



Working Paper

IRAQ
United Nations/World Bank
Joint Needs Assessment

Transportation & Telecommunications

TASK MANAGER: MOHAMMED FEGHOUL, WORLD BANK
AGENCIES PARTICIPATING: UNDP & ITU

October 2003

Currency Rate

Currency Unit: Iraqi Dinar (ID)

US\$1 = ID1,500

(August 2003)

TRANSPORT	3
INTRODUCTION	3
HIGHWAYS, ROADS, AND BRIDGES.....	4
<i>Characteristics and Summary Status</i>	4
<i>Institutional Structure, Staffing, and Financing</i>	5
<i>Priority Needs and Funding Requirements</i>	6
AIRPORTS AND CIVIL AVIATION.....	9
<i>Airport Characteristics and Summary Status</i>	9
<i>Airline Services</i>	9
<i>Institutional Structure, Staffing, and Airport Status</i>	10
<i>Priority Needs and Funding Requirements</i>	10
PORTS AND INLAND WATERWAYS.....	12
<i>Characteristics and Summary Status</i>	12
<i>Inland Water and Maritime Transport</i>	13
<i>Institutional Structure, Staffing, and Future Port Direction</i>	13
<i>Priority Needs and Funding Requirements</i>	13
RAILWAYS	15
<i>Characteristics and Summary Status</i>	15
<i>Role of Railways</i>	16
<i>Institutional Structure and Staffing</i>	16
<i>Priority Needs and Funding Requirements</i>	16
PUBLIC TRANSPORT	19
<i>Characteristics and Summary Status</i>	19
<i>Institutional Structure</i>	19
<i>Priority Needs and Funding Requirements</i>	19
FREIGHT AND COMMERCIAL TRANSPORT	21
<i>Characteristics and Summary Status</i>	21
<i>Institutional Structure</i>	21
<i>Priority Needs and Funding Requirements</i>	22
TELECOMMUNICATION	23
INTRODUCTION	23
CURRENT STATUS AND ISSUES	23
NEEDS AND PRIORITY FOR THE SECTOR	26
Medium- and Long-Term Needs and Policy/Institutional Changes	26
Broad Financial Needs Over the 2004-2007 Period	27
Proposed Policy Changes	29
Proposed Institutional, Legal, and Other Requirements	30
2004 Needs and Policy/Institutional Changes	30
Financial Needs for 2004	30
Proposed Policy Changes (To Be Initiated in 2004)	30
Proposed Institutional, Legal, and Other Requirements	30
TRANSPORT AND TELECOMMUNICATION CONSOLIDATED BUDGET (US\$ MILLION)	33

TRANSPORT

Disclaimer: The Needs Assessment for the Transport Sector in Iraq was conducted in the absence of a conventional national counterpart and under severe security conditions. The Study Team relied heavily on the local knowledge and expertise of Iraqi professionals who were consulted during this exercise. This report has not been reviewed by Iraqi stakeholders. As a result, this report should only be regarded as a preliminary assessment for future work on the transport sector in Iraq.

INTRODUCTION

1. Iraq's transport sector is comprised of 40,690 km of road; two international, and three major domestic airports; six cargo ports; two dedicated oil terminals; and 2,456 km of rail line. Roads accommodate 70 percent of all traffic volume in Iraq, and approximately 85 percent of the network is paved. Given the topography of Iraq, with two major river systems along which most of its cities are located, the country's 1,156 bridges are a vital part of the road network. The Iraqi railway system, which is one of the most extensive in the region, consists of five principal lines totaling about 2,456 km and has 107 stations. Rolling stock is in poor condition, and commercial speeds along some sections of the network are as low as 30 km/hour. This is primarily due to the absence of a functioning signaling and telecommunications system, and partly because of the poor condition of the tracks.

2. Iraq has two international airports at Baghdad and Basra, and major domestic airports at Mosul, Kirkuk, and Irbil. All airports are designed for joint-use civil military facilities, but suffered only limited amounts of battle damage. However, years of neglect and a lack of maintenance and available spare parts have rendered most electromechanical systems useless, and none of the airports are capable of supporting commercial air operations. Commercial flights were completely grounded between 1991 and 2000, and only a very low level of domestic service was available between 2000 and 2003.

3. The country has six cargo ports, plus two dedicated oil terminals, of which the Port of Umm Qasr is Iraq's only deep-water port, and serves as the country's most vital link for importing and exporting goods. Its infrastructure is generally in good condition, but most superstructure and equipment are no longer functional. Siltation in the 50 nautical-mile approach channel is a permanent challenge, and a number of wrecks obstruct passage. River transport has been completely neglected in recent years, and there are presently no services.

4. As a result of the sanctions imposed throughout the 1990s, significant pressure was put on Iraq's public transport systems, which for many, were the only affordable means of transportation. The high demand for public transport services coupled with the limited number of available jobs, has led many owners of private vehicles to offer informal transport services. The economic sanctions also impacted the transport of freight and commercial goods in Iraq. The majority of goods imported under the "Oil for Food" Program were transported from neighboring countries using trucks. While there are approximately 400 private trucking firms, most are smaller, family-owned enterprises that participate in freight transport by leasing their vehicles to larger trucking firms, which have a quasi-monopoly on the land transport market.

5. The identification of priority needs and funding requirements for each of the transport sectors is based on a four-year program (2004 through 2007) to rehabilitate and develop the sector. The principal objective of the program's first year is to bring the sectors back to pre-March 2003 levels. Key goals for the 2005 to 2007 period are to establish a framework and mechanisms to enable sector officials to effectively accommodate future growth and expansion.

6. Iraq's various modes of transport form a complex and integrated system. Beyond the immediate need of reestablishing regular transportation services, there is a need to plan for the future development and expansion of the various sectors. This should be done in an organized fashion, starting with a thorough review of each sector. The conclusions and recommendations formulated below for the individual sub-sectors should be amalgamated into an integrated Transport Master Plan to guide future sector development.

HIGHWAYS, ROADS, AND BRIDGES

Characteristics and Summary Status

7. Because Iraq is a large country with a total land area in excess of 432,000 square km, and has around 25 million inhabitants (2003 estimate), roads play a central role in the movement of people and goods. Most of Iraq's 40,690¹ km road network was developed during the 1970s and 1980s. Little, if any, new construction occurred during the last decade. The network includes an expressway system of 1,061 km, which consists of one six-lane highway connecting Basra in the south with the Jordanian border in the west via Baghdad, and 10,000 km of border roads, which were developed as part of Iraq's military buildup in the 1980s. Roads accommodate 70 percent of all traffic volume in Iraq, and the expressway network alone accounts for 20 percent of all traffic.

8. Iraq's roads are classified in the following five categories: (i) expressways, with controlled access, grade separated six-lane divided carriageways; (ii) primary roads, which are mostly four-lane divided carriageways connecting the Governorates with Baghdad; (iii) secondary roads linking towns with the Governorates; (iv) village roads, which provide villages and towns with access to the secondary network; and (v) military/border roads that accommodate the movements of troops and facilitate the protection of borders.

9. Approximately 85 percent of the overall network is paved. Most of the unpaved network consists of secondary and village roads. While about 50 percent of the expressway system is considered to be in good condition, the percentage of primary and secondary roads in good condition is between 30 percent and 20 percent. Just 10 percent of village roads are considered to be in good condition. Most roads have not been well maintained in recent years, and signage and highway furniture that was damaged or missing has not been replaced or upgraded. Table 1 below illustrates the present condition of the road network based on visual inspections.

Table 1: Roads, Length, and Condition

Classification	Length (km)	Condition of Roads (%)		
		Good	Fair	Poor
Expressway	1,061	60	40	10
Primary Roads	10,917	30	65	5
Secondary Roads	14,193	20	70	10
Village Roads	3,704	10	30	60
Military/Border Roads	10,815	n.a.	n.a.	n.a.
Total:	40,690			

10. The expressway system, which appears to be in fair condition, and the primary and secondary roads, most of which are in average condition, were designed over twenty years ago. However, in the intervening years, there has been limited maintenance, consistent overloading of freight trucks, and excessive use by heavy military vehicles. This resulted in a significant backlog of maintenance, which only began to be addressed in 2000 when a modest budget was allocated to implement an initial maintenance program. In addition, the expressway between Baghdad and Basra is missing an important section of approximately 150 km north of Basra.

11. The expressway and part of the primary road network, which were designed to very high standards, such that they could support loads of 16.3 tons per axle, while prevailing permissible load limits were 13.2 tons per axle, have endured for several years with little or no maintenance. However, pavement deterioration, increasing roughness, and damage to structures indicate that structurally, these roads are at the end of their design lives.

12. The topography of Iraq, with two major river systems along which most cities are located, make bridges a vital part of the road network. There are 1,156 bridges throughout the country, and they are

¹ There are varying figures as to the overall length of the road network. A first order activity should be to establish a road database and confirm the classification of roads, which would verify the overall length of the network.

classified as main (more than 180 meters in length and spanning rivers or tributaries), or secondary (less than 180 meters in length and built over tributaries and interchanges). The latter category includes pontoon or “floating” bridges. As a result of the first Gulf War, many bridges were damaged, and following the economic sanctions that were imposed on Iraq throughout the 1990s, most rehabilitative works were stopped and only maintenance activities undertaken. Consequently, of the 148 main bridges and 1,008 secondary bridges, most are in fair to poor condition. In addition, a number of key crossings are missing.

13. The deteriorating condition of Iraqi roads and bridges contributed an increase in road accidents. Other factors include: (i) an aging vehicle fleet, with an average age of around fifteen years; (ii) a lack of signage and traffic furniture; and (iii) poor driver behavior. Nearly 70 percent of all accidents occurred within cities, and the vast majority of accidents outside municipal limits occurred on two-lane roads. Enforcement of traffic laws, which has not been effectively practiced in the past, and dualization of dangerous sections of the road system, is needed.

14. Iraq has one of the lowest vehicle ownership rates in the region, with approximately 55 vehicles per thousand inhabitants. This figure is low compared with Jordan, which has some 100 vehicles per thousand inhabitants. With demand that has been suppressed for a number of years, it is expected that the size of Iraq’s vehicle fleet will increase, and traffic will grow significantly in the coming years. It was reported that since May 2003, more than 100,000 used-vehicles have been imported to Iraq. Additional road capacity in major urban areas may be necessary.

Institutional Structure, Staffing, and Financing

15. The State Commission for Roads and Bridges (SCRB), which is a Department within the Ministry of Housing and Construction (MOHC), is responsible for all national roads and bridges, including segments of the expressway network located within municipal limits. Municipalities are responsible for all other urban roads within their jurisdiction. SCRB is headquartered in Baghdad and has offices in each of the country’s 18 Governorates (including the northern Governorates). Countrywide, SCRB employs 1,307 staff,² of which 217 are engineers. About 25 percent of staff are located at headquarters in Baghdad, and the majority of women, which make up around 20 percent of SCRB’s overall workforce, hold middle-managerial positions.

16. SCRB mainly undertakes implementation activities, including supervision, signage and marking, and road maintenance. Although SCRB has the equipment to do emergency works, contractors do most overlay work. Much of the work is contracted out to state-owned construction companies, including two prominent ones. The involvement of private sector firms has been limited to some highway design and construction activities that require specialized expertise. Although staff at SCRB has effectively carried out their functions, economic sanctions have prevented them from keeping pace with technological advances, and the migration of qualified staff to other countries has reduced their capacity.

17. Policy formulation and planning are centralized at the Ministry of Planning (MOP), while the SCRB and other entities in the sector act more as implementing agencies. It will be important to reintroduce the discipline of network planning, and to prepare master plans for future network development. SCRB should be empowered to carry out these activities, and equipped with the tools needed to assess the condition of roads, identify network bottlenecks and deficiencies (including in rural areas), and survey traffic volumes. An associated task will be to confirm the classification of roads in the network in anticipation of decentralizing responsibility for local roads to the Governorate level. The role and structure of the SCRB should also be revisited with the aim of converting it into a Highway Authority that would own and manage the country’s main roads (expressways and primary roads).

