity test on the rate of return (Annex 16) indicates that a 20% reduction in benefits would reduce the estimated economic rate of return to 26%. Furthermore, a two-year delay in benefits but with no postponement of costs would reduce the estimated economic rate of return to 19%. A combination of a 20% increase in capital expenditures and operating costs combined with a 20% reduction in revenues, which is extremely unlikely, would reduce the estimated economic rate of return from 31% to 20%.

Environmental and Health Effects

6.12 The proposed project is expected to have no adverse environmental and health effects. On the contrary, more efficient use of telecommunications would substitute for personal transportation and correspondingly reduce environmental pollution and promote energy conservation. In addition, improved telecommunications services would facilitate dispersion of health services and emergency care.

VII. CONCLUSIONS AND RECOMMENDATIONS

7.01 During negotiations, the following assurances were obtained that:

- (a) TCC will: (i) consult with the Bank before introducing any major changes in its investment program, which in the aggregate would involve more than 10% of the total amount of investments planned for the five-year program ; and (ii) ensure that no such changes will be introduced unless TCC and the Bank have agreed that these changes are justified (para 3.03);
- (b) TCC shall finalize procurement and cofinancing agreements, in an aggregate amount of about US\$80.0 million, to finance switching, transmission and other project components to be procured under price and terms bidding before June 30, 1989 (para 3.09);
- (c) TCC will maintain the Project Implementation Unit until project completion and will employ or assign additional staffing and resources, according to agreed targets, to ensure effective project implementation (para 3.18);
- (d) TCC will present performance targets for 1990 and each subsequent fiscal year for joint review with the Bank by October 31 of previous year, review progress with the Bank not later than June 30 of each year, and take all necessary corrective actions (para 3.19). Agreement on 1989 targets was reached during negotiations;
- (e) TCC will furnish audited financial statements to the Bank, including an audit report of the Special Account, within six months after the end of each fiscal year (para 4.14);

- (f) TCC will: (i) take all measures necessary to ensure that the sector restructuring and tariff studies shall be completed and a copy thereof furnished to the Bank by July 31, 1989; (ii) carry out a mid-term review of the studies with the Government and the Bank by April 30, 1989; and (iii) following completion of the studies, the Government, the Bank and TCC will exchange views on the studies' recommendations and TCC will, on the basis of said exchange of views, carry out a Sector Reform Program approved by the Government, in accordance with the following schedule: tariff restructuring and adjustment by January 31, 1990, and sector commercialization by July 31, 1990 (para 4.20);
- (g) TCC will: (i) undertake all studies on institutional development under terms of reference acceptable to the Bank, and in accordance with the implementation schedule at Annex 12; (ii) furnish to the Bank quarterly progress reports and conduct semi-annual reviews with the Government and the Bank on interim results of the studies; and (iii) following completion of the studies' recommendations, and on the basis of such recommendations and exchange of views, prepare a Management Development Program and complete the implementation of said Program by October 31, 1991 (para 4.21);
- (h) TCC will furnish to the Bank, by end December 1988, a detailed aging schedule of accounts receivable and will implement a plan, satisfactory to the Bank, to provision over the project period for all outstanding bad debt (para 5.08); and
- (i) TCC will achieve a net internal cash generation not less than 50% of investment expenditures on a moving three year average basis in any one year during the project implementation period (para 5.13).

In addition, assurances were obtained from the Government that:

- (j) The Government will take all necessary measures for carrying out the Sector Reform Program and the Management Development Program, after exchanging views with the Bank on the studies' recommendations (para 4.22).

7.02 The following is a condition of effectiveness:

- (a) TCC shall have secured cofinancing agreements, satisfactory to the Bank, in an aggregate amount of US\$46.0 million to finance local networks (para 3.09).

7.03 Subject to agreement on the above, the proposed project is suitable for a Bank loan of US\$36 million at standard terms.

JORDAN

JORDAN TELECOMMUNICATIONS CORPORATION (TCC)

A TELECOMMUNICATIONS PROJECT

FORECAST DEMAND AND DEL GROWTH

1. Forecasts of demand have been carried out by consultants and as part of the revision of the Development Plan. These forecasts have focussed on the growth in the demand for connection to the national network for telephone service, that is, the number of direct exchange lines (DELs). Other elements in the demand that affect network planning are the number of leased circuits, and the traffic generated per connection.

2. Demand projections have been based on a standard forecasting model that is commonly used in the telecommunications industry. Demand is measured as the sum of connections, the waiting list for connection and suppressed demand. At the start of the planning period, these elements of demand totalled just above 300,000:

DEL Connections	203,000
Waiting List	84,800
Suppressed Demand	15,000
Total Demand	<u>302,800</u>

The figure for suppressed demand is probably underestimated, as customers are unlikely to register their interest in connection in areas not yet linked to the network. Taking the demand estimate at face value, the proportion of demand satisfied is 67%.

3. The growth in demand for exchange lines date can be approximated by an exponential curve. However, the use of a simple exponential curve as a forecasting method will eventually lead to overoptimistic projections as the penetration of exchange lines increases. Demand is therefore related to basic parameters: the rate of economic growth and the rate of growth and distribution of population.

4. In principle, the relative price of telecommunication services is also relevant^{1/}. In the forecasting work under review, no account has been

1/ The standard forecasting model for DEL demand is:

$$\text{Demand Growth} = \text{Constant} + b.\text{GDP per capita} + c.\text{Popn Growth} + d.\text{Relative Price of Telephone Service}$$

where the Constant and the coefficients b, c and d are to be estimated.

taken of the effect on demand of the expected long term fall in relative price of telecommunication services and to this extent the demand estimates are understated. The demand for leased circuits has been particularly suppressed by high prices charged.

5. The estimated rate of growth of demand for DELs in the revised Development Plan is 10% per annum, if the base is taken as total demand as estimated above. The forecasting model is long term; demand is estimated to continue to grow at 5.5% to the year 2005. Only the projections for the plan period to 1992 are reviewed in this Annex. Forecasts for later years are in any event subject to revision in future planning rounds.

Economic Growth

6. The ratio of the growth in demand for telephone service to the rate of growth of GDP per capita is a measure of the income elasticity of demand. Studies in other countries at varying levels of development and over many years indicate income elasticity at between 2 and 4. Jordan is likely to be at the upper end of this range because of the high proportion (over 60%) of the economy accounted for by services. Demand for telephone service has been shown to be particularly sensitive to growth rates in the service sector. Direct measurement of income has not been fully met and estimates of unmet demand are not reliable.

7. For the forecast period, an annual average growth rate of GDP of 4% has been assumed. Jordan's economy is sensitive to events in neighbouring countries and the rate of economic growth can vary substantially from year to year. During the last ten years, annual rates of growth have varied from 1 to 11%. On recent trends, 4% is a reasonable estimate which is also consistent with the Bank's economic projections for Jordan.

Population Growth

8. Jordan's population has been growing at a rate of 3.5% per annum, and this is expected to continue for some years. This rapid rate of population growth is likely to have a complex effect on demand. On the one hand, the rate of growth of GDP per capita will probably be no more than one per cent per annum. On the other hand, the increase of population will contribute to demand independently of income level.

9. The combined effect of GDP growth and population growth alone should be to increase demand by at least 7% per annum (the calculation is as follows: forecast growth in GDP per capita is 1.1% a year; multiplied by income elasticity of 4 gives a growth rate of 4.4 from existing population; add population growth of 3.5% gives a combined growth rate of 7.9%).

Population Distribution

10. The distribution of population will add to the growth of demand. As the predicted penetration rate, and hence demand, increases with the size of the population centre, the rapid long term growth in population will have a

slightly geared effect on demand. An additional factor tending to increase the rate of growth of residential demand is the expected fall in the average size of households.

11. The base for projections of population distribution is the 1979 Census, which provided data on employment and households. Using this data, several categories of population centre were identified and separate penetration rates were projected for each category. Local network planning has been based on the projections for the year 2005, but the numbers for later years can be revised once the results of the next Census, to be held in 1989, are available.

12. Some 60% of subscribers are located in the Greater Amman area. The detailed forecasts for this area substantially affect the national total. The Master Development Plan for Greater Amman published in 1986 provided a more up to date basis for projections than was available elsewhere.

13. Outside Amman, the deterrent effect of high installation fees and the limited reach of the existing network has suppressed demand. In future, a higher proportion of expansion will be accounted for by these areas.

14. The sum of the local area projections of demand corresponded well with the national total, estimated separately.

Excess Demand

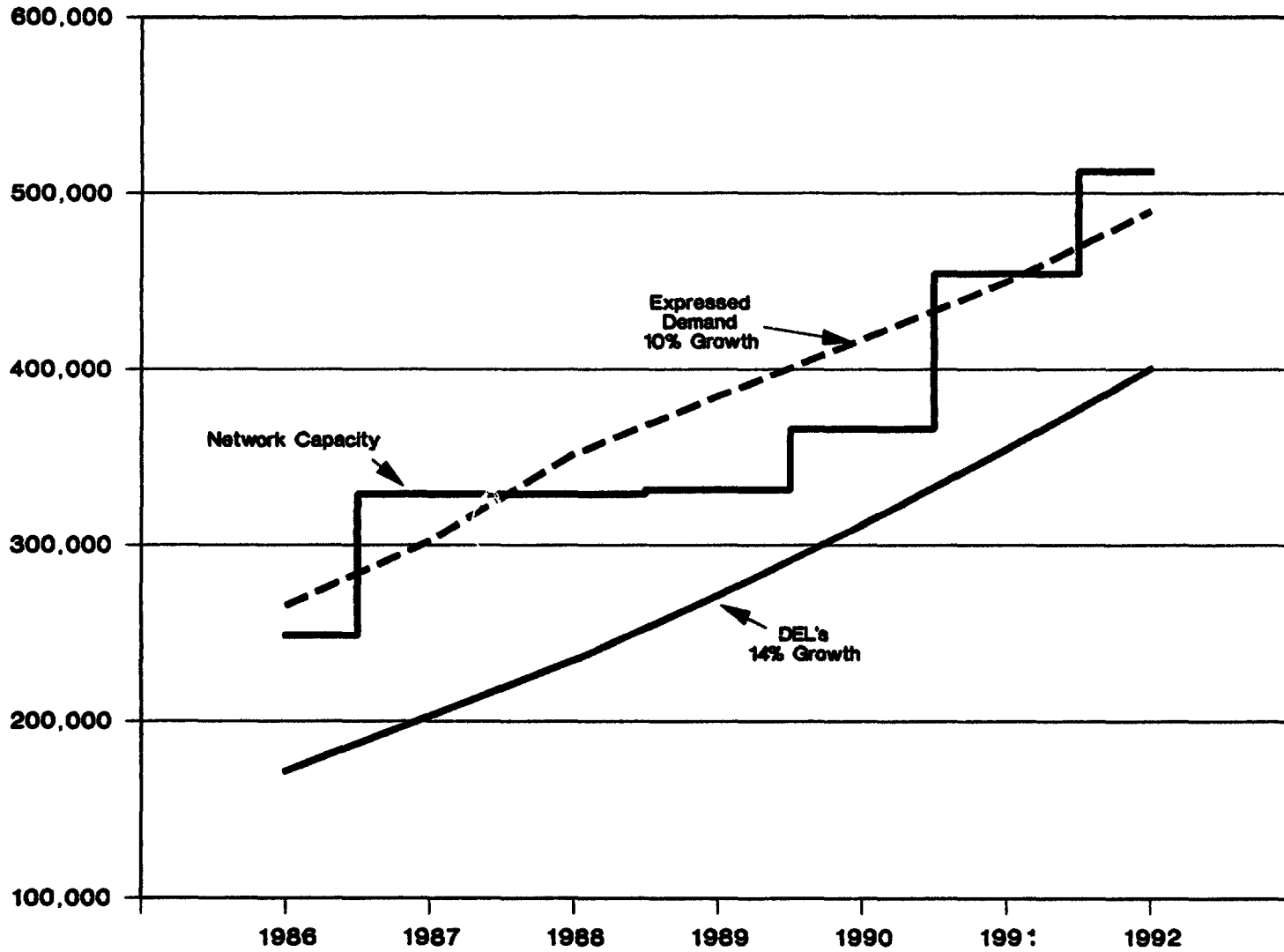
15. In practice, the growth in the number of DELs will continue to be supply constrained throughout the plan period. Growth in network capacity is projected at about 10% per annum to 1992, that is, at the same rate as demand. The number of connected DELs however is expected to grow at a slightly faster pace, on average at 14.5% per annum, as a result of the increased proportion of investment in outside plant during the expansion program 1988-1992.

