Transport Sector

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1. INTRODUCTION

1.1 BACKGROUND AND ANNEX OBJECTIVES

A Vision Report has been prepared for the Council for Development and Reconstruction (CDR), that sets out a Development Programme for the period 2006-2009 for Lebanon in respect of a range of sectors within the Lebanese economy (Water Supply, Wastewater, Solid Waste, Health, Transport, Education, Power, Telecommunications and Land for Building Development). In support of the Main Report, a series of annexes has been prepared and this annex, Annex 5, addresses the Transport Sector. The principal objectives of Annex 5 are:

- To summarise the existing situation in respect of the transport sector in Lebanon for all transport modes (road, rail, air and sea).
- To propose a new technical and institutional approach to the planning and implementation of transport sector projects.
- To examine alternative ways of funding transport sector projects.
- To consider ways to plan and provide transport infrastructure that are in balance with land use development and the needs of other sectors.
- To suggest a strategy towards the systematic selection of projects to be implemented.
- To formulate a "Vision" for the transport sector over the medium term, compatible with the long-term plans set out in the SDATL study.

The annexes have been structured in a manner that ensures a systematic approach to the development of a vision for the overall Lebanese economy. In preparing this annex, several previous reports have been studied, notably the report "Formulation of Options for Transport Sector Policy in Lebanon" (December 2002, commissioned by OMSAR), the Eur-Med Transport Project "Summary Country Report for the Republic of Lebanon" dated November 2003, and the "Schema Directeur d'Amenagement du Territoire Libanais" study of 2004, and discussions have been held with officials and advisers of the CDR and the Ministry of Public Works and Transport (MPWT).

1.2 DEFINITIONS AND AIMS OF TRANSPORT INFRASTRUCTURE PROVISION

The aims of transport facilities and infrastructure provision must be the provision of effective, affordable and sustainable transport to contribute to medium and long term overall national economic and social objectives. In this context, sustainability involves the reduction of national debt levels incurred for transport purposes and transport facilities provided from internal revenue sources.

The services provided by transport facilities and infrastructure are not an end in themselves. Rather, they are a means to a series of wider ends which may be any combination of political, economic, military or social. The output resulting from the construction, maintenance and use of transport facilities and infrastructure may be expressed as intermediate economic "goods" which contribute to wider benefits or disbenefits.

Transport solutions generally involve the use of funding, often in significant amounts. Decisions on how best to develop, operate and maintain transport facilities and

infrastructure normally treat such expenditure mainly in terms of investment and the economic return available on alternative options for action. Given the current financial situation in Lebanon, this approach on its own is likely to be unrealistic since it must now be an aim of the transport sector to assist overall economic growth without significantly increasing overall borrowing.

Economic benefits that result from improvements to transport facilities and infrastructure can accrue from factors that are either internal to the transport system (e.g. reductions in travel costs) or external to the system (e.g. changes in land values, improvements in international competitiveness, etc).

It is self evident that in economic terms the objectives of the provision of transport facilities and infrastructure must be either:

a) The maximisation of benefits from a given total investment, - or
b) The achievement of a given level of benefit from the use of a minimum necessary investment, or
c) Some combination of these two cases.

In the real world, transport solutions must take account not only of economics but also of social, political, physical and financial pressures. An "ideal" organisation for the provision and maintenance of transport facilities and infrastructure would operate as effectively and efficiently as possible using procedures which:

- Are responsive to all of these pressures in ways that are transparent and appropriately weighted.
- Are considered fair and equitable by all those who administer and use the facilities and infrastructure.
- Ensure that office decisions are translated into real and physical changes as effectively and efficiently as possible.
- Continue to reflect changes in the organisation's operating environment.

The achievement and sustainable operation of such systems requires at least:

1. Real political commitment to the concepts involved.
2. A series of consistent transport related policies, which are sufficiently specific to form a framework for the planning and effective and efficient execution of work to improve and maintain transport facilities and infrastructure within available levels of Government finance.
3. An "organisation" designed around the procedures necessary to evaluate and assess these economic, social, political, physical and financial factors, and to produce "output" in the form of additions, enhancements, management, operation and maintenance of the facilities and infrastructure.
4. A level of total funding that is both realistic for the aspirations expressed by the country and is sufficiently consistent to allow confident forward planning. Such funding may be sourced from both public and private (non loan) sources.
5. Adequate total staffing to gather, process and evaluate data and output, and to ensure the satisfactory achievement of programmes of work.
6. A forum in which the output and working of these systems can be discussed by representatives of all those who administer and use transport facilities and

infrastructure, and through which pressure can be brought to bear to correct failings and deficiencies in the provision and use of the transport system.

It is quite possible for the "organisation" referred to in (3) above to consist of a series of different bodies. However these must each have a clearly defined and interlocking brief and the interfaces between them must be specified such that responsibilities are clearly and unambiguously defined and that the overall integrated output is consistent with the overall requirements.

1.3 TRANSPORT POLICY ISSUES

1.3.1 General

The Role of Government

The core sectoral requirement placed on any Government is to provide transport facilities and infrastructure. For the Government to meet this requirement it must control the policies and strategy which head up the process of transport facility and infrastructure provision. Beyond this, the Government does not itself have to be the physical provider, manager and operator of transport infrastructure and transport equipment. It must, however, provide the way in which these facilities are made available. This leaves the way free to seek the most effective and efficient forms of organisation to carry out the necessary work.

1.3.2 Land Transport

The Place of Transport in the National Economy

The provision and operation of transport facilities and infrastructure is not an end in itself. It is a means to a series of wider ends that may be any combination of political, economic, military or social. The output resulting from the construction, maintenance and use of transport facilities and infrastructure may be expressed as intermediate economic "goods" which contribute to wider benefits or disbenefits.

The major seaports and the Beirut Rafic Hariri International Airport operations are already operating at a profit, at least a part of which contribute to Government funds. The land transport sub-sector in Lebanon is currently a net beneficiary from the national economy. It must be the aim to turn this situation around and make the sub-sector a net contributor to the economy as a whole.

Transport in the Greater Beirut Area - The need for Modal Transfer

Many of Lebanon's transport problems occur in or around the Greater Beirut Area. In this area travel demand is growing, and the current dependency on the private car is now unsustainable in terms of:

- The provision of additional road space.
- The provision of additional parking space.

- The environmental effects of traffic congestion.
- The economic effects of traffic congestion.

To solve this problem, people must either reduce the number and lengths of trips made or switch from private cars to public transport (road or rail based). Three basic requirements must be fulfilled to achieve this second option, as shown in Table 1.1:

Table 1.1: Requirements for Modal Transfer to Public Transport

	Requirement	Operational solution
1	Perceived Public Transport (PT) costs that are lower than those for the private car.	A) Provide a fair charging system in which all travellers pay the true direct cost of a journey. This will mean that road users pay for use of the road network as rail users do for the rail network. B) Ensure that PT operates in an efficient, truly competitive and non-restrictive environment.
2	Appropriate PT vehicles running on routes and to schedules which meet travellers' requirements.	Reform and competition between providers will ensure that customers' needs are met.
3	An ability to achieve set schedules. This implies an ability to travel across the network without becoming entangled in extreme traffic congestion.	Carry out construction, traffic engineering and control and traffic management activity to optimise the capacity of the existing road network in a way that discriminates in favour of public transport.

The need to switch to a situation in which road users contribute directly to the costs of providing and operating the road network will require a full understanding of, and commitment to, the need for this modal transfer, at the highest levels of Government. Ways in which such contributions could be made, and the resulting finance managed for the benefit of road users, are discussed later in this Report.

National and Local Responsibilities for Roads

Current responsibilities and funding for classified and unclassified roads are divided arbitrarily between Local and Central Government and between different Ministries within Central Government. Responsibilities should ideally be allocated at the level at which they apply. Issues that affect the whole nation should be determined at the national level and issues that only affect local communities are best addressed at the local level (albeit often within nationally determined guidelines). Such responsibilities without the necessary authority to fulfil them are meaningless. In institutional terms, authority translates into the ability to fund that for which an organisation is responsible. Road network responsibility can be divided between overall national strategic responsibility for the complete network as a single entity serving national objectives, and tactical more localised responsibility for discrete parts of, or operations on, the network.

The option exists to either:

1. Continue with a way of working which treats the network as a series of separate entities for overall policy and planning matters as well as for tactical management and operations.

2. Consider the network as an integrated whole.

Option 2 does not mean that this total network must be managed in detail as a single entity but that policies and overall strategies could more easily be developed for the complete network. The choice of this option would entail the transfer of at least strategic responsibility and budget allocation for the two sections of the network to a single organisation, while planning at a local level remains the responsibility of local organisations. This option is consistent also with the concept of the separation of supervision from execution of work that is envisaged also for the classified parts of the network.

2. EXISTING SITUATION

2.1 GOVERNMENT RESPONSIBILITIES AND INSTITUTIONAL ISSUES

2.1.1 Distribution of Responsibilities

The demarcation of existing responsibilities for land transport is complex and confused, as illustrated in Table 2.1.

Table 2.1: Governmental Functional Responsibilities for Land Transport

Mode/ Function Process	Roads	Traffic Manage-ment	Parking	Public Trans-port	Para Transit	Freight	Acci-dents	Urban Trans-port	Vehicle Regist-ration	Rail Trans-port
Policy	DGRB	TAVMA DGRB		DGLMT	DGLMT	DGLMT		DGLMT		DGLMT
Regulation	DGRB	TAVMA DGRB	DGU	DGLMT	DGLMT	DGLMT	DGRB		MOIM TAVMA	OCFTC
Planning	DGRB CDR		TAVMA	OCFTC						
Financing	MOF CDR	MOF CDR		OCFTC MOF			MOF CDR			
Project Preparation & Implement-ation	DGRB CDR MUNI						DGRB CDR MUNI			OCFTC
Operation Management		MUNI	MOIM TAVMA	OCFTC			DGRB MUNI			
Maintenance Management	DGRB	MUNI	MOIM TAVMA	OCFTC			DGRB MUNI			
User Information		MOIM TAVMA	MOIM TAVMA				MOIM TAV-MA		MOIM TAVMA	

(Source: TEAM International/CATRAM 2002)

LEGEND:

MPWT		Ministry of Public Works and Transport	
	DGRB	Directorate General of Roads and Buildings	- Within MPWT
	DGLMT	Directorate General of Land and Maritime Transport	- Within MPWT
	DGU	Directorate General of Urbanism	- Within MPWT
CDR		Council for Development and Reconstruction	
MOF		Ministry of Finance	
OCFTC		Office des Chemins de Fer et des Transports en Commun	
MOIM		Ministry of the Interior and Municipalities	
	TAVMA	Traffic and Vehicle Management Authority	
	MUNI	Municipalities	

Inspection of Table 2.1 shows clearly the complexity of the existing institutional arrangements for land transport and also that some processes have unallocated institutional responsibility. Also, there is no institution currently charged with co-ordinating inter- and multi-modal transport logistics.

2.1.2 Roads

The current institutional situation in Lebanon does not lend itself to the production of land transport solutions in the way set out in the preceding section of this report. A number of recent studies and reports refer to the bodies now involved in the administration and management of roads and traffic matters across Lebanon. The Management Support Consultancy (MSC-PW 2002), TEAM International/CATRAM 2002 and others have drawn attention to the complex fragmentation of transport related responsibilities across different parts of Government.

The main authorities responsible for the construction and maintenance of roads are the Ministry of Public Works and Transport, the Ministry of Finance, the Municipalities, the Ministry of Interior and Municipalities (MOIM), and the CDR (see Table 2.2).

Table 2.2: Distribution of Road Responsibilities

Authority		Length (Km.)	
Classified Roads			
MPWT/CDR	International	529	
	Primary	1673	
	Secondary	1367	
	Local	2811	
Total			6380
Unclassified Roads			
Municipalities and Local Authorities	Beirut	724	
	Other Cities	601 (approx)	
	Rural and Towns	14000 (approx)	
Total non MPWT			15325 (approx)
Overall Total			**21705** (approx)

(Source: Consultants' estimate)

The MPWT is responsible for managing and maintaining the classified road network. The unclassified part of the Lebanese road network is under the responsibility of the different municipalities and local authorities. Neither the MPWT nor these latter organisations have the staff, skills or resources to properly undertake these responsibilities. Specific responsibility for road network matters within MPWT lies with the Department of Roads. This Department lies within the Directorate General of Roads and Buildings (DGRB).

Within the Department of Roads are two units funded by donors. These are:

- The Project Implementation Unit (PIU), supported by the World Bank. Its responsibility is to facilitate projects that are supported by the World Bank.
- The Management Support Consultants (MSC), supported by the European Union. Its aim is mainly to improve the productivity of administrative and technical services within the Ministry.

The Council for Development and Reconstruction came into being in 1977 as a "para-statal" organisation as part of a move to improve the effectiveness of public services. Established outside the existing Government Ministry structure, it was not constrained by Civil Service procedures, salary scales or staffing controls.

Traffic management matters are the responsibility of the Traffic and Vehicle Management Authority (TAVMA), established in 2000 within MOIM. This organisation is concerned with the management of traffic from the point of view of driver behaviour and vehicle operation. Traffic engineering and management does not appear to be dealt with in any systematic way by MOIM, in terms of:

- Traffic speed and flow control, and
- Accident investigation and prevention through road infrastructure provision and modification.

There is no provision for liaison or cooperation over these two closely linked elements of traffic management.

Roads that are not the responsibility of the MPWT include roads within the cities, as well as roads in rural areas and towns. These roads are, in principle, under the responsibility of the various municipalities within which they fall.

The operation of vehicles on the road network is under the shared responsibility of the MPWT and the MOIM. MPWT is responsible for preparing plans and regulations covering the transport of passengers and goods, including axle weight regulations, while MOIM is responsible for ensuring the implementation of those plans and regulations, together with traffic policing.

2.1.3 Public Transportation

Public transport on the Lebanese road network comprises taxis, minibuses and bus services. Of these, bus services are provided either by OCFTC or by a number of private operators. Services between urban centres are said to be infrequent, uncomfortable and unreliable. OCFTC receives a subsidy to assist it in its provision of services, while other operators exist without such a benefit.

Minibuses are a recent addition to the public transport fleet and operate either as communal taxis on popular routes or on a roaming basis as do taxis. The numbers of taxis and minibuses gives rise for concern and it is clear that they make a significant contribution to urban traffic congestion. There is reason to suppose that the numbers now operating exceed the commercially viable level of demand.

Some 35% of households in the Greater Beirut Area do not have access to private road transport. Hence the limited availability of an effective public transport system militates strongly against policies aimed at improving social equality of opportunity.

A further influence on urban public transport is the congestion on the road network. In this context, the proper application of traffic engineering and management techniques, and better driver behaviour as a consequence of education and competent

enforcement, would greatly assist the operation and scheduling of public transport services.

Some form of regulation and integration of the way in which individual units operate could show advantages for operators, users and non-users alike. This must however be applied as a "framework" made up of regulation, targeted subsidy and preferential traffic management treatment for private sector bus operators in a competitive environment.

2.1.4 Railways

Most railway services ceased operating in Lebanon in the mid 1970s. One single route continued until it, too, stopped some 10 years ago. However, the administration of railways continues to exist in the form of the Office des Chemins de Fer et des Transports en Commun (OCFTC), which was created in 1961. OCFTC reports to the MWPT. In 1964, on the ending of tram services in Beirut, OCFTC shifted its services to buses and in 1988 its mandate was extended to cover the whole of Lebanon. In 1995, the responsibility for the management of bus stations was also bestowed on the OCFTC. Therefore, currently all national land transport in Lebanon is overseen by MPWT through the Directorate General of Land and Maritime Transport and OCFTC.

2.1.5 Airports

The Directorate General of Civil Aviation (DGCA) was established through Decree 1610 of 26 July 1971 to manage the aviation sector in Lebanon. The DGCA, which lies within the area of responsibility of the MPWT, is charged with:

- Supervising air transport.
- Supervising air navigation safety.
- Ensuring civil aviation communications.
- Promulgating laws concerning aircraft operation.
- Controlling the implementation of these laws.
- Managing civil airports.
- Collecting the appropriate fees.

One of the DGCA's principal responsibilities is for the management of the Beirut Rafic Hariri International Airport (BRHIA), which was recently up-graded. The DGCA has invested heavily in airport infrastructure at BRHIA and has adopted the latest technologies and procedures (such as the Common Use Terminal Equipment (CUTE) system) to automate its passenger processing operations.

Some airport activities (parking, duty free shops, catering services, routine maintenance and cleaning services) are operated by private operators under 15 years concession contracts.

A draft law has recently been passed authorizing the creation of a Civil Aviation Authority (CAA) to replace the DGCA (Law number 481 dated 2002). The objective of creating the CAA is to upgrade and promote the sector of civil aviation through a modern organization of administration, investment, supervision and control of various

civil aviation related sub-sectors. The CAA, when fully established, will be a public organisation with administrative and financial autonomy.

2.1.6 Ports

2.1.6.1 Commercial Ports

From 1887 the port of Beirut was for many years managed through a concession (Compagnie du Port, des Quais et des Entrepots de Beirut). After various institutional changes and since 1990, the port is now managed by the "Commission Provisoire de Gestion et d'Exploitation du Port de Beyrouth (GEPB)" through a Provisional Ministerial Decree (decision 1 PV 23) to ensure the management and operation of the port for the account of the State and also to determine and propose a permanent management structure.