18. Government road laboratories and technical centers, which played a central role in controlling the quality of road construction and maintenance activities throughout the country, were decimated by looting, and all equipment and supplies were stolen. While there are one or two private sector laboratories in Baghdad, a limited number at engineering universities, and one at the Baghdad Municipality, they cannot replace the lost capacity of the country’s central and regional road laboratories.

² It could not be confirmed whether this figure includes staff at the northern Governorates.

19. Capital and recurrent expenditures are financed from the national budget. Investment needs are estimated based on annual plans developed by SCRB's regional offices. The plans are then consolidated at the national level and submitted, along with MOHC's other departmental needs, to the MOP for consideration. The MOP approves funding for capital investments based on available resources, and authorizes annual allocations for their implementation, while recurrent expenditures (including road and bridge maintenance) are funded by the Ministry of Finance as part of the annual general budget.

Priority Needs and Funding Requirements

20. A first order priority will be to reestablish the physical and technical capacity that was damaged during the recent conflict. This will require constructing appropriate office facilities, repairing damage done to the national road laboratories, and replacing lost equipment and supplies. The estimated cost is about US\$17 million (US\$7 million in 2004, and US\$10 million in 2005-2007).

21. An equally important priority will be to provide technical assistance, equipment, and software to institute a proper planning system to effectively manage the country's roads and bridges. This will be achieved by undertaking inspections of roads, traffic counts, axle load surveys, and road user charges studies to develop and implement an effective Road and Bridge Management System. The estimated cost is about US\$2 million (US\$0.5 million in 2004, and US\$1.5 million in 2005-2007).

22. To support effective planning and future development of the network, revising master plans for the country's roads and expressways will be necessary. A revision of existing plans should take place in 2004, followed by regular updates in subsequent years. Studies should also be undertaken to review and confirm network classifications in advance of decentralizing responsibility for local roads to the Provincial/Governorate level. Finally, the role and structure of the SCRB should be revisited with the aim of converting it into a Highway Authority that owns and manages the country's main roads (expressways and primary roads). The estimated cost is about US\$2 million (US\$0.5 million in 2004, and US\$1.5 million in 2005-2007).

23. It will also be critical to reestablish a program of regular maintenance for roads and bridges. In 2004, an aggressive program of routine and periodic maintenance must be launched to prevent further deterioration of the road network. Between 2004 and 2007, the program should include resurfacing (application of a thin overlay of 4 to 5cm) to about 5,600 km of expressway, primary, secondary, and village roads (1,100 km in 2004; 1,300 km in 2005; 1,500 km in 2006; and 1,700 km in 2007). The estimated cost for routine and periodic maintenance is about US\$358.31 million (US\$70.24 million for the year 2004, and a total of US\$288.07 million for the period 2005 to 2007). The assumptions made to estimate the cost of the routine and periodic road maintenance are summarized in the Tables 2.1, 2.2, and 2.3 below.

Table 2.1: Roads - Routine Maintenance

Routine Maintenance										
	Total Length		2004		2005		2006		2007	
			US\$/km/year	US\$ Million	US\$/km/year	US\$ Million	US\$/km/year	US\$ Million	US\$/km/year	US\$ Million
Expressway	1,061		420	0.446	510	0.541	550	0.584	600	0.637
Primary Roads	10,917		280	3.057	340	3.712	360	3.930	400	4.367
Secondary Roads	14,193		140	1.987	170	2.413	180	2.555	200	2.839
Village Roads	3,704		70	0.259	80	0.296	90	0.333	100	0.370
Total	29,875		192	5.749	233	6.962	248	7.402	275	8.212

Table 2.2: Roads - Periodic Maintenance

Periodic Maintenance (4 to 5 cm overlay)												
	Total Length	(4 to 5 cm overlay) US\$/km	Total 2004 - 2007		2004		2005		2006		2007	
			km	US\$ Million	km	US\$ Million	km	US\$ Million	km	US\$ Million	km	US\$ Million
Expressway	1,061	147,000	222	32.599	40	5.880	50	7.350	62	9.079	70	10.290
Primary Roads	10,917	91,000	2,079	189.162	410	37.282	483	43.965	556	50.585	630	57.330
Secondary Roads	14,193	36,000	2,640	95.026	520	18.729	613	22.086	706	25.412	800	28.800
Village Roads	3,704	20,000	660	13.198	130	2.601	153	3.067	176	3.529	200	4.000
Total	29,875		5,600	329.986	1,100	64.492	1,300	76.468	1,500	88.606	1,700	100.420

Table 2.3: Road Maintenance - Routine and Periodic Maintenance

	2004	2005	2006	2007
Total Assets (Roads) Maintenance	70.241	83.430	96.008	108.632
Average annual maintenance budget per km	2,351 US\$/km	2,793 US\$/km	3,214 US\$/km	3,636 US\$/km

24. Clearing the backlog of maintenance and strengthening the network through a program to rehabilitate and reconstruct the country's roads is also key. The proposed program would rehabilitate a total of 1,750 km of roads over a four-year period (100 km of expressway; 750 km of primary roads; 650 km of secondary roads; and 250 km of village roads). The estimated cost for the four-year first Road Rehabilitation Program is about US\$207.50 million (US\$29.05 million in 2004, and US\$178.45 million in 2005-2007). The assumptions made to estimate the cost of the Road Rehabilitation Program are summarized in Table 3 below.

Table 3: Road Rehabilitation Program (Excluding Periodic Maintenance)

	Total Length	Average cost per km	Total 2004 - 2007		2004		2005		2006		2007	
			km	US\$ Million	km	US\$ Million	km	US\$ Million	km	US\$ Million	km	US\$ Million
Expressway	1,061	300,000	100	30.000	14	4.200	20	6.000	26	7.800	40	12.000
Primary Roads	10,917	160,000	750	120.000	105	16.800	150	24.000	195	31.200	300	48.000
Secondary Roads	14,193	75,000	650	48.750	91	6.825	130	9.750	169	12.675	260	19.500
Village Roads	3,704	35,000	250	8.750	35	1.225	50	1.750	65	2.275	100	3.500
Total	29,875		1,750	207.500	245	29.050	350	41.500	455	53.950	700	83.000

25. Completing the missing 150 km segment of the expressway system north of Basra must also be considered a priority. The expressway accommodates 20 percent of total traffic volume in Iraq, and the Port of Umm Qasr is assuming an increasingly vital role in the movement of goods. The estimated cost for completing the construction of this missing expressway segment is about US\$219 million (US\$30 million in 2004, and US\$189 million in 2005-2007).

26. A program to replace the floating "pontoon" bridges (which have a temporary life with permanent structures (bridges) is a priority. A total of nine bridges would be replaced, with two in 2004, three in 2005, and two each in 2006 and 2007. The estimated cost is about US\$25 million (US\$3.5 million in 2004, and US\$21.5 million in 2005-2007). There is also a need to rehabilitate about 10 bridges for a total estimated cost of about US\$18 million (US\$5.4 million in 2004, and US\$12.6 million in 2005-2007).

27. The development of links at three critical locations would dramatically improve access to the expressway system and the flow of traffic in certain urban areas (Al Ramadi Link to Expressway No.1, Dourah Al Yousifiya Road, and linking Hillal to Expressway No.1). For this reason, they are considered priority projects and their total estimated cost is about US\$50 million (US\$5 million in 2004, and US\$45 million in 2005-2007).

28. Given the absence of any substantial new road construction over the last twenty years, it is likely that village roads are in need of expansion. Improving the access of rural populations to markets and social

services is considered a priority, and a program to build 400 km of new village roads should be considered. The estimated cost is about US\$30 million (US\$3.75 million in 2004, and US\$26.25 million in 2005-2007).

29. A priority will be to launch a dualization program to increase the capacity of about 250 km of selected primary roads, not only would this increase the network's capacity, it would also improve safety. The estimated cost is about US\$70 million (US\$3 million in 2004, and US\$67 million in 2005-2007).

30. To relieve congestion in major urban areas, additional capacity in the form of freeways or bypasses would be required. An estimated budget of about US\$36 million is proposed for the 2005-2007 period.

31. The overall cost of the proposed four-year program (base case) is estimated at US\$1.034 billion, excluding staff costs and services and goods recurrent costs. The estimated costs are recapitulated in Table 4 below:

Table 4: Road and Bridges – Priority Needs Budget (US\$ million)

	2004	2005-2007
Gross Expenditure		
Asset Maintenance (Roads and Bridges Routine and Periodic Maintenance)	70.24	288.07
Rehabilitation/Reconstruction (<i>Required to Bring Sector Back to March 2003 Level</i>)		
SCRB and National Central Laboratory (Building and Equipment)	7.00	10.00
Investment (Base Case)	80.70	578.80
Total Gross Expenditures	157.94	876.87
Investment Requirements (Base Case)		
Priority 1		
– Equipment and Technical Assistance to Develop a Road and Bridge Management System	0.50	1.50
– Road and Expressway Master Plan; Prepare SCRB Restructuring (Highway Authority)	0.50	1.50
– Replacement of 4 Floating Bridges	3.50	3.50
– Completion of Expressway No. 1 (About 150 km)	30.00	189.00
– Road Rehabilitation Program (100 km Expressway, 750 km Primary Roads, 650 km Secondary Roads, and 250 km Village Roads)	29.05	178.45
Total Priority 1 Capital Costs	63.55	373.95
Priority 2		
– Replacement of 5 Floating Bridges	0.00	18.00
– Rehabilitation of 10 Bridges	5.40	12.60
– Construction of New Links to Expressway No.1	5.00	45.00
– Dualization of Selected Primary Roads (A Program of About 400 km)	3.00	67.00
– Village Roads (400 km New Village Roads)	3.75	26.25
Total Priority 2 Capital costs	17.15	168.85
Priority 3		
– Urban Freeways, Bypasses and Ring Roads in Major Urban Areas	0.00	36.00
Total Investment Requirements (Base Case)	80.70	578.80
Additional Investment Requirements (High Case)		
– Construction of New Links to Improve Network Connectivity (About 250 km of Primary and Secondary Roads)	3.00	122.00
– Construction of 12 New Bridges	0.00	25.00
Total Additional Investment Requirements (High Case)	3.00	147.00

AIRPORTS AND CIVIL AVIATION

Airport Characteristics and Summary Status

32. In 2001, Iraq had 108 airports and airfields, the majority of which were under the control of the military. There are two international airports at Baghdad and Basra, and major domestic airports at Mosul, Kirkuk, and Irbil. All airports are designed for joint-use civil military facilities. While each of the airports suffered a limited amount of battle damage, the greater impact came from neglect and a lack of maintenance and spare parts over the past 13 years. The useful life of most electromechanical systems has expired, and none of the airports are compliant with International Civil Aviation Organization (ICAO) standards or capable of supporting commercial air operations.

33. *Baghdad International Airport* is located about 20 km from the city. It covers an area of 3,000 hectares, has two runways (3,300 meters long and 45.7 meters wide; and 4,000 meters long and 60 meters wide), and a passenger terminal complex made up of three terminals. Collectively, the terminal complex has a design capacity of 7.5 million passengers per year (2.5 million at each terminal). The airport's original terminal, which is separate from the passenger terminal complex, has not been in use since 1982. State-of-the-art air traffic control systems were introduced with the opening of the passenger terminal complex in 1982, but never achieved design levels of performance due to lack of service and maintenance.

