

CHAPTER VIII

TRANSPORT AND COMMUNICATIONS

Transportation and communications contribute to the development of all other sectors of the economy. The components of the systems, including roads, railroads, seaports, air transport, postal services and telecommunications, must be expanded to meet the demands arising from the growth of the other sectors.

Considerable progress has been made in developing adequate surface and air transport systems in recent years, but these systems will need continuing emphasis in the next several years. Postal and telecommunications services will also need to be improved and expanded.

Transportation and communications services are expected to grow at an average annual rate of 12.9 percent during the Plan as measured by their contribution to GDP. This compares with a growth rate of 11.8 percent during the previous five years.

By the end of the Plan, the major and secondary road network will be completed, the feeder road construction will have been initiated, and a program of rural road construction will have been undertaken. The airport construction and improvement program will be well underway. Automatic telephone systems will be installed in the cities and most of the towns. The most important intra-Kingdom links of the telecommunications system will be completed. Service to the Arabian Gulf area by microwave or coaxial cable will be available during the first portion of the period. Service to other foreign areas via satellite will be possible before the end of the Plan.

Implementation of these programs will require stronger organizations and more trained personnel. Improvements in operations and methods will be emphasized. Replacement of foreign workers with Saudi Arabians is an overall goal that will be pursued throughout the Plan.

ROADS

In a large and sparsely populated country, such as Saudi Arabia, a network of well planned roads has an important part in the development of the country. This fact was realized by the Government when the first road construction program was initiated in 1370-71. Later, in 1383, a new Main Road Program was prepared for the construction of roads of primary importance with the help of international consultants. Responsibility for roads was vested in a Department of Roads in the Ministry of Communications.

This Plan is a further step in the roads program, and as an integral part of the national plan will result in the coordinated development of the whole country to achieve well defined objectives and targets.

Objectives

Generally the road sector aims to promote the growth of other sectors while minimizing the overall cost of the transportation required for their projected economic and social activities. This Plan has the following objectives:

1. Development of regulations and measures which promote the efficient use of the roads;
2. Completion of highways and primary roads connecting the major urban centers which are now being constructed;
3. Study, design and construction of new internal paved roads, including reconstruction of some old roads;
4. Provision under a new program for the study, design and construction of feeder roads;
5. Provision for the construction and maintenance of rural roads;
6. Development of a maintenance program for existing and new roads;
7. Improving the organization and administration system of the roads sector;
8. Development of the manpower resources through training;
9. Replacement of consultants now employed for studies, designs and supervision of construction with local personnel.

Targets

1. Completion of 1,195 kilometers of roads under construction;
2. Construction of 1,286 kilometers of roads already designed;
3. Construction of 1,831 kilometers of roads under study and design, or to be studied and designed;
4. Construction of 900 kilometers of feeder roads;
5. Construction of about 2,000 kilometers of rural roads.

Required Regulations for Efficient Road Use

Road Use Regulation

At present, the use of roads is unregulated, however, a detailed proposal has been prepared for approval by the Council of Ministers which limits the maximum axle load and maximum sizes of vehicles using the roads in the Kingdom. It is expected that the proposal will be approved early in the plan period.

The Department of Roads will cooperate with the Ministry of Interior in preparing a program to enforce these regulations during the plan period. Initially, five permanent stations with weighing scales will be set up to check the loading of trucks. In addition, portable scales will be carried in pick-ups or jeeps. The permanent stations will check the truck loads before commencing a journey; the portable scales will be used for the actual control and enforcement of regulations.

Road User Charges

The Government's total revenues from road user charges (such as tax on petroleum products, and registration, transfer and license fees on vehicles) is estimated to be about SR 59 million in 1388/89. Allowing a 10 percent increase per year, the expected total revenue for the plan period will be about SR 400 million. On the other hand, expenditures on maintenance of roads for the plan period are estimated to be around SR 600 million. Thus revenue from the road user charges will cover only a part of expenditures on maintenance of roads unless the tax structure is modified. A tax structure that charges individual road users (vehicles) approximately in proportion to their use of the facilities will be prepared.

Programs

Road Construction

Main Roads. Of the 3,311 kilometers of roads under construction, it is estimated that the equivalent of 2,116 kilometers will be completed before the start of the plan period, leaving the equivalent of 1,195 kilometers for completion during the period.

Study and design have been completed for those main roads which can make the most important contribution to the development of the Kingdom and will be selected for priority construction. Projects thus selected total 1,286 kilometers during the period.

In addition to these roads, many are under study and design and others have been selected for future analysis and design. The total length of roads in these two categories comes to 1,925 kilometers and it is planned to complete an equivalent of 1,831 kilometers during the period.

The total for main roads to be constructed will be 4,312 kilometers. (See Fig. 26)

Feeder Roads. Feeder roads are short stretches of road connecting villages to main traffic arteries. The feeder road program, notwithstanding the size of the main road program, is a necessary strategy in achieving the objective of accelerated development of the Kingdom.

This program is divided into three phases — the first two for study and design, and the third for construction. It is projected that designs for 1,200 kilometers of feeder roads will be ready by the end of 1391-92 and by the second half of the next year the Ministry should be in a position to begin construction. It is thought advisable to start construction of 150 kilometers of roads somewhat later and 750 kilometers will be scheduled for the remainder of the Plan.

Rural Roads. These roads are intended to ease vehicle movement from villages to the main roads or to the neighboring villages until the construction of asphalted connections is justified by the traffic load.