The GEPB is not subject to any statutes, but a number of texts have come progressively to define the powers of this provisional structure. The Chairman of GEPB, nominated by the Council of Ministers, is at the same time the General Manager. GEPB has the charge of managing and operating all the activities carried out on the port domain. This domain has been expanded (as far as Nahr Beirut) and its extent laid down by the decree 9040 of 29/08/1996.

GEPB is notably in charge of all operations of storage and handling on the quays, in the Free Zone, and in all types of warehouse. It also provides services to vessels (supply of water, electricity and telephone). Most of the cargo handling activities are sub-contracted by GEPB to stevedores (ship-loaders), with GEPB receiving a third of the sums charged out for cargo handling. Towage, pilotage and mooring are the monopoly of a family business by virtue of a contract going back to the 1950s. As an exception, the grain silo is operated by the Ministry of Economy and Trade (MOET).

The cargo handling and storage monopoly that GEPB has "inherited" from the previous concessions are understood as "intuitu personae", that implies that they can sub-contract this activity only under their own full responsibility.

The other commercial ports of Lebanon (Tripoli, Saida and Tyre) are public enterprises governed by the law 4517. Thus the port of Tripoli is managed by a Board of Directors with 8 members of which 7 are appointed by the Council of Ministers and one by the MPWT. A manager is responsible for the day to day running of the port. All the decisions of the board have to be ratified by the MPWT. Any financial engagement over 3 million Lebanese Pounds has also to be ratified by the Ministry of Finance.

Revenues received at Beirut Port are distributed as follows:

- Operating expenses (60%).
- Development (20%).
- Government (20%).

2.1.6.2 Other Ports

There are twenty-four ports, used mainly for fishing and leisure purposes, which are being tendered under the "loi programme" for complementary works, and three of these (Tripoli, Dbayeh and Sarafand) have already been tendered. The allocated budget for these works is US$80million.

2.2 CURRENT STATUS OF INFRASTRUCTURE AND OPERATIONS

2.2.1 Roads

The Road Network

The overall road network serves most of Lebanon, but previous studies identified gaps and potential strategic links that could add more efficiency to the road system and contribute to the objective of connecting different regions. Some of these links are listed in Section 2.3.2.1.

Currently, only around 6,400km out of a total national road network of some 22,000 km is classified, and is hence the responsibility of Central Government (MPWT) in terms of both overall policy and operational management (Table 2.2). The remainder of the network is the responsibility of municipalities and local authorities.

Surveys conducted in 2000-2002 showed that around 17% of the classified network can be categorized as in good condition, 70% in fair condition and the remaining 13% in poor to critical condition. With respect to the unclassified road network, no systematic records are available on their condition since works on these roads have mainly been limited to localized repairs and overlays, although it is understood that this mainly paved part of the network is in reasonably good condition.

The road network serves a vehicle fleet which numbered some 988,000 vehicles in 2002 (SDATL 2002) and is estimated to be growing at around 4% per year overall. In the Greater Beirut Area this growth rate is likely to be somewhat higher. The traffic flow intensities as determined from the SDATL in 2002, reveal that more than half the trips made in Lebanon are in Greater Beirut and the adjacent Metn area.

Of the total vehicle fleet only some 1.6% could be classified as vehicles having axle loadings of the order of 1 ESA or more. However, a survey as part of a Road User Charges Study carried out in 1998 (Dar Al-Handasah) showed that most commercial vehicles were overloaded. It is of course these heavy axles which cause the bulk of the structural deterioration on the paved roads.

In the last decade, the MPWT obtained a World Bank loan towards the maintenance and rehabilitation of the classified road network. A program was developed and a dedicated unit was established (PIU) to administer and monitor implementation. The program, which was partly covered by the Lebanese Government, was never able to translate into a comprehensive and convincing framework for the maintenance of the road network due to unsatisfactory performance of the pilot programme**.**

In 2002 the MPWT initiated a long standing program aiming at the development of a maintenance action plan for the classified road network (around 6000kms). The driving force behind this program was the intent to optimize the use of resources and improve the efficiency of operations. The program has been approved by the Parliament and the Cabinet within the framework of a "loi-programme" covering the entire Lebanese road network. It is subdivided into three components:

- Running maintenance for all road links.
- Widening of some links and construction of some strategic links.
- Periodic maintenance for part of the network.

The budget allocated for the implementation of this program amounts to L.L.600 Billion ($400 Million) over a period of 9 years. Works started in 2004, but technical and financial constraints have resulted in delays.

Currently, the yearly expenditure on road maintenance by the MPWT is around $40 Million. However, if the entire network were to be brought up to an acceptable condition (at an estimated cost of about $1billion), the funding needed to maintain the network in good condition would be of the order of $100 million/year.

The responsibility for work on the unclassified road network rests with the Municipalities. In most cases this works well, with what need there is for cooperation between adjoining municipalities being achieved informally at the local level.

The situation in and around Greater Beirut is less satisfactory. The SDATL study recommended the establishment of a single transport authority for the Greater Beirut area. The Urban Transport Development Project (UTDP) for Greater Beirut now aims, amongst other things, to create an institutional solution to this problem.

There is currently no one organization responsible for policies and strategies that relate to the unclassified road network. Design standards and specifications for work on these roads either do not exist or are fragmented and uncoordinated. Financial allocations for work on these roads are made by MOIM in response to local requests rather than in response to any overall strategy or development plan.

Local roads spending are largely funded from allocations made by Central Government (MOF) in response to bids from the local level. Local taxes are collected by Municipalities but are passed on in their entirety to the Centre.

Locally funded work is at present restricted to routine and minor road maintenance and environmental work carried out by Municipalities, generally by direct labour. Most Municipalities have very limited technical capabilities and if they were to be allocated additional road maintenance and management responsibilities, arrangements to provide technical staff at regional and/or local levels would have to be addressed.

Traffic

The vehicle fleet can be characterized as being relatively old and poorly maintained, and can be subdivided into three major categories shown below:

- Private Vehicles
- Passenger Public Transport
- Goods Vehicles

Land freight can be characterized as having poor logistics and operations. The total number of trucks registered in the MPWT in 2002 amounted to about 1,400 trucks, of which around 600 are refrigerator trucks. These trucks are operated by private owners, mainly for transit between the ports and neighboring countries.

2.2.2 Public Transportation

The present situation of the public transport sector in Lebanon is unsatisfactory. There is an urgent need for significant reforms and operational improvement in the sector, in order to attract travelers to transfer to this mode of transport.

Public Transportation (PT) is described under two main headings: urban and inter-urban. Urban PT is considered in Beirut and Tripoli only since these are the only cities where some form of PT currently exists. However, urban PT is not completely independent from inter-urban PT, since many operators work in both urban areas and outside.

In urban areas, the uncontrolled increase in the number of public transport vehicles (taxis) has resulted in a supply that exceeds the actual demand. This situation has contributed to traffic congestion, negative environmental impacts and an increase in noise pollution. The sector is generally considered to be not viable, and some bus companies are facing financial difficulties due to low patronage and downward pressure on fares from competition with taxis.

A 1998 study estimated that transport demand is about 1.75 million daily motorized trips within Greater Beirut Area (GBA). This demand was expected to increase to 3 million and 5 million daily motorized trips in 2005 and 2015 respectively. In Tripoli, there were 0.5 million daily motorized trips in 1998. The shares of the different transport providers in GBA were as shown in Table 2.3.

Table 2.3: Trip Demand Distribution by Vehicle Classification (1998)

Region	Greater Beirut	Tripoli
Population	1,300,000	400,000
Daily Motorized Trips	1,750,000	500,000
Transport Share:		
1) Service and Taxi Vehicles	15%	21%
2) Private Sector Buses	14%	12%
3) OCFTC Buses	3%	0%
4) Private Passenger Cars	68%	67%
(2)+(3): Trips by Bus	297,500	60,000

Source: SDATL 2002

As can be seen from Table 2.3, the private bus companies are servicing a larger portion of the demand on public travel than the OCFTC. A major factor in this is the nature of the service in itself; while the OCFTC buses are old and badly maintained, the private buses are relatively new and offer a better overall image. The bus

operations in the urban areas are characterized by inefficiency and unreliability; neither frequency, nor stop locations are fixed.

The inadequate bus operations are setting the ground for other public modes to benefit from the main demand on public transport. In addition, the lack of constraints on public license plates is contributing further to the poor usage of buses. In this respect, a 1996 law allowed the issuance of up to 4000 plates of a new category of public transport vehicles, the 'Minibus". The driving pattern of minivan (minibus) operators is one of roaming, which increases traffic congestion. Operated by individuals or groups of individuals, minibuses cover the major Lebanese cities and a few other destinations around the country. There is no uniformity in colour or model; they rarely operate to a timetable and they usually have the destination written only in Arabic, which is unhelpful to tourists. These services cater mainly for lower income groups

Service-taxis play a major role in transport services provision, especially for disadvantaged groups. They operate with unlimited flexibility, and the number of taxis and service plates has increased from 10,650 plates in 1996 to 33,300 plates in 1998 (a three-fold increase in only two years). The owners of these plates have the right to provide service anywhere in the Lebanese Republic**.** Of the 33,300 red plates, 1,300 were licensed to taxis (with a meter) and 32,000 to service vehicles. One reason behind this huge number is the financial, medical and social benefits provided by the National Social Security Fund for the owners of all vehicles bearing red plates. Furthermore, preliminary statistics estimate that 20,000 to 25,000 service vehicles and taxis operate in Beirut while the number in Tripoli is about 4,000.

Many private companies are also running taxi services, mainly dealing with hotels to serve tourists and businesspeople. These companies use new cars and provide high quality services. Usually, people must call the company to be served, and fees are much higher than those of the individual taxis.

The minivans, service-taxis and taxis are also common to the interurban PT. The situation in this domain is somewhat better than in the urban areas. Bus companies, whether private or OCFTC, are more organized, with operations extending to most of the highly populated regions and at acceptable fares, in comparison with other modes such as taxis and minivans. However, the PT in interurban travel is still far from being a mode attractive enough to provide the desirable shift from private cars.

Another issue concerning interurban PT is the high competition and over-supply on high demand routes, such as Tripoli-Beirut, which have a surplus of buses, while other routes are under serviced.

A further observation related to the interurban PT is the absence of proper termini in the regions as well as in the urban center of Beirut. Even if some attempts were made to provide an adequate transport station like Charles Helou, the passenger services provided in it are far from being appropriate for a central terminal, noting that Beirut itself should have more than one terminal in order to service different directions.

2.2.3 Railways

Although there are currently no railway services operating in Lebanon, the administration of railways continues to exist in the form of the OCFTC. Three main routes were operational in the past, namely:

- The coastal Naquoura-Beirut-Tripoli (NBT) line that extends towards Homs in Syria.
- The Beirut-Damascus line.
- The Riyaq-Homs line.

The existing rail infrastructure is largely defunct and many parts of the railway right of way (R.O.W.) have been encroached upon.

Depending on its condition and current use, the coastal railway right-of-way could be classified into the following categories:

- Abandoned R.O.W. overgrown by vegetation.
- Abandoned R.O.W. paved and converted into local streets, with direct vehicular and pedestrian access to adjacent properties throughout.
- Preserved R.O.W., recently (1996 – 2000) paved to serve as a relief road for the coastal highway north of Beirut. Total length of this category is around 10.5 km with a width of 16 m.
- Newly built platform, recently (1999 – 2000) paved to serve as a relief road for the coastal highway north of Beirut. Total length of this category is around 3.5 km. Width of platform ranges from 12 m on embankment to 10 m on structures. Total right of way however is around 16 m. (The new platform had been coordinated with Sofrerail at the time (during design – 1994) to accommodate a dual track 80 km/hr electrified high frequency rail service, and is therefore a controlled access facility with grade separated intersections).
- Planned and decreed right of way either not built or not yet expropriated.
- Obstructed right of way due to new highway projects.
- Obstructed right of way due to illegal encroachment or construction.

Of the Beirut-Damascus railway line, a segment from Riyaq to Serghaya in Syria is subject to rehabilitation for reinstatement of operation.

2.2.4 Airports

Beirut Rafic Hariri International Airport (BRHIA) is the main airport in Lebanon. In the early 1990s a Master Plan was developed for the airport, with the objective of ultimately having a capacity of 16 million passengers per year. Proposals were formulated for the progressive upgrading of the airport in parallel with an anticipated growth in air travel demand, and major upgrading works were completed in two stages (the first by 1999 and the second by 2002), in accordance with the Master Plan, that included:

- Two runways, one extending 2km into the sea, related taxiways and aircraft stands.

- Upgrading/extension of the terminal building with 23 contact gates and 3 remote stands to accommodate 6 million passengers/year.
- A new catering building, fuel farm, car park for 2,350 cars, and ancillary facilities.

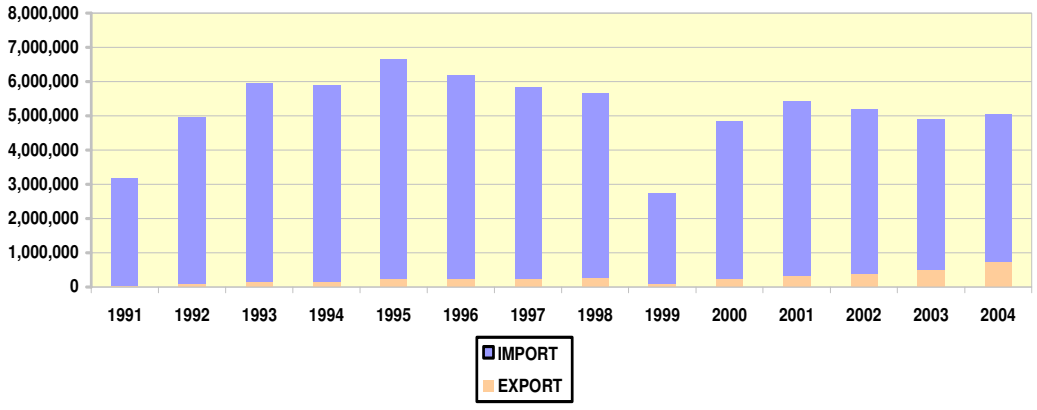
Current levels of traffic through BRHIA were around 3.2 million passengers and 60,000 tons of cargo in 2004, so the airport still has spare capacity to serve demand into the medium term. However, there are certain important shortcomings with the current airport layout and facilities that need to be addressed, and these include:

- The need for compliance with new ICAO standards relating to airfield lighting and marking.
- The need to consider updating the Master Plan, since this is a dynamic tool for managing airport development in a systematic manner.
- The need to consider the provision of services for New Large Aircraft (NLA) such as the A380, which is planned to be operational at other airports by 2007.
- The need to impose and enforce strict planning regulations for the area around the airport in order to protect all airport approaches from obstacles (the eastern runway has a displaced threshold due to obstacles to the north).
- The need to consider the provision of an alternative runway to serve air traffic when BRHIA is closed at short notice due to an emergency such as poor weather conditions.

2.2.5 Ports

Beirut Port is the main port in Lebanon. Over the years, the port has progressively expanded, and recent rehabilitation and extension works have added a new cargo area, new container terminal, and a range of new buildings and warehouses. The main traffic through the port is for goods, with only moderate passenger flows (50,000 passengers in 2004). Cargo volumes at the port have fluctuated considerably with changing conditions in the country during the 1980s and 1990s, but traffic has stabilised at about 5m tons/year in recent years, as shown in Figure 2.1. Exports, in particular, have increased each year since 1999.

Figure 2.1: Port of Beirut Traffic (Tons)



The recent increase in exports is due to a range of factors, including greater stability in the country and added facilities at the port, but also as a result of improved administration such as computerisation of Customs and Excise procedures (which used to cause lengthy delays) and modifications to legislation to conform with modern international trade practice.

However, Beirut Port is subject to several shortcomings that affect its efficiency, and these include:

- Some container handling, which made up about 30% of cargo traffic in 2001, is carried out under inadequate technical and safety conditions. In this respect, the Harbour Master only has authority on matters on the sea side of the port, and has no powers to deal with safety and hazardous materials issues on the land side.
- The volume of transit cargo for Jordan, Iraq and Syria has been falling in recent years, to 100,000 tons in 2001, possibly due to prevailing conditions in the region but also due to lack of a railway connection.
- Recording of some port operations appears not to be carried out in a systematic manner, leading to a lack of reliable data. For example, the data currently collected does not permit the productivity of cargo handling to be accurately assessed.
- Manning levels at the port are high, with more than 1,000 staff employed in 2002. Furthermore, the average age of employees (57) is high, which could lead to a rapid loss of experience in the near future as staff retire.

Apart from Beirut Port, there are three other commercial ports of some importance in Lebanon, at Tripoli, Saida and Tyre. The principal characteristics of these include:

- Tripoli Port:
  - Situated about 80km to the north of Beirut, extensive rehabilitation works were undertaken during the 1990s, providing 700m of quay, extended access channel 1200m in length, and increased draft to –10m.
  - Cargo traffic of over 600,000T in 2002, mainly imports.
  - Unsatisfactory port configuration, with warehouses on the quayside, leading to inefficiency of operations.
- Saida Port:
  - Situated 45km south of Beirut, traditionally serving fishing and leisure activities, but developed to cater for merchant shipping during unstable conditions in the 1970s and 1980s.
  - Traffic of 200,000T in 1998, mainly imports of marble.
- Tyre Port:
  - The smallest commercial port in Lebanon, situated 100km south of Beirut. The port receives, on average, one vessel per week, with cargo mainly comprising the import of second-hand cars.