34. *Basra International Airport* was designed and constructed in the early 1980s, and sits on 2,300 hectares. The complex consists of one runway (4,000 meters long and 44.8 meters wide) and one terminal building, which was designed to accommodate three million passengers per annum. As with Baghdad International Airport, much of Basra's airport deficiencies can be attributed to the prolonged general lack of servicing, maintenance, and spare parts for both facilities and equipment.

35. *Mosul Airport*, located four km from the city, is an important regional airport that occupies an area of about 30 hectares. It has one runway (2,600 meters long and 45.1 meters wide) and a terminal designed to process 550,000 passengers annually. While the terminal is structurally sound, there are presently a number of problems with the airport, including: (i) it is surrounded by housing and public land and cannot be expanded; (ii) there are no systems in place to handle passengers or cargo; (iii) air traffic control and navigation systems are not functional; (iv) there is no provision for aircraft turnaround and refueling; and (v) Coalition Forces fully occupy the airport and have no immediate plans to withdraw.

Airline Services

36. Between 1991 and 2000 there were no commercial flights, and only a very low level of domestic service between 2000 and 2003. During the past 13 years, no international commercial air carriers have operated in Iraq, and the only domestic airline services available were those offered by Iraqi Airways. Between 1991 and 2000, Iraqi Airways was completely grounded as a result of the sanctions, and domestic service only resumed in late 2000 with flights linking Baghdad with Basra and Mosul. These services were limited to two non-stop flights per day for a maximum of four daily flight operations. This is equivalent to less than 2 percent throughput capacity at Baghdad International Airport. Currently, Iraqi Airways has more than 2,300 staff.

37. Prior to the first Gulf War, Iraqi Airways had a total of 23 passenger and cargo aircraft. At the start of the recent conflict, just 10 aircraft remained in Baghdad, two of which were destroyed in the fighting. Of the remaining eight, five were found to be serviceable. Although Iraqi Airways has had 13 aircraft in storage at Amman, Tehran, and Tunis Airports for most of the past decade, they are virtually worthless due to the fact that they are about 30 years old, have not been maintained, and in most instances, have claims against them that exceed their present value. As such, fleet replacement and acquisition will be necessary if Iraqi Airways is to resume operations.

38. While Iraqi Airways provided very limited domestic services prior to the recent conflict, the future of Iraqi Airways, and its 2,300 idle employees, is unknown. It is, however, unlikely that the airlines will be revived, but this matter should be considered under the program to restructure state-owned enterprises.

Institutional Structure, Staffing, and Airport Status

39. Within the Ministry of Transportation and Communications (MOTC), three entities are responsible for airports and civil aviation: (i) Iraq Civil Aviation Authority (ICAA); (ii) Iraqi Airways (IA); and (iii) Meteorological Department (MD). ICAA is responsible for all civil aviation in Iraq, and for managing and operating the country's airports. It has a Director General overseeing 17 departments and 1,200 staff. Currently, all airports and civil aviation activities are currently under the control of the Coalition Provisional Authority (CPA). Airport and air traffic control operations are wholly Government funded.

40. Given the absence of air traffic throughout the 1990s, airport staff, who have been operating in isolation for the better part of 13 years, have not had access to modern traffic management techniques and ICAO operating standards. As a result, there is a significant need to upgrade air traffic control systems and equipment, as well as the skills of those who will be charged with operating the systems. Reestablishing air services to Iraq will require both the recruitment of new staff, and a substantial training program to qualify air traffic controllers.

41. Currently, Coalition Forces are providing air traffic approach and control services at Baghdad and Basra International Airports. The CPA is working to reopen Iraqi airspace to overflights, preparing specifications for a modern air traffic control system, and processing applications from numerous airlines interested in providing commercial air services to Iraq. Because the security situation at Baghdad Airport remains a serious concern, efforts have shifted to reestablishing flight operations at Basra first. As part of the effort to reopen Iraq's airports, elevated security standards will be enforced, and technical specifications for all systems will be at the higher post-9/11 level.

Priority Needs and Funding Requirements

42. Reliable air transportation for passengers and cargo is vital to activities that promote economic growth and production, and the resumption of air services in Iraq should be considered as a prerequisite to rebuilding the country. Air transport facilitates global access and the movement of goods and people; improves communications; and promotes business interaction. It also supports the growth of leisure travel and tourism, which is now the world's largest industry. To sustain the large-scale investments that will be needed in Iraq, a fully integrated transportation system, with the restoration of air services that are safe, reliable, and affordable, will be essential.

43. Priority needs in the airports and civil aviation sector focus on supporting the resumption of regular commercial air services to Iraq, particularly at Baghdad and Basra International Airports. A first order need will be to establish a Civil Aviation Authority to operate and regulate the sector. This will necessitate the formation of an integrated National Air Traffic Management System that will permit ICAO recertification. Equipment and software will be required, as will a substantial training program to prepare Iraqi controllers to operate the new systems. The estimated cost is about US\$100 million (US\$30 million in 2004, and US\$70 million in 2005-2007).

44. The country's three principal airports at Baghdad, Basra and Mosul³ will need to be restored before they can effectively accommodate commercial air traffic. This will involve a number of actions, including refurbishing control towers and related facilities, and replacing air traffic control equipment and navigation aids. Related activities, such as repairing runways, taxiways and aprons, and restoring utility services, including power, water, sewerage, telecommunications and air conditioning systems, will also be required. Finally, cargo and passenger handling services will need to be reinstated, which will likely entail renovating storage areas, replacing electromechanical systems, and installing security systems that are post-9/11

³ Although Coalition Forces currently occupy Mosul Airport, it is anticipated that they will vacate the premises within the 2004 to 2007 timeframe covered in this assessment, and as such, cost estimates include refurbishing Mosul's airport.

compliant. The estimated costs are about: (i) Baghdad Airport US\$153.0 million (US\$67.2 million in 2004, and US\$85.8 million in 2005-2007); (ii) Basra Airport US\$56 million (US\$29 million in 2004, and US\$27 million in 2005-2007); and (iii) Mosul Airport US\$16.7 million (US\$13.2 million in 2004, and US\$3.5 million in 2005-2007).

45. The completion of a strategy for future development of the civil aviation sector, supported by a master plan, must be considered a priority. The country's large number of airports, airfields, and other aviation assets should be profiled, plans for rationalizing facilities produced, and the future role of remaining assets identified. Over the medium-term, policy should be devised that separates regulatory functions from airport management, and private operation of airports should be supported. A policy of "open skies" should be pursued. The estimated cost of these activities and training services is about US\$3.5 million (US\$1.5 million in 2004, and US\$2.0 million in 2005-2007).

46. The overall cost of the proposed four-year program (base case) is estimated at US\$328.7 million, excluding staff costs and services and goods recurrent costs. The estimated costs are recapitulated in Table 5 below:

Table 5: Civil Aviation - Priority Needs Budget (US\$ million)

	2004	2005-2007
Gross Expenditure		
Rehabilitation/Reconstruction <i>Required to Bring Sector Back to March 2003 Level</i>	Will be done in 2003	Will be done in 2003
Investment (Base Case)	140.90	187.80
Gross Revenues <i>(Where Some Tariffs May Be Collected)</i>		
Investment Requirements (Base Case)		
Priority 1		
Baghdad International Airport (For Full ICAO Certification)	67.20	85.80
Basra International Airport	29.00	27.00
Mosul Airport (For Full ICAO Certification)	13.20	3.50
	109.40	116.30
Priority 2		
National Air Traffic Management System (ATMS)	30.000	70.000
Civil Aviation Master Plan and Training Services	1.500	1.500
	31.500	71.000
Total Investment Requirements (Base Case)	140.90	187.80

PORTS AND INLAND WATERWAYS

Characteristics and Summary Status

47. There are six cargo ports, plus two dedicated oil terminals in Iraq, all located in the riverine area of Shatt al Arab. These include: Umm Qasr; Az Zubair; Maqal (Basra); Abu Al Khazib; Abu Flus; and Al Faw.

48. *Umm Qasr Port* is Iraq's only deep-water port, and serves as a vital link for importing and exporting goods. It is located adjacent to the Kuwaiti border and has established intermodal connections, both road and rail, with a number of spur lines throughout the port. The port complex has 21 berths with a total length of 5 km from the main gate to Pier 1 in the south (the "Old Port"). The Port's property extends about 1 km to the west. Currently, Port facilities do not permit the safe transit and docking of 50,000 metric-ton vessels, and depths alongside berths range from 2 to 8 meters. A grain storage facility consisting of 48 silos with a total storage capacity of 45,000 metric tons, was constructed in the early 1980s, but suffered from years of neglect. Efforts to restore the complex, which had been decommissioned, are underway. There is also ample warehousing and storage capacity at the Port, with approximately 177,000 square meters of covered warehouse facilities, and 800,000 square meters of open storage space. The warehousing facilities, which are in relatively good condition and accessible by road and rail, have had little maintenance over the years and are in need of weatherproofing and rodent control.

49. The infrastructure is generally in good condition, but the superstructure and equipment (from various origins), received only minimal maintenance over the past several years. As such, most of the equipment is no longer useful. In 2000, the Port handled 2 million tons of general cargo, and processed 28,185 TEUs (20-foot equivalent units), although the facilities available are more than adequate to handle in excess of 100,000 TEUs per annum.

50. Siltation in the 50 nautical-mile approach channel is a problem, and it must be dredged on a regular basis. The average depth throughout the channel's length is between 11 meters and 11.5 meters. As such, the development of a good dredging plan, which also addresses the broader, more complex environmental concerns associated with dredging operations, will be required.

51. There are also considerable numbers of wrecks in the approach channel left over from the Iran/Iraq War, and attempts are underway to remove them. However, because much of the channel has silted over and the soil has become claylike, the task is very challenging.

52. The United States Agency for International Development (USAID) contracted the US firm, Stevedoring Services of America (SSA), to operate the Port of Umm Qasr under a one-year Management Contract. SSA, stated its aim was to operate the Port on a commercial basis, and is charging for port services on the basis of a tariff structure approved by the CPA. The development of a transition plan detailing the steps and mechanisms for the Ports Authority to take over operations from SSA will be a priority. Fencing of the Port for security purposes is ongoing under a USAID-funded contract with Bechtel. Two dredgers, one financed by USAID and the other by UNDP, are actively dredging the channel. The Port of Dubai is helping to reestablish procedures for processing passengers and cargo, and is providing scheduled passenger services from Dubai to Umm Qasr. Currently, there is a tax holiday on all cargo imported into the country, and to July 2003, more than 300,000 tons of humanitarian assistance was cleared through the Port.

53. *Az Zubair Port*, located 18 km north of Umm Qasr Port, is an industrial port built with specialized facilities for exporting fertilizer, importing iron ore, and processing general cargo. *Maqal (Basra) Port*, which served as Iraq's main port prior to the Iran/Iraq War, was heavily damaged during that conflict, and a decision was taken to develop a new port at Umm Qasr, rather than repair Maqal Port. *Abu Al Khazib* and *Abu Flus Ports* are situated on the Shatt al Arab waterway about 20 km south of Basra. These small ports serve as an export terminal for the products of a nearby fertilizer plant (Abu Al Khazib), and for general cargo (Abu Flus). The *Al Faw Port* was a loading jetty that was used to supply two offshore oil platforms. Its structures are in very poor condition.

Inland Water and Maritime Transport

54. River transport was completely neglected. In 1984, between 5 percent and 7 percent of all cargo in Iraq was carried along inland waterways. Goods, including steel, cement, grains, and other non-perishable products, were transported using a barge and pusher. “Kalaks,” or local sailing vessels, also played a role. Today, there are several problems that hinder the movement of freight along the main inland waterway passages of the Shatt al Arab and the Shatt al Basra, including: damaged infrastructure, 13 pontoon bridges blocking access, heavy siltation, insufficient signage, and lack of security. In addition, the water level decreased significantly over recent years due to the construction of dams in Turkey. Over the medium-term, it is not envisaged that river transport will be part of any investment program.