Conclusions

16. The forecasts of demand underlying the development plan are satisfactory. Network expansion and DEL connections are planned to grow at a rate of 10% and 14.5% per annum over the plan period, respectively. Examination of underlying economic and demographic projections suggests growth in demand will be sustained at the rate of 8-10% per annum. This lower, more robust, estimate will not affect the plan targets because of the overhang of unmet demand. That is, the planned rate of expansion in the number of DEL connections will satisfy the demand if demand grows at no more than 9% per annum. The forecasts for later years will be revised when the results of the 1989 Census of Population are available.

**JORDAN
 JORDAN TELECOMMUNICATIONS CORPORATION (TCC)
 A TELECOMMUNICATIONS PROJECT
 FORECAST DEMAND AND DEL GROWTH**

ANNEX 1.1



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JORDANJORDAN TELECOMMUNICATIONS CORPORATION (TCC)A TELECOMMUNICATIONS PROJECTRegional Distribution of Telephone Service

(As of December 31, 1987)

Network	DELS in Service	Population (100) ^{1/}	% of DELS	% of Population	No. of DELS Per 100 Population	Waiting List
Amman	128,134	11,719	63.2	41	10.9	36,619
Ajloan	1,784	664	0.9	2	2.7	1,784
Aqaba	3,497	416	1.7	1	8.4	308
Dair Abi Said	1,834	1,052	0.9	4	1.7	3,238
Hanina	1,802	813	0.9	3	2.2	3,545
Irbid	16,666	2,659	8.2	9	6.3	10,906
Jarash	2,636	815	1.3	3	3.2	1,395
Maan	1,980	553	1.1	2	3.6	122
Madaba	5,895	929	2.9	3	6.3	2,809
Mafraq	3,582	1,102	1.8	4	3.2	3,596
Ramtha	2,883	550	1.4	2	4.8	635
Salt	6,158	1,268	3.1	4	4.1	3,560
Zarka	18,611	4,517	9.2	16	4.1	15,885
Rest of Country	6,812	1,625	3.4	6	4.2	404
Total	202,908	28,682	100	100	7.1	84,806

^{1/} Based on the 1979 census updated and projected forward.

JORDAN

JORDAN TELECOMMUNICATIONS CORPORATION (TCC)

A TELECOMMUNICATIONS PROJECT

Basic Data - Jordan Telecommunications Facilities

(As of December 31, 1987)

	<u>1987</u>	<u>1992</u>
<u>TELEPHONE SERVICE</u>		
Telephone Switching Units		
-Automatic	85	191
-Manual	350	200
Installed capacity		
-Automatic	316,502	498,000
-Manual	13,220	3,000
Connected main lines (DELS)		
-Automatic	190,715	400,000
-Manual	7,264	876
-Exchange fill (automatic exchanges)	60%	80%
-Percentage of automatic DEL	96%	99%
-Public call offices/PCO	1	7
-Coin Boxes	80	180
Telex exchanges		
-Installed capacity	4,000	4,000
-Telex DELs	1,178	2,500
-Exchange fill	29%	63%
<u>INTERNATIONAL FACILITIES</u>		
Satellite earth station	3	3
-International satellite circuits	570	1,001
International terrestrial circuits		
-Installed international switch capacity	900	1,800
-Installed circuits	276	396

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Description of the Physical Components of the Project

General

1. The proposed project is TCC's 1988-92 investment revised program. Jordan back-bone long distance transmission routes, including regional transmission links with neighbouring countries have already been established under the previous investment programs. Therefore, the proposed project mainly aims at the development of the local telephone networks across the country and at increasing the network penetration into the less developed rural areas. Under the project, the expansion of the domestic and international long distance facilities will be consequently limited to the supply and installation of an additional national and international transit switching center (NISC), introduction of transit switching facilities in Irbid, switching and signalling modifications in the existing exchanges, additional multiplex equipment on the existing transmission routes to cope with the additional traffic resulting from the expansion of the telephone subscriber base, and the replacement of a worn-out satellite earth station antenna.

Existing facilities at the beginning of the project

2. The first semi-electronic exchanges (SPC analog FETEX-100 of Fujitsu) were introduced in Jordan in 1979, but in 1984, Jordan entered in the digital switching era with the introduction of the FETEX 150 of Fujitsu, Japan and the E10B from Alcatel, France and the phasing out of the electro-mechanical switching systems which is now fully completed. As of February 1988, the total installed switching capacity in the country amounts to 316,000 lines, 79,000 of which or 25% being of analog SPC FETEX-100 of Fujitsu and 6,300 or 2% of semi-electronic PENTEX from Plessey). The 230,700 lines of local digital switching equipment are divided between E10B of Alcatel 65% and FETEX-150 35%. The long distance network is a star centered on the National Switching Center (NSC) located in Amman. The NSC is a E10B switch with an installed capacity of 4,500 trunks. The international gateway is also a digital switch of type MT-20 of Thomson, France with an installed capacity of 3,400 trunks of which about 600 are used on international routes. The domestic long distance transmission network is predominantly digital with the exception of the microwave route Amman-Aqaba, which is close to the end of its economic life.

Technology

3. The expansion under the proposed project will further increase the coverage of the country with facilities using the digital technology to about 85% of the total installed capacity. Digitalisation of the network has the following advantages:

- the progress in the electronic components technology has been extraordinary over the last years and the resulting large-scale integration of circuits enables the production of relatively low-cost equipment.
- compared with electromechanical switching systems and analog transmission systems, digital systems facilitate the introduction of a large variety of new services as well as the enhancement and quality improvement of existing services;
- another important aspect of digital systems is their capability to integrate within a single domestic network, not only the transmission, switching and control functions, but also to integrate different telecommunications services and forms of transmission of information which results in cost reduction;
- finally, digital technology allows lower cost expansion of facilities to the rural areas.

The drastic reduction of optical fiber transmission cost has also made possible to introduce this new technology into the metropolitan junctions and primary areas networks where justified by the route capacity and the distance between nodes.

Local Telephone Networks

a) Local Switching

4. The Amman multi-exchanges area presently accounts for 63% of the total number of subscribers. Under the proposed project, the balance in favor of network development outside of the Greater Amman area will increase. However, although decreasing to 41% at the end of the project, the Greater Amman area will still dominate the Jordan network. Outside of Amman, the urban networks of the cities of Irbid and Zarqua will become multi-exchanges areas with the addition of new primary exchanges in Irbid Shamali and Zarqua Shamali. The telephone networks expansion has been conceived in such a way that the possibility remains open for the introduction of a third digital switching system into the domestic network, depending on the outcome of the international bidding. In this respect,

all 14 new primary centers totalling 116,832 lines to be created under the project and 76 small nodes stand-alone exchanges or concentrators totalling 53,008 lines to be linked to them within the new primary exchange areas, will be awarded following international competitive bidding. Switching equipment of ten existing switching nodes (9 E10B RLU's + 1 Fetex 150 RSU) totalling 21,352 + 6,020 lines which have to be replaced by newly created primary centers will have to be relocated within primary exchange areas whose primary exchange is of the same existing system (FETEX or E10B). Since equipment of those nodes is installed in containers, the redeployment should not raise too many difficulties. Expansion within 8 existing primary exchange areas under the project (7E10B + 1 FETEX) includes expansion of 4 primary exchanges by 6,184 lines, 31 small nodes by 18,622 lines and creation of 27 new nodes totalling 18,278 lines. Most of the switching equipment to be relocated will be used to carry out these expansions. Extension and modifications of the existing exchanges as well as redeployment will have to be procured from the original suppliers of the FETEX and E10B systems under negotiated contracts. Overall the installed switching capacity in the country will increase by 185,552 lines, 169,840 of which will be of new equipment purchased under ICB to be located in new created primary areas, the balance of 15,712 lines results from expansion of existing switching equipment by 43,084 lines within E10B and FETEX 150 primary areas, less 27,372 lines of dismantled and relocated existing equipment. Details regarding the population clusters affected by the project as well as the list and capacities of the switching nodes to be created, expanded and redeployed is available in the Project File.

b) Cable Networks

5. This project component includes expansion of local cable networks in about 620 cities, towns and villages, representing about 350,000 distributed main cable pairs (MDF) available for immediate and future connection of subscribers. This project component comprises civil work construction of ducts and installation of cable systems, for the primary and secondary levels of the local distribution networks and also for inter-exchange junctions in the three multi-exchange areas. The proposed network expansion is estimated to include about 2,525 km of underground duct cables, 10,790 km of buried cable and 29,936 km of aerial cable in the less populated areas. TCC's planning unit designed the duct system capacity for about 20 years of expansion, the primary and secondary cable systems for 5 years demand in the metropolitan areas and cities.

c) Transmission

6. As noted under Para 1 above, the transmission component under the project is mainly for the creation of new junctions links within the multi-exchange areas and between the new primary centers and the small switching nodes attached to them. Single mode optical fibre cables with 2 or 4 fibre pairs working at the wavelength of 1,300nm and microwave radio

links in the 8 or 15 GHz bands are planned to carry either 8 or 34 Mbit/s on the new routes. On some existing metallic pair cable routes, there will be new 2 Mbit/s PCM systems installed. Furthermore, there will be some extensions by new metallic pair cables to be used for PCM. Overall this project component comprises 61 short distance microwave links (one hop sometime using a passive relays) 29 optical fibre routes totalling 728 pair-km, 37 PCM cable routes totalling 181 km each with 10 X 2 Mbit/s PCM systems, and PCM systems expansions on existing PCM cables on improved pairs of junctions cables. This project component also comprises the redeployment and extensions of existing transmission routes with Alcatel and NEC equipment and the supply and installation of surveillance systems monitoring the alarms and the transmission characteristics of each route.

Long Distance and International

7. The following items are included in the project to cope with the traffic increase expected from the network expansion.

- (a) The existing National Switching Center in Amman which has reached its expansion capacity will have to be supplemented by the creation of an additional transit center. A national and international switching center (NISC) will be installed under the project. The NISC is planned for 450 analog international circuits and 170 2 Mbit/s digital interfaces (170 X 30 = 5100 ccts) for national or international traffic. A transit function will also be introduced in Irbid so that the traffic between the Northern primary areas will be independent from the NSC's in Amman.
- (b) Under the project, system modifications and some expansion or re-arrangement of the trunk routes are required in the existing primary exchanges, and in the NSC; increase of processor capacities, and modification of the R2 signalling system. Furthermore, TCC has included under the project the introduction of the CCITT common channel signalling system Nr7 (C7), and the full synchronization of the digital network.
- (c) The antenna of the Indian Ocean satellite earth station is worn out and repair costs without guarantee are excessive. A new satellite earth station and facilities for digital transmission antenna are planned under the project.