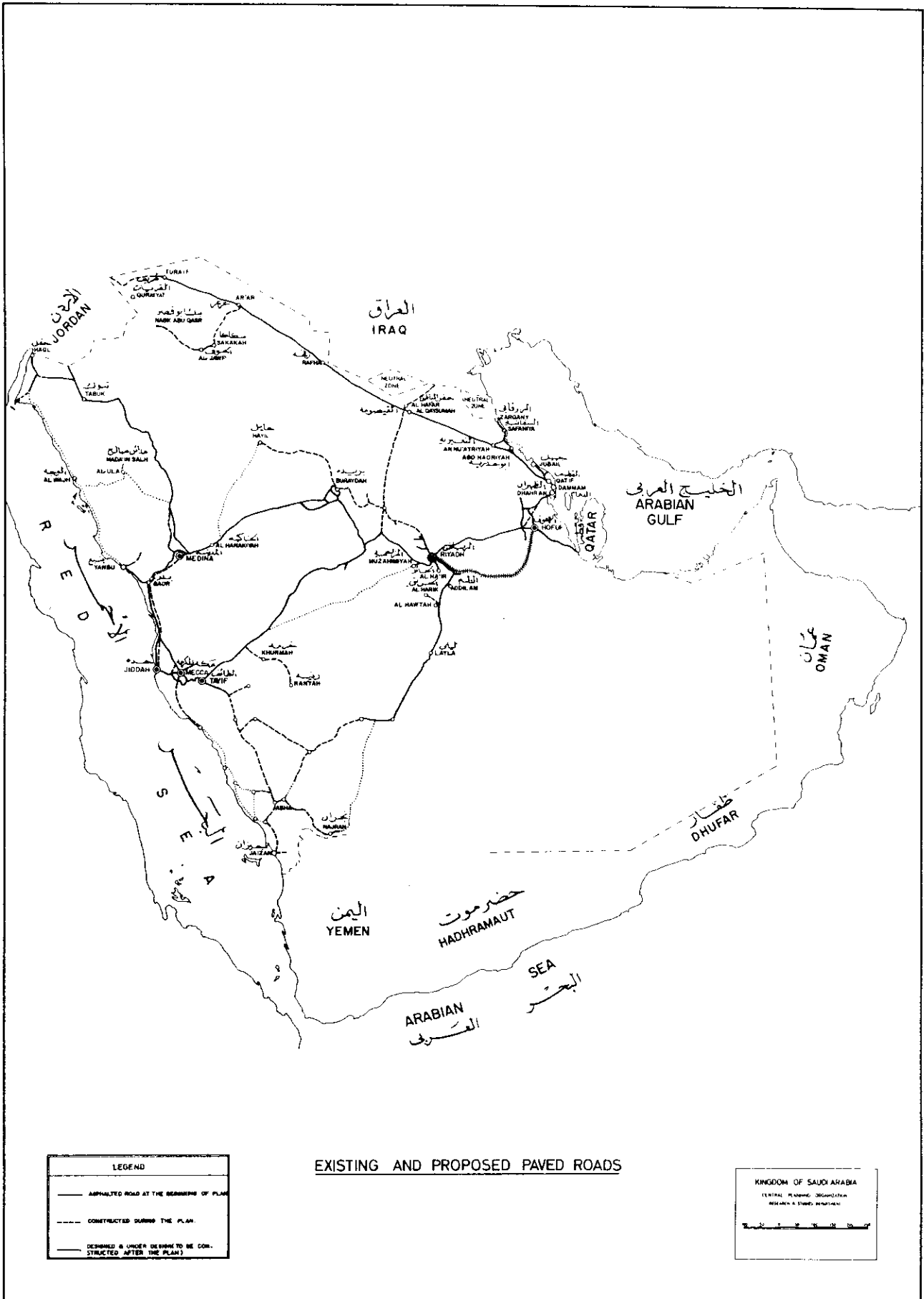


FIG - 26

The construction of rural roads is carried out by the Rural Roads Division of the Ministry; this division controls seven branches with one or more teams in each branch. There now are 17 teams; it is proposed to add 3 more during the plan period. Thus there will be 20 teams to construct about 2,000 kilometers during the plan period.

Hajj Roads. Early in the period, studies will be undertaken to determine how traffic congestion in the Hajj area can be eased during the annual pilgrimage. During the remainder of the period, roads will be constructed in the area based on the priorities established by the studies.

Studies

Main Roads. Studies related to the main roads program, initiated earlier, will be continued during the plan period, but with much greater emphasis on economic evaluation.

It is estimated that 1,356 kilometers of main roads will be subjected to study and design during the period, including 230 kilometers to be designed by the Road Department at the Ministry of Communications.

Transportation Study. In the early development of the Kingdom's road network, roads were selected for construction on the basis of linking important population centers. A second phase of the program brought other important centers into the network. The studies and designs for such roads included economic evaluations based on the individual links without regard for the overall needs of the Kingdom, or the effects on the network of any future construction. While this approach would eventually provide a road network for the Kingdom, it is not the most effective or efficient means of achieving such an objective. It is considered that the optimum solution to the road transportation problems of the Kingdom can be achieved only after the completion of a comprehensive study considering all modes of transportation. Such a study would investigate the following:

1. Present and future transportation requirements;
2. Interdependencies of transport links;
3. Alternative network configurations.

After consideration of data relating to these topics, the study would formulate the optimum combination of future transport projects, and assign priorities including Road Program Priorities. It is estimated that a consultant organization would be able to complete such a study in about 18 months.

Maintenance

The last years have seen great progress in construction of paved roads in the Kingdom; however, such roads were not properly maintained. This has resulted in serious deterioration of some roads and others are threatened. The Ministry therefore authorized a consultant company to complete a detailed study covering the following points:

1. A comprehensive road inventory;
2. Evaluation of the present situation;
3. Proposals for an organization to take care of maintenance in the future.

This study has recently been submitted and is being considered by the Ministry. During this plan period, the maintenance program is expected to eliminate the backlog of work and build up an organization so that within ten years the Ministry will be in complete control of all maintenance with adequate trained Saudi personnel on its rolls.

It is expected that by the end of the period, 8,260 kilometers of roads will require routine maintenance, and during the period, 6,800 kilometers will receive preventive maintenance. A total of 252 kilometers will have to be rebuilt. Lack of adequate facilities and training personnel makes it necessary to depend on foreign help for supervision and on contractors for the execution of the work during the plan period. However, a systematic training program will be launched, utilizing either consultants, foreign firms, agencies, or foreign governments, as required, so that the Ministry can gradually take over the maintenance of roads under its direct control.

Organization and Procedures

Major changes in organization or procedures are not expected during the plan period; however, the Maintenance Department will be developed and the materials testing laboratory will be expanded. In addition, a management study will be conducted to determine if modifications would produce any increase in efficiency.

As the few traffic surveys carried out in the past have helped in designing and programming both construction and maintenance works, a comprehensive program of traffic counts and surveys will be carried out during the Plan to provide the detailed information required for implementation of the Plan.

Financial Allocations

The plan for roads will cost SR 3,919 million, of which SR 286 million are for recurrent expenditures. Detailed information is included in Table 48.

TABLE 48
FINANCIAL ALLOCATIONS FOR ROADS
(SR Millions)

	<u>Recurrent</u>	<u>Project</u>	<u>Total</u>
Administration and Maintenance	219.3	—	219.3
Training	11.4	—	11.4
Planning and Research	9.2	26.2	35.4
Main Road Construction	—	1,946.9	1,946.9
Feeder Road Construction	—	180.0	180.0
Rural Road Construction	—	41.0	41.0
Hajj Roads	—	433.7	433.7
Emergency Works	—	220.0	220.0
Supervision of Construction	—	86.8	86.8
Maintenance Program	46.5	697.7	744.2
Total	286.4	3,632.3	3,918.7

PORTS AND RAILWAY

Port expansion was recognized at an early date as a necessity if the Kingdom was to obtain the materials, equipment and foodstuffs needed for development. Substantial sums have been invested in the ports of Jiddah and Dammam. With these expansions nearing completion, the capacities of these ports now approach the level required for efficient operations. The program during the Plan will complete these two expansion projects and develop some of the minor ports.

The Saudi Arabian Railways Corporation serves the port of Dammam and provides a transportation link between Dammam, Hofuf and Riyadh. In recent years its long-haul routes have been subjected to considerable competition from trucks in the private sector.

Objectives

The objectives of the program are to:

1. Increase the capacity of Jiddah Port to 1.7 million tons per year by the end of the period;
2. Increase the annual capacity of Dammam Port to 2.75 million tons, including both exports and imports;
3. Expand the capacity of Jaizan Port to 500 thousand tons annually; and,
4. Complete studies to determine which other ports should be developed and the future of the railway.