In addition to the four commercial ports, there are a number of small ports along the Lebanese coastline primarily used for fishing and leisure purposes.

2.3 CURRENT TRANSPORT PROPOSALS

2.3.1 General

In view of the transport sector shortcomings, several plans dealing with strategies and developments within the transport sector are being considered at both the National and the Regional levels. While many plans drafted in the past have not been implemented, or have expired due to unfavorable conditions for their implementation, the current trends and the levels of deterioration within the sector are creating a sense of urgency in the validation and ultimately the adoption of the current plans.

Among the studies that were considered, two strategic plans are of high importance due to their expected impact on the performance of the transport sector and its integration within the overall national setup. These plans are the SDATL (Schéma Directeur d'Aménagement du Territoire Libanais) and the Land Transport Sector Policy, and these are discussed below. Other important plans are described in the sub-sections that follow.

The SDATL was prepared between 2002 and 2004. This study consisted of a multi-sectoral approach, in which several issues were examined within each sector and between sectors. In the transportation sector a number of broad recommendations were developed, which can be summarised as follows:

- The transport issue should be tackled on the two scales, international, and national.
- Secondary Ports, in particular Tripoli, should be privileged compared to the port of Beirut.
- Rail transport of freight has few chances to compete with road transport, except on connections from point-to-point for heavy freight.
- It may not be beneficial for the road transit to pass by Lebanon (additional borders). Furthermore, the benefit to Lebanon is not significant. However, the international motorway project which runs around the Eastern Mediterranean coast should be sought.
- The problem of insufficient maintenance to the secondary road network should be raised.
- The contribution of roads in the urbanization of new areas is being carried out in two ways, either around the interurban roads created by the government, or through opening land areas by the private sector. In the first case, linear development is encouraged, and in the second the inconsistency and bad condition of the local area network are being organized.
- Need for finding solutions to maintain the function of the motorways as limited access.
- Need to provide a mass transport corridor along the Northern entrance to Beirut taking into account the congestion problems, which soon could not be relieved any more by adding new roads.
- Skepticism on the need for logistic platforms of freight around Greater Beirut, taking into account the proximity of the Port and the airport.
- Seeking additional ways for financing public transport: wage taxes, fuel taxes, parking fees.

- Need for a single authority to organize the transport (investment and operation) on the scale of Greater Beirut or even of Beirut plus Mount Lebanon.

The recommendations from that study that should be brought forward are as follows:

a. Finance and Economics
   - Establishment of a consistent, reliable and adequate level of finance for road maintenance work.
   - Establishment of proper procedures for the selection of projects which are to be undertaken.

b. Technical
   - Improved execution of road maintenance across the complete road network.
   - Improved satisfaction of current and future travel demand from Beirut to the north.

The other plan that is equally important is the Land Transport Sector Policy that was drafted by the MPWT in 2002 and needs to be officially approved by the Council of Ministers in order to be fully implemented. Although the transport policy is not yet officially approved, the various government bodies responsible for the transport sector have started to implement key aspects of the policy, such as the concessioning of the container terminal to a private operator, or the preparation of regulations for the establishment of autonomous bodies for the management and operation of civil aviation, land transport and maritime transport.

It is still possible to introduce some adjustments and have comments taken into consideration in the final law to be issued following the formal approval. The main objectives of this policy are stated as follows:

1. Provision of passenger mobility with reasonable prices
2. The multiplicity of transportation modes available for passengers
3. Ensuring an efficient internal movement of goods at reasonable costs in cities and in rural areas
4. Removal of obstructions against the competitive ability of the Lebanese owners of freight transport modes
5. The allocation of a competitive role for Lebanon on the regional level of providing logistic services
6. The relieving of financial burden on the government budget due to transportation
7. Applying specific standards on transport infrastructure in order to preserve the landscape
8. Safety provision on roads
9. Maintenance of road infrastructure and protection of its investments
10. Establishing a high class of transport specialists and individuals with initiatives in the transport sector with international caliber

The issues addressed in the LTSP draft paper are:

- The need for an integrated land transport policy.
- The need to establish a transport fund.
- The necessity for a shift from private cars to public transport modes.
- The importance of reactivating public transport, especially within the capital area.

- The need for the protection and development of road infrastructure.
- The need for regulation of vehicle numbers and their condition.
- Safety.
- The regulation of freight and logistic services.
- The need for capacity building in the transport sector.

A recent addition to the policy issues is the need to encourage private contribution to the land transport sector, in terms of sector development, operation and management of its services.

The Land Transport Sector Policy Study forms a solid foundation for the direction of the Lebanon transport system. However, it requires follow-up in order to be endorsed by the concerned municipalities and authorities.

In addition, the Government has carried out a series of studies on the best way to manage the different modes of transport in the context of Lebanon. These studies recommend various reforms and restructuring for each mode of transport, and these recommendations should now be reviewed and possibly amended in line with the transport policy, and the amended recommendations implemented as quickly as possible.

2.3.2 Roads

2.3.2.1 Strategic Road Improvements

Several potential strategic links on the inter-urban and urban road network have been identified, with studies prepared for them at different levels of detail. The main links and projects referred to are shown in Table 2.4.

Table 2.4: Potential New Strategic Road Links

Link	Length (km)	Development Status
Beirut Peripherique	20	Preliminary design completed
Antelias-Maameltein Motorway (A2)	14	Preliminary design to be completed
Pan-Arab Motorway	60	Design available, needs updating
Tripoli Bypass	12	Design available, needs updating
Tripoli-Northern Border Motorway	55	Design available, needs revision
Rehabilitation Projects on Primary Road Network		

The implementation of these projects has been delayed for many reasons, including lack of funds, and expropriation and right-of-way issues. The importance of these projects is increasing over time, with the growth in demand and the deterioration of service offered by the existing road system. Consequently, the issue of priority of those links, relative to other projects that are perhaps more directly related to overall economic growth, needs examination. Once such a screening process is complete, the resulting program should be activated without delay.

2.3.2.2 New Traffic Law and Enforcement

The existing traffic law that was put into application in 1967 was recently revised, and is currently being discussed by the parliamentary Committee of Public Works. The revision of the law was directed mainly towards reinforcing safety aspects, by introducing more regulations in this respect as well as a penalty system to ensure public adherence. Several issues were addressed by transportation experts during the process of reviewing the law, among which are the need to have more focus on road usage and more flexibility in dealing with technical advances. For example, the law does not address the issue of how vehicles should use roundabouts. Other issues, some dealing with conditions or technologies that have developed since the year of the previous issue of the law (1967), include the following:

- The need to protect a road R.O.W.
- The need to remove buildings, advertising hoardings, etc., that encroach upon the R.O.W.
- The need to control access to a highway.
- The need for effective enforcement of regulations.
- Specific laws and conditions relating to the use of motorways and other limited access roads.
- The need to control vehicle emissions.

Nevertheless, the revised law is expected to be approved very soon and will form the basis for dealing with vehicular traffic operations. In addition to this law, changes in driver behaviour could be brought about through driver education. This could build on work currently going on in Lebanon's schools and could include the production and issue of a small book, and of TV advertisements that give instructions on how to drive safely, and in a way that helps traffic flow on links and through junctions. The most important factor in the success of the new law, however, remains in the ability to couple it with proper enforcement by the concerned authorities.

2.3.2.3 Urban Traffic Engineering and Management

The Traffic and Vehicle Management Authority (TAMVA) was established in 2002. This authority does not normally deal with traffic engineering as the term is generally understood by road engineers (i.e. the application of measures such as junction improvements, coordination of traffic signals, and organization of on-street parking).

There is a need for a formal and systematic approach to traffic engineering and management in terms of traffic speed and flow control, and to accident investigation and prevention through road infrastructure provision, operation and modifications. This should be undertaken as a matter of urgency, initially by either CDR or MPWT. There will be a need for close cooperation with TAVMA over traffic regulation and enforcement matters linked to such traffic engineering matters.

In the longer term, this engineering role could pass to organizations responsible for the Greater Beirut Area and Tripoli.

Currently, the Urban Transport Development Project (UTDP) for Greater Beirut aims to create the institutions to alleviate the current traffic issues. The UTDP seeks to

improve traffic management by establishing an autonomous metropolitan agency that will monitor and control traffic operations, and will install and monitor traffic signals at major intersections throughout the Greater Beirut Area.

2.3.2.4 On-Street Parking Control

On-street parking control forms part of the overall urban traffic engineering and management activity. Primary routes within urban and interurban areas are to be studied in terms of the existing on street parking, the control of parking and available alternative off-street parking. A great deal of the existing road capacity becomes unusable due to permitting free on-street parking. Strict regulation and enforcement of on street parking could reduce congestion substantially. The provision of alternative off-street parking should be studied further and, where appropriate, pilot schemes should be implemented. The UTDP for Greater Beirut aims to regulate and control on-street parking in selected zones, with parking management measures, parking meters and enforcement.

Limiting the available urban parking space, together with strict enforcement and penalties for illegal parking, can be a very useful, if somewhat unpopular tool in transport demand management and for encouraging the use of public transport. To be successfully implemented, it usually needs to be done on a “carrot and stick” basis, for example by improving public transport facilities at the same time as restricting on-street parking.

2.3.2.5 MSC Project

Part of the effort undertaken by the MPWT in trying to optimize its use of different resources is the assignment of a team of experts under the program of assistance financed by the European Union (EU), namely the MSC (Management Support Consultants). The aim of this action is mainly to improve the productivity of administrative and technical services at the Ministry.

One of the main achievements of MSC so far is the establishment of the Highway Management System. This integral system provides a tool for the administration to have a better view of road network maintenance problems and needs, and to decide on necessary actions in dealing with them. Also, this system allows the central administration to develop long-term programs, and foresee solutions to future technical and financial problems. The tasks to be undertaken through the use of different expertise and procedures are the following:

- Developing a global strategy for maintenance and development of the road sector.
- Prioritization of investment projects and programs.
- Follow up and control of execution.

2.3.3 Public Transportation

2.3.3.1 Public Transport Tasks within the LTA

The land transport policies and objectives resulting from the Land Transport Sector Policy Study, set out in Section 2.3.1, have been used as guidelines for the preparation of a draft law on "Authorities of Land and Maritime Transport". This law proposes the establishment of a General Authority of Land Transport (LTA) and a General Authority for Maritime Transport (MTA).

Under this draft law the LTA would be responsible for land transport services, including public transport by both road and rail, and freight transport. It would not be addressing issues related to the road infrastructure network.

Clause 19 of the Draft Law proposes the foundation of a "National Company for Public Transport". The company objectives will be the provision of services for the public transport of passengers by buses. It is understood that this company will only provide services in Beirut, in which case the text of the law should be amended to specify this.

The policy of the Government is to establish such a company within six months of the approval of the Land and Maritime transport law. The company's capital will be defined, possibly in foreign currency taking into consideration that the company stocks ownership, once founded, will revert to the Lebanese Government which remains the sole shareholder when stocks are partially or totally sold.

Clause 20 considers the possibility of giving the company a temporary exclusive right for a maximum of 5 years.

Clause 22 concerns the railway - It is possible at the reception of a decree taken in the Cabinet, on the suggestion of the minister and if necessary, to create an anonymous company undertaking the provision of the transport services for passengers and goods by the railways.

Consultants have recently been recruited to conduct a comprehensive analysis of the passenger transport demand in Beirut in order to design the best network of routes and to identify the capacity and the frequency needs on each of these routes.

Considerations in respect of the draft law include the following:

- At present, land transport is not controlled in any way, so the establishment of an authority that will coordinate, regulate as necessary and monitor the sector would be of benefit.

- Land transport can be divided into: urban passenger services, inter urban passenger services and freight services. These services have their own specificities and characteristics and cannot be treated equally by the authority. The lack of differentiation of these services in the authority objectives (clause 5) and authority tasks (clause 6) could create problems in the future.

– Freight transport monitoring and regulation should be kept to a minimum. Major developed countries have now completely deregulated their trucking industry. It would be advisable to deliver licenses to operate a trucking company on the same basis as the delivery of licenses for any other economic activities. For safety reasons, vehicles should be regularly inspected, as should all vehicles operating in Lebanon. Licenses for drivers should be given after a thorough examination, and working conditions, including working hours of drivers, should be regulated and controlled. Considering the size of Lebanon, a license should allow truck owners to operate anywhere in the country. As with any commercial business, they should be free to fix their tariffs and to decide on which part of the market they wish to take. In order to assist the small trucking companies that might have problems in evaluating their costs, the Authority could:

  - Regularly publish the elements of trucking costs.
  - Organize training sessions on the management of transport companies.

– Inter urban services should be more strongly regulated. The routes for these inter city bus services, their frequencies and the capacity on each route should be defined and the regulatory system should ensure that the potential transport demand is satisfied. The services can be provided by public or private entities and competition among various private/public companies might or might not be the rule on each route. Considering that some routes might be more profitable than others, one alternative could be to attribute these routes through competitive bidding by associating one or more profitable routes with one or more less profitable routes and allowing a cross subsidization between these routes. Where necessary, negative bidding (i.e. amount of subsidy requested) should be allowed.

  To encourage the private operators to offer good and reliable services, the general policy should be that these transport services should be profitable overall. An optimum solution would be to let the tariffs be freed and to let the competition regulate the system. This might prove difficult to implement and, in the short term, the tariffs could be approved by the authority, but the bus owners should have the right to arbitration in case of disagreement with the authority on tariff levels. For safety reasons, and as for the trucking industry, the vehicles should be regularly inspected, and the working hours and the qualification of the drivers checked.

– Urban transport services. There are many ways to deliver urban bus services. Some large cities like Buenos Aires (Argentina) or Maputo (Mozambique) use only private operators grouped in cooperatives per route, some use a combination of public (large buses) and private system (often mini buses) such as Addis Ababa (Ethiopia) or Sao Paulo (Brazil), while others use only a public system, such as in many European capital cities. In all these cities there exist competing private taxi systems.

  Each solution has its advantages and disadvantages. A large public bus company will, at the beginning, offer good and reliable services. However, contrary to many other businesses, there is no economy of scale in the cost of maintaining and operating these buses. Services provided through cooperatives of small bus operators are usually much cheaper than the cost of similar services provided by

large public entities. These private buses normally cover their cost and do not enjoy any subsidy from the Government or the municipality (except in some cases, access to non taxed fuel). However, as in all cases of Public Service Obligation, the sustainability of the company will directly depend on the level and reliability of the agreed subsidies between the Authority and the private operator. Not only is the evaluation of the level of subsidies often a source of conflict but, considering probable future budget constraints, the timely payment of these subsidies by the authority might be difficult, and this will cause the operator problems. It should be noted that one objective of the transport policy is "reducing the financial burden of the transport system on the budget of Lebanon".

Before taking a final decision on the establishment of such a national company, it would be prudent to run various financial scenarios to estimate the likely amount of needed subsidies considering various alternative tariffs and quality of services.

An alternative solution could be, as indicated above, for inter city passenger services to define a series of routes to be served in and around Beirut, to group these routes in such a way that the possible losses on some routes could be compensated by benefits on other routes through cross subsidization. The authority would then allocate these groups of routes through bidding to one or more private operators. The authority should carefully monitor the quality of the vehicles, as well as the capacity to be provided and the frequencies.

A further way to establish the bus company would be to decide to sign a concession with private operators for, say, a period of 10 years. The bidding document would spell out the routes, the conditions, and quality of services and the contract could be signed with the operator offering the best deal (i.e. a negative concession, with the contract given to the operator that could propose the cheapest costs in order to reduce subsidies).

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– In respect of giving a monopoly for a period of 5 years, it should be noted that even for a short period of time, a monopoly situation generates many distortions that are difficult to correct later. The existence of competition is always an incentive to deliver better and more efficient services. It would be advisable to eliminate these clauses from the law (once it is in the law it tends to become inevitable) and to consider the possibility of a monopoly at the time of the establishment of the company, if proved necessary to make the company sustainable.

The development of busways/bus lanes can be included in this process. The funding of rail and mass transit schemes and the tendering of rail operating company services to, from and within Beirut should also be within the LTA remit, jointly with the newly proposed rail institution (modified OCFTC). Other funds for capital-intensive rail schemes might be raised by planning gain contributions, or other economic externality benefits. This should be considered where there are large developments that are unsustainable with the present transport system and would not normally gain planning permission without the provision of a viable transport alternative. A study has been undertaken in 2004 – 2005 to assist the Government of Lebanon in the establishment of autonomous authorities for regulating the land and maritime transport sectors. Phase A, comprising tasks related to administrative strengthening and setting the stage

for the LTA/MTA has been largely completed, but Phase B (assistance during the transition and post-implementation periods) is pending.

2.3.3.2 Public Transport Study

The DGLMT launched a study in 2004 through a World Bank loan under the Urban Transport Development Project. The study, entitled "Revitalization of the Public Transport Industry in Lebanon", aimed at developing an integrated framework for the improvement of the industry covering the following aspects:

- Institutional.
- Policy.
- Regulatory.
- Organizational.
- Financial.
- Legislative.
- Enforcement.