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A TELECOMMUNICATIONS PROJECT

DETAILED COSTS OF 1988-1992 INVESTMENT PROGRAM

(JD '000)

	1988			1989			1990			1991			1992			TOTAL		
	Local	Forex	Total	Local	Forex	Total	Local	Forex	Total	Local	Forex	Total	Local	Forex	Total	Local	Forex	Total
I. ONGOING WORKS																		
JPL-4 Project	1780	3501	5281	0	0	0	0	0	0	0	0	0	0	0	0	1780	3501	5281
Consultants	426	613	1039	374	539	912	420	607	1027	314	454	768	189	244	412	1702	2456	4158
TOTAL ONGOING COSTS	2206	4114	6319	374	539	912	420	607	1027	314	454	768	189	244	412	3482	5957	9439
II. NEW WORKS																		
Switching	8	12	20	322	2992	3314	597	6643	7240	551	5286	5847	172	1413	1585	1659	16346	18005
Transmission	0	0	0	827	1478	2305	732	2401	3133	1300	3621	4921	53	262	315	2912	7782	10674
Local Networks:																		
-Cables & Heavy Equipment	61	1126	1187	552	10141	10693	40	695	735	224	4021	4245	0	0	0	677	15633	16310
-Construction & Installation	0	0	0	6991	4423	11414	5274	3236	8560	3166	2257	5423	3443	2473	5916	10674	12439	23113
Buildings	636	146	782	486	86	572	551	99	650	241	43	284	0	0	0	2124	378	2502
Computer Systems	0	0	0	0	500	500	0	200	200	0	0	0	0	0	0	0	700	700
Technical Assistance	0	200	200	0	500	500	0	300	300	0	0	0	0	0	0	0	1000	1000
Miscellaneous																		
-Net. Network	0	0	0	70	980	1050	0	0	0	0	0	0	0	0	0	70	930	1000
-Satellite	25	95	120	225	475	700	0	390	390	0	0	0	0	0	0	250	950	1200
-Sub.Installations	210	640	850	222	880	1102	240	960	1200	258	1032	1290	276	1104	1380	1206	4816	6022
BASE COST	1140	2421	3561	995	22405	32100	7444	14964	22408	5750	16260	22010	3944	5252	9198	27972	61302	69274
Plus:Physical Contingency	102	185	287	886	1653	2739	666	952	1618	469	1129	1598	369	386	754	2492	4506	6997
Plus:Price Contingencies	37	26	63	982	486	1368	1099	482	1582	1196	1154	2350	1067	585	1671	4282	2735	7017
TOTAL NEW WORKS COSTS	1279	2632	3910	11444	24745	36189	9209	16399	25607	7415	18543	25958	5400	6223	11623	34748	68542	103288
TOTAL INVESTMENT COSTS	3484	6746	10230	11817	25284	37101	9829	17306	26634	7729	18997	26726	5568	6467	12035	88228	74498	112727

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JORDAN TELECOMMUNICATIONS CORPORATION (TCC)

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Procurement Packages for Goods and Services

The procurement of goods and services under the Project will be divided into six categories:

- (1) Outside Plant - heavy materials.
- (2) Outside Plant - services and accessories.
- (3) Supply and installation of switching equipment.
- (4) Supply and installation of transmission equipment.
- (5) Buildings.
- (6) Miscellaneous.

CATEGORY 1

Heavy materials for outside plant will be procured through one tender divided into seven lots:

- (1) Aerial cables.
- (2) Buried cables.
- (3) Duct cables.
- (4) Wooden poles.
- (5) PVC pipes.
- (6) Manhole covers.
- (7) Drop wires.

The materials will be delivered in two batches. The proposed World Bank loan will finance the first batch of lots 1,2, 3 and lot 7.

CATEGORY 2

The Outside Plant civil works, installation services and network accessories (i.e., materials not included in the Category 1 tender) will be procured through one international tender. The total requirements will be divided into two lots, one comprising the north of the country and part of Greater Amman, the other comprising the south of the country and the remaining part of Greater Amman. The contractors shall be joint ventures between foreign and local companies.

CATEGORY 3

The supply and installation of switching equipment will be procured through one international tender on prices and terms divided into ten lots:

- (1) Reinstallation of EIOB switching equipment.
- (2) Expansion and modification of EIOB switching equipment in 3 primary exchanges and 15 RLU, creation of 27 new RLU, dismantling of 9 remote units to be reinstalled under LOT 1, modifications in the existing EIOB primary exchanges and in the NSC, which include modifications/expansions of 2 Mbit/S interfaces, processor capacities, synchronization and modifications to the R2 signalling system.
- (3) Introduction of the C7 signalling system in the NSC.
- (4) Introduction of the C7 signalling system in all EIOB exchanges.
- (5) Redeployment of the Fetex 150 switching equipment.
- (6) Introduction of the C7 signalling system in the Fetex equipment.
- (7) Supply and installation of 76 RSU's in the 14 new primary areas.
- (8) Supply and installation of 14 new primary centers.
- (9) Supply and installation of a new national and international switching center (NISC).
- (10) Supply of diesel engine generators (DEG).

By including items 1-6 in the tender, the previous suppliers will become aware of the competition element.

The tenderers will be allowed to bid for any combination of lots with two exceptions:

- Alcatel and Fujitsu must bid for the redeployment of their existing equipment in order to be allowed to bid for other lots.
- Tenderers who bid for new large nodes defined as Primary Centres must also bid for the small nodes in the Primary Area.

The objectives aimed at by floating all new nodes in a single tender package are:

- Not more than one new additional switching system (if any) will be chosen.
- To make the package large enough to attract a maximum number of bids (i.e., maximum competition) and good financing offers.

CATEGORY 4

The supply and installation of transmission equipment will be procured through one international tender on prices and terms divided into eight lots:

- (1) Redeployment of TRT equipment.
- (2) Redeployment of NEC equipment.
- (3) New micro-wave routes.
- (4) New cable routes (optical fibres and conventional PCM).
- (5) New multiplex equipment.
- (6) New or extended supervisory equipment.
- (7) Rural Subscriber Radio System.
- (8) Satellite earth station.

Lot 4 includes optical fibre cables as well as conventional PCM cables. A preliminary choice will be made on the basis of currently available cost figures. The final system choice will depend on actually prices as tendered.

The tenderers will be allowed to bid for any combination of lots except that TRT and NEC must bid for the redeployment of their existing equipment in order to be allowed to bid for other lots.

CATEGORY 5

The procurement of buildings involves two types of tenders:

- (1) Tendering for consultancy services for detailed building design.
- (2) Tendering for construction.

Both types of tender will be local and restricted to companies of good repute, duly registered with the Ministry of Public Works.

The total requirements will be divided into 3-5 batches according to the priorities of the project implementation program (PIP). The batches may be further divided into lots based on the geographical distribution of the buildings to be erected.

The construction portion of each batch will be tendered separately.

CATEGORY 6

Under miscellaneous, the following tenders will be issued separately:

- (1) Telephone instruments (could possibly be included under Category 1 or 3 and tenders invited with prices and terms).
- (2) Computer Systems (Bank Guidelines for procurement of goods).
- (3) Consultant Services (Bank Guidelines for the selection of consultants).

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Disbursement Schedule
(\$ million)

IBRD Fiscal Year and Semester Ending	-----Project Schedule-----		-----Bank Profile-----
	Disbursements Per Semester	Cumulative ^{1/} Through Semester	For All Sectors Jordan
<u>FY89</u>			
December 88	0.0	0.0	0.0
June 89	2.5	2.5	0.0
<u>FY90</u>			
December 89	4.0	6.5	2.5
June 90	4.3	10.8	6.5
<u>FY91</u>			
December 90	6.1	16.9	10.8
June 91	4.4	21.3	16.9
<u>FY92</u>			
December 91	5.0	26.3	21.3
June 92	3.2	29.5	26.3
<u>FY93</u>			
December 92	2.9	32.4	29.5
June 93	1.8	34.2	32.4
<u>FY94</u>			
December 93	1.8	36.0	34.2
June 94	0.0	0.0	36.0

^{1/} Disbursement profile based on the Bank profile for all sectors in Jordan. Disbursements were advanced one semester because all invitations to bid for contracts to be financed by the Bank have been issued.

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JORDAN TELECOMMUNICATIONS CORPORATION (TCC)
A TELECOMMUNICATIONS PROJECT
PROJECT IMPLEMENTATION

Proposed Organization

1. TCC's present organization is not yet tailored to deal with the requirements of a substantial expansion program. The set-up of a permanent program implementation organization is one of the tasks to be undertaken in the framework of TCC's institutional development. To ease the transition an ad-hoc organization is proposed which best utilizes the available manpower within TCC, minimizes the need for consultancy services and which provides a good environment for the transfer of know-how.

The Project Implementation Organization

2. The Project Implementation Unit (PIU) has been organized in two levels. At the top level is the Project Director (PD) who has overall responsibility for the implementation and who represents TCC in contractual matters. At the second level there are Project Managers (PM) who are responsible for defined portions of the Project Implementation Plan (PIP).

3. The PD and the PMs make up the line organization of the PIU. They will need staff resources in the following areas:

- Technology
- Field Supervision
- Budget control
- Follow-up of quantities, etc.
- Supply management
- Contract administration
- Scheduling and coordination
- Logistics including secretarial services

The resources for field supervision will be allocated to the PMs. The other resources can be allocated to the PD or the PMs or a combination of both. The determining factor is the structure of the projects, i.e., the defined portions of the PIP which is handled by the PMs.

4. This structure is determined largely by the contractual arrangements which, in their turn, depend on the procurement strategy. TCC's strategy aims at separate procurement of the different technological components of the Program. In the following we will assume that the organization of the Implementation Team will follow the same lines, i.e., a functional type organization with a Project Manager for each technical discipline.

5. The Project Director will require staff resources for: a) registration, filing and monitoring of correspondence with the contractors; b) budget follow-up and forecasting; c) scheduling and coordination; and d) legal/commercial contract administration. Specialist staff for common technologies such as power and air-conditioning may also be attached to the PD.

6. Each Project Manager will be responsible for one or several contracts. The field supervision staff will be allocated per contractor. In addition, the PMs will be supported by a number of technical specialists/chief supervisors. One of their main responsibilities will be to ensure unified standards for field supervision, acceptance testing and interpretation of specifications.

TCC Manpower

7. Qualifications. The staff has been divided into three categories: managers, specialist staff and field staff. The Project Managers need good qualifications not only technically but also managerially including experience of dealing with contractors. Other TCC staff need good technical knowledge but the requirement for management experience is less vital. The field staff must also have good technical knowledge. This can partly be acquired through on-the-job training.

8. Recruitment and Training. Ideally, the TCC project staff should come from the operational departments. This may be achievable for switching and transmission. However, for outside plant there is a definite lack of qualified staff for operations so the process will have to be reversed. At the end of the implementation, the additional staff recruited for the Implementation Team will be transferred to the operational departments. Recruitment of additional staff will be required. The specialist staff for outside plant implementation should come from the design team and the deficit there made up by recruiting more designers.