55. Maritime transport services are not covered in this Needs Assessment, nor is the future of the Iraq Water Transport Company which has no operating vessel and more than 800 staff. In the 1980s the Iraq Water Transport Company operated a fleet of 21 high sea vessels transporting goods and cargo. A decision on its future, and that of its staff, will need to be made as part of the program to restructure State-Owned Enterprises.

Institutional Structure, Staffing, and Future Port Direction

56. With the exception of the two dedicated oil terminals (Al Baker and Khawr Al Amaya), which fall under the responsibility of the Ministry of Oil, all ports are under the jurisdiction of the Port Authority, a Department under the Ministry of Transport and Communications (MOTC) with headquarters in Basra. A Director General, who is supported by a Director at the port level, heads the Port Authority. With the exception of dredging and survey works, which is undertaken by the Navigations Affairs Office, Directors at the port level are responsible for administering, operating, and managing all port functions. Port employees carry out the majority of port operations, however, stevedoring services are contracted out to private operators. Planning and future port development activities are centralized at the MOTC. As shown in the Table 6 below, there are nearly 10,000 staff working for the Port Authority:

Table 6: Staff Working for the Port Authority

	Headquarters at Basra	Umm Qasr	Az Zubair	Maqal (Basra)	Abu Khazib & Abu Flus	Marine Department	Total
Staff	3,063	3,520	650	540	100	2,060	9,933

Priority Needs and Funding Requirements

57. The future direction of Iraq’s port system will need to be articulated in an integrated Master Plan for the sector. A key first step would be to restructure the sector, which would necessitate the development of a strategy, particularly for Umm Qasr Port as it is the Iraq’s primary port. The Port of Umm Qasr has large tracts of land for expansion, and although much of its infrastructure has been neglected in the past and is currently underutilized, it has great potential. To capture the Port’s full potential, it’s operations could be restructured along the lines of the Landlord Port Model. Under this approach, ownership of the land and port infrastructure would remain with the Port Authority, but the private sector would be responsible for developing the superstructure, equipping the facility, and operating services.

58. The Port of Umm Qasr is Iraq’s most important port and has the potential to become a major cargo and container-handling facility in the region. Should that occur, a considerable number of job opportunities would be created. However, this will require both physical rehabilitation and policy and institutional reform.

59. A first priority for the sector will be to continue the ongoing dredging activities that are currently underway in and around Umm Qasr Port. The development of a detailed dredging plan that assesses and prioritizes the needs of all of Iraq’s ports will be essential. In some instances, it might not be feasible or advantageous to reopen channels to all ports, especially given the small size and limited traffic at some facilities. The estimated cost is about US\$30 million (US\$10 million in 2004, and US\$20 million in 2005-2007).

60. Rehabilitating Iraq’s chief ports and repairing the physical and structural damage caused by past conflict or neglect is a priority. To do so, the development of a rehabilitation plan, based on detailed inspections of the country’s ports, will be a key first step. Works would be sequenced accordingly, and should focus on Umm Qasr because of its critical role in replenishing and reconstructing the country.

Rehabilitating the Port's building and marine structures, grain silos, and warehousing facilities will be necessary. Consideration should be given to developing and, if necessary, reconfiguring the intermodal transport systems within the Port complex. The efficient interchange of commodities and containers reduces transport costs and increases the attractiveness of a port, thus reinforcing the Port's potential. The estimated cost is about US\$ 100 million (US\$30 million in 2004, and US\$70 million in 2005-2007).

61. The loss of vital equipment to support a fully functioning Umm Qasr Port, including vessels for piloting, tugs, and emergency response vehicles, will need to be replaced. It is anticipated that most acquisition will occur in 2004 and 2005. The estimated cost is about US\$ 35 million (US\$15 million in 2004, and US\$20 million in 2005-2007).

62. Cargo and container handling equipment should be acquired. The estimated cost is about US\$40 million (US\$15 million in 2004, and US\$25 million in 2005-2007).

63. To achieve greater efficiency and competitiveness, governments are reorganizing the way ports are run, port institutions function, and services are delivered. As a result, private ownership and delivery of port services is on the rise. However, managing the transition to increased private sector involvement and understanding the needs, challenges, and risks associated with sector reform and institutional change is critical. To facilitate and guide future development in the sector, the development of a Master Plan is considered a priority. The estimated cost is about US\$2 million (US\$1 million in 2004, and US\$1 million in 2005-2007).

64. The overall cost of the proposed four-year program (base case) is estimated at US\$207 million, excluding staff costs and services and goods recurrent costs. Approximately US\$71 million would be required for 2004, and the balance, US\$136 million, for the 2005 to 2007 period. The estimated costs are recapitulated in Table 7 below:

Table 7: Ports - Priority Needs Budget (US\$ million)

	2004	2005-2007
Gross Expenditure		
Rehabilitation/Reconstruction <i>(Required to Bring Sector Back to March 2003 Level)</i>	Will be completed in 2003	Will be completed in 2003
Investment (Base Case)	71.000	136.000
Gross Revenues <i>(Where Some Tariffs May Be Collected)</i>		
Investment Requirements (Base Case)		
Priority 1		
Ports Master Plan and Ports Restructuring	1.000	1.000
Dredging	10.000	20.000
Equipment and Systems for Marine Traffic Management, Pilotage, Pollution Control, Firefighting, Marine Patrols, Navigational/Safety Advice, and Emergency Preparedness for the Port.	15.000	20.000
Rehabilitation of Structures	30.000	70.000
Handling Equipment	15.000	25.000
Total Investment Requirements (Base Case)	71.000	136.000

RAILWAYS

Characteristics and Summary Status

65. Construction of Iraq's railway network, which is one of the most extensive in the region, first began in 1912. Today, the overall length is around 2,456 km, including 551 km of branch line. Of this, about 45 percent, or 1,130 km, are considered to be in poor condition, and commercial speeds along some sections of the network are as low as 30 km/hour. This is primarily due to the absence of a functioning signaling and telecommunications system, and partly because of the poor condition of the tracks. The system consists of five principal lines from: (i) Baghdad to Basra and Umm Qasr, constructed about 40 years ago and can accommodate 24 trains daily; (ii) Baghdad to Mosul and the Syrian border, built about 80 years ago and has a design capacity of 18 trains per day; (iii) Baghdad to Al Qaim via Ramadi; (iv) Al Qaim to Akashat; and (v) Kirkuk to Baiji and Haditha. The last three lines were built in the mid-1980s. Table 8 below provides some characteristics of Iraq's principal rail lines:

Table 8: Railway Lines

Line	Length (km)	Single Line (SL) Double Line (DL)	Signal and Telecommunication	Number of Stations
Baghdad - Basra - Umm Qasr	609	S.L. 1960	Semi-Automatic (Obsolete)	43
Baghdad - Mosul - Syrian Border	524	S.L. 1910 to 1940	Manual (Damaged)	20
Baghdad - Ramadi - Al Qaim	376	S.L. (D.L. to Ramadi) 1987	Semi-Automatic (Damaged)	24
Al Qaim – Akashat	144	S.L. 1987	(Damaged)	6
Kirkuk - Baiji - Haditha	252	S.L. 1987	CTC (GEC) (Damaged)	14
Total Five Lines:	1,905			
Branch Lines:	551			
Totals:	2,456			107

66. There are 107 stations throughout the system, 11 regional offices, seven maintenance facilities and workshops, a plant for producing concrete sleepers, and a training institute. However, most equipment and machinery at the workshops, sleeper plant, and training institute were lost due to war damage and the looting which followed.

67. Rolling stock is in poor condition. Between 1976 and 1984, Iraq Railways (IRR) had 385 locomotives in service, all powered by diesel. In 2002, 50 additional locomotives were obtained, but today, less than 40 percent (160) of the locomotive fleet is functional. In 2001, IRR had around 319 passenger coaches and 12,442 freight wagons and flatbeds (400 for oil, the rest for grains and general cargo), but today, just 150 coaches and 8795 freight wagons are functional. Over the past 15 to 20 years, funding has not been provided to maintain tracks, supporting facilities, or rolling stock.

68. Prior to the 2003 conflict, there were 30 trains per day. Today, IRR is operating at about one-third of pre-war levels with just 10 daily trains operating on the system. Services, before and after the war, are shown in Table 9 below:

Table 9: Railway Services

Service	Pre-War	Post-War	Time Needed
Baghdad to Basra	4 daily trains, each direction	1 daily train, each direction	11 hours
Baghdad to Mosul	2 daily trains, each direction	1 daily train, each direction	8 hours
Baghdad to Baiji	1 daily train, each direction	1 daily train, each direction	5 hours
Kurkik to Haditha	1 daily train, each direction	No service	3 hours

69. IRR's peak years of operation were in 1994, when 7,734,000 passengers utilized the system, and in 1990, when 7,701,560 tons of cargo were transported by rail. In 2002, IRR moved 1.2 million passengers and 5.4 million tons of freight (an average of 196,000 freight ton km per wagon). Most passengers use the Baghdad-Basra line, and before the war, there were three classes of service. Today, there is just one. Passenger fares from Baghdad to Basra, which pre-war were ID500 (US\$0.32), have doubled to ID1,000 (US\$0.65). Today, the cost to carry cargo is ID7 per metric ton/km (US\$0.005).

70. Under the supervision of the Coalition Forces, IRR resumed rail services to the Syrian border when a train carried passengers and oil wagons from the border to Baghdad on July 30, 2003. Other IRR services include: transporting sulfur from Mosul to Baghdad, phosphate in the western part of the country, and goods and grains from the Port of Umm Qasr to Baghdad. Rail facilities at Umm Qasr are being used to move containers and transport bulk goods brought in from Kuwait by truck to points north.

Role of Railways

71. Despite the existence of an extensive road network, rail has typically accounted for about 30 percent of all traffic volume in Iraq, although this percentage has declined since the latest conflict. Rail has had a prevalent role in the movement of goods and people because of the country's vast size, and the need to economically transport heavy goods and bulk commodities, especially to and from the Port of Umm Qasr.

72. Rail's role is likely to be amplified during the reconstruction efforts, given that the Port of Umm Qasr is taking on an increasingly significant role as a main portal for the movement of goods, and because of the existing intermodal rail links at the Port. However, rail infrastructure and facilities will need to be upgraded, and services increased and made reliable. The development of a fully integrated logistics platform, including the construction of inland port facilities at Baghdad with intermodal road and rail connections, would contribute to stronger and more vibrant competition between rail and road, particularly for transporting containers from Umm Qasr Port.

73. In the past, rail services also fulfilled a key social function by providing an affordable alternative mode of transportation for Iraqis. This role should continue, and the frequency of passenger services, as well as the quality, elevated.

Institutional Structure and Staffing

74. The Iraqi Railway Company, which was corporatized in 1998 and is an independent entity under the MOTC, has overall responsibility for planning, managing, and operating rail services in Iraq. There are about 13,300 employees located at headquarters and in the regional offices. This works out to roughly 5.2 employees per km of line, a figure that is in line with Morocco's similarly-sized system (5.7), but lower than Syria's (7.1). Staff are technically skilled, but have limited exposure to managerial techniques and the discipline of commercially run organizations. The Training Institute, which serves an important function and is located in Baghdad, provided training to more than 2,200 people in 2002, mostly in technical issues, administration matters, and computer programs.

75. With the exception of earth works and concrete, which was undertaken by the private sector, physical works, including construction of new lines and improvements to existing routes, were financed by the national budget through allocations decided by the MOP. Works were implemented through force account arrangements. Since 1995, IRR revenues have consistently exceeded operating costs, and as such, they have been able to self-finance their recurrent costs (excluding depreciation of infrastructure) for the past eight years.