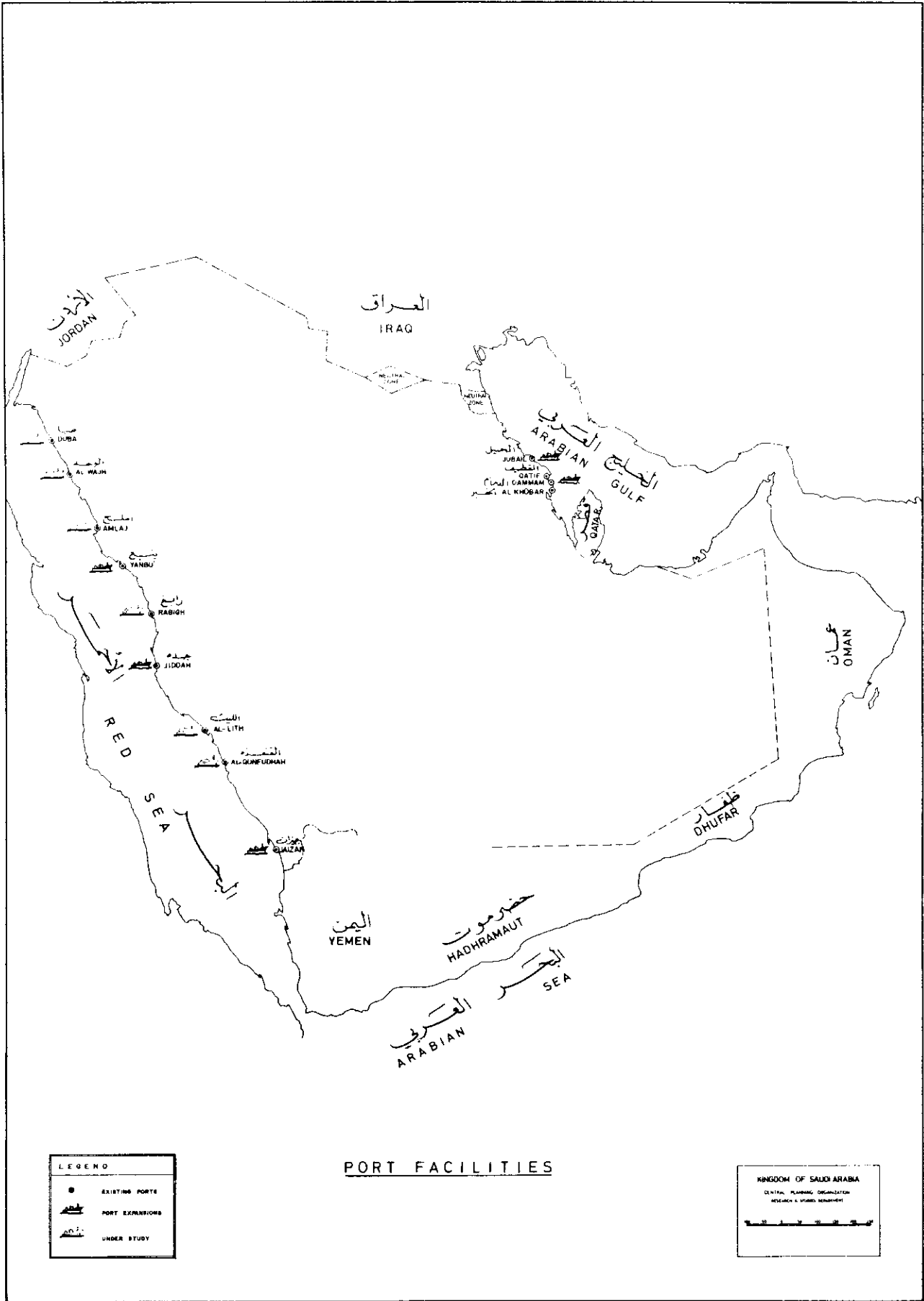
Programs

Port Construction

The projects at Jiddah and Dammam will be completed by the end of the period. It is expected that further expansion will not be required until after the beginning of the new Hijri century.

If economically feasible, a third berth at Yanbu' is proposed. It is not expected that further expansion at Yanbu' will be required until the late 1390's.

The current Jaizan port expansion will be completed. The future requirement for this port to serve the southern Red Sea will be determined by the feasibility studies of Red Sea ports now in progress. Further development of minor ports will also depend upon the results of these studies. Some of these may be expanded during the period, (see Fig. 27).



LEGEND	
●	EXISTING PORTS
⚓	PORT EXTENSIONS
---	UNDER STUDY

PORT FACILITIES

KINGDOM OF SAUDI ARABIA
 CENTRAL PLANNING ORGANIZATION
 RESEARCH & STUDIES DEPARTMENT

FIG. - 27

Maintenance

The maintenance of certain types of equipment used at the ports is included in the contracts for maintenance of road equipment. A study is to be made by Ministry personnel to determine means of improving the other maintenance programs for ports.

Railway

A study is to be undertaken to determine proper rate levels, considering potential markets and competition. In addition, the Corporation is to seek long-term contracts for certain types of cargo at a special rate. These should reduce the deficit in revenues compared to expenses.

The long term role of the railway will be determined by the transportation study of the Kingdom which will be completed during the first two years of the period. Major programs designed to improve the railway's operations will be deferred pending the findings of this study.

Studies

A study of the minor ports on the Red Sea is already in progress. The "General Transport Study" will consider the other aspects of sea and rail transportation.

Training and Personnel

Efforts will be made to recruit local personnel for training both on-the-job and at the Marine Academy at Jiddah. Training programs at the Marine Academy will be strengthened. It will be necessary, however, to rely for the most part on expatriate personnel to carry on routine operations during the period.

Organization

It is proposed to combine the administration of the Jiddah and Yanbu' Ports under a single autonomous governmental body. With this type of arrangement, fees could be varied to encourage off-loading at Yanbu' for much of the troublesome cargos such as reinforcing steel and cement.

Financial Allocations

The project cost of the port development program is expected to be SR 691 million. Recurrent costs will be SR 131 million of which SR 72 million represents the subsidy to the Saudi Arabian Railway Corporation as shown in Table 49. The annual subsidy to the Corporation has been maintained at the current level pending the findings of the transportation study.

Revenues from the ports will increase during the period, returning the cost of operating and maintaining them as well as making a contribution to the project costs.