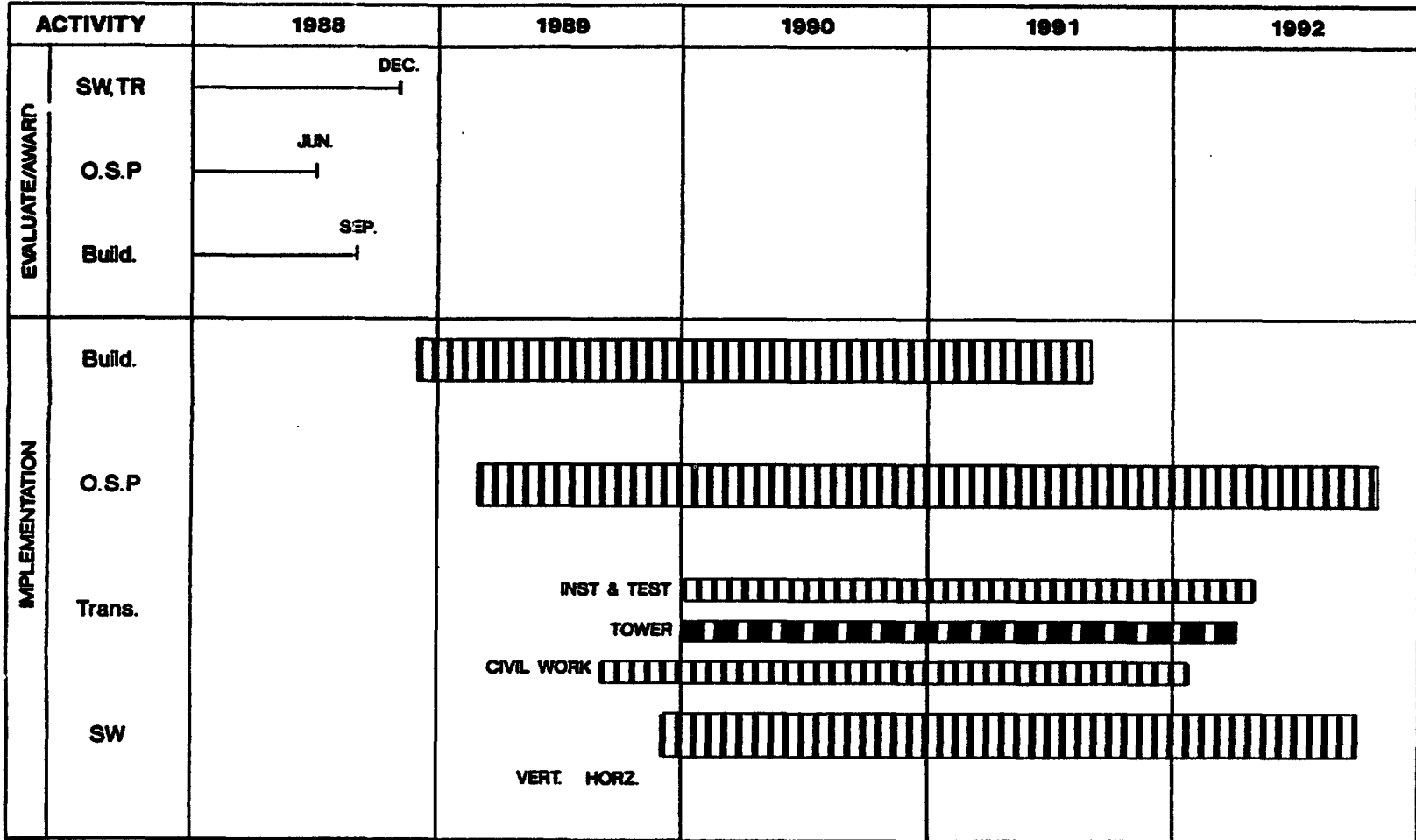
9. Technical training for switching and transmission will be conducted by the contractors. This training should be substantially complete before the first acceptance test.

10 In the case of Outside Plant, additional staff resources are needed. Considering that OSP is implemented and paid for on the basis of unit rates for work actually done, there is a need for vigorous follow-up and analysis of deviations between design and as-built quantities. Installation services and heavy materials will be procured separately. Staff resources will be needed to keep track of the material flow and to ensure that deliveries match requirements. The design work will continue during most of the implementation period.

11. Technical training for OSP will have to be arranged by the Telecommunications College and the Consultants. At least one design/engineering course similar to the one held in 1987 should be conducted. The students can be allocated either as designers or as field supervisors. The ongoing training program for Quality Controllers is a potential source for field supervisors. The field supervisors will need on-the-job training. This will be the task of the specialist staff. They will have to spend considerable time in the field during the early days of the implementation.

12. It is estimated that the Project Implementation Unit will require 36 staff in 1989 and 48 staff in 1990 and 1991. From mid-1991 to mid-1992 staff requirement is expected to decrease to about 34 and toward the end of the project PIU function and staff will be progressively integrated into the permanent organization. PIU staff will be recruited either from within the present organization or from outside. To meet the needs of PIU, TCC will have to recruit and train 36 staff in 1988 and 12 in 1989.

**JORDAN
JORDAN TELECOMMUNICATIONS CORPORATION (TCC)
A TELECOMMUNICATIONS PROJECT
PROJECT IMPLEMENTATION SCHEDULE**



OSP = Outside Plan

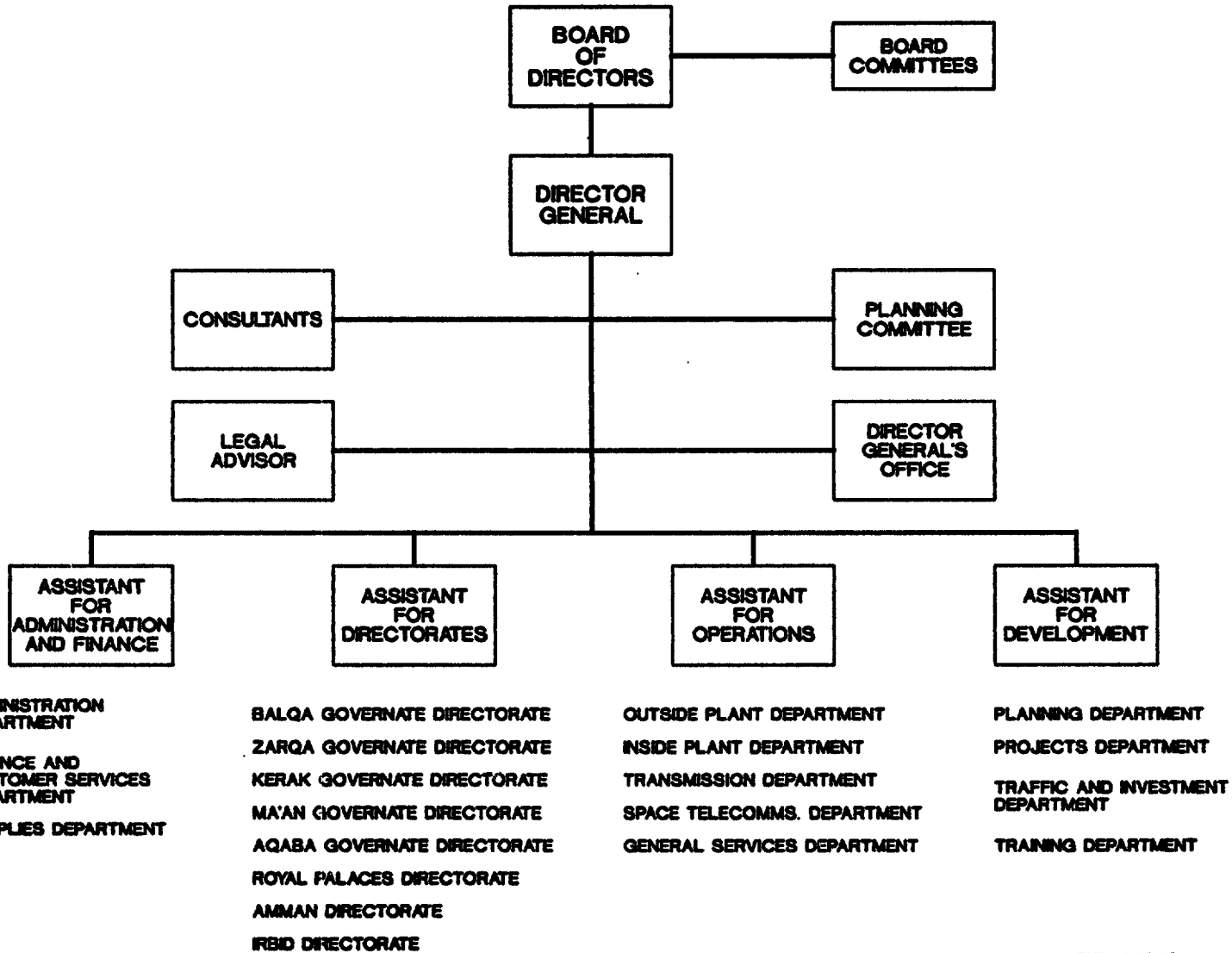
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JORDAN TELECOMMUNICATIONS CORPORATION (TCC)
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Performance Indicators

YEAR ENDING DEC. 31	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>
I. TECHNICAL PERFORMANCE						
(a) Telephone exchanges capacity (000 lines)	329,000	329,000	332,000	366,000	454,000	513,000
(b) Main telephone lines (connected (000 DELs))	203,000	235,000	272,000	312,000	355,000	400,000
(c) Telex exchange capacity (lines)	4,000	4,000	4,000	4,000	4,000	4,000
(d) Telex subscriber connected	1,172	1,190	1,200	1,300	1,400	1,500
(e) Network maintenance targets						
i) Faults reported per annum per 100 DELs	59	50	40	30	20	10
ii) Percent of faults:						
-Cleared within 48 hours	N.A.	70	75	80	85	90
-Cleared within 7 days	N.A.	90	95	97	98	99
(f) Average call completion rate						
i) Local call (%)	41	45	53	60	65	70
ii) Long distance (STD) (%)	47	50	55	63	65	67
iii) International calls						
-Outgoing (%)	45	48	52	55	55	55
-Incoming (%)	53	55	60	62	65	67
II. FINANCIAL PERFORMANCE (JD '000)						
Operating revenues	42,800	50,500	57,000	65,100	74,000	84,200
Operating expenses	17,400	28,000	32,300	36,000	40,000	43,700
Operating income	25,400	22,500	24,700	29,100	34,000	40,500
Net income	16,400	16,200	17,900	21,700	26,100	32,400
Rate of return (%)	17	14	13	15	17	20
Net Internal cash generation (%)	70	98	75	85	90	95
Operating ratio (%)	41	55	57	55	54	52
Current ratio	2.0	2.2	2.1	2.0	2.2	2.2
Debt Service Coverage ratio	2.3	2.8	3.1	3.4	3.8	4.5
Debt/Debt & Equity (%)	45	44	45	46	48	47
Receivables (days)	270	210	180	150	120	90
Operating Revenue/DEL (JD)	217	221	212	212	212	212
Direct Operating Cost/DEL (JD)	60	60	59	57	55	55
III. PROGRAM/PROJECT IMPLEMENTATION						
Construction Expenditures (JD'000)	23,500	9,000	35,700	25,300	26,000	21,600
IV. MANPOWER						
-Staff per 100 DELs	17	15	14	12	11	11

**JORDAN
 JORDAN TELECOMMUNICATIONS CORPORATION (TCC)
 A TELECOMMUNICATIONS PROJECT
 Basic Organization Chart**



JORDAN

JORDAN TELECOMMUNICATIONS CORPORATION (TCC)

A TELECOMMUNICATIONS PROJECT

Consultants' Terms of Reference

General

1. The aim of the technical assistance component of the proposed project is to support the Government and TCC in the commercialization of the telecommunications sector. The principal objectives are to: improve the overall regulatory, financial and institutional framework for the sector and TCC's operations; rationalize TCC's organizational structure and upgrade its management capabilities and manpower skills; and revise tariffs structure and levels including the development of pricing models. The technical assistance program has two main elements: (a) a sector restructuring study and a tariffs review; and (b) an institutional development plan covering key management areas; namely, organization and management, personnel and human resource development, accounting and financial systems, store and inventory management systems, management information systems and computerization.

Sector Restructuring

2. Objective: To reform the legal, financial, administrative and market structure of the telecommunications sector in order to commercialize TCC's operations and the provision of telecommunications products and services in Jordan.

3. Main Tasks:

- (a) review TCC's relationships with Government ministries and agencies, the rules and regulations governing such relationships, and recommend changes that would improve TCC's performance;
- (b) specify the policy responsibilities that need to remain with the Ministry of Communications and other regulatory authorities and delineate them from TCC's strategic, management and operational functions;
- (c) review TCC's Corporate Law and propose amendments so as to grant TCC commercial autonomy;

- (d) review and amend TCC's financial and administrative bylaws to provide TCC with the characteristics of an autonomous commercial entity, both in the conduct of its operations and its relations with customers and suppliers;
- (e) formulate policies for the transfer of resources between TCC and Government including taxation whether in the form of customs duties, income tax or sales tax; dividends; investment financing and raising of capital;
- (f) develop a personnel policy for the staff of TCC separate from the Civil Service Code and appropriate to its autonomous status and commercial functions;
- (g) review the structure and function of TCC's Board of Directors, reassessing its role, the criteria for selection and appointment of Members and the delegation by the Board of financial and administrative powers to TCC's management;
- (h) devise and institute policies and rules that would allow for private sector participation in the provision of telecommunications services; and
- (i) with respect to each of the above items, make proposals, formulate a 'Plan of Policy Actions' and assist the Government and TCC to carry out agreed recommendations;

Tariffs

4. Objective: To develop principles and procedures to guide the formulation of an appropriate level and structure of tariffs for telecommunication services in Jordan; to devise analytical tariff models incorporating these principles; to apply the models to the present tariffs and to recommend changes that meet national objectives in a way that is consistent with the strategy of commercialization.