Priority Needs and Funding Requirements

76. While rail will play an important role in Iraq's reconstruction efforts, it will have a larger and more permanent position in serving the needs of the Iraqi economy. As such, development of the rail system will continue to be a priority beyond the four-year timeframe covered in this assessment.

77. A key priority will be to bring the sector back to pre-March 2003 levels. To do so will necessitate the rehabilitation of key stations that were damaged as a result of the recent conflict, and subsequent looting.

Refurbishing rolling stock and maintenance equipment will also be necessary to get operations back to pre-conflict levels. The estimated cost is about US\$8 million (US\$5 million in 2004, and US\$3 million in 2005-2007).

78. To restore access to the entire network, the Al Datha Bridge near Baiji and the Akashat Bridge near the Syria border (two key structures that were damaged during the conflict) will need to be reconstructed. The cost to repair the bridges is forecast to be \$US1 million, and should be completed by the end of 2004.

79. A study to assess the merits of restructuring the sector to permit greater private sector participation in the delivery of services is a final priority. The study could be completed in 2004 at an estimated cost of US\$500,000.

80. Modernization of the Railway Training Center is considered a priority because of the need to maintain the skills of railway staff. The estimated cost is about US\$6 million (US\$1.5 million in 2004, and US\$4.5 million in 2005 to 2007).

81. With the anticipated increase in the volume of cargo and number of containers handled at the Port of Umm Qasr, the construction of a logistics platform in Baghdad (Terminal Container) and the acquisition of equipment (rubber-tired gantry cranes and specialized cranes and forklifts) to load and unload containers at the port/rail interface, as well as throughout the rail system, will be a necessity. The estimated cost of Baghdad Container Terminal and container handling equipment is about US\$10 million (US\$4 million in 2004, and US\$6 million in 2005-2007).

82. To restore and mobilize the full potential of the system, a more prolonged and costly program to rehabilitate the entire system will need to be undertaken. This will entail :

- (a) First Priority: (i) establishing appropriate signaling systems on lines from Baghdad to Basra and Umm Qasr, Baghdad to Mosul and Al Yarubiyeh, Baghdad to Al Qaim and Akhshat, and Kirkuk to Baiji and Haditha; (ii) rehabilitating all stations in the system which also need varying levels of reconstruction, including the Central Train Station at Baghdad, and the rolling stock (locomotives, coaches and wagons) will need to be overhauled; and (iii) finally, restoring workshops to their original state to enable proper maintenance and repair of the rolling stock. The estimated cost of this first priority investment package is about US\$169 million (US\$52 million in 2004, and US\$117 million in 2005-2007).
- (b) Second Priority: (i) completing the replacement of tracks (construction of new parallel tracks) for the Baghdad – Basra – Umm Qasr Line (536 km); (ii) rehabilitating the concrete sleeper factory at Abugharib; and (iii) installing an optical fiber communication system on all railway lines. The estimated cost of this second priority investment package is about US\$256 million (US\$38 million in 2004, and US\$218 million in 2005-2007).
- (c) Third Priority: completing the replacement of tracks (construction of new parallel tracks) for the Baghdad – Mosul - Al Yarubiyeh (Syrian Boarder) Line (524 km). The estimated cost is about \$US245 million (US\$35 million in 2004, and US\$210 million in 2005-2007).

83. The overall cost of the proposed four-year program (base case) is estimated at US\$733.5 million, excluding staff costs and services and goods recurrent costs. The estimated costs are recapitulated in Table 10 below:

Table 10: Railways - Priority Needs Budget (US\$ million)

	2004	2005-2007
Gross Expenditures		
Asset Maintenance		
– Track Maintenance	4.00	17.00
– Rolling Stock Maintenance	3.00	10.00
– Stations Maintenance	1.00	3.00
Total Asset Maintenance	8.00	30.00
Rehabilitation/Reconstruction <i>(Required to Bring Sector Back to March 2003 Level)</i>		
– Railway Stations	2.00	0.00
– Rolling Stock and Maintenance Equipment	3.00	3.00
– Reconstruction of 2 Damaged Bridges (Al Datha Bridge Near Bajai and at Akashat)	1.00	0.00
Total Rehabilitation/Reconstruction	6.00	3.00
Investment (Base Case)	131.00	555.50
Total Gross Expenditure	145.00	588.50
Gross Revenues <i>(Where Some Tariffs May Be Collected)</i>		
Investment Requirements (Base Case)		
Priority 1		
1 Railway Restructuring Study	0.50	0.00
2 Modernization of the Railway Training Center	1.50	4.50
3 Construction of a Logistics Platform in Baghdad (Baghdad Container Terminal) Including Acquisition of Equipment (Fork Lift/Crane) for Container Loading/Unloading	4.00	6.00
4 Restore and Mobilize the Full Potential of the System (Priority 1)	52.00	117.00
– Studies for Repair/Rehabilitation/Upgrading of Track, Rolling Stock, Signaling + Telecommunication	1.00	3.00
– Rehabilitation of All Station Buildings in All Governorates and Central Station at Baghdad	7.00	13.00
– Overhauling of Rolling Stock (Locomotives, Coaches, and Wagons)	10.00	30.00
– Signaling System for Baghdad – Basra – Umm Qasr (Blocking System with Signaling)	10.00	20.00
– Signaling System (Blocking System - Token Less Radio Blocks) for : (a) Baghdad – Mosul – Al Yarubiyeh; and (b) Baghdad – Al Qaim – Akhshat; and (c) Kirkuk – Bajai - Haditha	17.00	33.00
– Rehabilitation of Workshop at Shalachia – (Baghdad) and Other Workshops at Samawa – Bajai Al Qaim and Kirkuk	7.00	18.00
	58.00	127.500
Priority 2		
5 Restore and Mobilize the Full Potential of the System (Priority 2)		
– Replacement of Track Work for the Baghdad – Basra – Umm Qasr Line (536 km) to the New Standard Instead of Renewal Work Already in Progress	35.00	210.00
– Rehabilitation of Concrete Sleeper Factory at Abugharib	1.00	4.00
– Provision of Optical Fiber Communication System on All Railway Lines	2.00	4.00
	38.00	218.00
Priority 3		
6 Restore and Mobilize the Full Potential of the System (Priority 3)		
– Replacement of Track Work for the Baghdad – Mosul - Al Yaribiyeh (Syrian Border) Line (524 km) Parallel to Existing Line Instead of Renewal Work Already in Progress	35.00	210.00
	35.00	210.00
Total Investment Requirements (Base Case)	131.00	555.50
Additional Investment Requirements (High Case)		
Construction of a New Railway Line (Mosul – Zakho, Connection to Turkey) (150 km @ US\$2 million = US\$300 million)	2.00	150.00
Construction of About 10 Bridges (Over Roads)	1.00	9.00
	3.00	159.00

PUBLIC TRANSPORT

Characteristics and Summary Status

84. The economic sanctions that were imposed on Iraq throughout most of the 1990s had a significant impact on vehicle ownership in Iraq. During the mid-1980s, the country had around 750,000 total vehicles. Nearly 20 years later, in 2003, that estimate had increased to just 1.3 million. As a result, significant pressure had been put on Iraq's public transport systems, which for many, is the only affordable means of transportation. With the exception of very limited domestic commercial services that operated from 2000 to 2003, the absence of flights only compounded the situation for intercity transport.

85. Public transport services offered in Iraq are: (i) within municipal areas; (ii) between cities; and (iii) to other neighboring countries. The public transport fleet includes: taxis, mini-buses, medium-sized “coaster-style” buses, and large buses. There is passenger service from Baghdad to all the Governorates, and principal routes run from Baghdad to Basra, Kirkuk, Babylon, Thee Qar and Ninawa. The route between Baghdad and Amman is the most heavily traveled international route. The high demand for public transport services coupled with the limited number of available jobs, has led many owners of private vehicles to offer informal transport services.

86. Three types of land transport companies operate in Iraq: (i) large, Government-owned firms (principally the General Company for Passenger Transport and Dhilal Company); (ii) firms that have joint public/private ownership (Baghdad Public Transport Company and Al-Ishar Transport Company, which provides services in Basra); and (iii) privately-owned companies. In 2002, Government-owned operators carried around 104 million municipal passengers (in Baghdad), and some 20 million intercity passengers.

Table 11: Public Transport State Owned Companies

Name of Company	Size of Vehicle Fleet	Number of Employees	Passengers Carried (millions)
Company for Passenger Transport	1,464 Buses	3,053	109 (Urban); 18 (Intercity); 0.03 (International)
Dhilal Transport Company	121 Buses	557	2.1 (Intercity); 0.04 (International)
Baghdad Public Transport Company	n.a.	15	n.a.
Al-Ishar Transport Company	n.a.	36	3.0 (Urban - in Basra)

Note: Figures are for 2002.

Institutional Structure

87. Responsibility for overseeing the public transport sector lies with the MOTC. A Government-owned entity under MOTC, the Private Transport Company manages and operates the country's 165 terminals (it does not provide transport services). The Private Transport Company regulates services within and between urban areas, determines routes, frequency of service, fares, and the numbers of vehicles needed to provide the services. To fund its activities, the Private Transport Company collects 5 percent of the farebox from each bus utilizing its terminals. In the northern Governorates, terminals are operated by private firms.

88. Although the Private Transport Company has responsibility for setting policy and articulating plans for the sector's development, such activities have been neglected for several years. As a result, staff skills have atrophied in terms of fleet planning and optimization, passenger demand modeling and forecasting, and route selection.

Priority Needs and Funding Requirements

89. Given that demand for vehicles has been suppressed for a number of years, the size of the vehicle fleet is expected to grow substantially in the short- to medium-term, and an associated increase in traffic is

anticipated. As traffic congestion grows in major metropolitan areas, the need for an efficient public transport system will become increasingly important. Although the participation of the private sector would likely support efficiency, there are several reasons not to rush dramatic restructuring of the sector, including the need to preserve jobs and maintain socially necessary routes. Over the medium-term, the public sector should begin withdrawing to a position of setting policy and regulating the sector, and permit the private sector to deliver bus services. In the short-term, however, municipal bus operations should remain under Government control. A priority in the sector is to provide financing to refurbish key facilities and replace enough of the buses lost to enable normal operations. The estimated cost is about US\$10 million (US\$6 million in 2004, and US\$4 million in 2005-2007).

90. Management of the country's 165 bus terminals, which are currently under the control of the Private Transport Company, should be contracted out to the private sector. A priority project is to define a strategy for concessioning the facilities, and provide assistance in carrying out the transactions. The estimated cost is about US\$0.5 million and would be completed in 2004.

91. In anticipation of greater private sector participation in the delivery of bus services, the development of a strategy to define an appropriate institutional structure, establish a functioning regulatory entity, and define appropriate regulations is a priority. It is expected that the study would cost around US\$0.5 million, and would be completed in 2004.

92. Another early priority is to examine ways to facilitate the flow of traffic in the country's major municipalities, and especially Baghdad. The potential for developing Bus Rapid Transit (BRT) systems, and dedicated bus lanes, should be explored. Such a study would be completed in 2004 at an estimated cost of around US\$0.5 million. It would be followed by implementation works in 2005-2007 for an estimated cost of about US\$10 million

93. The overall cost of the proposed four-year program (base case) is estimated at US\$22.5 million, excluding staff costs and services and goods recurrent costs. The estimated costs are recapitulated in Table 12 below.