TABLE 49

FINANCIAL ALLOCATIONS FOR PORTS AND RAILWAY (SR Millions)

	<u>Recurrent</u>	<u>Project</u>	<u>Total</u>
Operation and Maintenance by Ports Department	59.7	—	59.7
Dammam Port and Railway Corporation Subsidy	71.5	—	71.5
Jiddah Port Expansion	—	64.0	64.0
Dammam Port Expansion	—	462.0	462.0
Other Red Sea Ports Expansion	—	123.0	123.0
Other Arabian Gulf Ports Expansion	—	14.0	14.0
Studies and Supervision of Construction	—	28.4	28.4
Total	131.2	691.4	822.6

SAUDI ARABIAN AIRLINES CORPORATION

Saudi Arabian Airlines is simultaneously developing to become, while functioning as, a modern air transportation system. This dual role has required making substantial efforts to train local personnel to assume at an early date the functions now being performed by foreigners. In effect, the airlines has had two staffs, one composed of Saudi trainees and another functioning as trainers and operators during the interim, thus making it a high cost operation. The program of the airlines represents a forecast of the means of achieving its long term objectives, but it has several limitations:

1. The unsettled political situation in the Middle East which includes some of its high density routes;
2. The lack of a funded plan to replace obsolete and uneconomic equipment; and,
3. The lack of sufficient historical data on which to forecast future trends.

Objectives and Strategy

The first objective of the Saudi Arabian Airlines Corporation is to operate the airline as a commercial entity and achieve financial independence from the Government except in those instances where losses result from routes served at the direction of the Government. In these instances, a contribution from the Government may be necessary to cover such losses.

The second objective is to contribute to the development of the national communication system by providing efficient scheduled and charter air service within the Kingdom. In the long run, the airlines must be able to provide domestic air service at a breakeven level without sacrificing quality of service.

The third objective is to develop a cadre of Saudi nationals skilled in the use of modern air transportation techniques and capable of progressing with technological advances in equipment and methods: This is a long range goal that extends beyond the scope of the period.

The fourth objective is to carry at least half the international traffic originating or terminating within the Kingdom. While many international routes are not profitable initially, they should be in the long run. In addition, they should immediately offer such non-financial returns as encouraging other airlines to offer service to the Kingdom (thus strengthening its links with the rest of the world), the religious benefits of linking the Kingdom with most of the Moslem world, and the political benefits of having a Saudi flag-carrier operating throughout much of Europe, Africa and Asia.

The fifth objective is to maintain leadership in technological progress in the air transport industry. Saudi Arabian Airlines proposes to play a dominant role in developing new and better ways to serve the air travelling public in the Middle East.

Targets and Programs

Marketing

1. The quality of domestic service will be upgraded consistent with the airport development program.
2. New markets will be studied and services added to better utilize equipment.
3. Jet service will be initiated to Najran, Jaizan, Bishah, as-Sulayyil, al-Wajh, Hayil and al-Jaof during the plan period.
4. A DC-6 cargo aircraft will be added to the European flights in 1973 if the market warrants.
5. Rome will be added to the European networks in 1971, and Paris and other markets will be studied to determine the potential of future service to these cities.
6. In 1972, the possibility of providing service to the major Muslim population centers throughout the world will be considered as a means of increasing utilization of the long range fleet.
7. The feasibility of providing air service for all inland mail will be studied jointly with the Postal Service.
8. It is proposed to replace domestic sales agents with airlines employees, and international sales offices will be staffed with corporate employees when traffic levels warrant.
9. The airlines will continue to ask the Government to require that its employees and contractors travel by Saudi Arabian Airlines when its routing is consistent with the individual's requirements. This would result in a substantial saving of foreign exchange and would also help combat the discounting of fares by foreign carriers in violation of air industry rules.
10. The Hajj market will be analyzed by area of origin of pilgrims and the more lucrative of these will be served consistent with equipment availability.
11. Inflight service will be improved and sales of consumer items will be expanded. Arabic decor and atmosphere will be enhanced through cabin attendant uniforms, cuisine, etc.

12. When airport facilities become available, the airlines will operate dining and commissary units within the Kingdom.
13. The seat selection system by passengers will be expanded as communications systems improve.
14. Domestic tariffs will be studied to determine the level which covers more costs but does not discourage travel. Domestic promotional fares will be introduced.
15. The airlines will continue to seek governmental assistance to encourage involved agencies to accept ICAO recommendations for the facilitation of passenger and cargo processing.
16. A program is underway to readjust existing bilateral agreements with foreign governments whose national carriers operate to the Kingdom without reciprocity for Saudi Arabian Airlines.
17. Studies will be undertaken to determine the profit or loss attributable to each route.

Operations

1. Passengers boarded are expected to increase 7 percent per year during the period and revenue passenger miles to increase 8 percent annually.
2. Traffic on domestic routes is expected to grow faster than that on the more profitable international service.
3. Load factor is forecast to increase from 44 percent in 1969 to 54 percent by the end of the Plan.
4. Two additional 100-passenger aircraft will be required by the end of the period to accommodate the increase in traffic.
5. DC-6, Convair and some of the DC-3 service will be phased out.

Technical Programs

1. The airlines will phase out and lease many support functions as rapidly as the local economy can provide them.
2. The internal capability to overhaul aircraft is to be expanded by the end of the period to encompass almost all work now performed by contractors. Quality control will be expanded to all shop areas.
3. Purchasing and stores procedures are to be revised.

Communications

Reservations, service, and control of operations administration will be greatly facilitated by the Ministry of Communications intra-Kingdom communications network. Point-to-point communications will be installed at all airports by the end of the period. Ground-to-air communications will be installed by the end of 1973 at the three stations that now lack these facilities.

Manpower and Training

The long term program of replacing contract and consultant personnel with Saudi nationals will continue. A secondary goal will be to decrease the number of consultant employees and increase the use of third-country nationals with resulting reduction in costs. As vacancies occur, the first effort will be to upgrade qualified Saudi personnel. Primary attention will be paid to the utilization of the limited number of Saudi nationals in positions suited to their ability to grow and assume greater responsibility.

Among the new employee practices proposed, or being developed, are:

1. An employee savings plan;
2. A recreation program;
3. Periodic meetings with management;
4. A suggestion plan;
5. An employee service recognition program;
6. Computerization of employee records; and
7. A salary review program.

Property and Facilities

It will be general policy to lease rather than invest in real property and other major facilities. A program has been developed for the refurbishing of certain facilities. New warehouses will be constructed in Jiddah.

Data Processing

Much of the record keeping will be computerized, including accounting, payroll, statistics, inventory control and sales analysis. It is anticipated that imported personnel now being used for more routine operations will be replaced by Saudi nationals now being trained. Imported personnel will continue to be needed for the more sophisticated operations, such as crew simulation training, marketing and other operations.

Financial Allocations

In the past, the Government has purchased flying equipment for the airlines, thus funds have not been set aside for depreciation under past accounting procedures. With a fund established through depreciation, the airlines could establish itself on a sound financial basis, and provide its own capital equipment. It is therefore proposed to set up a depreciation allowance beginning in the second plan year.

The amount budgeted as the Government's contribution to the corporation during the period is SR 392 million, (See Table 50). It is proposed that the amount for each year will be equal to the deficit the corporation incurs because of training and other extraordinary costs associated with developing a national airline and as a result of serving routes at the Government's direction. The amount of the deficit resulting from these sources will be determined by isolating the unusual development costs and by the studies that are to be made of the profitability of each route of the airlines.