5. Main Tasks:

- (a) Demand - assess the characteristics of government, business and residential demand for telecommunications services and the sensitivity of demand to changes in prices charged.
- (b) Usage - review data on the development of the national telecommunications network, the level and pattern of use of services and revenues. Particular emphasis should be placed on analysis of peak traffic periods, the distribution of usage among customer groups and the pattern of international traffic.

- (c) Costs - identify the incremental costs of system expansion in relation to changes in technology and of additions to traffic carrying capacity in and between Amman, other urban and routing centres and rural areas.
- (d) International services - review the level of collection and settlement rates for international services taking into account the balance of incoming and outgoing traffic, the number and routing of circuits and circuit occupancy.
- (e) National Development and Social Considerations - an analysis should be made linking national economic development plans, sectorial objectives and the role of tariff policy. Discussion should focus on the desirable basis for charging customer groups for access to, and use of, particular services, including public call offices, mobile and data services and services in rural areas.
- (f) Financial Implications - a financial impact analysis of the recommended tariff policy should be made, in order to ensure that principles and procedures are applied so as to ensure TCC's continued viability as a commercially autonomous entity able to finance expansion while recognizing Jordan's need for resource mobilization;
- (g) Organizational Aspects - assess the process for tariff review and for approval of tariff changes, and examine the role and constitution of a tariff review committee, the timing and methodology of implementing tariff adjustments, and the staffing requirement of a tariff section with TCC;
- (h) Results - the study should result in a set of recommendations for a tariff policy, guidelines for the revision for telecommunication services with implications for revenues, financial performance and resource transfer to Government. The study should also produce an analytical, computer-based, model of tariffs capable of being used with TCC for the systematic review and adjustment of tariffs.

Organization and Management

6. Objectives - To develop for TCC an organizational structure, management functions, systems and practices suitable for an efficient and effective commercial telecommunications entity.

7. Main Tasks:

- (a) review with TCC's management the Corporate mission, goals and objectives and agree on appropriate strategies for commercialization;
- (b) conduct a comprehensive review of TCC's current organizational structure, management functions and operations both in the Headquarters and in the Regions;
- (c) assess the current managerial, administrative and operational procedures, delegation of authorities and division of responsibilities between Headquarters and field units;
- (d) translate the corporate objectives and strategies into broad functions and structural units. Break-down each structural unit into job structure and determine capital and human resource requirements and allocations;
- (e) introduce and develop new commercial functions necessary for TCC to be managed as an independent business entity such as treasury, corporate planning, business development and marketing. Define the composition and structural linkages of these functions in relation to TCC's other organizational units;
- (f) design an organizational structure that would achieve a balance between central managerial control and decentralization of operational authority to the Regions, reinforce TCC's structural linkages, streamline its operational and managerial functions along commercial lines, enhance the efficiency and productivity of TCC's operations and improve TCC's effectiveness in managing growth, responding to shifts in demand patterns and technologies and in integrating new value-added services;
- (g) specify the critical work and information flows and design a reporting system that would facilitate effective management planning and control;

- (h) formulate and propose measures for assessing performance and for strengthening managerial accountability of TCC's organizational units;
- (i) devise a reorganization action plan and an implementation scheme that would ensure optimal reallocation of physical and human resources. Particular emphasis should be placed on the question of staff participation, behavioral resistance and the management of change; and
- (j) assist TCC in the implementation of the reorganization.

Personnel and Human Resource Development

8. Objective: To develop a modern personnel management system and a human resource development program consistent with TCC's reorganization, commercialization and investment plans.

9. A. Personnel Management - Main Tasks:

- (a) examine the job structure under the proposed reorganization and develop appropriate job classification and grading;
- (b) design a reporting system for the preparation and periodic review of job descriptions for all job staff categories;
- (c) establish methodology and procedures for setting performance targets and productivity measures;
- (d) develop a formal and systematic process for staff performance evaluation. Propose measures relating performance to compensation levels and career advancement;
- (e) review current salary structure and levels, employee benefits and compensation programs. Propose a salary adjustment plan that recognizes relevant labor market rates and TCC's financial and operational requirements. Address the issue of equity between new recruits and existing staff;
- (f) review current recruiting, hiring and promotion policies and procedures, and propose necessary changes;
- (g) develop the functional specifications for a personnel data system to support management control and staff development;
- (h) coordinate with the MIS study group to determine technical specifications for a modern computerized personnel system. Assist TCC in the identification and the acquisition/development of appropriate payroll software system;

- (i) review current payroll procedures and develop functional specifications for a modern computerized payroll system. Assist TCC in the identification and the acquisition/development of appropriate payroll software system; and
- (j) assist TCC in the implementation of the above, and provide on-the-job training.

10. B. Human Resource Development - Main Tasks:

- (a) in conjunction with the reorganization and commercialization plans, assist TCC in the formulation of manpower strategies and policies;
- (b) assess existing manpower availability, skill mix and overall productivity levels;
- (c) determine future manpower needs to carry out TCC's investment program and reorganization plan;
- (d) identify staffing and skill deficiencies and formulate accordingly recruitment strategy and action plans;
- (e) examine current and planned technical and management training programs and facilities, and integrate into a master human resource development program;
- (f) identify management development needs, and design training programs for various functional areas. Determine organization, budget and other resource requirements;
- (g) develop a system for planning and controlling manpower productivity, measuring performance and deciding on training programs with changes in demand, technology and the corporate objectives and strategies; and
- (h) coordinate closely with TCC's Training College and Jordan's Institute of Public Administration for the development and implementation of the above.

Accounting and Financial Management

11. Objective: To upgrade and modernize TCC's accounting and financial methodologies, practices and procedures in view of commercialization. Develop an integrated computer-based financial and managerial accounting system and a financial planning and management system.

12. A. Accounting - Main Tasks:

- (a) review and further develop TCC's survey, initiated by the Finance Department in 1987, of TCC's general financial activities and accounting applications. Evaluate the system of internal controls, degree of integration and functionality;
- (b) review TCC's procedures, documentation and reporting for commercial book-keeping. Recommended changes to allow for the computerization of TCC's accounts;
- (c) review the allocation of responsibilities for the accounting functions and major reports. Establish organization, rules and procedures for the decentralization of certain accounting and budgeting tasks to Regions while maintaining integration with central accounts;
- (d) review current methodology and procedures used for asset management, including fixed assets and inventory. Evaluate assigned responsibility levels and procedures for acquisition, retention and sales of assets;
- (e) assess and improve the valuation, recording and reporting system of fixed assets;
- (f) evaluate current depreciation and revaluation policies, and recommend changes to reflect prudent commercial considerations;
- (g) set up a stock documentation, reporting and costing system linked to the main store and inventory management system;
- (h) examine current billing and collection procedures for Amman and the Regions. Review current procedures for monitoring and accounting of payments by subscribers and for disconnection of defaulters. Develop and institute new policies and procedures in order to improve billing and collections, enhance control and effectiveness of debt settlements and minimize level of floating funds;
- (i) review the capital and operating expense budgeting processes. Specifically, assess assumptions, authorization levels, techniques, time horizons, and levels of managerial participation in the overall budgeting process;

- (j) evaluate current methods and procedures for setting budget targets and for measuring, monitoring, controlling and interpreting the budget variances. Introduce new measures to improve the overall budgeting and control process;
- (k) establish methodology and process for setting cost standards, financial performance and productivity measures;
- (l) develop an analytical cost accounting system that would permit a breakdown and a detailed cost/benefit assessment of network components, services, centers of activity, operational and organizational units; and
- (m) establish a system for assigning and assessing cost/revenue responsibility and accountability.

13. B. Financial Planning and Management - Main Tasks:

- (a) create and develop a unit for financial planning and management, including capital investment and treasury functions. Determine organization, staffing and budget requirements;
- (b) introduce methodology, system and procedures for evaluating the costs and benefits of alternative investment decisions, including the development of computer-based analytical models for financial planning and economic analysis;
- (c) develop a capital budgeting process specifying the appropriate budgeting cycles, the groups involved in financial planning and their organizational levels, the structure and format of budget reporting, and the extent of senior management involvement and their responsibility for investment decision making;
- (d) institute a feedback monitoring system covering key financial indicators that the management needs to adjust and guide investment targets and strategic decisions; and
- (e) provide TCC with all the capabilities of a treasury function of a commercial entity; including, inter alia: financing techniques to assess benefits, risks and costs of alternative financing sources for project financing and for optimizing the overall capital structure of TCC; issue of debt (and ultimately equity) securities; management of liabilities and foreign exchange exposure, and cash management.

14. C. General

- (a) Technical Specifications - translate the functional specifications, stated above, into an integrated computerized financial system. Coordinate with the MIS study group to determine the appropriate hardware and software requirements. Assist TCC in the acquisition/development and implementation of financial software applications.
- (b) Financial Information - develop a financial information base and reporting system to support effective planning and control at various operational and managerial levels.
- (c) Organization - examine current Finance organization and procedures, and recommend improvements in the framework of TCC's overall reorganization plan.
- (d) Staff and Training - determine staffing and skill requirements to realize proposed financial systems. Develop and implement financial training seminars for central and field personnel on the use of the reporting and budgeting system as well as the use of computers in accounting and finance.
- (e) Implementation - develop action plans for the implementation of each subsystem, the acquisition of software packages and for training. Ensure staff participation and transfer of know-how.

Management Information Systems and Computerization

15. Objective: To develop an integrated management information system (MIS) and a computerization plan to support the decision making process at all levels in strategic, managerial and operational functions.

16. Main Tasks:

- (a) formulate with TCC's management the MIS objectives in a manner that support the achievement of the corporate objectives, strategies and plans, particularly in regard to commercialization;
- (b) examine TCC's reorganization plan and its structural and management characteristics. Assess resource availability and constraints;

- (c) propose organization for "MIS Steering Committee" involving key managers of principal functions to direct and monitor the planning process for MIS;
- (d) devise strategies and policies to govern resource deployment in the development of an integrated and effective MIS. Specifically, propose policies regarding such issues as: MIS structure and evolution (centralization versus decentralization); acquisition of hardware equipment; software development (internal versus external); selection of MIS applications (return on investment and/or strategic importance); personnel training and motivation; etc...
- (e) propose an MIS organization at a high managerial level to be responsible for planning, system development, design and coordination of information systems and computer applications. Determine budget and manpower requirements;
- (f) perform a system analysis to define the information needs and reporting requirements at various operational and managerial levels within TCC;
- (g) organize the information needs into a set of output reports. The reports content, format and level of detail should be determined according to the functional needs of each management position;
- (h) specify the input data elements, processing and flows and integrate into the design of a management information reporting system;
- (i) define the functional and technical specifications for the development of a data base to support management planning and control;
- (j) identify the main functional applications for computerization. Select and prioritize according to strategic relevance to TCC's objectives and taking into consideration TCC's resource constraints;
- (k) design a computer-based information subsystem for each functional application. Define hardware and software specifications and determine organization, budget and manpower requirements;

- (l) integrate all subsystems into a master MIS plan. Formulate short-term and long-term action plans with particular emphasis on personnel deployment and training;
- (m) design a computer network configuration tailored to TCC's management structure and MIS plans. Consider, wherever possible, a modular design to minimize the risk of capacity under-utilization;
- (n) assist TCC in preparing technical specifications and tender documents for the acquisition of computer systems. Take into consideration changes in technology trends, system compatibility for future integration, ungradability for expansion, system transparency and user-friendliness for staff acceptance and availability of local support for maintenance;
- (o) coordinate with other study groups for the acquisition of specific application software packages such as personnel, payroll and accounting; and
- (p) assist TCC in establishing the core of the proposed MIS organization and in implementing the management information reporting system and the selected computer applications. Conduct orientation and training seminars to ensure management and staff participation. Design and implement a scheme for on-the-job training.