Table 12: Public Transport - Priority Needs Budget (US\$ million)

	2004	2005-2007
Gross Expenditure		
Rehabilitation/Reconstruction (<i>Required to Bring Sector Back to March 2003 Level</i>)		
Replace Lost Buses	6.00	4.00
Investment (Base Case)	1.50	11.00
Total Gross Expenditures	7.50	15.00
Investment Requirements (Base Case)		
Priority 1		
Technical Assistance to Concession Out Bus Terminals	0.50	
Study to Organize and Regulate Public Transport	0.50	
Studies for Bus Lanes and Bus Rapid Transit (BRT) Systems in Baghdad and Basra	0.50	1.00
Implementation of Dedicated Bus Lanes		10.0
Total Investment Requirements (Base Case)	1.50	1.00

FREIGHT AND COMMERCIAL TRANSPORT

Characteristics and Summary Status

94. Throughout the 1990s, the transport of freight and commercial goods via road has been significant in Iraq. The majority of goods imported under the “Oil for Food” Program were transported from neighboring countries using trucks. The main international freight corridors for goods destined for Iraq were/are from Aqaba (Jordan) to Baghdad via Amman, and from Tartous (Syria) to Baghdad. The chief domestic corridor continues to be between Baghdad and Basra/Port of Umm Qasr. Of the total tonnage transported by land in 2002 (approximately 11 million tons of general cargo and around 3 million tons of oil products), 20 percent came in from Jordan, 20 percent from Syria, and the balance, 60 percent, was transported locally, primarily from the Port of Umm Qasr. Overall, trucks constitute around 26 percent of Iraq’s total vehicle fleet.

95. Similarly to the public transport sector, there are four types of land transport companies operating in Iraq: (i) large, Government-owned firms (principally the General Land Transport Company and Dhilal Company); (ii) inter-governmental companies jointly owned and managed by the Government of Iraq and other governments (Jordanian-Iraqi Company for Land Transport and the Syrian-Iraqi Company for Land Transport); (iii) firms that have joint public/private ownership (Iraqi Land Transport Company, Badia Transport Company, and General Company for Goods and Oil Products Transport); and (iv) approximately 400 private trucking firms, most of which are smaller, family-owned enterprises. The majority of the smaller private sector firms participate in freight transport by leasing their vehicles to larger trucking firms, which have a quasi-monopoly on the land transport market. In addition to managing its own fleet of 1,949 trucks, the General Land Transport Company oversaw the operation of 7,000 private trucks and 5,000 tankers in 2002.⁴ During that same year, the General Land Transport Company reportedly carried 2.25 billion ton km. The larger land transport entities tend to have their own depots for servicing and maintaining their fleets, and warehousing facilities for storing spare parts and equipment.

Table 13: Freight Transport State Owned Companies

Name of Company	Size of Vehicle Fleet ⁵	Number of Employees	Cargo Transported (million tons)
General Land Transport Co.	1,949 trucks	1,502	4.2 (goods)
Dhilal Transport Co.	50 trucks	557	3.2 (goods); 0.4 (oil products)
Jordanian-Iraqi Co.	900 trucks	498	n.a.
Iraqi Land Transport Co.	43 trucks; 3 tankers	181	2.8 (goods); 0.1 (oil products)
Badia Company	29 trucks; 1 tanker	192	1.4 (goods)
Gen. Co. for Goods and Oil	300 trucks; 1,100 tankers	24	0.9 (goods); 0.6 (oil products)

Note: Figures are for 2002.

96. Most of the land transport companies reported profits in 2001 and 2002. However, at the same time it was reported that there was little investment to upgrade the aging truck fleet, and maintenance was inadequate. Emphasis was placed on volume, rather than quality of service.

Institutional Structure

97. Land transport activities are regulated by the former Ministry of Transport and Telecommunications (MOTC), which have now been separated. However, the MOTC is only undertaking minimal regulatory functions, and has given little attention to sector planning, although recently, universities were invited to assist in a transport planning study. Given the prevailing circumstances, MOTC’s focus appears to be on supporting the trucking industry and not disrupting the movement of goods and cargo by land through the rigid enforcement of regulations. This has resulted in a number of unintended consequences, including lax enforcement and the requirement for trucks transporting commercial goods within Iraq to be properly insured.

⁴ It was reported that Government-owned trucks transported an average of nearly 3,000 tons per annum in 2002, whereas the often smaller leased vehicles carried between 700 and 1,300 tons per year.

⁵ Statistics on the total number of vehicles leased in 2002 were not available.

98. In the past, the Cabinet of Ministers determined tariff levels for goods transported within Iraq, while the MOTC was responsible for enforcing the approved tariff structure. Fees for transporting goods regionally were coordinated with relevant counterpart entities in neighboring countries. Presently, the tariff structure is no longer enforced, and this has contributed to fierce competition in pricing of services.

99. Low maintenance levels and an aging truck fleet have also contributed to a decrease in the general level of safety on the country's road network, and negatively impacted air quality due to unregulated vehicle emissions.

100. While some support should be provided to reconstructing facilities that were damaged as a result of the recent conflict and subsequent looting, greater emphasis should be placed on formulating a strategy to liberalize the sector, open access to markets, and increase competition. The strategy should emphasize the Government's role as regulator, and encourage the private delivery of land transport services. Implementing such a strategy is likely to put a greater demand on institutional capacity than is currently available, and strengthening skills must form a part of the strategy. Addressing safety issues and environmental concerns must also be incorporated. Such a strategy would necessitate the drafting of a new transport law.

Priority Needs and Funding Requirements

101. It is important to note that the team undertaking this analysis was not able to assess the condition of facilities and vehicles in the freight industry. However, because much of the services associated with transporting freight can best be delivered by private operators under commercial terms, a priority need is to produce a new land transport law that will support liberalizing the sector. The needed land transport reform and its supporting law could be developed within a year's time and at a cost of approximately US\$0.5 million.

Table 14: Freight Land Transport - Priority Needs Budget

	2004	2005-2007
Gross Expenditure		
Rehabilitation/Reconstruction <i>(Required to Bring Back to March 2003 Level)</i>		
Investment (Base Case)	0.50	0.00
Total Gross Expenditures	0.50	0.00
Gross Revenues <i>(Where Some Tariffs May Be Collected)</i>		
Investment Requirements (Base Case)		
Priority 1		
Land Transport Reform	0.50	
Total Investment Requirements (Base Case)	0.50	0.00
Additional Investment Requirements (High Case)		

TELECOMMUNICATION

INTRODUCTION

1. Modern communications systems are vital for the successful reconstruction and future development of Iraq. Across the world, access to communications is linked to economic growth, increased incomes, improved delivery of other services, and the development of enterprises. A dependable communications infrastructure is essential for efficient administration, management, and operation of the public and private sectors. This includes areas such as: internal government operations, citizens' services, trade, banking and financial services, advertising, and tourism.

2. The existing telecommunications, posts, and Internet infrastructures in Iraq are poor. The effect of almost 13 years of economic sanctions, coupled with the recent war, has left this vital sector of the country undeveloped. The modernization of this sector will be key to the overall development of a prosperous and well-governed country. The sector needs a significant amount of resources and policy changes in order to attain the pre-war level of services, and subsequently, to the regional levels. Fortunately, it will be possible for Iraq to leap frog in this sector by adopting the latest technologies for the equipment and favorable business environment by proper policy and regulatory frameworks. Iraq could also use the experience of other regional countries in liberalizing this sector and achieving significant growth in smaller time frame.

3. The telecommunication sector is presently under government control. The telecommunication and postal services in Iraq are run by the state-owned Iraqi Telecommunication and Post Company (ITPC) and the Internet services are run by State Company for Internet Services (SCIS). While ITPC and SCIS were supervised by the sector Ministry -- The Ministry of Transport and Communications (MoTC), the two companies were effectively self regulated.

4. Iraq maintained a teledensity of about 5.6 percent for the period 1985 to 1990. This figure suffered decline due to the war in 1991 and dropped to just over 4 percent. The coming years saw further decline due to the economic sanctions and aging of telecommunication infrastructure. The trend marginally reversed towards the year 2002 with the induction of telecommunication equipment and materials received under the Oil for Food (OFF) Program. By the end of year 2002, the teledensity touched a figure of 5.2 percent.

5. The telecommunication infrastructure suffered another blow after the war in the First Quarter of 2003. There has been extensive damage to 12 out of 38 telephone exchanges in Baghdad. The exchanges in Mahmodia, Al-Qaim, Baghdadi, and Samarra'a – all outside Baghdad - have also suffered damages. The international switches and satellite earth stations have been completely damaged. The radio link connecting Baghdad with Basra has suffered damages due to war and the Kirkuk station in the North has been looted affecting the connectivity with Basra and with the North of Iraq.

6. At present, the Coalition Provisional Authority (CPA), UN, and other aid agencies are using satellite-based mobile services and small networks provided by MCI of the US, and MTC-Vodafone of Kuwait for their operation.

CURRENT STATUS AND ISSUES

7. **Sector Policy and Regulatory Environment:** There has been no clear policy, legal framework or independent regulation in the sector. The sector's policy, regulation, and operations have been dominated by the Government-owned, incumbent operator ITPC. Almost all telecommunications and postal services have been provided by ITPC. Internet services have been provided by SCIS. A few small private operators have also provided Internet services and satellite-based services in the Northern Governorates. ITPC have been self regulated with no significant role played by the MoTC. The CPA has recently issued an order that assigns the responsibility of licensing new operators and managing the radio spectrum to the MoTC. An independent and competent sector regulatory authority established under a new sector law will still be necessary.

8. **Human Resource Development:** ITPC has a total workforce of about 17,700. The telecommunication work force of 14,750 in Iraq, includes over 1,000 engineers, 4,500 diploma-holders and

3,500 technicians. This work force, however, has little exposure to modern technologies, as very few new technologies and services have been introduced in this market. There are more than 12 employees for every 1,000 telephones in Iraq. This number is more than the regional average. It is expected that this figure will improve with the expansion of telecommunications services. The postal operations have a staff of about 3,000.

9. With regard to the planning, handling, and development of new technologies and services, there is an urgent need to provide training to ITPC personnel at all levels. This can be achieved by a two-prong approach. A selected few of the technicians and managers can be sent for training abroad and international experts can organize training sessions and workshops for a larger audience within Iraq. The focus should be to enable the Iraqi communications sector policy makers, regulators, administrators, and engineers to understand the nuances of the new business environment and act in a manner to make this sector an engine to the economic growth in the country. The issue of human resource development needs very thorough handling so that the disadvantage of legacy network falling on ITPC can be offset and this organization becomes fighting fit to face competition from other operators.

10. **Basic Telephone Services:** Telecommunication in Iraq has not developed to its full capacity due to economic sanctions, limited investment, and inadequate policy framework and regulation. ITPC was the sole service-provider for the telecommunications services. The country had 1.24 million telephones before the war. The capacity declined to 0.94 million due to war-related damages. In all, there were 316 telephone exchanges in Iraq of which 38 were in Baghdad. A total of 16 exchanges including international gateways have been damaged, due to the war. The access to telephone services was improved pre-war by the operation of 1,000 card operated payphones in Iraq. These phones have since been looted or destroyed in the aftermath of the war.

11. The telecommunication transmission network is largely radio-based. Iraq has, however, tried to change the trend by laying over 4,500 km of fiber network around the country. ITPC has also inherited about 5,000 km of fiber network post war, from the Iraqi defense establishment. This network, however, cannot now be used commercially since it does not pass through the telephone demand areas. The capacity of the overall fiber network is inadequate to handle the perceived demand of the telecommunications services.

12. The United States Agency for International Development (USAID) recently awarded a US\$45 million contract for the rehabilitation of the Iraqi telecommunications infrastructure that was battered during the war. This project has two parts: (i) to undertake a technical audit of about 2,000 km fiber optic networks between Mosul in north to the Umm Qasr in south; and (ii) to install makeshift exchanges at four damaged telephone exchange sites in the city of Baghdad. USAID officials have indicated that it is possible to provide replacements for four or more exchanges.