The study objectives also included the development of a practical implementation plan to prioritize improvement measures given the existing setup. Moreover, the study included a system design to ensure the full integration of the public transport system in its multi-modal context.

The study was given out to consultants, but to-date no results have been published.

2.3.4 Railways

The responsibility for the non-functioning railway lines now lies with the OCFTC. This institution will probably disappear with the establishment of the National Land Transport Authority.

There are, however, various proposed projects to rehabilitate railway infrastructure and operate trains, for both international freight transport and passenger mass transit in the Greater Beirut Area. Considerations in respect of these proposals include the following:

- At the national level, distances are too short to economically justify a national railway line for freight.
- Freight traffic could only be justified for transit traffic, which also depends on the policies of the neighboring countries. Any investment addressing transit traffic should be made in close cooperation with the relevant neighboring countries that should share part of the financial risks with Lebanon.
- A light rail system for commuter traffic might be economically and financially justified. However, the search for services that cover both passenger and freight traffic might lead to technical solutions that are not economically justified. One solution might be that the transit traffic could be concentrated on the port of Tripoli and be transported by rail to Syria and that the use of the railway layout in the Beirut area be reserved for commuter traffic. Transit traffic passing through

the port of Beirut could be transported by road once the road access to the port is completed.

In respect of the institutional aspect, there are some concerns about the transfer of responsibility for railways to the proposed LTA. According to the law, this transfer will be for a short period, pending the setting up of an autonomous railway company. An alternative solution would be to keep the OCFTC for the time being and to refocus its activities on the development of railway services.

2.3.4.1 Urban Rail System

The Beirut Mass Transit Corridor Feasibility Study considers implementing a bus mass transit system along the Beirut to Jounieh rail right-of-way. This could form an initial step in providing either a light rail passenger mass transit service along the coastal strip, or a heavy rail service if there were to be any proven economic benefit for this.

Studies have revealed that the highest potential for mass transit is concentrated in the northern approach corridor to Beirut, specifically between Jounieh and Quarantina. A first stage implementation strategy would be to operate a Bus Tollway along that corridor, and to prepare its right-of-way in a manner suitable for future conversion into a rail service. Upon build-up of a more significant demand for mass transit along this route, Bus Rapid Transit (BRT) could be implemented to replace the tollway. Demand forecasts have indicated that, by year 2015, the two-way peak hour ridership along this route would reach 15,000 passengers, rendering a heavy rail passenger service feasible. By the same time horizon, a freight service between Beirut and the northern national borders was considered in this report to be feasible, operating at a frequency of one or two trains per day.

The route from Beirut to Jounieh follows existing and/or decreed railway right-of-way. It has a length of approximately 17 km and runs between St. Michel station in Beirut and the Jounieh railway station, and is access-controlled. The alignment is mostly at-grade and design speed (from a road traffic viewpoint) ranges between 70 and 100 km/h, with maximum grades suitable for future railway operation. Intersections with the local road network would involve combinations of grade separations and at-grade crossings.

The most critical features of this route would be new bridge structures to be provided at the Quarantina/Nahr Beirut area, ensuring access into the St. Michel station and Beirut Port (in the future, if the freight link is accepted). Furthermore, during the conversion of a bus scheme to rail, careful planning would be required to ensure minimum disruption to passenger services.

Three main stations are considered, namely at St. Michel in Beirut, at Antelias and at Jounieh. Thirteen additional stops are also considered, plus two park and ride facilities at Antelias and Jounieh. Although the service would initially be provided along existing (old or newly acquired) right-of-way, additional route expropriation is necessary at Nahr Beirut, as well as expropriation for facilities at Jounieh.

The capital cost of this starter project (bus tollway) is estimated at US$ 39M, while the expropriation cost is estimated at US$ 8M.

2.3.4.2 Regional Links

Plans related to the reactivation of two regional rail links extending from the northern and eastern national borders are ready for implementation. The first is from Tripoli to the northern borders at Aaboudiyeh and the second from Riyaq to the eastern borders towards Serghaya. These lines would be used in transporting goods and passengers. However, the track of the Riyaq link would be kept on narrow gauge, which limits its operational efficiency. These projects are currently on hold due to prevailing political developments.

2.3.5 Airports

2.3.5.1 Civil Aviation Authority

A draft law to create the Civil Aviation Authority (CAA) from the former Directorate General of Civil Aviation (DGCA) was passed in 2002, and is currently pending approval by the Council of Ministers. The principal responsibilities of the CAA will be related to:

- Laws and regulations in the field of civil aviation safety.
- Air transport policies and operations monitoring.
- Relations with international and regional aviation authorities.
- Regulation, supervision and control over civil airports.
- Regulation, supervision and control over air navigation, communications and control.
- Analysis of weather reports.
- Technical training.

The draft law establishing the CAA indicates that, within one year of approval, the Government should incorporate a joint stock company denominated the "Beirut International Airport Company", whose objective is to provide airport, air navigation, communication and meteorological observation services and related activities. The company's shares would be initially owned by the state and may be totally or partially sold to the private sector. The draft law also states that more airport activities could be conceded to private operators.

It is considered that increased participation by private operators in the management of Beirut Rafic Hariri International Airport should be encouraged. However, as for the proposed airport company, the call on the private sector only as shareholder of the airport is not the only solution. It might even result in a conflicting situation if a major shareholder proposes substantial changes in the way the airport is managed. The concession of airport activities for a long period of time (25 or 30 years) to a private operator might be a better solution.

2.3.6 Ports

2.3.6.1 Maritime Transport Authority

As described in Section 2.3.3.1, a Law is proposed for the establishment of a General Authority for Maritime Transport (MTA), which will operate under the overall trusteeship of the MPWT. The remit of the proposed authority is to deal with both port and sea shipping issues, and its principal proposed responsibilities are:

- To formulate general policies applicable to the maritime transport sector.
- To establish the necessary regulations for all activities within the sector.
- To promote the efficient and cost-effective performance of the sector.
- To ensure that the performance of the sector is in keeping with international standards and meets the social and economic requirements of Lebanon.
- To raise the level of performance of workers in the sector.
- To improve safety and environmental protection in the sector.
- To encourage competition within the sector.
- To encourage investment in the maritime transport sector.

This law needs to be approved, and the necessary resources made available, so that the MTA can proceed to carry out its responsibilities.

The objectives and tasks related to shipping are clear, but the objectives and tasks related to port activities need to be clarified.

In the recent past, the Government has conducted two major port studies, one by HP Rendel Cabinet (Feb 2001) and the other by BCEOM (2002). The conclusions and recommendations of these studies, which were contradictory, were reviewed in some detail in the TEAM/Catram Consultants report "Formulation of Options for Transport Sector Policy in Lebanon, dated December 2002". This study recommends the preparation of a "Ports Act" that would define a port policy for Lebanon. The Act would apply to all port entities to be established, to be responsible for each national port. The study also recommends the establishment of an autonomous port agency on the same model as the proposed CAA. The study finally concluded that the "Landlord" approach is the most suitable for Lebanon, and gives recommendations on how best to call upon the private sector to operate the various activities of the ports of Beirut and Tripoli. It is considered that the recommendations of the TEAM/Catram report should be implemented as a matter of priority.

Consequently, it is suggested to revisit the proposed law establishing the MTA, in order to better harmonize its text with the final decision on the port policy. For example, it is important to define the regulatory entities of the port sector.

2.3.6.2 Beirut Port Container Terminal

As part of the reconstruction and expansion of the Beirut Port, a new container terminal was created at a cost of US$150 million in 2000 but remained idle until the start of operations at the end of 2004. The operation of the container terminal has been awarded by the Beirut Port Authority (GEPB) to a consortium of US, British and Lebanese companies for a 10 year contract, renewable for 5 additional years.

The terminal has a berth of 600m length (Quay 16), 15.5m depth, and 23 hectares of backup area, equipped with container handling equipment. The terminal also has the capability to handle containers on Ro/Ro vessels. Currently, the terminal is handling 350,000 TEU per year on average but has the capacity to handle 600,000 TEU/year.

The objective behind the Beirut container terminal is to support local economic growth by providing a dedicated facility serving transit traffic and offering competitive transshipment services in the Eastern Mediterranean in an efficient and cost-effective manner.

The consortium operation results for the first quarter of 2005 were encouraging, which favored considering another container terminal, through the extension of the Port up to Nahr Beirut.

2.3.6.3 Beirut Port Expansion Plan

Future expansion of Beirut Port up to Nahr Beirut would be facilitated by the fact that the land required is already owned by the Port. This expansion would allow the creation of the second container terminal with a berth of 600m. However, another expansion plan is being considered up to Nahr El Maout, for which a preliminary study was carried out. The new expansion would house gas and oil terminals in addition to an extension to the existing free zone.

2.3.6.4 Tripoli Port

A project is currently under implementation at Tripoli for the construction of a new quay and a new dock. The present stage involves the construction of a new 1200m long breakwater on the north side, extension of the western breakwater by 1000m, and construction of 600m of quayside. A planned second stage will include extension of the quay by another 600m, and storage areas totalling 120 hectares.

2.3.6.5 Other Ports

The management authorities at the port in Saida have prepared a proposal for the development of a 2km stretch of coastline to the south of the present site for port activities. The principal components of the project are:

- A container terminal with 1300m of quayside and 450,000m^2 of storage areas, providing a potential capacity of 1.2million TEUs, largely for transhipment.
- A multipurpose terminal with 600m of quayside and 172,000m^2 of storage areas, giving a potential capacity of 1m tons of cargo.
- A free zone with an area of 81,000m^2.

The estimated cost of the proposals, which would be carried out under some form of concession contract such as BOT (Build, Operate, Transfer), is about US$500m. However, the overall economic justification for the total expenditure on all of these projects should be confirmed.

2.3.7 Inter-modality and Logistics Sub-sector

The main objectives in the Inter-modality/Logistics Draft Policy, which will form the cornerstone upon which the future regulatory frameworks pertaining to this sub-sector will be based, include the following:

- Improving the efficiency of the goods-distribution systems (this is achieved by constructing the required terminal/warehousing/logistics facilities that can be used for break-bulk, consolidation, packing, labeling and other operations).
- Adopting the necessary legal framework to encourage the introduction of e-commerce activities, and providing the required communication infrastructure to support Electronic Data Interchange (EDI).
- Achieving better utilization of the multimodal transport infrastructure (reinstating rail services, improving road access to Beirut and Tripoli Ports, etc).
- Improving safety and reducing congestion in residential areas (reducing the penetration of trucks into urban areas, controlling loading/unloading operations, preventing the location of warehouses in the basements of buildings, etc).

The above objectives are considered to be reasonable. The customs procedures have recently been modernized with the implementation of the Asycuda system, which has substantially improved custom clearance processes. It is not clear, however, from the available reports, if the existing customs regulations could authorize the setting up of dry ports outside the port areas of Beirut or Tripoli. Considering the rapid increase of traffic in these ports, and the relatively long delays for custom clearance, it might be economical to establish dry ports in other parts of the country. The containers could be transported immediately from the ports to these terminals, where customs clearance could be carried out. These dry ports could be financed by the private sector through BOT arrangements. The facilities should be close to, but not integrated with any proposed logistics centres.

In tackling the land freight issue, the SDATL proposed three main regional logistics centers for the storage and distribution of goods, at the following locations:

- North of Tripoli.
- Adjacent to Zahle.
- South of Saida.

These regional distribution centers generally cover the north, south and central Lebanon. In addition to the above regional distribution centers, Beirut Port is the primary distribution centre for international goods. The majority of international goods are imported via Beirut Port, making it the predominant point for the storage of international goods before re-distribution direct to industry or to the regional distribution centers. The proposed regional distribution centers will act as break-bulk centers for shipments, to be then distributed to the nearby urban centers. For all three of the regional distribution centers, potential rail links are planned with links to a regional rail system currently being studied. This would enable the efficient movement of aggregate/bulk goods over large distances (about 80km - World Bank Railway Performance Database) where rail freight becomes competitive with road freight.

3. THE NEW INSTITUTIONAL AND TECHNICAL APPROACH

3.1 THE NEED FOR INSTITUTIONAL REFORM

3.1.1 Introduction

During the last few years, transport demand for freight and passengers in both developing and developed countries has increased at a rate 1.5 to 2 times the economic growth of these countries. For passengers, this is the result of an increase in vehicle ownership, reflecting a strong desire for individual mobility; for freight, it is the result of the globalization of the economy and, of course, of a substantial reduction in transport costs.

This increase in transport demand has resulted in an increase in traffic and a greater use of transport infrastructure. Since the deterioration of some transport infrastructure, such as roads and airstrips, is directly related to the number of vehicles running on them, and that this degradation is growing exponentially with the number of equivalent axle loads, it can be seen that if an increase in transport demand is twice the growth of the economy, this could result in an increase in maintenance and operation costs of the roads by a factor of 3 or 4 times the average economic growth of the GDP.

During the same period, national budgets have usually increased in line with the growth of the economy, and countries are facing great difficulty in securing the necessary funds for good and sustainable development and maintenance of their transport.

As with many countries, Lebanon has been confronted with a rapid increase in its transport demand, both for passengers and freight. This has resulted in a substantial increase of traffic, particularly road traffic. The geography of Lebanon concentrates the traffic along the coast and along narrow valleys where alternative roads are difficult to build. This results not only in large operating costs for the rehabilitation and maintenance of transport infrastructure, but also in large costs due to congestion and pollution.

Current levels of performance in the field of transportation leave room for improvement. A shortage of funding has an impact on staff numbers, salary levels and morale, as well as on the affordability of work to develop and maintain the network. A further factor is the ability of the various involved transport administrations to select, plan, design and implement such work as can be afforded, in a timely, effective and efficient way. It has been set out in a number of reports that major causes of this inability are founded in the complicated allocation of transportation responsibilities across and within the organisations involved, and in the numbers and skill levels of available relevant staff.

It is a paradox that while this type of problem with the transport management function often results from a country's general economic problems, poor transportation provision is often a direct contributor to these same economic problems. Therefore there is a need to "kick start" the effective provision of transport facilities by whatever means, including reform of the necessary procedures and responsibilities. This will

assist in achieving the very necessary overall objective of producing greater output from existing or lower levels of input.

To resolve these problem issues, and to improve the overall efficiency of the transport sector, the Government of Lebanon has started to develop and implement a national transport policy that focuses on:

- A redefinition of the role of Government in the management and operation of transport infrastructure and transport services.
- An increased appropriate role for private operators in the sector.
- Increased participation by transport users in the financing of investment and maintenance of transport infrastructure.

The objectives of such reform must be the development of an overall organisation that approaches as closely as possible the ideals set out below. In the real world, transport solutions must take account not only of economics but also of social, political, physical and financial pressures. An "ideal" organisation for the provision and maintenance of transport facilities and infrastructure would operate as effectively and efficiently as possible, using procedures which:

- Are responsive to all of these factors in ways that are properly weighted and are transparent.
- Are considered fair and equitable by all those who administer and use the facilities and infrastructure.
- Ensure that office decisions are translated into real and physical changes to transport facilities and infrastructure as effectively and efficiently as possible.
- Continue to reflect changes in the organisation's operating environment.

3.1.1.1 Finance and Its Management

The proposed transport policy has to be analyzed in the context of the recommendation of the Main Report of the current study on macro economic management of the Lebanese economy in the future.

According to the main report: “In Lebanon, the public debt dynamics is such that, sooner or later, the Government will no longer be able to service it. Comparison with countries having experienced fiscal/financial crises in recent years indeed suggests that Lebanon is by all accounts (fiscal, external, and the debt stock) in a worse pre-crisis situation than most of its comparators. In this context, Lebanon has no alternative but to seize all opportunities to immediately reduce the deficits and debt levels to considerably lower levels”.

The main report recommends a profound restructuring of the planning, implementation and evaluation mechanisms of public expenditures for investment, maintenance and operation. Basically, one recommended scenario would be to increase the fiscal revenue from 23% to 26% of GDP while reducing public expenditures (not including the debt service) from 22% to 19% of GDP. It can be assumed that under this macro economic hypothesis, funds available for the extension, rehabilitation and maintenance of transport infrastructure and transport services would be substantially reduced in the future.

It should be noted that, from a general point of view, the transport sector, being a commercial sector, should be a net provider of resources to the coffers of the State. The users of transport infrastructure and services should, as far as practicable, cover the costs of operating and maintaining this infrastructure or services through direct payment of tariffs or specific levies to be earmarked for the specific modes.