TABLE 50

FINANCIAL ALLOCATIONS FOR SAUDI ARABIAN AIRLINES

	<u>SR Millions</u>
Expenditures	1,267.5
Depreciation	81.9
Total	<u>1,349.4</u>
Revenues	957.8
Deficit	391.6

CIVIL AVIATION

The Civil Aviation Department provides support to all air traffic in the Kingdom. It furnishes air traffic services, airport development and maintenance, communications and navigational aids. The program of the Department encompasses improvements in all of these areas plus proposals for organizational improvements. During the program period it will be the Department's policy to :

1. Retain direct responsibility for all operational services concerned with air safety;
2. Contract with foreign firms for the maintenance of equipment associated with operational services until qualified local personnel can perform this function;
3. Contract with local contractors for all general maintenance work within their capabilities;
4. Contract with foreign firms for the maintenance of mechanical, electrical and electronic equipment until local employees or contractors are capable of providing this service; and,
5. Recruit and train a cadre capable of planning, designing and supervising all work to be executed by contract.

Objectives and Targets

The existing air traffic services are not commensurate with needs of aviation in the Kingdom. Areas to be improved include the following:

1. Operational standards should be improved as rapidly as possible to meet the requirements of air transport.

2. The general level of civil aviation support will be raised to an acceptable standard by improvement of the existing airports, addition of communication, navigation and other supporting equipment, and training of Saudi nationals to undertake the tasks now performed by foreigners.
3. It is proposed to extend the Jiddah Flight Information Region, which now covers about two-thirds of the Kingdom, to cover the entire Kingdom. This implies the establishment of new control airway routes, and that radar installations must be operational to monitor areas of 200 miles around Jiddah, Riyadh and Dhahran.
4. Improved air/ground communications for all the domestic airports, as well as international communication links, will have to be established by the end of the period.
5. Navigational aids and instrument landing systems for the major airports will be installed.
6. Search and rescue services are proposed to cover the entire Kingdom by the end of the period, requiring the addition of equipment and personnel, and coordination between the interested agencies.
7. It is proposed to establish fire and rescue organizations at all airports with scheduled air service by the end of the period.
8. It is expected that standards for registration, inspection and certification, and licensing of aircraft and personnel will have been established by the end of the period, and that necessary procedures will have been put in force to carry out these functions.
9. The training operations at the two technical institutes will be increased to provide 555 trainees during the period, more than doubling the output of the previous five-year period. On-the-job training will be continued, as will foreign training for selected personnel.
10. It is hoped that by working with other organizations it will be possible to improve immigration, health and customs procedures, thus facilitating passenger and freight processing at the international points of entry.

Programs

There are five general programs:

1. Operational services.
2. Administrative services.
3. Airport development and maintenance.
4. Communications systems installation and improvement.
5. Navigational aids, radar installation and maintenance, and flight checking.

Operational Services

Most of the projects in this program entail increased staffing to bring existing operations up to an acceptable standard. The projects include improvements in air traffic control, search and rescue services, aeronautical information services, and communications systems. Airworthiness standards are to be developed for aircraft operating in the Kingdom, and licensing procedures are to be revised for pilots, flight engineers and aircraft mechanics. Fire and rescue operations at many of the 23 airports with scheduled services are to be brought up to an acceptable standard through staffing and the purchase of equipment.

Administrative Improvements

The Statistical Section will be reorganized and some modifications in working area will be undertaken. Training projects include expansions of the existing training centers at Jiddah and Dhahran and offering fellowships locally and abroad to some key personnel in the Department. Continuing effort will be made to improve the organization at all levels and for all functions.

Airport Development and Maintenance

The present airport at Jiddah is surrounded by urban development which presents a hazard, and it is also inadequate for the annual peak in Hajj air traffic. A study for a new airport at Jiddah will be completed during the Plan; construction and development of several other airports are included in the Plan.

Communications

A teletypewriter link between Dhahran and Cairo is proposed. An extended range, very high frequency radio installation is planned to provide better coverage for aircraft enroute. High frequency direct speech communication facilities will be provided at Jiddah for international controller-to-controller communication. Ground-to-air very high frequency and ultra high frequency communications equipment will be installed at the airports for control of military and civil aircraft.

Navigational Aids

Seven radar stations are to be installed to control air traffic in the Kingdom, as well as seven ground stations from which aircraft can determine their direction and distance. An aircraft to test navigational equipment and provide standby air search and rescue facilities is to be purchased.

Financial Allocations

Project costs of the Civil Aviation Department program will amount to SR 449 million, while recurrent costs will be SR 436 million, or a total of SR 885 million as detailed in Table 51.

It is anticipated that revenues of the Department will be sufficient to return 10 percent of the operation costs.

TABLE 51
FINANCIAL ALLOCATIONS FOR CIVIL AVIATION
(SR Millions)

	<u>Recurrent</u>	<u>Project</u>	<u>Total</u>
Operation and Maintenance	305.5	—	305.5
Operational Services Improvements	50.2	36.3	86.5
Administrative Improvements	4.9	2.6	7.5
Airport Development	22.4	311.5	333.9
Communications	4.7	13.7	18.4
Navigational Aids	48.8	85.0	133.8
Total	436.5	449.1	885.6

TELECOMMUNICATIONS

The program to provide a modern telecommunications system for the Kingdom is well underway. The first phase of the automatic telephone system will be completed by the middle of the Plan. It is now evident that the initial estimate of the requirement for telephones falls considerably short of actual demand, and the program will require expansion during the period.

The telephone system alone will not be fully satisfactory until the installation of an intra-Kingdom communications system using modern techniques has been completed. Such a network is scheduled together with requisite facilities for communication with areas outside the Kingdom. Other ancillary facilities are proposed for the period.

Objectives and Targets

The general objective is to build a national communications system. A primary target is to provide telephone subscribers with trunk dialing facilities between the important cities in the Kingdom by the end of the period. It is expected that a total of 137.2 thousand telephones will have been installed by the end of the period, nearly all of which will be automatic telephones. Direct access will be provided to all important centers in the eastern and western hemispheres as well as the neighboring states. Telegraph services will be improved by introducing teleprinters to replace existing Morse Code radio circuits. Telex-Gentex will be expanded and photo-telegraph services will be introduced.

Attainment of these targets, while not meeting the total expected demand for such services in the Kingdom at the end of the period, will tax the administrative and physical capabilities of the Ministry of Communications. A base will have been established, however, for further orderly expansion in the years following.

Programs and Projects

Telephone Systems

Currently, 25,000 automatic telephones, of the total of 125,200 proposed for 14 major population centers, have been installed. Existing manual exchanges in 20 smaller communities will be replaced by automatic telephones, representing a total of 9,500 lines, (see Fig. 28). Some of the manual exchanges being removed will be installed in selected rural areas to provide interim telephone service.