Procurement and Inventory Management

17. Objective: To develop and implement an integrated computer-based procurement and inventory management and control system which would enhance TCC's operating efficiency and profitability.

18. Main Tasks:

- (a) review and upgrade the procurement planning and purchasing routines including the maintenance of stock specifications files, supplier files, reorder levels and quantities. Establish order processing files that takes into account TCC's policies and regulations;
- (b) develop an adequate stock costing system, particularly for local purchases;
- (c) review the current structure of stores management, and propose a new stores organization. Develop an implementation plan that specifies resource requirements including staff redeployment and training;

- (d) devise and institute modern practices and procedures for the storage and distribution of capital project and maintenance materials, based on detailed volume movement analysis;
- (e) reorganize the stocks layout and storage in order to allow access to frequently used items as well as effective control of project material;
- (f) develop proper stock specification and location codes, covering remote locations. Install verification system of stock balance;
- (g) establish proper stores issues, receipts, routines, and procedures for stores maintenance and stock distribution;
- (h) design and help implementing a computer-based stock recording, evaluation, storing and ordering system;
- (i) develop and establish a data base to provide management with information on stock levels, movements and costs for planning and control purposes; and
- (j) design and implement a scheme that would ensure proper staff training, particularly with regard to the use of computer models for store and stock management of modern telecommunications entities.

Organization and Transfer of Know-how

19. Consultants will organize and carry out each study in three main phases: (i) development phase which will involve situation analysis and formulation of proposals including functional and technical specifications for each principal activity; (ii) review of recommendations with TCC to agree on proper actions; and (iii) implementation of agreed recommendations on the basis of detailed action plans that recognize TCC's cultural environment, organizational and resource conditions and constraints. Particular emphasis should be placed on top management involvement in understanding the benefits and risks of restructuring and of introducing change.

20. TCC has already retained consultants to help in developing TCC's investment plan and operational functions. Hence, selected Consultants for any component of the technical assistance program will review thoroughly on-going and planned consulting activities to avoid duplication and to ensure effective coordination. TCC will be responsible for establishing an organizational framework for directing, monitoring and coordinating all consultancy work.

21. Consultants will be required to train and transfer skills and know-how to designated counterpart staff in all the above tasks. Consultants shall make specific proposals in this regard.

22. Consultants shall indicate in their proposals the following for each of the above tasks:

- (a) total manmonths proposed to be employed for each phase;
- (b) person (or persons) proposed to be employed with his/her curriculum vitae, and period for which each will be available;
- (c) bar chart indicating the proposed dates of commencement and completion of the task, period for review, preparation of proposals, implementation of proposals, training of TCC staff, the availability of personnel for the task both in consultants headquarters and in Jordan;
- (d) detailed work program;
- (e) program for transfer of skills and know-how and training of TCC staff; and
- (f) assistance expected from TCC specific to the task.

Consultants' Responsibilities

23. The Consultants shall be responsible for providing all the services specified in the Terms of Reference and any additional services that TCC deems necessary in the course of Consultants' assignment which are mutually agreed between TCC and the Consultants. Additional consultancy services and their costs shall be mutually agreed between TCC and the Consultants and an amendment to the contract issued which shall be subject to IBRD's clearance before becoming effective.

24. The Consultants shall appoint a Team Leader and a Deputy Team Leader to assume overall responsibility for the total assignment and liaison with TCC. The Team Leader shall be fully responsible for all activities and performance of all Consultants personnel, and settlement of all accounts in Jordan including any duties or taxes that may become due during the Consultants assignment(s).

25. The Consultants shall be responsible for providing necessary accomodation (office and residential), furniture, office equipment, (word processors, copying machines), typewriters, secretarial assistance, local transport and all other facilities for their assignment in Jordan. The

Consultants requirements of telecommunications facilities will be discussed during contract negotiations and agreement recorded in the minutes of the negotiations.

26. In submitting proposals and reports which require TCC's agreement prior to Consultants proceeding with the next step, the Consultants shall allow TCC adequate lead time for review and comments. TCC shall be responsible for providing timely response to all such Consultants requests.

27. The Consultants shall inform TCC promptly of any circumstances or proposed changes in the agreed work program and/or constitution of Consultants team which may affect the contents of Consultant assignment, its budget, time schedule, and in agreement with TCC take all measures to minimize the effect of such changes.

JORDAN

JORDAN TELECOMMUNICATIONS CORPORATION (TCC)

A TELECOMMUNICATIONS PROJECT

Action Plans for Sector Restructuring and Institutional Development

1. The list of studies under the project's technical assistance component, the responsibility for each and an agreed implementation schedule are tabulated on page 2 of this Annex.
2. From an implementation standpoint, the studies will be grouped in two categories; sector reform and institutional development.
 - (a) Sector reform studies: These are the sector restructuring and tariff studies which would require the involvement of both the Government and TCC. Upon the completion of the studies, the Government, the Bank and TCC would review the studies' recommendations and agree on a "Sector Reform Program" and a corresponding implementation action plans by end August 1989. A mid-term review would be carried out in April 1989.
 - (b) Institutional development studies: TCC would have the responsibility for all studies related to the development of its organization, manpower skills and management functions. All studies under this category would be designed to be carried out in two broad phases; development and implementation. This approach would allow the Bank and TCC to plan and agree jointly on appropriate management programs at the end of the development phase that could be realized during project implementation. The Bank would review regularly with TCC the consultancy work based on quarterly progress reports. By end October 1989, an agreement would be reached on a comprehensive "Management Development Program" and implementation action plans. Manpower allocations and implementation schedules would be adjusted according to the results of the initial development stage.
3. The studies' term of reference (Annex 11) have been finalized and agreed with the Bank. To ensure that both the sector commercialization and institutional development plans are carried out in accordance with the agreed action plans, letters of invitation to a short list of qualified consulting firms, approved by the Bank, will be issued by end May and contracts awarded in September, 1988.

	Responsibility	Start	Elapsed Time (Month)	Completion
A. <u>Sector Reform Studies</u>				
1. Sector Restructuring	Government/TCC			
-Development		Oct. 88	9	July 89
-Implementation		Aug. 89	12	July 90
2. Tariff Structure and Levels	Government/TCC			
-Development		Oct. 88	6	April 89
-Implementation		Aug. 89	6	Jan. 90
B. <u>Institutional Studies</u>				
3. Organization and Management	TCC			
-Development		Oct. 88	9	July 89
-Implementation		Nov. 89	15	Jan. 91
4. Personnel System and Human Resource Development	TCC			
-Development		April 89	6	Oct. 89
-Implementation		Nov. 89	12	Nov. 90
5. Accounting & Financial Systems	TCC			
-Development		Oct. 88	9	July 89
-Implementation		Aug. 89	18	Jan. 91
6. Procurement & Inventory Management	TCC			
-Development		Oct. 88	6	April 89
-Implementation		May 89	9	Feb. 90
7. Management Information System	TCC			
-Development		April 89	9	Jan. 90
-Implementation		Feb. 90	18	July 91

JORDAN

JORDAN TELECOMMUNICATIONS CORPORATION (TCC)

A TELECOMMUNICATIONS PROJECT

Income Statements

(JD '000)

FY ending December 31	ACTUAL				DRAFT		FORECAST				
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
REVENUES											
TELEPHONE											
DOMESTIC:											
Installation	1766	1207	2133	4112	4007	3407	4940	4625	5000	5375	5750
Subscriptions	1789	1714	3174	3564	4309	4845	5829	6841	7881	9001	10203
Excess Calls	1015	947	1302	2676	1884	1368	2051	2335	2009	2891	3178
Subtotal	4549	3869	6609	10352	10200	9619	12819	13801	15490	17267	19131
INTERNATIONAL:											
International Calls	5637	14257	17345	19579	20044	19280	23777	29302	35442	42506	50588
Leased Circuits	487	557	633	688	872	707	778	855	941	1035	1138
Settlements	434	2608	1641	2520	4050	6309	5994	5694	5409	5139	4882
Subtotal	6558	17422	19618	22707	24966	26296	30548	35852	41793	48680	56609
SUBTOTAL	11107	21291	20227	33139	35166	35915	43367	49653	57282	65946	75740
TELEX											
Installation	53	50	42	44	30	25	24	25	26	27	29
Subscriptions	578	669	798	831	944	839	987	1015	1066	1119	1175
Messages	4355	4313	4180	4393	4191	3860	3843	3914	3987	4061	4136
Subtotal	4984	5032	5020	5268	5165	4723	4834	4954	5079	5207	5340
TELEGRAPH	372	318	282	282	252	272	259	246	234	222	211
SATELLITE STATION	168	284	491	381	392	403	423	444	467	490	514
OTHER REVENUES	264	506	684	896	1024	1409	1616	1777	1955	2151	2366
LESS: BAD DEBT WRITE-OFF	0	0	450	675	500	1000	1000	1500	1500	2000	2000
Value Added Tax	0	0	0	0	0	0	0	0	0	0	0
TOTAL REVENUE	10695	27410	32234	39200	41499	41783	49499	55574	63516	72016	82170
OPERATING EXPENSES											
Personnel	3882	3968	4614	4977	5702	6150	6953	8097	9400	10883	12568
Materials, Maint., & Transp.	1325	1574	2095	4428	2904	3397	3851	4379	4888	5411	5945
Depreciation	1976	2195	3288	5539	5998	6224	14805	17210	19139	21541	23405
Satellite Station	381	584	727	772	1018	1081	1135	1192	1251	1314	1379
Write-off of obsolete stock	454	835	676	0	1148	0	0	0	0	0	0
Consultancy Fees	557	227	433	647	300	585	1238	1412	1327	768	412
Value Added Tax	0	0	0	0	0	0	0	0	0	0	0
Subtotal	8534	9361	11831	16364	17150	17437	27983	32290	36005	39917	43710
OP. TING INCOME	8361	18049	20402	22927	24349	24346	21518	23285	27511	32098	38459
Less: Exchange Loss(Gain)	-27	208	687	1300	2550	1988	0	0	0	0	0
Net Income before Interest	8388	17843	19716	21627	21799	22358	21518	23285	27511	32098	38459
Less: Interest	385	283	1152	1143	3284	5920	5537	5384	5784	6022	6089
Net Income before Tax	8003	17560	18564	20484	18515	16438	16179	17900	21727	26077	32370
less: Income Tax	0	0	0	0	0	0	0	0	0	0	0
NET INCOME AFTER TAX	8003	17560	18564	20484	18515	16438	16179	17900	21727	26077	32370
Operating Ratio	48	31	34	41	38	41	55	57	55	54	52
Rate of Return (%)	20	41	38	24	19	17	14	13	15	17	20
ROR after Taxes (35%)	13	27	26	16	14	13	10	10	11	12	14

JORDAN

JORDAN TELECOMMUNICATIONS CORPORATION (TCC)

A TELECOMMUNICATIONS PROJECT

Balance Sheets

(JD '800)