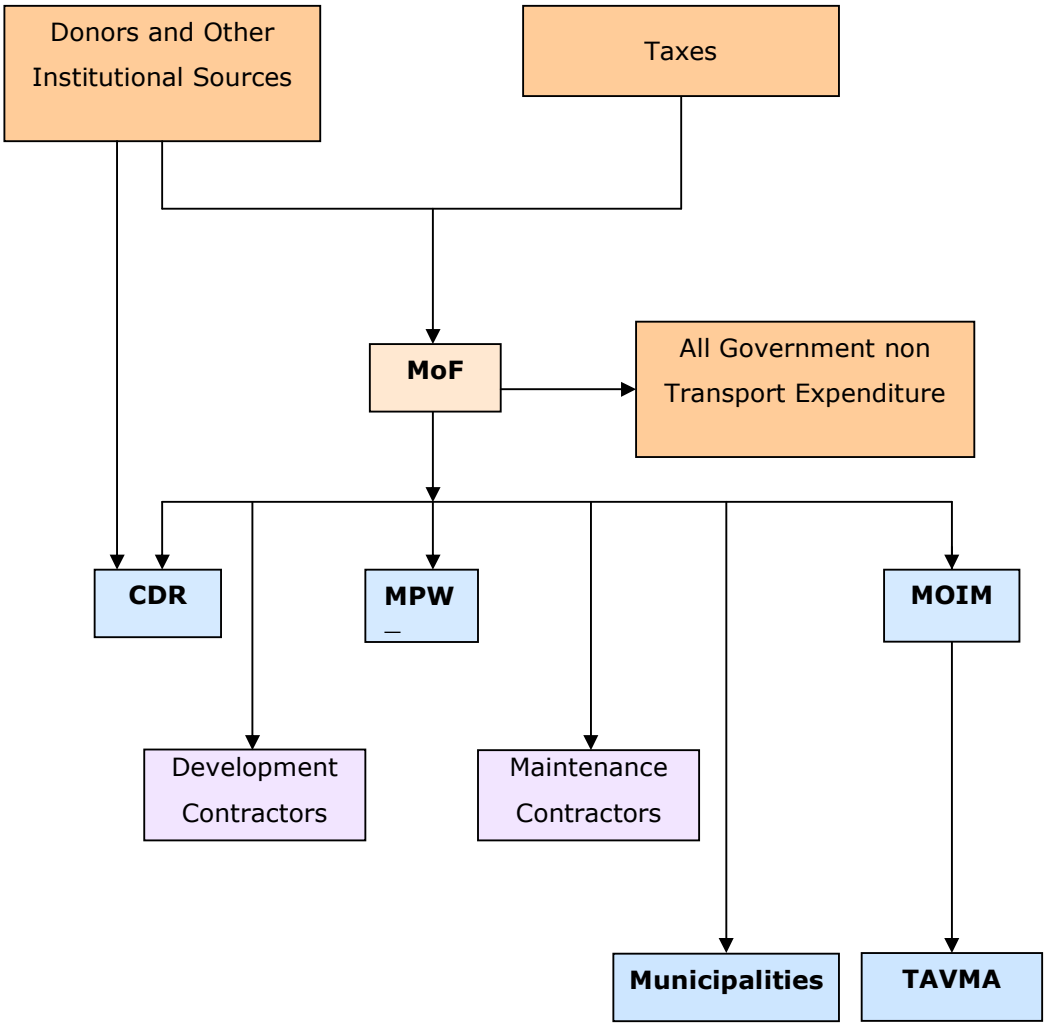
The challenges linked with finance are:

1. To identify and tap alternative sources of finance.
2. To achieve more with the available funding.

Additional sources of funding are discussed in Section 3.2.1.

Current arrangements for managing finance destined for use in the roads sector are broadly as shown in Figure 3.1.

Figure 3.1: Current Transport Sector Finance Flows



The pivotal organisation involved in the broad allocation and disbursement of funds is the Ministry of Finance. The key objective of this Ministry must be broad financial management across the complete spread of Government responsibilities. It is inevitable that in times of overall financial difficulty the transport sector budget is reduced by amounts that reflect both the scale of the difficulty and the priorities placed upon transport either entirely or partially by others.

It should be noted that, although the bulk of the finance is provided by Lebanese individuals and corporations, the allocation of this money by the MoF, and the more specific allocations by MPWT and CDR, are not subject to any form of public scrutiny or accountability other than by the political establishment and audit.

If additional finance becomes available, from whatever sources, the possible future management of that finance and the institutional questions this raises are discussed in Section 3.2.1.

3.1.1.2 The Efficiency of Road Network Management and Operations

In order to achieve the objectives set out above it is necessary for the roles and responsibilities of each part of the overall organisation to be properly and clearly defined and understood. This includes both responsibilities for different parts of the complete network, and for different processes used in the management of each part of the road system.

It is clear that in terms of the processes used, each set of roles and responsibilities will involve input and output interfaces such that the input required for each role matches the output from the preceding role or roles.

Experience shows that the interfaces between stages (such as from concept design to preliminary design) can be a source of difficulties, problems and delays in the execution of the total process of which each stage forms a part. On the other hand, an interface which provides a precise definition of the output required from one stage and pre-knowledge of the form of the input to be provided, enables work in the next stage to be planned and carried out efficiently. An example of a good interface is a well-prepared set of contract documents that enables the contractor to know exactly what is required of him. The use of such a comprehensive and expensive form of interface is clearly not warranted between most stages, although the concept of pre-defined formats for interfaces is a good one.

Problems can also arise if different stages are carried out by different parts of the overall organisation (e.g. different ministries, authorities, agencies or departments) each of which can have different overall organisational objectives (for example, where funding of a scheme is approved by one organisation and design by another). In such cases when staff resources are stretched, there is an inevitable tendency for tasks which contribute to such a Ministry's own core objectives to be given priority over those of another.

These potential problems can be minimised by:

1. Reducing the number of separate stages, and hence the number of interfaces.
2. Reducing the number of different parts of the overall organisation that have a part to play in the overall process.
3. Aligning the objectives of each part of the overall organisation.

Taking as an example of the involvement of different functional units in the development of an overall transport solution, consider a project for the reduction of journey times in a part of a major municipality (Table 3.1). The example assumes that the project is initiated and financed by the Municipality and that no land acquisition is required. It is accepted that these assumptions may or may not be realistic and that the number of stages listed might be reduced. It is also possible that the number could be increased if, for example, the scheme was designed and supervised by a Municipal organisation with assistance from one or more Central Government specialist units. The unit descriptions are functional only and there are, of course, a number of entirely different ways in which the inputs to such a project could be provided. In any event the purpose of the example is to indicate the scale of the problem rather than its detail at this stage. Tasks are listed in an approximate sequence order only.

Table 3.1: Example Project Tasks and Input Provision

	Task	**Unit** Possible role of:
1	Proposal to carry out the investigation work.	Planners or Politicians
2	Produce justification for investigation of the work.	Forward Planning
3	Allocation of finance to fund the investigation work	Finance, and/or Politicians
4	Traffic counts and analysis	Traffic
5	Development of travel desire lines.	Forward Planning
6	Physical survey of the roads within the area.	Design or Survey
7	Development of cost estimates for the design work needed.	Design
8	Produce justification for design work	Design
9	Allocation of finance for the design work.	Finance, and/or Politicians
10	Development of parking restrictions to free up carriageway space	Traffic
11	Design of traffic management measures to maximise utilisation of road space - with input from public transport interests.	Design
12	Consideration of accident potential of proposed altered road system.	Accident unit and/or Police
13	Develop public transport services to take advantage of increased traffic capacity.	Public Transport
14	Develop cost estimates for the on-site work needed.	Design
15	Produce justification for the necessary on-site work.	Design
16	Allocation of finance for the on-site work	Finance, and/or Politicians
17	Produce and issue contract documents for the on-site work.	Design
18	Consider tenders and award contract/s.	Design and/or Politicians
19	Traffic Police keep areas free of parked cars to allow work to proceed.	Police
20	Carry out on-site work.	Contractor
21	Supervise on-site work.	Site Supervision
22	Investigate claims for additional payment to contractors	Site Supervision
23	Justify additional payments to contractors	Site Supervision
24	Certify payments due to contractors	Site Supervision

25	Reimburse contractors	Finance
26	Implement parking restrictions.	Contractor/Police
27	Operate new public transport services.	Public Transport
28	Enforce parking restrictions.	Police
29	Maintain roads and traffic management measures. (Traffic signals, road markings and signing etc.)	Maintenance unit
30	Monitor traffic flow and accident rates and consider the need for modifications to the arrangements.	Traffic and/or Police

Management keys to the successful realisation of the project would be:

- The acceptance by all units of a "Lead Unit" with overall responsibility for the project.
- The existence of a time-based programme leading to project completion and detailing the input of each participating unit.
- The acceptance by each unit of its role in the overall process.
- The commitment to the project by every individual unit.
- The ability of each unit to carry out its tasks effectively and on time.
- The availability of funding as required by the overall timetable.
- Complete understanding between participating units over:
  - Timescales.
  - The required content of the output from one task that forms the input to a later one (i.e. the interface).
  - The precise responsibility of each unit involved to both the Lead Unit and to everyone else involved in the project.

In order to enable the achievement of this situation in all of the work leading to transport solutions, existing allocation of roles and responsibilities must be clarified. The process of clarification in this way is likely to throw up situations where certain roles and responsibilities can, with advantage, be moved between Ministries and/or Departments in order to approach more closely to the ideals set out above. This process can be completed only when the overarching transportation responsibility structures are finalised, and the procedures for the achievement of all categories of transportation solutions are defined in some detail. Further study will therefore be necessary to define these procedures in detail and to allocate roles and responsibilities following the establishment of revised overarching transportation responsibility structures.

Some options for overarching responsibility and institutional structures are set out in Section 3.2.1.

3.1.2 Demarcation of National, Regional and Local Responsibilities

Whilst work on the classified road network is the responsibility of MPWT, work on non-classified roads is carried out by Municipalities. This work is planned in accordance solely with local needs and is financed from allocations to Municipalities from central government.

There are advantages that accrue from considering the non-classified road network as part of the total road network national asset. There are also advantages in allocating responsibility for local roads to those who benefit most from them. Ideally, this local responsibility should be reflected in this work being financed from local sources.

The institutional problem lies in how best to allocate roles and responsibilities for non-classified roads in such a way as to obtain the benefits from both of these approaches. The options available to meet these objectives are considered in section 3.2.1.2 below.

3.1.3 The Role of Central Government

The provision of transport facilities and infrastructure is an hierarchical process. In the roads subsector, for example, the end product of the service process is the existence of an adequate, safe, well-maintained road system for use by passenger cars, road freight and buses, and the provision of reliable and affordable public transport. This end product is arrived at by passing through stages of construction or procurement, contract, design, planning, financial allocation, justification, scheme selection, strategy and overall policy definition. A range of different end result schemes will arise within a single strategy and set of policies, and yet it is these latter which shape the form and priorities that define each end product.

The core requirement placed on any government is to provide transport facilities and infrastructure. For the government to meet this requirement, it must control the policies and strategy that head up this hierarchical process of transport facility and infrastructure provision. Beyond this, the Government does not itself necessarily have to be the physical provider, manager and operator of transport infrastructure and transport equipment so long as it provides a way in which this work is undertaken.

It has now become increasingly accepted around the world that government's role in transport provision can, if required, be restricted to that of co-ordination of planning and the regulation of the services that are provided. This leaves the way free for the consideration of ways of managing and operating transportation facilities which if required:

1. Reduce the total scope of direct government activity and hence of "above the line" direct costs and overheads.
2. Allow greater freedom of action in terms of procedures, staffing and salary levels.
3. Encourage initiative and innovation in the search for more effective and efficient ways of carrying out organisational and operational tasks.

(1) above would contribute to the financial objectives identified by this study.

Both the private sector and Government authorities and agencies have the freedoms in (2) above. It is generally accepted that the profit motive provides an in-built incentive for the private sector to look for ever more efficient ways to operate, so fulfilling point (3), while proper competition between companies ensures that the results of such improvements in efficiency are to the ultimate benefit of the nation. It is of

course important that private sector contracts are drawn up so that payment is based upon all the relevant aspects of performance.

Examples of government authorities are the LTA, which is currently being established to control and co-ordinate public passenger, road and rail freight transport across the country, and the Council for Development and Reconstruction.

The use of both of these options within an overall methodology for different parts of the management and operation of transport facilities and infrastructure is quite possible.

As described earlier, there is a need for a clearer allocation of responsibilities and roles for each of the bodies involved in national transport planning, operation and management. It is also clear that the existing public sector establishment is insufficient, both in numbers and in skills, to provide the policy and strategy development, planning and management services that are required. Further, it is apparent that the existing restrictions on civil service pay and conditions may prohibit the development of a viable system within the present situation. The use of either the private sector or para-statal organisations could enable these barriers to the achievement of improved performance to be overcome. It is considered important that any road network policy and strategy making and monitoring body should report directly to Ministerial level of Government.

Revision of the existing overall institutional organization may or may not therefore require the creation of one or more new bodies, that could operate free of existing government sector limitations, and the transfer of roles and responsibilities currently held by Government ministries to either other Ministries, such as para-statal bodies, or to the private sector. This could as a consequence enable a reduction in the scope of ministerial activity and staff levels. It could also involve the establishment of a General Directorate of Roads within MPWT.

It is relevant that the National Transport Policies document prepared in 2001 contains reference to a commitment to privatization within this context.

In some political environments, for example Sweden, this has led to the contracting out of all former Ministry tasks in the transport sector, with the Ministry only retaining a slender core guidance committee (17 persons in the Ministry of Transport for Sweden, for example). Effectively, the Ministry becomes a small, powerful supervisory body, co-ordinating and regulating the Ministry workload, which is almost entirely executed by others.

A transfer to such a way of providing transport facilities and infrastructure does not have to be total or immediate. If such a transfer were to be contemplated, careful study would be required to ensure that the long-term objectives were met without disrupting services in the short term.

3.1.4 Need for Separation of Supervision and Operation of Transport Infrastructure

This can be considered both in terms of:

1 The outsourcing of services currently performed within government, and
2 The separation of the development of policies and strategies from the execution of work to achieve these strategies (discussed in Section 3.1.3 above).

It has long been acknowledged that the skills of the contractor differ from those of the designer. In the construction of a road or other project, both sets of skills are harnessed to the benefit of the project overall. Contractors' skills, in particular, lie in the organisation and management of resources to carry out a large number of relatively small interdependent tasks in order to complete the overall contract within required financial and time constraints. This task of management involves both planning and then the more difficult task of implementing the plan.

A requirement of such contract arrangements is the production by the designers of drawings, specification and quantities as a "brief" for the contractor to work to. This package of contract documents then forms the interface referred to earlier and in this case makes it possible for the contractor to pre-plan his activities efficiently and economically.

In many other stages (for example routine maintenance work) in the provision of transport facilities and infrastructure, however, it has been the practise for a "client" organisation to (typically):

- Define policies and strategy.
- Define projects.
- Set project objectives.
- Carry out justification and design.
- Programme.
- Survey.
- Plan.
- Carry out physical work.
- (Hopefully) monitor progress and quality (in terms of achievement of objectives).

The mix of skills that are typically developed within such a "client" organisation, rarely include those found in a contractor, and yet many of the tasks involved in the procedures listed would benefit from the application of such management attitudes and skills. Many tasks which are currently carried on within the "client" organisation could be performed more efficiently if they were to be defined by a "work brief" which included details of the input and output required (i.e. the interfaces between such tasks) and the timescale allowed for the execution.

It is possible to divide up the tasks involved in the generation of transport solutions to distinguish between those which are essentially policy and strategy definition (type A tasks), and those which are not (type B tasks). Briefs can then be developed for these tasks, which define input and output interfaces, and performance indicators that enable the tasks to be monitored. Type B tasks divide into:

- B1. Tasks that contribute to the fulfilment of defined policies and strategies.
- B2. Tasks that involve co-ordination, monitoring & supervision of Type B1 tasks.

Type A and B2 tasks can then be considered for allocation to either Government Ministry or para-statal organisations. Type B1 tasks can be considered for possible allocation to the private sector under some form of contract arrangements. Remaining unallocated type B1 tasks can then be allocated to either ministry or para-statals.

At this point the organisational and management structures of Ministry or para-statal bodies can be matched to the requirements of the allocated tasks. If the arrangements for the management of transport sector finance were to change, then it could also be possible to develop and operate road network policies and strategies through an independent para-statal body and a form of either private or public sector independent contractor acting on an agency basis.

Some overall institutional options for the future to take advantage of this approach are set out in Section 3.2.

3.2 INSTITUTIONAL REFORM OPTIONS

3.2.1 Roads

A number of alternative institutional reform options are considered in this section. These are not exhaustive but are those considered to be the most applicable to the situation in which Lebanon now finds itself. In particular, note is taken of the aims of transport facilities and infrastructure provision as set out in Section 1.2. These aims and objectives imply limiting Government budget spending and suggest a need to improve value for money achieved in the provision of transportation services.

3.2.1.1 Financial Management Options

This section deals both with possible ways of obtaining the finance needed to provide and operate transport related facilities and infrastructure, and ways in which the procurement, safeguarding and disbursement of this finance could be managed.

3.2.1.1.1 Sourcing the Necessary Finance

Current sources of funding for roads spending are:

- Allocation from MoF.
- Donors and international loans.

The loan book may now be reaching a point at which further borrowing is becoming unsustainable in terms of the country's current and immediately projected economic performance. This means that operation and development of the road network will have to be funded mainly from internal resources for at least the foreseeable future.

The funding currently available from MoF is limited and is currently almost all allocated to maintenance work on, mainly, the classified network. There are no guarantees that even this level of finance can be sustained in the future.

Viewed from the standpoint of the transport sector, and the understanding of the impact that this sector can have on the economic performance of the nation as a whole, the vulnerability of the roads budget to variation due to the priorities of others is a cause for concern.

If the consistent levels of financial expenditure that are called for economically are to be reached, it is therefore necessary to identify and tap alternative sources of finance.

Government revenue is raised through the collection of taxes. It is reported that tax collection in the country may not be particularly effective and hence there may be a shortfall in the contributions actually made by the population for services such as transportation.