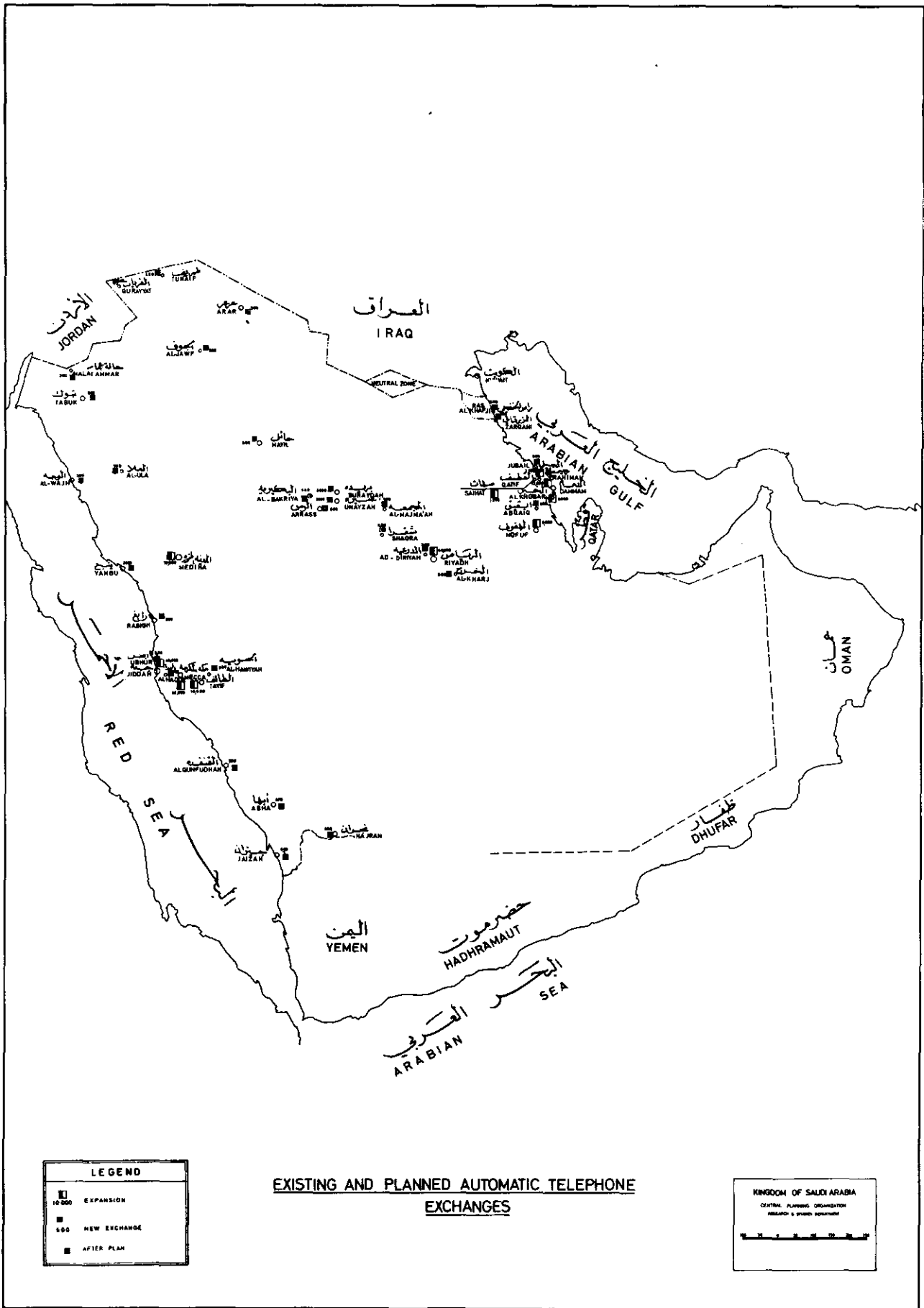


FIG - 28

The installed telephones, including those manually operated, will total 137,200 by the end of the period, (see Table 52). This does not include the private systems such as the one owned by Aramco.

TABLE 52
NUMBER OF TELEPHONE INSTALLATIONS
(in thousands)

	<u>Existing</u>	<u>Total Proposed</u>
Automatic System		
Urban areas	25.0	125.2
Communities	—	9.5
Total	25.0	134.7
Manual Exchanges	—	2.5
GRAND TOTAL	25.0	137.2

A firm is being employed to operate and manage the automatic telephone system during the next five years. One of the important functions of this firm will be to develop methods of planning service extensions on a rational basis. Governmental agencies should undertake studies to determine future telephone requirements by area to facilitate this effort. By the end of the period it is anticipated that there will be sufficient numbers of adequately trained local personnel to undertake operations with a minimum of foreign personnel.

International Links

Earth stations are proposed at Jiddah and Riyadh to facilitate communication with most areas outside the Kingdom via satellite. The Arabian Gulf area will be linked to the Kingdom via microwave between Dammam and Bahrain which will be completed in the first year, and by a coaxial cable between Dammam and Kuwait which is scheduled for completion in the second year. These systems will replace the existing high frequency radio now utilized for international communications.

Telegraph Services

Teleprinter services are to be expanded in two phases. Telegraph services are to be expanded and improved while photo-telegraph services are to be established.

Intra-Kingdom Network

The present system of low-power, high-frequency radio is generally inadequate for a variety of reasons. It is being augmented on an interim basis by the installation of six high-power transmitters at Jiddah, Riyadh, and Dammam along with ancillary equipment. At the same time a high priority is being given to the following proposed projects:

1. A coaxial cable and/or microwave trunk route connecting the western and eastern regions through Riyadh and Qasim;
2. An auxiliary coaxial cable and/or microwave network to connect major population centers in the Kingdom. The type, capacity and scope of the system to be undertaken is currently being studied, (see Fig. 29).

Monitoring and Testing

Laboratories to test and inspect equipment before acceptance from the installing contractor are to be established at Jiddah and Dammam.

Additional radio monitoring stations are to be established to control and monitor radio frequencies, identify type of radio emissions and locate stations causing harmful interference. Stations are proposed at Riyadh and Dammam.

Organization and Training

General strengthening of the organization will be necessary during the period. Complete separation of telecommunications and postal services early in the period will facilitate this by more clearly defining organizational responsibilities. Consideration should be given to the ultimate creation of an autonomous governmental body to operate the telecommunication services. Freedom from restrictive governmental rules, especially as related to personnel should help maintain efficiency at the level required for this business-type operation.