FY ending December 31	ACTUAL				DRAFT		FORECAST				
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
ASSETS											
Gross Fixed Assets	53189	57539	79356	149546	154123	162196	198938	226391	256371	284449	300074
Plus:F. Exchange Adjus.					5151	13673	19805	19805	19805	19805	19805
	53189	57539	79356	149546	159274	176069	218743	246196	276175	304254	319879
Less:Acc. Depreciation	10740	12935	16222	21466	25114	31338	46144	63354	82493	104034	127439
Net Fixed Assets	42449	44604	63134	128080	134160	144730	172599	176842	187683	200220	192440
Work In Progress	16888	43473	56792	5367	24467	39887	6204	20440	15768	7648	8646
Long-term Investments	2492	3456	3788	3925	3811	3696	3881	4675	4279	4493	4717
CURRENT ASSETS:											
Cash	531	1144	1842	1712	2437	37	9415	12565	15662	24517	32739
Accounts Receivable	6014	14085	16681	27446	27974	33464	32117	32803	32984	32718	31270
Less: Doubtful Accounts	375	375	825	1500	2000	3000	4000	5500	7000	9000	11000
Net Accounts Receivable	5639	13710	15856	25946	25974	30464	28117	27303	25984	23718	20270
Other Debtors	38	38	286	142	138	210	221	232	243	255	268
Inventory	1629	1600	1198	1446	2054	2303	2844	3123	3512	3955	4158
Total Current Assets	7837	16490	19103	29246	30692	33015	40597	48222	45341	52446	57436
TOTAL ASSETS	69666	108024	142807	166618	192980	221329	223281	244579	253070	264806	263238
LIABILITIES											
Equity:											
Government Contribution	42308	46967	46967	46967	46967	46967	46967	46967	46967	46967	46967
Retained Earnings	6164	23664	39434	50845	56079	64653	66572	74994	76312	77366	77943
Total Equity	48412	70631	86401	97812	103046	111620	113539	121961	123279	124333	124910
Debt Outstanding:											
Long-term Debt	15324	26256	41547	53014	72021	90204	98936	99174	104258	114301	109938
Current Liabilities:											
Cur. Portion of LT Debt	802	610	3391	3958	7437	7776	7506	9001	8933	7671	8811
Suppliers	1782	5599	3149	4983	4789	4593	6989	8031	8931	10053	10922
Contract Retentions	293	1833	4652	3590	2146	2595	1627	2234	3050	2563	2379
Accrued Expenses	458	808	820	637	893	1677	2000	2316	2656	3022	3414
Total Current Liab.	3335	8650	12313	13069	15266	16642	18043	20582	22671	23309	25527
Reserves & Other:											
Sub/cont to projects	811	811	730	694	762	724	724	724	724	724	724
Subscribers Deposits	884	1026	1166	1379	1556	1744	1744	1744	1744	1744	1744
Indemnity Reserves	900	950	650	650	330	395	395	395	395	395	395
Subtotal	2595	2486	2547	2724	2648	2863	2863	2863	2863	2863	2863
Total Liabilities	21254	37393	56406	68806	89934	109708	109742	122619	129791	140473	138328
TOTAL EQUITY & LIABILITIES	69666	108024	142807	166618	192980	221329	223281	244579	253070	264806	263238
Current Ratio	2.35	1.91	1.55	2.24	2.00	1.98	2.25	2.10	2.00	2.25	2.25
Debt/Debt+Equity	0.24	0.27	0.32	0.35	0.41	0.45	0.44	0.45	0.46	0.48	0.47

JORDAN

JORDAN TELECOMMUNICATIONS CORPORATION (TCC)

A TELECOMMUNICATIONS PROJECT

Funds Flow Statements

(JD '000)

FY ending December 31	ACTUAL					DRAFT		FORECAST			
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
SOURCES											
Net Income Before Interest & Exchange Loss	8361	18649	26482	22927	24349	24346	21516	23295	27511	32898	38459
Plus: Depreciation	1976	2195	3288	5539	5998	8224	14805	17210	19139	21541	23485
Internal Cash Gen. (Gross)	10337	20844	23690	28465	30347	30571	36321	40495	46650	53640	61864
Less: Income Tax	0	0	0	0	0	0	0	0	0	0	0
Less: Debt Service											
-Interest	385	283	1152	1143	3284	5920	5337	5384	5784	6022	6889
-Amortization	3483	802	610	3691	3858	7437	7776	7506	8801	8033	7671
Internal Cash Gen. (Net)	6469	19159	21928	23631	23285	17214	23209	27684	32865	39585	48184
Change in LT Debt Borrowings:											
Proposed IBRD	0	0	0	0	0	0	1500	7700	1500	600	700
Other Ext. Borrowings	3913	11302	18644	18423	19814	15578	4639	10639	11617	17114	3749
Local Borrowings	0	0	0	0	0	0	0	0	0	0	0
Foreign Exc. Adjustment	0	241	338	4982	6631	10381	0	0	0	0	0
Subtotal	3913	11542	18982	15325	26444	25959	6139	18339	13117	17714	4449
Reserves & Other	336	-109	60	177	-76	216	0	0	0	0	0
TOTAL SOURCES	10712	30592	48970	39133	49573	43388	29347	45943	45982	57299	52553
APPLICATIONS											
Construction											
Previous Program	10395	30935	35126	19089	25987	23553	0	0	0	0	0
Proposed Project	0	0	0	0	0	0	8991	35689	25307	25958	16823
Preinvestments	0	0	0	0	0	0	0	0	0	0	5000
Subtotal	10395	30935	35126	19089	25987	23553	8991	35689	25307	25958	21823
L-T Investments	782	864	332	137	-114	-115	185	194	284	214	225
Net Working Capital	-2251	2146	2832	9554	2737	1377	5910	581	62	6184	3912
Exchange Loss & Adjustment	-27	276	687	5896	7781	18710	5932	0	0	0	0
Transfers to Government	1893	-4656	2794	5277	13282	7863	8329	9479	20488	25023	26793
TOTAL APPLICATIONS	10712	30592	48970	39133	49573	43388	29347	45943	45982	57299	52553
Net Internal Cash Gen./ Construction (X):											
-annual rate	62%	62%	62%	124%	89%	73%	258%	77%	130%	152%	222%
-3 year moving average	n.a.	62%	76%	86%	93%	109%	100%	120%	115%	165%	184%
Debt Service Coverage Ratio	2.7	18.7	13.4	5.9	4.2	2.3	2.8	3.1	3.4	3.8	4.5

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JORDAN TELECOMMUNICATIONS CORPORATION (TCC)

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Notes and Assumptions for the Financial Forecasts, 1988-92

Detailed traffic and operating statistics which form the basis for these forecasts are shown on page 4 of this Annex. Tariffs are maintained at the same levels as in 1987 (Annex 15). Domestic traffic per line is assumed to decrease with network expansion. International traffic is increased at 5% per year to account for the 28% decrease in international tariffs in 1987, which would require an effective increase in international calls of 40% to arrive at the same revenue level. The number of connected telex lines are assumed to grow at a modest rate of 5%, but telex use is expected to decrease at 3%. Where no major change is expected, financial projections represent extrapolations of historical data.

I. INCOME STATEMENTS

(A) Operating Revenues

Telephone and Telex - Traffic and subscription revenues are calculated by multiplying the revenue per DEL times the average number of DEL in service. Installation revenues are calculated on the basis of additional lines installed. All details are given in the table at the end of this Annex.

Leased Circuits - Forecast to increase at 10% per annum.

International Settlements - Forecast to decrease by 5% per annum as a result of increased international tariffs which will adversely affect outgoing traffic.

Telegraph - Forecast to decrease by 5% per annum.

Satellite - Use of satellite station services such as for TV coverage of international events. Assumed to increase at 5% per annum.

Other Revenues - Include subscription fees of military agencies and public telephone and telex. Forecast to increase at 10% per annum.

Write-offs of Bad Debt - Have been selected so as to reduce receivables by the equivalent of 30 days of billing each year in order to arrive at a receivables level of 90 days of billing in 1992.

(B) Operating Expenses

Personnel - Average number of employees times average salary per employee. The total number of employees is expected to increase by 1000 during the project five-year period. Annual salaries are to increase at 10% per annum, which is higher than the projected inflation rate, to reflect salary adjustments in case TCC is granted autonomy under the commercialization plan.

Materials, Maintenance, Transport - Forecast to decrease by 3% per annum with the use of modern digital technology, improved maintenance and staff productivity.

Depreciation - Depreciation rate is accelerated from 4% in 1987 to 7.5 in 1988 and thereafter, calculated on the basis of average gross fixed assets in service.

Satellite - Forecast to increase at 5% per annum.

Write-off of obsolete stock - Zero.

Consultancy Fees - The sum of the cost of retained consultants and that of the consultancy work under the project's technical assistance, as projected in the investment program (Annex 15).

Income Tax - TCC pays no taxes.

II. BALANCE SHEET

(A) Assets

Gross Fixed Assets - Addition to fixed assets are based on the Project Implementation Plan (PIP), as follows: 1988-6434; 1989-21453; 1990-29980; 1991-34078; 1992-15625.

Work-in-Progress - Calculated by taking into account the total investment expenditures in any year less the corresponding additions to fixed assets.

Long-term Investment - Participation in INTELSAT and ARABSAT. To increase at 5% per annum.

Accounts Receivable - Expected to decrease by the equivalent of 30 days of billing per annum in order to achieve a receivables level of 90 days of billing in 1992.

Other Debtors - Forecast to increase at 5% per annum.

Inventory - Forecast at 12 JD per DEL which correspond to about 2% of gross fixed assets, based on historical data.

(B) Liabilities

Long Term Debt and Current Portion - Based on the project financing plan, cost of funds and projected debt service.

Suppliers - Forecast at 4.5% of average gross fixed assets in service.

Contract Retentions - Forecast at 10% of construction expenditures of each year.

Accrued Expenses - Forecast to increase at about 14% per annum, corresponding to the average increase in DELs in service.

Reserves & Other - No change.

III. FUNDS FLOW STATEMENT

Borrowings - Borrowing schedules based on estimates of contractual payments, resulting from the phasing of the investment program.

Construction - As per investment program (see Annex 5).

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Operating Statistics

(JD '000)

	ACTUAL				EST.		FORECAST				
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
POPULATION('000)	2399	2496	2595	2694	2796	2902	3018	3127	3246	3369	3497
EXPRSD (ESTMD) DEMAND	171070	197175	226318	255127	265778	302800	352356	384915	417473	450032	490445
EXCHANGE CAPACITY	96784	113984	156844	244948	248968	329172	324452	331844	366582	454476	512717
TELEPHONE DELs	80074	98176	119340	144972	171951	202876	234876	271876	311876	354876	400876
DELs/100 POP	3.6	3.9	4.6	5.4	6.1	6.8	7.8	8.7	9.6	10.5	11.5
DELs/Household	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7
% INCREASE IN DELs	20	14	22	21	19	14	19	16	15	14	13
% DEMAND MET	50	50	53	57	65	65	67	71	75	79	82
% EXCHANGE FILL	89	86	76	59	69	61	72	82	85	78	78
AVERAGE TEL. DELs	78050	92125	100750	132150	158402	187414	218876	253376	291876	333376	377876
REVENUE PER DEL:											
DOMESTIC:											
Installation	122	100	101	100	149	137	130	125	125	125	125
Subscriptions	22	19	29	27	27	26	27	27	27	27	27
Excess Calls	13	10	12	20	12	7	10	9	9	9	8
INTERNATIONAL:											
Call Minutes	99	163	177	153	131	150	157	165	173	182	191
Charge per min	0.73	0.95	0.90	0.97	0.97	0.70	0.70	0.70	0.70	0.70	0.70
Revenue	71	155	159	148	126	105	110	116	121	128	134
TELEX LINES IN SERVICE	1856	2163	2459	2702	2612	2620	2751	2889	3033	3185	3344
AVG. TELEX LINES IN SERVICE	1712	2459	2311	2581	2657	2616	2686	2820	2961	3109	3264
% INCREASE IN TELEX LINES	18	17	14	10	-3	0	5	5	5	5	5
REVENUE PER TELEX LINE:											
Installation	183	163	142	181	180	180	180	180	180	180	180
Subscriptions	337	272	345	322	355	360	360	360	360	360	360
Messages	2544	1754	1809	1702	1577	1475	1431	1388	1347	1306	1267
TELECOMMUNICATIONS STAFF	3310	3265	3248	3315	3325	3310	3510	3710	3910	4110	4310
STAFF/1000 DELs	38	33	27	22	19	17	15	14	12	11	11
AVERAGE NO. OF STAFF	3177	3288	3257	3282	3320	3318	3410	3610	3810	4010	4210
AVERAGE COST/STAFF PER YEAR	1216	1206	1417	1517	1717	1854	2039	2248	2467	2714	2985
MAT, MAINT, TRANSP/DEL	16	17	19	33	18	18	18	17	17	16	16
TOTAL OPERATING COSTS/DEL	106	99	107	121	106	93	128	126	122	119	115