Section 4.1 below sets out an economic rationale for an increased level of direct recovery of the costs of providing and operating the road network. Such direct recovery may be both an end in itself and an aid in achieving modal transfer away from private car use. Within such a rationale there exist alternative ways of increasing the roads funding available. Such means generally involve the imposition of some form of levy or charge on some aspect of the activities of some part of the public. When considering the imposition of a roads levy, it is necessary to identify whether such a levy should be imposed:

a) Directly and solely on road users, or
b) On all those who benefit from the existence and operation of the road network. Such beneficiaries are, for example the shop customer (who may or may not be a road user) who buys goods that are supplied to the shop by road.

In practice, of course, the end result of a direct levy on the road user will generally result in an indirect levy (in the form of cost increases) on the wider public.

Such measures are seldom popular when they are introduced although, in countries which have followed this approach and combined it with a demonstrable and publicised improvement in road network condition, the move has proved more acceptable in the longer term.

It is acknowledged that public acceptance of the collection of such finance is easier to achieve when starting from a low level of road condition. However, it should be noted that the timescale involved in the introduction of such an approach is such that it may be advantageous to consider the concept well before the network deteriorates to a condition which is affecting travel costs.

Ways of raising finance in this way include:

- A levy on vehicle fuel.
- A levy on the annual license fee for vehicles.
- A levy on the fee for registration or re-registration of vehicles.
- A levy on the fee for annual vehicle inspections.

- A levy on the purchase price of new vehicles and spare parts (this can be at the stage of the imposition of import duty and so also encourage local economic activity).
- A levy on, or the imposition of a fee for granting permission for the construction of developments that will be major traffic generators (e.g. shopping centres or sports stadia), i.e.planning gain.
- Imposition of tolls on selected stretches of roads.
- A dedicated Highways Lottery.

To identify appropriate levels of the charges to be applied, the Road User Charges Study of 2000 would need to be updated to current values in order that the demands on the fund could be correctly estimated.

3.2.1.1.2 The Management of Finance

The imposition of any form of road user charging will be seen by the public as an increase in taxation. As such it will be unpopular. The recommended option in the main report to this stage of the study is to increase fiscal revenue from 23% to 26% of GDP. This is a recommendation to increase taxes. The imposition of road user charging will necessitate an explanation of what the finance raised will be used for. As part of the process of achieving acceptance by the public of direct recovery road changes, it will be of help if it can be shown that the money raised will be:

a. Kept separate from the Governments' general finances.
b. Used solely for road based projects.
c. Overseen by representatives of all groups of road users.

In countries which have used this approach, the mechanism for achieving these objectives is generally called a Road Fund or a Transport Fund.

One option for Lebanon is to leave the existing financial mechanisms in place, and accept the current levels and variability of funding for the Transport Sector, together with the limitations which this imposes on the maintenance and development of transport services.

A second (theoretical) option is to leave the existing financial mechanisms in place and to increase overall government income to a level at which consistent and adequate financial allocations to the Transport Sector can be made by MoF.

A third option is to follow the advice of the Transport and Energy Directorate of the European Union, the World Bank, and previous consultant's reports, and establish a specialised and dedicated fund into which additional finance collected is paid. Such a fund can be a useful tool to safeguard the transport sector in economies that are in their earlier stages of development (or redevelopment). This type of fund does not have to be a permanent feature of a nation's financial management structure.

The UK, for example, used a Road Fund from 1909 to 1955 as its road network and economy developed. That fund was abolished only when the economy was sufficiently large and stable. The fund was used:

a) To provide the finance needed from the general budget, and
b) To avoid the need for large annual variations in transport allocations.

By this time also the road network was largely established and stabilized, and effective and trusted institutional arrangements had been in place and operational for many years.

Such a fund has been established and is now working satisfactorily in a range of countries including Ireland, Ghana, South Korea and Morocco. The establishment and operation of such a fund is now advocated by the European Union for all countries that are current or potential (from Eastern and Southeastern Europe) EU members. The World Bank is also a strong advocate of this approach.

It is possible that in the short term at least, the fund could provide finance for the entire national road system, covering urban, rural, national, and local needs. Allocations from the fund would thus be both to central organisations for the currently classified roads, and to local organisations for local and urban road needs. This initial municipal allocation could be seen as a maximum that could decrease with time, providing an incentive for local administrations to develop, over time, their own fund raising capabilities at the local level.

The establishment of such a fund to finance transportation expenditure is a specific requirement in the list of proposed Lebanese National Transportation Policies as prepared in 2001**.**

Such a fund would have to be managed, and the monies that were held in it properly disbursed, in line with required roads sector policies and strategies. This could be achieved in a number of ways. Options include:

A1 Establish the fund within the MoF with safeguards to prevent the transfer of its contents to non-transport related expenditures. This would ideally require the approval of MPWT and/or CDR before any allocation or disbursement from the fund. In the context of this study, it is not known whether such an arrangement could be acceptable to MoF or guaranteed in times of overall budget shortage. In addition, accountability for transport expenditure remains unchanged from the present situation.

A2 Establish the Fund within MPWT. This would probably be resisted by MoF and, in any case, would require the establishment of a unit within the MPWT to manage and disburse the funds in such a way that probity and transparency could be ensured. The management of the fund would involve the making of financial investments to benefit from capital held in the fund for any length of time, and the skills and procedures involved in this would be completely new fields for this Ministry. This management would also involve keeping updated the scale of the levies that provide income to the fund such that allocations are able to meet operational requirements. Links with local administrations would need to be developed to enable appropriate allocations and disbursements to be made to cover work carried out by these bodies on the local road network. In addition, accountability for transport expenditure would remain unchanged from the present situation.

A3 Establish the fund outside any of the existing organisations. This raises the question of both its management and accountability. An "independent" fund would need a small organisation to properly manage and disburse monies and to keep updated the scale of levies that provide its income. The provision of probity and transparency, together with the need to obtain approvals for levy increases argues for this organisation becoming accountable to either:

- A senior part of the Government office which is independent of the Transport Sector. (For example a Nominated Committee of the Council of Ministers).
- An independent "stakeholder" body constituted either as:
  - A formal para-statal organisation with responsibilities in the fields of road transport policy and strategy development.
  - A solely consultative transparency-providing forum allowing road users to lobby for the management of the road network in ways which are responsive to their needs as users.

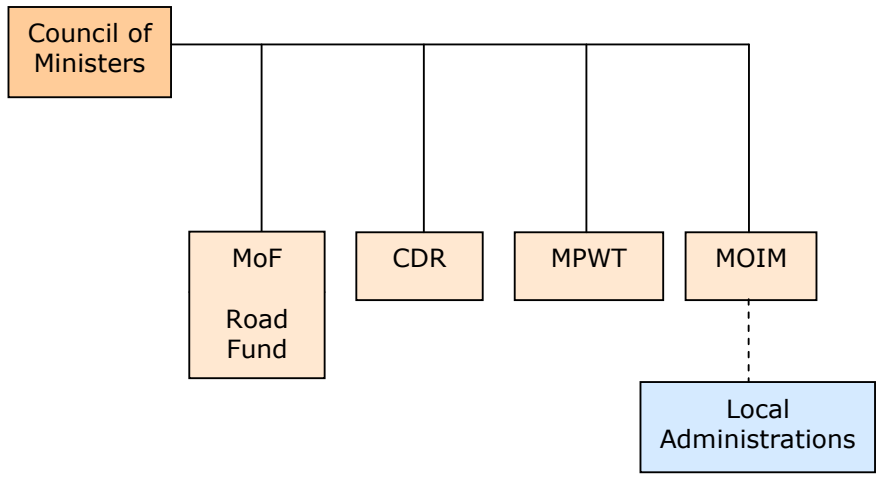
  In either case this body is generally known as a "Roads Board".

Diagrams showing outline relationships under options 1,2 and 3 are set out in Figure 3.2.

Figure 3.2: Alternative Road Fund Outline Relationships

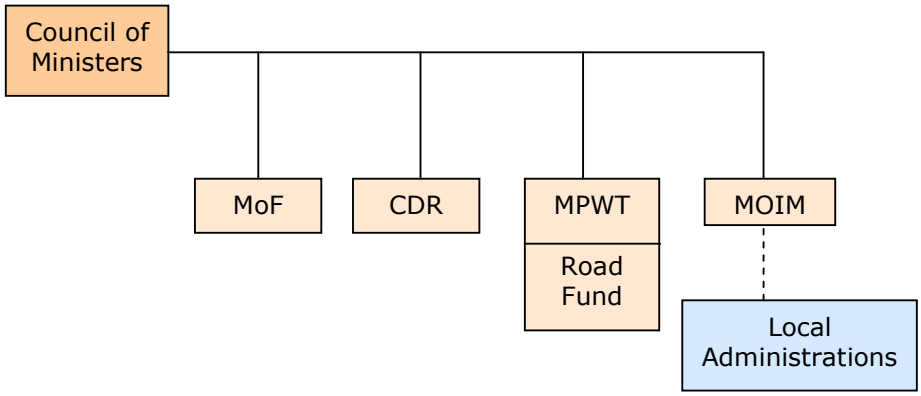
Option 1

(Road Fund held within MoF)



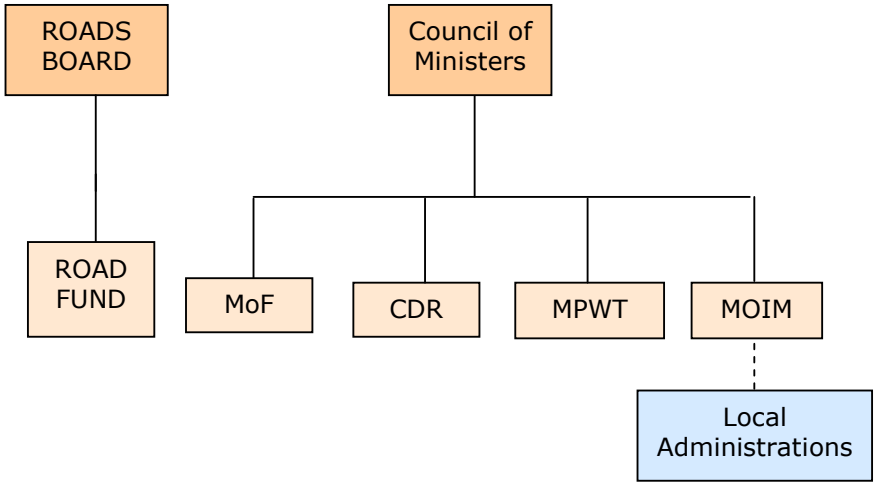
Option 2

(Road Fund held within MPWT)



Option 3

(Independent Road Fund accountable to an independent Roads Board)



Any recommendation or suggestions as to which of these arrangements might be preferred for the situation in Lebanon must be developed in the light both of further study and work currently in hand to review roles and responsibilities of all government ministries.

3.2.1.2 Options for the Demarcation of National and Local Responsibilities

Responsibilities should ideally be allocated at the level at which they apply. Clearly, issues that affect the whole nation should be determined at the national level and issues that only affect local communities are best addressed at the local level (although often within nationally determined guidelines).

One problem associated with this is that responsibility without the necessary authority to fulfil the responsibility is meaningless. In institutional terms, authority translates into the ability to fund that for which an organisation is responsible.

For funding to be available for local responsibilities at Municipality level, it must either be allocated from Central Government or raised through local taxes.

Local spending is at present restricted to routine and minor road maintenance and environmental work carried out generally by direct labour. Most Municipalities have very limited technical capabilities and if they were to be allocated additional road maintenance and management responsibilities, arrangements to provide technical staff at regional and/or local levels would have to be addressed. Possible solutions will depend upon funding and whether such staffs are to be employed by the private sector, or be public sector staff providing a central consultancy and assistance service, being seconded out from Central Government, or employed directly at the appropriate level.

One option could be the use of the private sector, which may provide a solution in connection with maintenance, minor improvements and emergency response on local roads. Should the current trials with the use of term road maintenance consultants and contractors prove successful, and this way of maintaining the complete network be adopted (as has happened for example in UK), then there exists an interim way of providing controlled regional and local input to maintenance programmes. This would be to authorise private sector maintenance managers to allocate a predetermined part of their budgets to geographical areas with provision for regional and/or local input to the work planning for each area. This would necessitate the transfer of responsibility for the funding and some technical guidance from MOIM to MPWT.

The option exists also to either:

1. Continue with a way of working which treats the road network as a series of separate responsibilities for overall policy and planning matters, as well as for tactical management and operations, or
2. Consider the possibility of the network as an integrated whole.

The latter does not, of course, mean that this total network must be managed in detail as a single entity, but that policies and overall strategies could more easily be developed for the complete network. This would assist:

a) The development of the network as part of land use planning development.
b) Revision of the classified network, as required, with the passage of time and changes in function of parts of the network.
c) Effective allocation of funding for development and maintenance of the network.
d) Development and use of appropriate design and construction standards for the whole network.
e) Liaison in connection with junctions and connections with the existing classified network.
f) Use of appropriate maintenance intervention levels across the network.

g) Inventory and management of database operation for road condition and traffic information across the network.

The choice of this option would entail the transfer of at least the strategic responsibility for the two sections of the network to a single ministry or organization. This would ideally be the MPWT or CDR, who are already at least partially equipped to deal with such a total responsibility.

If responsibility for operational management and maintenance of the complete network were passed to the MPWT or CDR, they would become involved in local issues and details for which they would be ill equipped. Assumption of responsibility for policy issues (like international or primary roads passing through urban areas) would provide the advantages listed above while leaving local administrations to deal with execution of work within ministry guidelines.

This option would make it necessary for MPWT or CDR to become responsible for financial allocation to administrations for transport related expenditure.

The option of continuing to treat the network as two distinct areas of responsibility perpetuates the situation in which factors listed at (a) to (g) above are harder to achieve.

3.2.1.3 The Change of Emphasis in the Role of Central Government, and the Separation of Supervision and Operation of the Transport Network

This section considers these issues at the strategic or "macro" level. "Micro" considerations deal with the possible transfer of individual tasks currently carried out within government organisations to the private sector. Options under which such transfers may or may not be decided upon are not dependent on the choice of the strategic "macro" options as set out in this section. Options for "micro" privatisation are considered in section 3.2.1.4 below.

Central government's role is the current responsibility of MPWT, MOF, MOIM and CDR.

Requirements in this area centre on the separation of the definition of policy and strategy from the execution of work in response to such policy and strategies. The policy and strategy fixing operation must be responsible for the allocation of finance to fund activities which are within its requirements, and must monitor work carried out to ensure that it is in accordance with its requirements. This combination of responsibilities ensures that the “management control loop” operates properly.

The responsibilities of this policy and strategy-defining organisation could be for roads related activities across either the total road network of the country, or merely for the classified roads. The body or bodies responsible for the execution of work in response to these policies and strategies can be either public or private sector organisations.

Institutional options considered are:

B1 Redefine the roles of MPWT and CDR such that MPWT becomes responsible for policy and strategy development only, while CDR becomes responsible for the work needed to fulfill such policies and strategy. In this case the MPWT would become responsible for budget allocation and budget monitoring for transport related work to ensure that such work was in accordance with its policies.

B2 Redefine the roles of MPWT and CDR such that a new organisation (Roads Board, see 3.2.1.1) becomes responsible for policy and strategy development. MPWT becomes responsible for the execution of the work and CDR retains responsibility for coordination with national plans and donors.

B3 Establish a new Agency organisation to operate under policies and strategy defined by MPWT or CDR.

The options are set out in Table 3.2 below. A choice of option to form the basis of institutional structural reform of the roads sector will require significant study that may identify a course of action which takes individual elements from the different alternatives set out in this table.

Table 3.2: Options for Institutional Reform

No.	Option	Advantages	Disadvantages
B1	• Redefine the roles of MPWT and CDR. • MPWT responsible for policy and strategy development. • CDR responsible for work needed to fulfill such policies and strategy on classified roads. • MPWT responsible for budget allocation and monitoring.	• MPWT already nominally responsible for this role. • CDR transfers strategic planning role to MPWT, retains planning for execution of work. • Funding allocation linked to policy/strategy, keeps realism in strategies. • Budget monitoring linked to technical monitoring.	• Possible conflict over CDR role vis a vis donors. • Need to strengthen MPWT to become competent policy, planning and strategy body. • Loss of role for CDR in which it is now competent. • Need to establish financial management function within MPWT. • No change to overall accountability.
B2	• Redefine roles of MPWT and CDR. • New organisation (Roads Board) responsible for policy and strategy. • MPWT becomes responsible for execution of work on classified roads. • CDR retains responsibility for coordination with national plans and donors.	• Direct accountability for roads sector performance to road users. • Funding allocation linked to policy/strategy, keeps realism in strategies. • Budget monitoring linked to technical monitoring. • CDR will continue to have role vis a vis donors.	• Need to establish a new Roads Board organization. • Need to strengthen MPWT to become competent in planning and executing work.
B3	• Policy and strategy development the responsibility of MPWT or CDR. • Establish new agency organisation to operate under policies and strategy defined by MPWT or CDR on classified roads. • Budget allocation and monitoring the responsibility of MPWT or CDR.	• Direct accountability for roads sector performance to road users. • Possibility of use of private sector executive bodies. • Funding allocation linked to policy/strategy, keeps realism in strategies. • Budget monitoring linked to technical monitoring. • CDR will continue to have role vis a vis donors.	• Establishment of new organisation.