13. **Rural Area Penetration:** Like most of the countries in world, the rural penetration of telecommunications services in Iraq is low: around 1 percent. Iraq had 115 villages connected on a telecommunication network through a satellite-based technology. All these stations were looted in the aftermath of the war.

14. **International Telephone Connectivity:** Iraq had international telephone connectivity using five main satellite earth stations and nine small satellite terminals (VSATs). These accounted for about 3,800 channels. Post war, Iraq has only about 1,000 channels operating. This segment of the telecommunications network needs immediate augmentation in order to cope with the demand in the growing business environment.

15. **Leased Lines and Data Networks:** ITPC provided leased lines of up to 2 Mb capacity to various state corporations and ministries. Iraq does not have a managed leased-line network to cater to the demands of banks, transport, and courier services as in other regional countries. It does need to have a national Public Switched Packet Data Network (PSPDN) to cater to the foreseeable demand in this type of service.

16. **Cellular Mobile Service:** Iraq does not have cellular mobile network, except in the Northern Governorates. Iraq is the only country in this region that is deprived of this service. Immediately after the recent war, MCI of the US was contracted to provide 2,000 cellular phones to meet the needs of the CPA and UN agencies. At present there are an estimated 10,000 working connections. A similar arrangement was made with MTC-Vodafone of Kuwait for the south of Iraq.

17. Additionally, there are more than 50,000 Thuraya mobile satellite subscribers in Iraq. These phones are being used by relief agencies and private businesses alike. It was also observed that private/public call offices and hotels are providing international call services using these phones. They are easily available in the Iraqi markets, though the cost of handset and usage is expensive.

18. The CPA has recently issued a public tender to award three regional mobile licenses to provide cellular services in Iraq. Initially, the three operators will be allowed to provide service in their respective regions. Once a licensee has met its 12 month build-out obligation, licenses will be extended by the MoTC to become national. The cellular market is expected to have a penetration of more than 4 percent in two years time.

19. **Postal Services:** The postal services in Iraq are managed by ITPC. There are 336 post offices in the country. Out of this, only 193 are now functional, as most of them have been looted. The post offices were running savings deposits, in addition to handling mail and parcels. As per the ITPC officials, the post offices hold about ID17 billion as deposits, equivalent to about US\$10 million. The ITPC telephone bills could also be deposited at these offices. The post offices employ about 3,000 employees. There has been an effort to improve the performance of services in this sector by providing vans and motorcycles to post office personnel for faster distribution of mail. Since the postal network also handles financial services and savings accounts, the damage to post offices has also reduced the population's access to financial networks and other essential services. It will be difficult to rebuild the Iraqi economy without reconstructing and rehabilitating this basic infrastructure service.

20. This sector has growth potential, if liberalized. This should be possible in some market segments. Some international courier agencies were operating in Iraq to carry international mail and parcels. Maintaining an acceptable level of universal postal services while progressively liberalizing the postal market will require dedicated postal regulatory capacity and the monitoring of progress on established performance indicators against international and regional benchmarks.

21. **Internet Services:** Internet services are very limited in Iraq. The Internet services in Center/South Iraq are operated by SCIS, under the MoTC. SCIS has an equipped capacity of 60,000 subscribers of which 30,000 had been working before the war. The same figure also exists after the war. Most of the subscribers are based in Baghdad. Most government departments have access to this service. The dial-up access of Internet in certain areas of Baghdad is now barred due to the damage to the telephone exchanges in those areas. The status of other features of this network remains the same, even after the war.

22. The present Internet service works with a leased bandwidth of 36 Mbps, with two Points of Presence (POP). Most of the subscribers are hooked on dial-up connections, but the company has many users with access rates of 64 and 128 Kbps. The ultimate available capacity of 1 Mbps has not been used. The 64 and 128 Kbps accesses were provided using wireless modems, owned by the company.

23. In the Northern Governorates, the service is available through a number of private companies. The same trend has caught up in the Center/South after the war. A number of cyber cafes have opened in the city using VSAT technology. It is not possible to estimate at this time the exact number of Internet cafes.

24. Iraq was not allowed to use its domain name (.iq) under the UN sanction regime. It should immediately seek for the use of a national domain name.

25. **Telecommunications Tariffs:** The local telephone tariff in Iraq has been cross-subsidized by international call tariff. The local call tariff and telephone rentals were pegged at below cost and this deficit was being recovered by charging above cost for the international calls. A local call for three minutes cost as low as one tenth of an Iraqi Dinar, which is very much less than the US cent. The calls to Arab countries charged ID1,000 a minute, whereas to Europe it was ID1500 (little less than a US Dollar). The country will have to progressively rebalance the tariff in order to move to the cost-based tariff structure. This policy change will lead to a better playing field in the telecommunications market and will help attract investment in this vital sector.

26. **Billing System:** ITPC has a centralized billing system based in Baghdad, where the telephone bills of Iraq are processed and printed. The present billing system cannot cope with the requirement of new services, which demand multiple options for tariff and charging. Also, a well defined charging data is required for the revenue sharing with other operators. ITPC has a plan to upgrade this system so as to make it more flexible and adapt to the new regime of revenue sharing with other operators.

27. **Frequency Spectrum Management:** ITPC has a Spectrum Management Department, which looks after the Frequency Spectrum Management in Iraq. In a single operator environment there was very little to coordinate so far as the frequency spectrum was concerned. It is well known that radio spectrum is an important national resource, which is in increasing demand by many kinds of users. It supports an enormous range of services and applications, and is important to business efficiency, international competitiveness, and for services we all take for granted in this millennium. In order to use this important national resource efficiently and equitably there is an urgent need to infuse new measurement technologies, training of personnel, and independence of the spectrum management from the state-owned telecommunications operator.

28. **Demand for Telephone Services:** As per the data received from the ITPC's managers, the country had a waiting list of two million customers for telephone services. This number is likely to rise as the service provisioning actually starts and the economic activity in the country picks up. At present, the demand for telecommunications services is suppressed due to the lack of the latter. Exponential rise in demands is expected, as soon as the basic and value added services are introduced in Iraq.

NEEDS AND PRIORITY FOR THE SECTOR

Medium- and Long-Term Needs and Policy/Institutional Changes

29. The overriding objective in the communications sector in Iraq is to rebuild, modernize, and rapid expand telecommunications, Internet, and postal infrastructure and services. If properly positioned and structured, these important infrastructure services can provide increased access to critical communications facilities while providing significant support to rebuild the Iraqi economy. However, developing the right sector policies and institutions are key to building and providing such infrastructure and services.

30. Given the current status of the communications infrastructure, services, and institutions in Iraq, significant financial resources and major policy and institutional changes will be needed to achieve these national objectives in this sector. The private sector should play an important role in building the needed infrastructure and services. However, there remain important roles for Government in terms of supervision and support. The Government must develop and enforce stable policies and the transparent regulatory environment required to promote competition and private participation in the provision of services. The Government should also play a role in ensuring the Universal Service Obligation (which provides service access to remote areas and underprivileged). The Government, through State-Owned Enterprises, will also continue to provide some services for a few more years, until these enterprises are commercialized and privatized.

31. The overall strategy for developing the communications sector in Iraq should therefore be based on both operational improvement and policy and institutional reform. From the *operational* standpoint, the immediate goals (end of 2003) have focused on bringing the infrastructure and services back to as near as possible to its pre-war (March 2003) level. Short-term goals (end of 2004) should focus on expanding the

infrastructure and services to a level sufficient to meet increased demand and short-term development goals. These short-term goals should also establish a base line and performance indicators to measure continuous progress towards long-term goals (end of 2007). Long-term goals, in turn, should focus on expanding the infrastructure and services to achieve performance indicators benchmarked to international standards while supporting expected economic growth and satisfying increased demands over the forecast period.

32. From the *policy and institutional* standpoint, the short-term goals are: to clarify the Government's policy and role in the sector; to establish the incumbent operator – ITPC on a sound operational and financial foundation that allows it to provide an acceptable level of services on a cost-effective and efficient basis while enduring the expected competitive pressures; and to award licenses to private operators in some segments of the market, including mobile and Internet service providers. The long-term goals are to: enact new sector laws; establish a competent and independent sector regulatory authority; restructure ITPC into separate telecommunications and postal commercial companies and introduce private sector investment and management in their operations; and liberalize the telecommunications sector through introducing competition in all market segments in conformity with the international trade and business laws.

Broad Financial Needs Over the 2004-2007 Period

33. Although the financial resources needed to develop modern communications services over 2004-2007 are expected to be significant, the level of this sector's needs from the Government's budget will depend on the kind of policies which the Government adopts in developing the sector. The demand for Government's budget support will depend on several key factors including:

- National development targets established by the Government for the sector. These targets typically reflect GDP growth, level of economic activity, level of international trade, and other national development objectives and priorities;
- The extent and the timing of permitting private sector investment in the various segments of the sector especially the mobile, Internet, data, and other value added services;
- The extent and the timing of the restructuring of ITPC operations allowing ITPC to attract external funds, improve its self-financing capacity, charge cost-oriented prices for its services, and improve the productivity of its work force; and
- The Government's policy with respect to universal access and the extension of services to remote and rural areas, particularly since commercially-oriented operators may find it uneconomical to extend services to these areas without government subsidy.

34. The financial needs over the period 2004-2007 were therefore developed under three major components, with certain assumptions made on the key relevant policy issues. The three components are:

- Component One: Financial needs for ITPC to develop its infrastructure and services;
- Component Two: Financial needs for ITPC to obtain consultancy services to support its institutional strengthening program; and
- Component Three: Financial needs for the Government to obtain consultancy services and business systems to support setting up an independent and competent regulatory authority.

35. **Component One: Financial needs for ITPC to develop its infrastructure and to ensure high levels of service availability, quality, and network coverage over the 2004-2007 period.** Assessment of the financial needs of ITPC for the development of its infrastructure and services will cover four major priority areas. This assessment assumes that: little or no private sector investment in ITPC's operations will be possible during the period 2004-2007; ITPC will continue to provide universal access to remote areas while mobile telephone, data services, and Internet services will be provided by licensed private sector service providers; and ITPC will eventually become a carriers' carrier. The four priority investment areas are:

- (a). **Expansion of the fixed telephone services in the various Governorates to achieve a teledensity level of 13 percent by the end of 2007.** Iraq should be able to achieve this modest penetration level given its potential economic growth and its existing waiting list. This level is below what other countries in the region have already achieved in 2003 (about 15 percent in Jordan and Saudi Arabia and 32 percent in the UAE). This teledensity level translates to connecting about 3.3 million customers by 2007, up from its expected level of 1.3 million customers by the end of 2003. This would require rebuilding and expanding the existing switching, local access (copper cable or wireless in the local loop) and the needed building and other civil works. The estimated cost to achieve this target is US\$885 million.
- (b). **Build a modern and integrated national long distance backbone network and international connectivity.** The network should serve as a platform for ITPC and other operators who may choose to lease bandwidth capacity from ITPC, in order to provide various services including mobile, data, Internet, and value added services. The network will consist mainly of fiber optic cables, digital microwave links, international earth stations, and links. The total estimated cost is US\$120 million.
- (c). **Operation and business support systems.** A modern network operation center will be required to ensure efficient integration and operational management of the national network. In addition, a modern billing and customer care system will be necessary to support and enable an efficient and customer-oriented operation at ITPC, and to enable transparent and fair revenue sharing and interconnection charging to other service providers. The estimated cost of these systems is US\$50 million.
- (d). **Expansion of the postal services** in the various Governorates to achieve a per capita annual postal volume of 11 pieces (pre-1990 level in Iraq, and in line with other countries with comparable GDPs) by the end of 2007. This would involve, *inter alia*, (i) rehabilitation of postal facilities and existing buildings to bring the postal service back to 2001 level of about 3.2 pieces per person per year (by the end of 2004); (ii) modernizing and expanding postal facilities and services to bring the network up to international standards. This will require upgrading existing facilities and equipment (including vehicles, scales, scooters, information systems, cancellers, culling/facing machines, sorting systems, private boxes, collection boxes, inventory and operations and maintenance), offering new services, and modernizing mail processing activities. The estimated cost for achieving this goal by 2007 is US\$40 million.