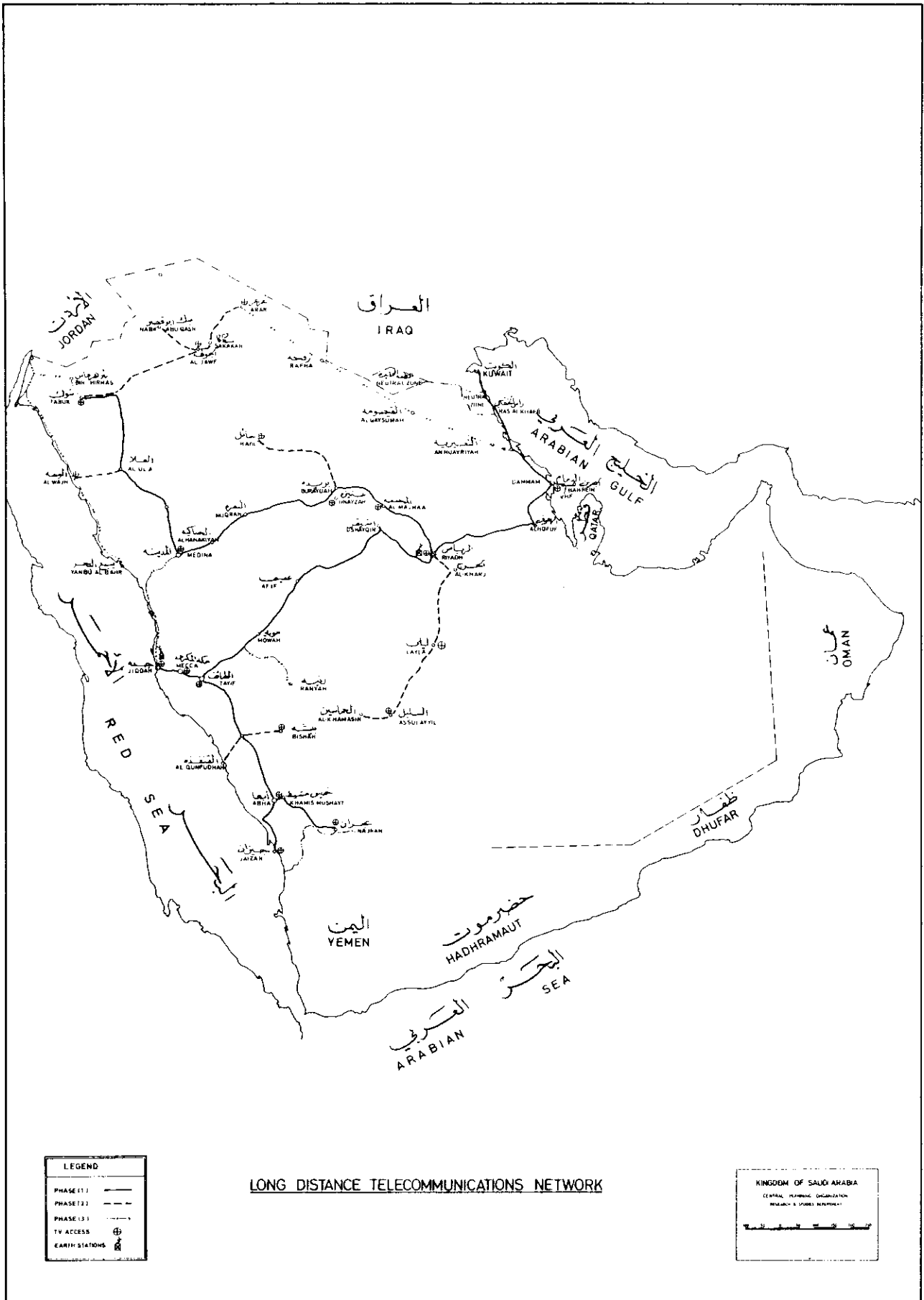


FIG - 29

The proposed establishment of the Telecommunication and Broadcasting Training Centers at Jiddah and Riyadh is a step toward providing the trained technicians required by the programs. On-the-job training of personnel by the foreign contractor employed to operate the telecommunications systems is also expected to markedly increase the reservoir of trained technical and administrative skills for future use by the Department.

Buildings

Most of the telecommunications offices are located in rented buildings; construction of 50 buildings to house these offices is anticipated during the period.

Financial Allocations

It is proposed that telecommunications facilities should be provided to the government on a "no profit-no loss (cost) basis". Rates which would provide a fair return on investment are proposed for non-governmental customers. It is anticipated that the firm being employed to operate and manage the telecommunications systems will undertake studies to determine a rational rate structure.

It is also anticipated that the project cost of the program during the period will be SR 905 million and recurrent expenditures will be SR 321 million. Consideration will be given to the possibility of financing part of the program from external sources. Expected expenditures are shown in Table 53.

TABLE 53
FINANCIAL ALLOCATIONS FOR TELECOMMUNICATIONS
(SR Millions)

	<u>Recurrent</u>	<u>Project</u>	<u>Total</u>
Operation and Maintenance of Existing Program by the Department	211.5	—	211.5
Local Telephone System	40.8	428.6	469.4
International Links	11.1	47.2	58.3
Intra-Kingdom Network (including provision for television transmission)	7.5	267.4	274.9
Testing Laboratories and Radio Monitoring Facilities	3.0	11.4	14.4
Telegraph Services	10.4	70.5	80.9
Training	36.8	21.7	58.5
Buildings	—	8.0	8.0
Minor Works	—	50.0	50.0
Total	321.1	904.8	1,225.9

METEOROLOGY

The Meteorological Department serves as a supporting function to weather-sensitive organizations in the Kingdom. These include those associated with defense and aviation, and some ministries like Hajj, Commerce and Industry, and Agriculture. To be effective, domestic and international data must be collected, analyzed, and quickly disseminated to the using organizations. If the Department is to adequately fulfill its role, considerable emphasis in the future must be placed on training and staffing, as well as the addition of some new facilities.

Objectives and Targets

The general objective of the program is to strengthen the Department so that it can assume its proper role in the development of the economy.

Specific targets are to:

1. Add facilities and personnel to enable the Kingdom to fulfill, by the end of the period, its commitment to the United Nations' World Weather Watch Program;
2. Meet the requirements of the Royal Saudi Air Force and Civil Aviation by the end of the second year of the Plan;

3. Combine the operations now included in the Ministry of Agriculture and Water into the Department by the end of the plan period;
4. Establish a training institute by 1391 with the cooperation of King Abdul Aziz University;
5. Strengthen the domestic data collecting and processing facilities during the period.

The attainment of these goals will result in the basic resources necessary for the Meteorological Department to serve the requirements of the Kingdom.

Programs

The World Weather Watch is a United Nations sponsored world-wide endeavor to improve weather data gathering. Since the Kingdom has agreed to participate in this effort, it will be necessary to fully staff the existing stations, as well as to establish three more surface observation stations and six upper air observation stations. These improvements, in addition to meeting the United Nations program, will also improve forecasting and weather analyses for areas within the Kingdom.

The Kingdom can obtain full benefits from the vast amount of international data available only by installing modern equipment for the reception of radioteletype transmissions from five international regional stations providing data for Asia, Africa, and Europe. Satellites which produce cloud pictures provide a means of assessing weather and are especially helpful in sparsely populated areas with widely scattered surface stations. These pictures also aid in the control of locusts. Stations to receive these pictures are proposed for Jiddah and Dhahran.

Air Force and Civil Aviation

A variety of weather maps relating to weather on the Arabian Peninsula and surrounding areas are transmitted from Cairo and Tehran and would be useful in preparing local weather forecasts. Installation of reception equipment in Jiddah is proposed; however, this information can be sent on a timely basis to users only when facsimile transmission equipment is installed in Jiddah and reception facilities are provided in strategic military points. Radio teletype equipment will be required in Jiddah and in the regional centers of Riyadh and Dhahran for the rapid exchange of data between these points.