3.2.1.4 Options for Enhancing the Efficiency of Road Network Management and Operations

There is possible scope for the transfer of transport operations from government to the private sector. A transfer to such a way of providing transport facilities and infrastructure does not have to be total or immediate. If such a transfer were to be contemplated, careful study would be required to ensure that the long-term objectives were met without disrupting services in the short term. This study should be designed to define factors involved in the establishment and operation of a new organisational approach such as:

- Scope.
- Required procedures.
- Individual tasks and interfaces.
- Allocation of roles and responsibilities.
- Organisation within ministries and departments to undertake allocated roles and responsibilities.
- Definition of private sector roles and responsibilities.
- Optimum contract arrangements for private sector roles.
- Contract letting arrangements.
- Phasing.
- Execution.

One advantage in transferring some functions to the private sector would be to overcome problems and obstacles brought about by the shortage of capacity and capability within sections of the public sector. In particular, this advantage can be used to fill shorter term gaps in public sector organization while reorganization, recruitment and training are being carried out, so that functions can then be transferred back from the private sector.

In addition, there is a need to strengthen the capacity of the bodies involved in transport sector operation and management to ensure that once procedures are defined they can be executed in a proper and timely way. The details of the requirements for such capacity enhancement will depend upon the overall institutional arrangements chosen.

Traffic Engineering

In particular, the integration of at least the technical aspects of traffic management should bring this important aspect of highway engineering into the orbit of mainstream roads activity. The economic benefits available from the application of Traffic Engineering techniques to enhance the capacity of existing parts of the network are high. It is clearly necessary that Traffic Engineering projects should be included with other road development schemes for screening and analysis for the purposes of justification and comparative prioritisation.

Road Maintenance

All road maintenance work, including routine and recurrent needs, could be contracted out to the private sector. The only exception to this might be the snow clearance teams, which at least initially might need to be provided by public services in order to guarantee their availability at short notice and in times of emergency, provided that such teams are gainfully employed for the remainder of the year. It is further envisaged that the road maintenance contracts would be for term periods (Term Maintenance), probably of 3-5 years duration. Such contracts provide security of revenue for a contractor, who can then feel confident to invest significantly in plant and manpower skills in order to perform the maintenance work both to a high standard and cost effectively.

The Term Maintenance contracts would be based upon specified intervention levels and performance standards (performance-based). Initially, contractors may find it difficult to estimate the costs involved under these conditions, but as experience grows, so the ability to develop competitive tendering for such contracts will progress.

The definition of areas of operation and contract period should be considered carefully. It is apparent that costs for road construction and maintenance work in Lebanon are high in comparison to other countries. A strategy to achieve reduced unit costs should be developed and then implemented.

3.2.2 Public Transportation

The currently proposed Law for the Authorities of Land and Maritime Transport contains some anomalies and inconsistencies. In particular, Clause 5g states as an Authority objective: "The encouragement of competition and the prevention of monopoly in the land transport sector." However, Clause 20a states that "It is possible to grant the company an inclusive license for maximum of 5 years…". This clause makes possible a monopoly, in contradiction of Clause 5g.

It is considered that the principle of the proposed establishment of the National Company for Public Transport is flawed, and is in any case unnecessary. It would be preferable to allow one or more tendered concessions for bus operation either in Beirut or in other parts of the country in which the concessionaires supply and operate the buses. If required, these could become the property of the Government at the end of the concession period.

At a time of financial stringency this approach would also have the benefit of not requiring significant public sector finance.

While the proposed LTA may have a role to play in regulating bus operation, this regulation should be imposed very carefully. A series of competitive private sector operations will provide fare levels well below what can be achieved by either a national or a too heavily regulated private company. Services on uneconomic routes can be the subject of subsidy allocated on a competitive basis, again to private sector companies.

It is not considered appropriate for the LTA to be involved with rail transport because:

1 If or when rail transport exists it will be in competition with public transport by road. To avoid any risk of distortion of this competition, the two sectors should be kept apart.
2 The cultures and skills involved in the two types of operation are completely different. The incorporation of both sets of values in a single operation would be likely to prove very difficult.

The involvement of the proposed authority in freight transport would require specialised resources to deal with this category of land transport. Again, the objective should be to achieve the most effective levels of competition between operators with the minimum possible regulatory burden. This applies both to truck operators and to the operators of hub, storage and transfer facilities.

3.2.3 Railways

The present situation in which there exists a railway controlling body but no railway operations is an historical anomaly.

The Office des Chemins de Fer et des Transports en Commun is currently concerned solely with public passenger bus transport and is itself expected to be dissolved following the enactment of the current draft law on "Authorities of Land and Maritime Transport" and the subsequent formation of the LTA.

It is proposed that the LTA will be responsible for the administration of all land transport of passengers and freight by road and by rail. LTA will not have responsibility for the provision, operation or maintenance of the infrastructure, road or rail, on which this transport runs.

Reasonable options for institutional reform of the railway sub-sector at this time depend upon firm decisions which have to be made about whether a rail sub sector is to be re-established and if so in what form, at what scale and over what timescale. At the present time, the only committed, though currently stalled, future rail lines are:

- Linkage from Tripoli Port to the Syrian rail system at Homs.
- A link from the Syrian rail to Rayaq in the Bekaa Valley.

The decisions to be reached will determine which, if any, of the following scenarios will materialise at least during the medium term (7 to 15 years).

- No railway construction (heavy or light rail) is programmed within the medium term period.
- Rail based transport system construction is programmed to begin within the medium term.

Institutional options for each of these scenarios, and the advantages/disadvantages of options within these scenarios, are shown in Table 3.3.

Table 3.3: Alternative Scenarios for Rail Sector Development

Scenario	Option No.	Option	Advantages	Disadvantages
No railway construction (heavy or light rail) is programmed for the medium term.	1	• LTA takes over all existing OCFTC responsibilities as in proposed draft law.	• Protects possibility of future introduction of rail transport. • Existing proposed draft law goes forward unchanged.	• Danger of rail interests being "lost" amongst more immediate road transport priorities.
Rail based transport system construction programmed to begin within the medium term.	2	• LTA becomes responsible for rail affairs. • A rail company is established to provide rail and freight services.	• Existing proposed draft law goes forward unchanged. • Service provision is separated from supervision.	• This option would require LTA staff numbers and expertise in rail policy and regulation purposes.
	3	• A new separate dedicated rail authority is established to become responsible for overseeing the rail sector • A rail company is established to provide rail and freight services.	• New organization dedicated to regulation and supervision of rail sector.	• Need to establish new organization. • Need to change proposed draft law.

3.2.4 Airports

A law creating a Lebanese Civil Aviation Authority (CAA) is currently awaiting Ministerial approval. It is intended that the CAA will take over the roles and responsibilities previously fulfilled by the Directorate General of Civil Aviation within the MPWT. The new body will have the structure of a para-statal operating outside the organisation of a government Ministry and as such will have authority and freedoms more aligned to a private sector organisation.

The contractual arrangements whereby individual airport services can be provided can be arranged and varied as necessary.

It is possible that should future significant new facilities have to be provided they should form the basis of a BOT arrangement between CAA and the contractor.

It is considered that the arrangements as currently proposed should be allowed to run for some time before conducting a review, with a view to possible improvement.

3.2.5 Ports

The first step of reform in the ports sector is the approval and implementation of the draft Land and Maritime Transport Law that creates the General Authority for Maritime Transport. This law establishes the framework for implementing the new maritime transport policy objectives in Lebanon.

Before implementation of the new law, however, it is proposed that it should be clarified with regard to the ports policy, thus reflecting recent developments in this sector. In particular, the text should be harmonized with decisions relating to the proposed "Ports Act" which should specify the regulatory and operational roles.

As stated in Section 2.3.6, a number of options for institutional reform in the ports in Lebanon were recently investigated under different studies, including those by HP Rendel Cabinet (Feb. 2001), TEAM/Catram (Dec. 2002, commissioned by OMSAR), and BCEOM (2002), with clear recommendations to address institutional, regulatory, legal and operational issues relating to this sector.

The main objectives of reforming the ports sector include:

- Improving performance and efficiency of operations.
- Reducing costs.
- Improving the quality of service to all port users.

These need to be coupled with greater involvement of the private sector in management and investment. These aims also require reduction of public involvement in ports management, reduction of over-staffing and improvement of the profile age of employees, training, modernization of work methods and procedures, elimination of restrictive practices, introduction of competition, reduction of staff costs and tariffs, investment in new equipment, increasing productivity, safety and environmental protection.

To achieve the stated objectives, reform proposals include:

- Formulation of a ports policy via the introduction of a "Ports Act".
- Adoption of the "Landlord Port" model for ports management.
- Establishment of ports agencies, under the umbrella of the Ports Act, that are charged with the regulatory activities including planning, development of ports infrastructure and installations through lease or concession arrangements.
- Involvement of the private sector in lease and concession contracts for the operation facilities and services including towage, piloting, mooring, container terminal, silo, free zone and warehousing.
- Recommendations to carry out several studies to:
  - Prepare a draft Ports Act.
  - Determine management mission and structure of the ports agency/authority.
  - Re-structure ports tariffs.
  - Assess the technical and economic viability of the separation of conventional terminals at Beirut and Tripoli Ports.
  - Provide assistance in placing the terminals under concession.

The implementation of the above proposals would be advisable, followed by review and monitoring of resulting improvements.

3.3 TECHNICAL ISSUES

3.3.1 Introduction

The establishment of a safe, economic, well-engineered transport network for all travel modes requires a broad range of technical issues to be taken into consideration at all stages in the development of a transport facility, from concept through to construction, operation and maintenance.

At the conceptual level for, say, a new airport, technical factors to be taken into account could include:

- The need for the airport. This would require an assessment to be made of: potential travel demand; location of a suitable site; competition from other airports, markets to be served, etc.
- The layout of the airport. A Master Plan would need to be developed, based upon international standards, travel demand, the physical characteristics of the site, prevailing weather conditions, etc.

For an individual road link in a rural area, however, factors to be taken into consideration at, for example, the design stage, would include:

- Design speed.
- The number and width of travel lanes and footways
- Intersections with existing roads, railways and rivers.
- Access to adjacent land, etc.

For all types of transport facility, however, it is important that potential technical issues are dealt with in a systematic manner at the appropriate time so that the Government's objective of achieving an efficient and cost-effective transport network can be met. Principal technical priorities of the transport authorities would be:

- The need for the responsible organization or unit to develop procedures for the identification of technical issues at the appropriate stage in the project development cycle.
- The need to ensure that appropriate technology is used in both the development of a facility and its operation (for example, the most suitable software for design of a road, and the installation of an area-wide traffic signal system to minimize delays in operation).
- The need to protect the transport infrastructure assets through timely maintenance.
- The need to ensure the effectiveness of the various elements of the transport system by monitoring performance through the use of appropriate indicators.

A broad range of technical issues relevant to the transport infrastructure of Lebanon is discussed in the following subsections.

3.3.2 Roads

3.3.2.1 Protection of Investment in Roads

Road network expenditure planning should be based upon the achievement of a level of benefit to the economy. This ratio of expected benefit to expected cost is used in the justification and screening process to select schemes considered viable for construction and for maintenance against new construction.

It must be noted that if the construction cost achieved in practice is higher than the estimate used to justify a project, its level of benefit will fall, possibly to a level at which the project ceases to be viable. In addition, the benefit calculation makes assumptions about, in particular, the pavement life of a road project. Again, if this assumed life is not achieved then the required level of benefit is not obtained. Common reasons for the non-achievement of pavement design life are:

- Inappropriate design standards and specifications. Factors to be taken into account should include:
  - Road function.
  - Traffic levels and projections.
  - Subgrade values.
  - Axle loads.
- A contractor's non-compliance with the specification. It is therefore economically important that construction supervision and axle load regulation enforcement are adequate to ensure that such deviations from specification do not occur.
- Axle loads that are higher than those assumed in the design process. Design assumptions should be realistic, and axle weight legislation needs to be enforced.

The asset value represented by the existing road network is discussed in section 2.2.1. The benefits that accrue from spending to maintain this network are high. These

benefits often outweigh those for adding to its capacity. In an environment of acute shortage of funding, it is important to ensure that only those projects which provide a higher economic rate of return than does network maintenance are included in capital programmes.

3.3.2.2 Road Network Classification and Responsibilities

Under the present system, the responsibility for any particular road or road section can be unclear. Therefore, it is vitally important that a full classification of the entire national road system should be made. In addition to identifying the road standard, the classification needs to identify function. This will break the road network into components of urban and rural roads and of International, National, Regional or Local function, with Motorway, Primary, Secondary or Tertiary design standards. This classification survey should also collect details of road lengths and widths. This will assist in both financial allocation and planning for the future of the network.

By defining the nature and classification of any road section, inherently the predominant strategic and/or tactical responsibility for that road will be identified. In addition, such information is required for the planning of local road improvements to enhance, for example, local access to hospitals, shops and schools.

Transport is just one of the sectors of the Lebanese economy that is examined within the overall scope of this study. All sectors place demands upon the available national budget, so it is therefore important that a systematic approach is taken towards project planning, in order to be able to arrive at a cost-effective development program for the transport sector that would justify the proposed investments. There are several tools available to assist with project selection in, for example, the roads subsector, including the following:

- Traffic Modelling. A computerized traffic model has been established that covers the road network in the Greater Beirut area. This model, which uses EMME/2 software, contains, for each link in the network, details such as road classification, length and width, junction types, and traffic flows. The purpose of the model is to enable traffic engineers to be able to forecast future traffic flows. This model needs to be updated on a regular basis to include details of newly completed road improvement schemes, and also to be expanded to cover the entire country.
- Highways Management System (HMS). This is a computerized system that is used in the process of evaluating and prioritizing road improvement or maintenance projects. The HMS includes several components:
  - A database containing the physical characteristics of each link in the road network, such as road type, length and width.
  - A database containing details of the physical condition of each link, which may consist simply of a classification of “good, fair or poor”, or may go into greater depth to include details such as the locations of pavement defects like potholes or depressions.
  - An evaluation program that integrates the physical data held in the databases with financial data and other criteria, to develop a prioritized programme.
- Geographical Information System (GIS). The GIS is a system that combines relational databases (such as those mentioned above containing road network data) with spatial interpretation. For example, the GIS enables the Lebanon road

network to be represented in graphical form, with maps showing road details, traffic flows, etc.

Each of the database and analytical tools used by the various transport agencies needs to be updated on a regular basis so that the information provided to decision-makers reflects the latest situation on the ground. In this respect, it is noted that the CDR and the Ministry of Public Works and Transport currently use different HMS systems, the CDR mainly for new road schemes and the MPWT for road maintenance. Furthermore, the Management Service Consultants (MSC) who are currently operating the MPWT system are due to complete their contract at the end of 2005, and consideration needs to be given to the staff resources required to continue operating the system in the future.

3.3.2.3 Planning Control

Currently, the population and employment traffic generators in Lebanon are heavily concentrated within Greater Beirut, leading to a geographically imbalanced economy and poorly distributed transport demand. The lack of a global master plan and the absence of control on urbanization has led to undesirable development patterns along existing transport corridors, which were themselves governed by demographic and natural constraints.

A prominent example is the dense linear development along the coastal highway, which was meant initially to function as an expressway. However, accessibility needs and lack of access control resulted in a loss of this function, and eventually the degradation of valuable capacity due to friction between local and long distance traffic. This has a restrictive effect on long distance traffic flow with the result that inter city journey times are high. The investment which this road represents is therefore not being achieved. It is not clear how this problem can be corrected, although urgent action of some kind is now required. A study leading to a plan of action and cost estimates for the work required to return the coastal highway to the function for which it was constructed is needed. This example is likely to be repeated elsewhere, whenever an expressway facility is to be constructed, due to lack of planning control.

Therefore, future development planning for Lebanon can be critical to the achievement of a viable and sustainable environment and economy. Planning control needs to be exercised in order to distribute economic activities and to minimize transport demand pressures. A process of decentralizing the economy and the administrative functions of Government is needed, so as to create additional population and economic nuclei in the other major towns of Tripoli and Saida, as well as Sour, Baalbek and Zahle.

In addition, the planning and programming of new decentralized development must take into account their accessibility needs. Roads planning and funding must ensure that access to such development is provided both to an appropriate standard and timescale.

3.3.2.4 Vehicle Numbers

The high number of private passenger cars and the large number of transport service providers combine to produce poor levels of transport service. In fact, traffic congestion in major Lebanese cities, and especially in Greater Beirut, results in long trip times relative to trip distances, and high consumption of gasoline, creating air pollution problems. This has a negative impact on the Lebanese economy that is multi faceted: a high gasoline import bill, additional costs to export goods (which harms their competitiveness), and additional passenger and goods transport time (which translates into low economic productivity and efficiency)[1].

The Lebanese road vehicle fleet has greatly expanded in recent years. A major reason for this was the lack of control of the import of a large quantity of cheap, older vehicles during the civil war period. However, although an age limit for imported vehicles of 4 years has now been set, the vehicle fleet has continued to grow strongly. An estimate of the operating vehicle fleet, prepared by Dar Al-Handasah Consultants, showed a total of some 783,000 vehicles operating on Lebanon's road network in 1997.