36. **Component Two: Financial needs for ITPC to obtain consultancy services to support its institutional strengthening program over the 2004-2007 period.** ITPC needs to be restructured and transformed into an effective, autonomous commercial enterprise in the short-term, and developed sufficiently to meet competition in the long-term. Without external assistance on institutional restructuring and capacity building, ITPC will face major difficulties implementing the proposed investment program and preparing for private participation and for competition. The estimated cost of such a program is US\$20 million and it should include:

- Evaluating institutional restructuring options and undertaking all legal due diligence and documentation required to carry out the establishment of the ITPC as a commercial company (or two separate companies for telecommunications and post);
- Developing and implementing clear corporate governance guidelines and strategic business plans for the telecommunications and postal businesses;

- Defining and implementing a comprehensive change program in order to build world-class systems capabilities in key strategic areas including: finance and accounting, human resources management, commercial and customer care operations, business planning and program management, and procurement;
- Conducting a financial audit, preparing an asset register, and creating opening financial statements which ITPC (or its successors) will be required to maintain. The financial audit will also provide valuable information about financial information systems to be created for ITPC;
- Preparing and implementing a cost-based and a benchmarking tariff regime for ITPC services. This would also provide the regulatory authority with the required data and analysis to support implementation of cost-based pricing for unbundled network elements; and
- Developing and implementing a staff training and skill development program covering the above mentioned areas, in addition to necessary technical training.

37. **Component 3: Financial needs for the Government to obtain consultancy services and business systems to support setting up an independent and competent regulatory authority over the 2004-2007 period.** Consulting services will be required to assist the Government to develop a strong and independent regulator. Procurement of certain systems and facilities will also be required to enable the regulatory authority to assume its role, especially in the area of spectrum management. The estimated cost of such a program, part of which should be undertaken in 2004, is US\$50 million (part of which will be for procuring part of the needed Spectrum Management System). Program goals should include, *inter alia*:

- Define the long-term objectives of the Government in the sector, develop an optimal liberalization strategy, and draft a new telecommunications and postal sectors laws with clear definition of the identity, level of independence, and powers of the regulatory authority;
- Develop organization structure, business plan, budget, staffing and capacity development plan, and operational guidelines for the regulatory authority;
- Elaborate the regulatory framework and detailed regulations on key issues, including: licensing, interconnection, numbering, dispute resolution, technical standards, consumers' complaints, spectrum management, pricing, quality of service standards, and other as "needed" support including potential development of a pro-competitive license for ITPC and other service providers; and
- Define and procure a spectrum management and monitoring system to enable the regulatory authority to carry out its spectrum management function.

Proposed Policy Changes

38. In recognition of the important role which communications services could play in the economic and social development of Iraq, and in line with regional and international experience (including WTO requirements), it is important to undertake key policy changes in the sector. These changes should conform to international best practice and along the following lines:

- Develop the communications sector to its full potential and expand the supply of communications services so as to fully meet customer demand while providing universal services at affordable prices;
- Focus the role of the Government in the sector on establishing long-term goals, policy formulation, and sector regulation; withdraw the Government's active engagement (financing, strategic planning, and managing operations) from the telecommunications sector, which is better suited to private companies;
- Promote effective, fair, and sustainable competition, and remove barriers to entry. The monopoly in provision of communications services should be abolished as soon as possible. While an aggressive liberalization strategy should be pursued in the telecommunications and Internet sectors, a more progressive approach should be considered in the postal sector;
- Boost private investment, including foreign investment, in all market segments;

- Where competition is not present - or where the interests of consumers cannot be otherwise protected - regulation will play a carefully structured role. For this purpose a new National Regulatory Authority should be established and made responsible for the transparent regulation of the telecommunications and postal sectors;
- Provide incentives for improving the operational efficiency of all operators and for increasing communications usage; and
- Ensure that the views of consumers are included in the decision making process, and that they become the focus of the market actors.

Proposed Institutional, Legal, and Other Requirements

39. There are three broad areas of institutional responsibilities inherent in the above policy principles: sector policy formulation; sector regulation; and operations and the operations and provision of services. The sector will be reorganized and institutional capacity will be built to undertake these distinct responsibilities.

40. **Sector Policy.** A new division should be established within the ministry in charge of telecommunications and post to undertake the sector policy setting function, including advising the Government on sector issues, promoting investment in the telecommunications and postal sectors, promoting public/private partnerships in the sector, and encouraging the use of telecommunications and Internet in supporting the provision of public services and key industries. Sector policy should be encoded in telecommunications and postal sector laws. These laws should also define the policy setting role ministry, and provide for the establishment of a National Regulatory Authority for the sector responsible for overseeing the implementation of sector policy and laws.

41. **Sector Regulation.** In order to allow competition to operate fairly, and to separate the Government's ownership interests in ITPC and SCIS from the need to regulate the telecommunications and postal sectors, a transparent and competent national communications regulatory authority, independent from all operators, should be established. The authority should have a full-time board of commissioners and professional staff. The commissioners should be appointed by the highest possible authority in the country and have sufficient stature to represent business, legal, academic life, and other stakeholders.

42. **Operations and Provision of Services.** Competing commercial and licensed operators should provide telecommunications networks and services. In addition to the existing state-owned companies (ITPC and SCIS), new private operators should be allowed to enter the market to provide infrastructure and services in line with the sector policy and regulation.

2004 Needs and Policy/Institutional Changes

Financial Needs for 2004

43. As mentioned above, the Communications Rehabilitation and Restructuring Program for 2004 must establish the foundation for the accomplishing of the long-term needs (end of 2007). It consists of several activities to support operational improvement and policy and institutional reform. As shown in Schedule 1, the 2004 gross expenditures required, based on information available to us, are estimated at US\$574.00 million and gross revenues for the same year are estimated at US\$66 million (Source: CPA).

Proposed Policy Changes (To Be Initiated in 2004)

44. As discussed in the previous section, the policy changes should be initiated in the year 2004 itself to allow competition and private participation in the telecommunications sector in Iraq, to give a fillip to the growth in this sector and economy as a whole.

Proposed Institutional, Legal, and Other Requirements

45. The year 2004 should see the setting up of an independent regulatory authority in the telecommunications sector, with adequate statutory powers to create a level playing field for the entry of new

operators in this vital sector. It should also include transforming ITPC into an effective, autonomous, commercial company.

Schedule 1: The Investments Required for 2004 Under the High Case and Base Case Scenarios.

No.	Project	Amount (million US\$)
1	Rehabilitation / Reconstruction (<i>Required to Bring Services Back to Pre-March 2003 Level</i>)	
	a) Rehabilitation of the basic telephone network (switching, local access, and transmission equipment) in all Governorates to bring the network back to March 2003 level of about 1.25 million lines or 5.2 teledensity.	123.00
	b) Reconstruction of damaged telephone exchange <i>buildings</i> (civil works) in all Governorates and the international gateway exchanges.	50.00
	c) Rehabilitation of optical fiber network.	15.00
	d) Rehabilitation of international gateway switches and four satellite earth stations.	26.00
	e) Rehabilitation and reconstruction required to bring the postal services back to 2001 level of about 3.2 pieces per person per year. This will involve rebuilding part of the 143 damaged post offices.	24.00
	Sub-Total	238.00
2	Investment Requirements	
	a) Expansion of the basic telephone network in all Governorates to achieve 8 percent teledensity.	284.00 (High Case) or 234.00 (Base Case)
	b) Phase 1 of the long distance backbone network and data network, including connectivity with North and international connectivity.	40.00
	c) Phase 1 of the operation and business support systems as described earlier.	30.00
	Sub-Total	354.00 (High Case) 304.00 (Base Case)
3	Sector Reform and Institutional Strengthening	
	a) Phase 1 of the consultancy services required to support the institutional strengthening of ITPC.	12.00
	b) Phase 1 of supporting the establishment of an independent regulatory authority.	10.00
	c) Procurement of the first part of a Spectrum Management System for the regulatory authority.	10.00
	Sub-Total	32.00
	Total (Rehabilitation/Reconstruction, Investments, and Sector Reform and Institutional Strengthening)	
	a) Base Case Scenario	574.00
	b) High Case Scenario	624.00

Table 1 - Preliminary Calendar 2004 Budget for Telecommunication Sector
in US\$ Million

	2004	2005-2007
Gross Expenditure		
Asset Maintenance	4	16
Rehabilitation/Reconstruction <i>(Required to Bring Sector Back to March 2003 Level)</i>	238	16
Investment	336	789
Gross Revenues	66	430
<i>(e.g., Telecommunication/Posts, License Fees from Private Operators Where Some Tariffs May Be Collected)</i>		
Investment Requirements (Base Case)		
Priority 1 Phase 1 of consultancy services required for institutional strengthening. Capital Costs (not included in the above).	12	8
Priority 2 Setting up of an independent regulatory authority. Capital Costs (not included in the above).	10	10
Priority 3 Procurement of Spectrum Management Systems for regulatory authority. Capital Costs (not included in the above).	10	20
Priority 4 Expansion of basic telecommunications network to achieve a teledensity of 8 percent. Capital Costs (not included in the above).	234	651
Priority 5 Phase 1 of long distance backbone network and data network, including connectivity with North. Capital Costs (not included in the above).	40	80
Priority 6 Phase 1 of the operation and business support systems. Capital Costs (not included in the above).	30	20
Additional Investment Requirements (High Case)		
Expansion of basic telecommunications network to achieve a teledensity of 8 percent.	50	

TRANSPORT and TELECOMMUNICATION CONSOLIDATED BUDGET (US\$ million)

	2004	2005-2007	2004-2007
Gross Expenditures			
Asset Maintenance			
– Roads and Bridges (Road Routine and Periodic Maintenance)	70.24	288.07	358.31
– Airports and Civil Aviation			
– Ports and Water Transport			
– Railways	8.00	30.00	38.00
– Public Transport			
– Freight Transport			
– Telecommunication	4.00	16.00	20.00
Total Asset Maintenance	82.24	334.07	416.31
Goods & Service Requirements	24.00	75.00	99.00
Rehabilitation/Reconstruction <i>(Required to Bring Sector Back to March 2003 Level)</i>			
– Roads and Bridges	7.00	10.00	17.00
– Airports and Civil Aviation	<i>2003 Exp.</i>	<i>2003 Exp.</i>	<i>2003 Exp.</i>
– Ports and Water Transport	<i>2003 Exp.</i>	<i>2003 Exp.</i>	<i>2003 Exp.</i>
– Railways	6.00	3.00	9.00
– Public Transport	6.00	4.00	10.00
– Freight Transport			
– Telecommunication	238.00	16.00	254.00
Total Rehabilitation/Reconstruction	257.00	33.00	290.00
Investments (Base Case)			
– Roads and Bridges	80.70	578.80	659.50
– Airports and Civil Aviation	140.90	187.80	328.70
– Ports and Water Transport	71.00	136.00	207.00
– Railways	131.00	555.50	686.50
– Public Transport	1.50	11.00	12.50
– Freight Transport	0.50	0.00	0.50
– Telecommunication	336.00	789.00	1,125.00
Total Investments (Base Case)	761.60	2,258.10	3,019.70
Total Gross Expenditures (including incremental O&M)	1,125	2,700	3825