Agrometeorological Requirements

The Ministry of Agriculture and Water now maintains about 200 stations for measuring precipitation. The Department will assume responsibility for gathering as well as processing these data.

Public Requirements

Certain activities in the Kingdom are especially sensitive to weather and accurate forecasts of expected weather conditions could conceivably avoid disaster in some instances. This is particularly true during the peak of the Hajj. Stations will be installed at Mecca and Minna as well as in the centers of government — Riyadh and Tayif.

National Meteorological Center

Efficiency would be improved if the various facets of the Department were centralized in one building: a National Meteorological Center is therefore proposed for construction.

Climatological Requirements

A Division of Climatology will be established to process weather data. Workload in this Division will increase as observation stations are established and others become fully operational, and after the assumption of responsibility for agrometeorological data processing.

Organization and Personnel

A National Meteorological School is to be established early in the period. This training facility will be installed in cooperation with King Abdul Aziz University in Jiddah. Although foreign training for upper level professional personnel will still be required, this School will provide the necessary lower level personnel.

Work rules should be revised: incentives to encourage personnel to work in isolated areas are needed as well as revised rules concerning assignment to those posts.

Financial Allocations

Recurrent expenditure for the Plan will be SR 55 million. Project costs will total SR 19 million, making the total cost for the period, SR 74 million. Detail concerning these costs is shown in Table 54.

TABLE 54
FINANCIAL ALLOCATIONS FOR METEOROLOGY
(SR Millions)

	<u>Recurrent</u>	<u>Project</u>	<u>Total</u>
Operation and Maintenance of Existing Facilities by the Department	24.4	—	24.4
World Weather Watch Program	10.6	10.2	20.8
Air Force and Civil Aviation Support	3.5	4.6	8.1
Establishment of Agrometeorological Division	0.1	—	0.1
Establishment of Weather Stations at Mecca, Minna, Riyadh and Tayif	0.4	1.0	1.4
Climatological Data Processing	0.4	0.2	0.6
Training	13.1	0.5	13.6
Establishment of National Meteorological Center	2.5	2.0	4.5
Total	55.0	18.5	73.5

POSTAL SERVICES

The efficiency and reliability of the Postal Services and the range and availability of its services must be improved before it can contribute fully to the Kingdom's communications network and to development. The Service is now handicapped by administrative problems, antiquated methods and buildings, and inadequately trained and motivated staff.

Objectives and Targets

The objective of the development program is to improve the service by administrative changes, introduction of new equipment and methods, construction of some new post offices, and improved personnel practices. These improved practices are expected to improve mail service without increases in expenditures on operations and maintenance, including new projects, proportionate to the increase in the volume and revenues.

Postage rates for foreign mail are comparable with those of other countries. It is desirable for social and political purposes to maintain intra-Kingdom postal rates at as low a level as possible. Rates for internal mail are relatively low and it is proposed to maintain them at this general level for the period of the Plan. Thus rate changes are not proposed for the period except perhaps in such isolated instances as registration fees, parcel rates, etc.

The volume of mail is expected to continue to increase by about 10 percent annually. Revenues and expenses will also increase. The planned target of the Postal Service is to improve productivity so that the increase in mail volume can be handled without an increase in the annual deficit of revenues in relation to recurring expenditures. This modest goal is considered to be realistic in view of present conditions in the Postal Service.

Programs and Projects

The program consists of 34 projects of which 10 represent operational improvements, 5 are training programs, 5 represent new buildings and the remainder consists of proposed improvements in public relations and administration.

Administration

1. The Postal Services headquarters is in Riyadh but the accounting and statistical office is in Mecca. All should be located in Riyadh if the Postal Services is to function efficiently.
2. Posts and telecommunications are sufficiently differentiated to be operated separately; bifurcation of the two is anticipated early in the plan period.
3. A project office should be established to implement the Postal Services program.
4. Studies and projects will be undertaken to improve financial operations, such as revising the system of providing money order service, tendering for postal stores and record keeping.

Operations

1. The current practice of registering governmental mail should be revised so that **only** the most important documents are registered.
2. Postage franking machines, which reduce use of stamps and decrease postal work load, should be introduced.
3. Billing of governmental agencies should be simplified.
4. A joint study with Saudi Arabian Airlines should be made to determine the feasibility of carrying inland mail at one rate to regional airports for dispatch by surface transport to addressee.
5. Joint studies should be undertaken with Customs, the Ministry of Information and the Security Services to determine more expeditious methods of processing mail.
6. Methods of processing various types of mail, including possible mechanization, should be studied and revised as feasible.
7. There is a need to standardize the sizes of envelopes used in the Kingdom.
8. Statistical and accounting procedures should be modernized.
9. Methods of selection, distribution and sale of stamps should be improved.
10. The use of mobile post offices should be given a trial.

Personnel and Training

1. Qualifications of personnel, pay scales, recruiting methods and methods of forecasting personnel needs should be thoroughly reviewed.
2. Recruitment of full-time Arab expatriate staff will be necessary as an interim measure.
3. Training will occupy an important role in the program. Included are plans to:
 - a. Send 10 middle level officials to the United Kingdom for training;
 - b. Establish a National Postal School in Riyadh and regional schools where relevant; and,
 - c. Train all postal clerks to read addresses in the English language.

Buildings

1. New post office buildings are planned for Riyadh to replace a rented building, and for Jiddah and Dhahran where existing facilities are inadequate. An expansion and improvement of layout is planned for Dammam.
2. It is anticipated that 20 new post offices will need to be established in small communities. It may be feasible to substitute mobile post offices for some of these proposed facilities.

Public Relations

1. Postal facilities should be easily recognizable and a program to standardize color and insignia on all post offices, post boxes, vehicles, uniforms, etc., should be undertaken.
2. The communication media should be used to inform the public about postal services and instruct them in their usage.
3. The philatelic section should be reorganized and philatelic standards should be improved.

Financial Allocations

Based upon available data, projected future expenditures during the period of the Plan will be SR 159 million or SR 41 million in excess of estimated revenues. The total includes SR 146 million for recurrent expenditures and SR 13 million for project expenditures as shown in Table 55.

Improvement of accounting procedures and separation of postal services and telecommunications may result in a significant revision of these estimated recurrent costs and revenues. These data are therefore provisional and some revision of budgetary allocations between postal services and telecommunications may be required when better data become available.

TABLE 55
FINANCIAL ALLOCATION FOR POSTAL SERVICES
(SR Millions)

	<u>Recurrent</u>	<u>Project</u>	<u>Total</u>
Operation and Maintenance of Existing Facilities	138.3	—	138.3
Administrative Improvements	1.8	0.3	2.1
Operations Improvements	1.1	1.2	2.3
Personnel and Training	3.2	3.7	6.9
Building Construction and Improvement	1.0	7.5	8.5
Public Relations Activities	0.1	0.4	0.5
Total	145.5	13.1	158.6