JORDANJORDAN COMMUNICATIONS CORPORATION (TCC)A TELECOMMUNICATIONS PROJECTSummary of Telecommunications Tariffs
(As of December 31, 1987)

1. <u>TELEPHONE SERVICE</u>	JD	
	<u>1983</u>	<u>1987</u>
- Connection fee		
• Residence	100.00	100.00
• Business	120.00	200.00
- Rental fee per year		
• Residence	18.00	24.00
• Business	24.00	36.00
- Call charges		
• Local per minute	0.01	0.01
• Long distance; per 3 min from Amman to:		
- Zerga	0.04	0.06
- Irbid	0.10	0.15
- Kerak	0.10	0.21
- Aqaba	0.20	0.24
• International, per minute:		
- Gulf States	0.65	0.45
- North Africa	0.86	0.45
- Europe	1.25	1.00
- USA and Canada	1.75	1.25
- Rest of the World	1.75	1.50
2. <u>TELEX SERVICE</u>		
- Connection fee	180.00	180.00
- Rental fee, per year	360.00	360.00
- Call Charges, per minute		
• Local	0.01	0.01
• Long distance		
- Zerga	0.02	0.02
- Irbid	0.04	0.04
- Kerak	0.06	0.06
- Agaba	0.10	0.10
• International		
- Gulf States and North Africa	1.35	1.35
- Other African States	1.60	1.60
- Europe	1.00	1.00
- USA	1.35	1.35
- Canada and South America	1.60	1.60

1/ Included 1,000 3-minute free calls in 1983; increased to 2,000 6-minute free calls in 1987.

2/ Nighttime rates are now operated at 70% of day rates for international and 50% for long distance.

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Return on Investment

1. The project covers TCC's entire investment program for the period 1988-1992. The benefit period of the project extends from 1988 to 2008, when on average the equipment installed under the project is expected to have completed its useful life. Operating costs attributed to the project are the costs of the new telephone and telex lines that would be connected, less the operating cost savings realised on existing lines. Benefits attributed to the project are the telephone and telex traffic on the new lines that would be connected and the higher growth (or decline) in traffic on existing lines. From 1993 on, operating costs and benefits relating to the project are assumed to remain constant. Maintenance and replacement costs for the period 1988-2008 are included in operating costs. No residual values of fixed assets have been taken into account as their present value in real terms would be minimal.

2. A summary of the cost and benefit streams is given below in JD million. All revenues and costs have been deflated to bring them to their comparable 1988 price levels.

Incremental Costs and Benefits of the Project

FY	Investment Costs	Incremental Operating		Net Benefits
		Costs	Benefits	
1988	9.0	-	-	(9.0)
1989	34.0	1.2	6.3	(28.9)
1990	23.0	2.2	13.2	(12.0)
1991	22.4	2.7	20.3	(4.8)
1992	13.7	3.5	27.7	10.5
1993 to 2008	0	3.5	27.7	10.5

3. The internal rate of return of the above financial streams is 25%. However, this calculation understates benefits that would be derived from TCC's investment program. The calculation does not take into account consumer surplus and indirect and external benefits that would be received by non-users of telecommunications services. A portion of the consumer surplus that would be realized has been estimated by assuming that: (a) service demands by new subscribers on average are similar to demands of existing subscribers; and (b) existing and new subscribers will be willing to pay for telecommunications services the same prices in real terms as they are paying at present. Based on these assumptions, the minimum estimate of the economic rate of return of TCC's investments between 1988 and 1992 is 31%.

4. A sensitivity analysis was made of the economic rate of return with the following results:

20% increase in capital expenditures	-	26%
20% increase in operating expenditures	-	30%
20% decrease in operating revenues	-	26%
Combination of the above	-	20%
Two years delay in benefits	-	19%

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Documents in the Project File

A. Selected Reports, Studies and Decrees on the Sector and TCC

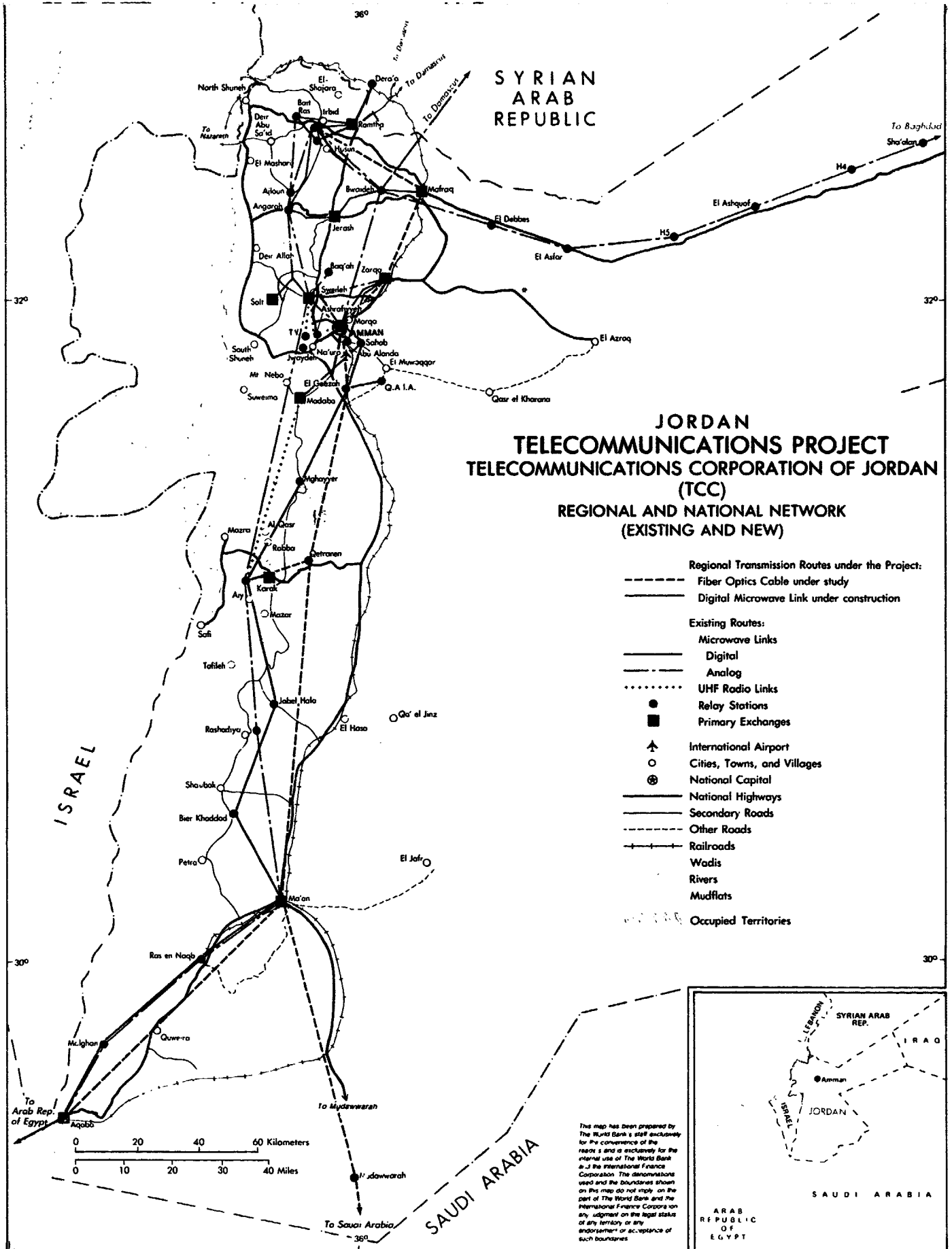
- A1 - A Revised Development Plan and a Project Implementation Plan for TCC's 1988-92 Investment Program, September 21, 1987.
- A2 - Organizational and Manpower Requirements for the Implementation of 1988-92 Investment Program, prepared by TCC, 1988.
- A3 - Feasibility study on the Privatization of the Telecommunications Corporation of Jordan, a British Teleconsult report, November 1985.
- A4 - Educational Project in the Field of Telecommunications in Jordan for 1986-1995, a study sponsored by the French Ministries of Foreign Affairs and Telecommunications, December 13, 1986.
- A5 - Complementary training for new TCC engineers, a study sponsored by the French Ministries of Foreign Affairs and Telecommunications, July 17, 1987.
- A6 - O & M Project Studies on Organizational Management and Management Information Systems, prepared by SWEDTEL Consultants, 1987.
- A7 - Law No. 29-1971, dated June 1, 1971, establishing the Telecommunications Corporation and its operations.
- A8 - ByLaw No. 3-1974, dated January 26, 1974, governing TCC's personnel statute.
- A9 - TCC's Financial ByLaw No. 30-1974, dated May 1, 1974.
- A10 - ByLaw No. 53-1978, dated August 27, 1978 governing TCC's procurement practices.
- A11 - ByLaw No. 50-1983, dated September 14, 1983, governing TCC's telephone rules and regulations.
- A12 - TCC: Financial procedures, 1988.
- A13 - TCC: Internal Auditing procedures.

B. Selected Reports, Studies Relating to the Project

- B1 - A Note on the Telecommunications and Postal Sector, Bank Exploratory Mission, May 9, 1986.
- B2 - Project Brief, October 26, 1987.
- B3 - Back-to-Office Report and Aide Mémoire, Bank Preparation Mission, September 11, 1987.
- B4 - Back-to-Office Report, Bank Preappraisal Mission, December 21, 1987.
- B5 - Post-Appraisal Report, Bank Mission, April 7, 1988.
- B6 - A Note on the Analysis of Rural Investment, prepared by a Bank Mission, August 1987.
- B7 - A Note on Sector Restructuring of Telecommunications in Jordan, prepared by a Bank Mission, April 1988.

C. Selected Working Papers, Documents, Statistics and Tables

- C1 - TCC: Audited Financial Accounts, 1982-86.
- C2 - TCC: Draft Financial Accounts for 1987.
- C3 - The Characteristics of Telephone Traffic in Jordan, July 1985 to February 1987.
- C4 - Personnel statistics, issued by TCC Administration Department, 1987.
- C5 - Bidding Documents - Local Line Plant, Category 1 for Heavy Materials, Volume 1-3, February 1987.
- C6 - Bidding Documents - Local Line Plant, Category 2 for Services and Accessories, Volume 1-4, February 1987.
- C7 - Letter of Invitation and Terms of Reference for Consultancy Services under the Project Technical Assistance.
- C8 - Agreement for Consultancy Services 1987-90 between TCC and Swedish Telecom International AB, No. TCC 2/87, 1987.



SYRIAN
ARAB
REPUBLIC

**JORDAN
TELECOMMUNICATIONS PROJECT
TELECOMMUNICATIONS CORPORATION OF JORDAN
(TCC)
REGIONAL AND NATIONAL NETWORK
(EXISTING AND NEW)**

- Regional Transmission Routes under the Project:
 - Fiber Optics Cable under study
 - Digital Microwave Link under construction
- Existing Routes:
 - Microwave Links
 - Digital
 - Analog
 - UHF Radio Links
 - Relay Stations
 - Primary Exchanges
 - ✈ International Airport
 - Cities, Towns, and Villages
 - ⊙ National Capital
 - National Highways
 - Secondary Roads
 - Other Roads
 - +—— Railroads
 - Wadis
 - Rivers
 - Mudflats
 - Occupied Territories

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