The car and vehicle registration authority, together with the Ministry of Finance, are responsible for producing estimates of the number of vehicles currently registered and licensed in Lebanon. The data provided by them, shown in Table 3.4, indicates that the vehicle fleet at the beginning of January 2002 was nearly 990,000, an increase of over 20% in five years.

Table 3.4: National Licensed Vehicle Fleet 2002

Vehicle Type	Number Registered and Licensed as at 01-01-02	Percentage of Fleet
Private cars	821,117	83.1%
Taxis	32,026	3.2%
Pick-Ups	90,574	9.2%
Buses	2,971	0.3%
Minibuses	3,996	0.4%
Private Trucks	11,246	1.1%
Public Trucks	1,954	0.2%
Motorcycles	24,083	2.5%
Total	**987,967**	**100%**

Source: SDATL 2002

The prevailing old age of the Lebanese vehicle fleet and the lack of proper maintenance have added to the worsening situation of continued growth in vehicle ownership and trip making, leaving decision makers with no option but to implement strictly the existing regulations dealing with vehicle inspection and traffic control. These measures are currently all available, and vehicle inspection has started to be implemented on a serious basis, whereas formerly the inspection was rarely properly implemented.

[1] *The Road User Charging Study in 2000 estimated that urban congestion had cost Lebanon 2 Bn $ in 1997 in wasted vehicle occupants time and fuel costs, equivalent to 15% of GDP.*

It has to be acknowledged that ownership of a private vehicle does provide many benefits and, in some respects, wider ownership can be considered as socially progressive. The problems associated with high levels of vehicle ownership are mostly in respect of the specific uses and times of use that are made by the vehicles. When used in peak traffic periods, this leads to traffic congestion and associated negative economic effects. Also, if the vehicle is old and is not properly maintained, it becomes an increasingly dangerous road safety hazard.

As noted earlier, the rapid expansion of vehicle ownership occurred during the civil war period, which enabled a much greater section of the community to gain access to a private vehicle. This has led to increased expectations of vehicle ownership and greater dependence upon such availability. Very aged and poor condition vehicles are still available relatively cheaply, permitting fairly wide access to the vehicle owning class. It would be quite difficult and highly unpopular to now dramatically reduce such expectations.

The problem is compounded by the fact that owning a vehicle is one of the easiest routes to gainful self-employment, through operating a taxi service. This, again, has socially desirable elements, as well as producing the negative impacts of excessive availability of taxi services and the associated traffic congestion and environmental problems. Currently, there are effectively no constraints applied in practice on the condition of vehicles used for taxi services, creating added road safety and environmental hazards but providing very low taxi use costs. Again, this is an area where progressively stricter controls could be used to improve conditions. In many countries, required vehicle condition standards are higher for taxis than for private cars.

The solution would, therefore, seem to be try reduce the use of private vehicles, particularly during peak flow conditions, and to endeavour to progressively raise the condition of the vehicles on the road. Such changes need to be introduced slowly and progressively and be coupled with associated measures to improve the availability of alternative means of transport (i.e. public transport services).

One option in dealing with the traffic issue is to do nothing beyond the vehicle inspection and traffic control measures mentioned above and already starting to be implemented. This option is the least costly, but the growth in traffic volumes associated with the growth in GDP will eventually lead to a total gridlock situation, whereby regular implementation of these measures alone will not be sufficient to keep the transportation system functioning.

However, the real key to a long term solution will be to provide a viable alternative to private car use, in the form of public transport. Successfully implementing such a system would be achieved through a “carrot and stick” policy, whereby using a private vehicle became harder, access to public transport services became easier, and public transport services became more attractive to users.

In this respect, the UTDP (Urban Transport Development Program) is one example of possible intervention that was considered some time ago without finding its way to complete implementation. This project should be reactivated so that advances in traffic surveillance and control can be introduced, in an attempt to ensure safer and

more environmentally friendly operations. The project should also be used to promote public transport services, through providing these with sophisticated traffic priority measures.

The introduction of demand management measures is another option that should be implemented in parallel, in order to promote a shift from the use of private passenger vehicles to public transport vehicles. The main measure that should be taken here would be to reduce parking availability in congested areas. This has the double effect of discouraging private vehicle use, while at the same time providing more space for public transport and developing public transport priority measures, such as bus and taxi lanes.

Other measures that could be taken in this respect include raising fuel taxes and making use of the revenues to improve public transport services (see Sections 3.1.1.1 and 4.1). This measure would be applied on regular fuel used in passenger cars and not on diesel fuel used mainly in the transport of goods, in order not to induce a crisis in the general cost of living. Also, congestion charges in urban centers could later be introduced, along with heavy parking fees and fines (however, residents living in these areas should be largely exempt from such charges).

The above measures would promote the use of public transport services, which means implicitly that such services would need to be upgraded to an adequate level. The study of the revitalization of the public transport industry in Lebanon, initiated by the Directorate General of Land and Maritime Transport, is an important step in this direction.

3.3.2.5 Transport Within Greater Beirut

As described in Sections 3.3.2.3 and 3.3.2.4, Lebanon has experienced significant land use development in recent years, accompanied by a substantial increase in the vehicle fleet and of road traffic volumes. Beirut, as the capital city and commercial centre, has experienced growth in travel demand both from within the urban area and on the northern and southern approaches where extensive development has occurred.

This increase in traffic is expected to continue and, although a number of road improvements have been implemented to accommodate growth, the space for further expansion of the road network is limited. The road network in Beirut is now running near to capacity, so any further traffic growth will lead to considerably increasing delays and further economic wastage (fuel, time, engine wear, etc), as well as deterioration in environmental conditions. Present congestion levels in Beirut are already causing a significant real loss to the economy.

A number of measures have been undertaken over the years to improve conditions, and these include:

- Rehabilitation of a number of roads and sidewalks.
- The installation of traffic signals at many junctions.
- Construction of several new links (e.g. Penetrators).
- Creation of pedestrianised streets and areas.
- Urban street landscaping and planting.

The principal characteristics of the road network and of traffic flow within Beirut may be broadly characterised as follows:

- Many narrow roads with limits on the possibility of widening because of building development. This situation was made worse by uncontrolled development carried out during the 1970s and 1980s.
- Poor driver discipline and disregard for traffic regulations.
- Lack of enforcement of regulations.
- Disruption of smooth traffic flow by the erratic driving of service taxis and minibuses.

Alternative ways of dealing with travel demand therefore need to be examined, and options available are shown in Table 3.5. Each approach to dealing with travel demand has particular benefits and disbenefits, and these may be summarised as follows:

Option 1 – Do Minimum. Under this option, the road network in Beirut will become increasingly congested. Delays to traffic will have substantial disbenefits to the Lebanese economy through increased journey times and travel costs. Noise and air pollution will worsen, road safety is likely to deteriorate, and eventually the city will experience gridlock on a daily basis

Option 2 – Traffic Engineering and Management Measures. The introduction of, and enforcement of, measures such as parking controls, area-wide signal control and CCTV, pedestrian crossings, coordinated road signing and regular replacement of road markings, which will lead to better and safer traffic movement though the separation of pedestrians and vehicles and the provision of clearer instructions to drivers. These measures could be implemented at relatively low cost, and within the short term (1-7 years). However, this will only prolong the day when full grid-lock occurs.

Option 3 – Expansion of the Road Network. A Master Plan for Beirut was originally drawn up in the 1960's. This has been partially implemented over the years, but a number of important components remain outstanding. These include the A2 Highway and the Beirut Peripherique. However, implementation of these schemes will require some expropriation and removal of buildings that have encroached upon the right-of-way, the construction of bridges, interchanges and possibly tunnels, will be extremely costly, and will cause substantial disruption to traffic flows during construction. In any event, completion of these schemes can be considered only in the medium-term (7-15 years).

Option 4 - Encourage Use of Public Transportation.

For reasons mentioned earlier, Beirut already suffers from high levels of traffic congestion in many areas and at several times during the day. Although traffic management measures and new road schemes may alleviate congestion to some extent, in the longer term, public transport systems will become vital to the continued effective functioning of the city. Given its topology and geography, it is hard to envisage any currently available system other than bus or light rail systems being applicable.

Table 3.5: Options for Meeting Travel Demand in Greater Beirut

Option		Description	Advantages	Disadvantages
1	Do minimum	• Maintain existing road network	• Low direct costs	• Increasing pollution • Severely increasing congestion and delays • Severe economic impact • Increased travel costs • Increased health costs
2	Traffic engineering and management measures	• Parking controls • Traffic signal improvements • Pedestrian facilities • Better signing and marking • Bus/taxi lanes	• Comparatively low direct costs • Improved safety • Better road discipline • Shift to public transport	
3	Expansion of the road network	• Implement road network improvements	• Increases capacity for road vehicles • Delays need for shift to public transport, allowing greater daily volumes	• Land expropriation • Environmental impact • Increasing pollution • High implementation costs. • Not a sustainable solution
4	Encourage use of Public Transportation	• Improve Public Transport provision • Introduction of mass transit (BRT, LRT, rail)	• Reduced environmental impact • Improved travel times • Provides key to long term solution	• High implementation costs for rail-based measures • Obstacles to improvement of public transport hinder its development. • Some initial public opposition

In this respect, the findings of the study "Revitalisation of the Public Transport Industry in Lebanon", described in Section 2.3.3.2, and of other studies of mass transit and public transport, need to be drawn together and a coherent plan for expansion of public transport in Beirut be formulated as a matter of priority.

With all options mentioned above, it is necessary now to develop the tools that are needed to manage and efficiently provide for traffic flows within Beirut. The existing EMME/2 traffic model of the city is a good starting basis but this should be both updated and refined. In terms of traffic management technology, the EMME/2 model (while still very useful in other respects) has now been superseded by traffic software such as PTV VISION. This state-of-the-art software permits the full visual simulation of traffic flows and provides a far more powerful tool for the review and analysis of potential traffic remedies, both for new transport infrastructure and for traffic management type solutions. It is therefore considered that, as a matter of priority, a new multi-modal (public and private transport) traffic model of Beirut should be built, together with a GIS database of traffic related inventory, condition, operational characteristics and traffic flow data.

The above systems will permit various bus routes and interchange locations to be tested and evaluated, leading to the identification of the most efficient systems. It will also permit the traffic impact of a progressive shift from private vehicle transport to a more public transport orientated system to be tested "on paper", prior to attempting actual implementation on the ground.

Current bus rider-ship is drawn mainly from lower income groups. If the required modal transfer from private car to public transport is to be achieved, bus travel will have to become more attractive to more affluent sections of society. This will involve the use of a package of measures that might include the following:

- Provision (at least initially) of a two-tier bus service, with "executive" buses with higher standards of comfort, cleanliness and perceived service, provided for premium fare levels.
- A Public Relations and advertising campaign aimed perhaps at the young affluent "metro-smart" who are fashionably concerned with "green" issues.
- Increasing the cost of private car use within Greater Beirut Area to achieve full cost recovery for road space provision.
- Real traffic management and enforcement improvements that enable reliable bus schedules to be achieved.

3.3.2.6 Bus/Taxi Lanes

In cities and towns across the world, the growth in the volume of private vehicles has led to increasing congestion, delays and pollution. In order to encourage motorists to transfer to high-capacity public transport, rather than low-capacity private vehicles, and to thereby reduce overall traffic volumes, road authorities are increasingly reserving certain lanes on highways for use by buses and taxis, either on a full-time or part-time basis. These lanes can usually be implemented at relatively low cost, requiring mainly new signs, road markings, and possibly surfacing of the dedicated lane. The use of these lanes results in reduced journey times for public transport passengers, and this improvement in time savings can be further enhanced by the introduction of special

measures such as priority for buses and taxis at signal-controlled junctions. These measures do, of course, rely on rigorous enforcement if they are to be successful.

The potential for bus/taxi lanes to make more efficient use of the available road capacity within urban areas, particularly within Greater Beirut, could be assessed through the implementation of a few pilot schemes at selected locations. Once the benefits have been verified, the schemes could be expanded across a greater number of roads within the urban area.

3.3.3 Railways

In order to reinstate a railway service in Lebanon, it is important to concentrate on corridors with the highest demand to render it cost effective. The first step in this venture could consist of preserving the railway right of way and running a mass-transit service along its alignment. The most promising demand for such a service was found to be located along the Beirut-Jounieh section. It is therefore sensible to implement a phased approach in revitalizing the railway, starting by using its right-of-way as a bus tollway, and then installing a rail service as demand grows.

A number of obstacles will need to be overcome in upgrading the right-of-way along that route to be compatible with eventual fairly high-speed, high-frequency rail service. These include the need to provide new grade separations at intersections with main roads, new river crossings, and tunneled access into main stations. Furthermore, the transition from bus operation to rail, although shown to be possible with minimal disturbance to transit services, will pose a significant technical challenge.

To increase the feasibility of the railway service over such a short segment, extending the service to the north and connecting to the regional network would add value. The northern route will need to be rehabilitated between Jounieh and Tripoli, in line with the recommendations of existing studies. Simultaneously, the section between Tripoli and the northern border would have to be completed. Thus, the railway service would be able to serve mass-transit requirements along the congested parts of Beirut Metropolitan Region (namely the northern approach to the city) and a regional freight service out of Beirut. The possibility of providing a regional passenger service will then also be available.

Another set of technical challenges will be faced in rehabilitating and upgrading the route between Jounieh and Tripoli, originally developed to suit a low-speed narrow gauge line. Options will be to refurbish it as either a single track or double track, depending on the traffic demand, but geometric standards will also impose alignment constraints. Studies have shown the need to provide a tunnel immediately north of Jounieh, in addition to other short realignments elsewhere. A number of road bridges will need to be provided for side roads to cross over the railway.

Furthermore, it should be noted that realignment will result in encroachment into private properties, which will need to be expropriated. In many places, mostly along the Beirut-Jounieh corridor, expropriation decrees are already issued, but need funding to be implemented.

3.3.4 Airports

Two important technical issues need to be addressed at Beirut Rafic Hariri International Airport (BRHIA). The first relates to the capability of the existing airport to cater for the new generation of large aircraft (NLA) that are scheduled to be in commercial service by late 2006. The A380 Airbus will be the largest airliner ever built, with a capacity of up to 840 passengers and a range of over 15,000km, thereby offering considerable competition to existing aircraft. However, the A380 has a wingspan of nearly 80m, so the existing runways, taxiways and aprons at some airports will be unable to meet the technical requirements for accommodating this aircraft, whilst some existing terminal buildings will be unable to handle the large peaks in passenger flow.

Since this new generation of aircraft is likely to form an important element of the total global fleet in the future, airport authorities will need to consider the economic implications of their airport being unable to accommodate this aircraft. Furthermore, those airports capable of serving the NLA will have greater potential for serving as regional hubs. Consequently, it would be prudent to consider the need for updating the airport Master Plan, since this is a dynamic tool for managing airport development in a systematic manner. Due to the imminent commencement of A380 services in the region, it is considered that this issue needs to be addressed as a matter of priority.

Secondly, contingency plans should ideally be in place in the event that BRHIA has to be closed at short notice due to an emergency such as extreme weather conditions, accident, fuel spillage, etc. This infrequent occurrence normally leads to diverting aircraft due to land at the airport considerable distances to Cyprus, Damascus or Cairo. In order to alleviate this situation, it is considered that the possibility of providing an alternative runway within Lebanon for emergency use needs to be examined. The need for, and implications of an additional emergency runway should be based on an assessment of existing and required facilities, costs and benefits.

Since emergency closures of BRHIA can currently be dealt with by diversion of aircraft to airports in neighbouring countries, there is no immediate need for an alternative facility within the country. However, air traffic at these alternative airports is also likely to grow with time, placing demands upon their facilities, so it would therefore be prudent if this issue were to be addressed as a matter for concern in the medium term.

3.3.5 Ports

Important technical issues that need to be addressed in respect of the ports in Lebanon include the following:

- A study needs to be made of Customs and Excise procedures, which have already been improved in recent years, to determine whether further changes could be made that would assist in expediting the flow of cargo through the ports.
- Legislation is needed to enable the Harbour Master at each port to deal with matters of safety and hazardous materials issues on the landside of the port.
- A computerised system needs to be put in place for recording operational data such as vessels received, types of goods, tonnages, productivity of cargo handling, costs and revenues, etc.

- A Master Plan needs to be prepared for the possible extension of Beirut Port from Nahr Beirut to Nahr El Maout.
- At Tripoli Port, the siting of warehouses, which are currently located on the quayside, needs to be studied in order to improve the efficiency of port operations.
- At Saida Port, the master plan and design developed in 1994 with the concept of making Saida a regional trans-shipment center needs to be reviewed, to assess the viability of implementing this project.
- The establishment of one or more inland or dry ports, possibly linked with logistics and inter-modal transfer facilities, needs to be studied.

4. THE NEW ECONOMIC AND SECTORAL APPROACH

4.1 ECONOMIC OPTIONS

4.1.1 General

The "Draft Vision Report – Main Report" of August 2005 sets out concepts which lead to the following objectives:

- Economic and Financial Sustainability; this requires that available resources be used efficiently and that assets be maintained properly. The aim is to make transport cost-effective, continuously responsive to changing demands and capable of financing itself, and ultimately becoming a contributor to the national economy.
- Environmental and Ecological Sustainability; this requires that the external effects of transport be taken fully into account when public or private decisions are made that determine future developments. The aim is to ensure that environmental issues are addressed as an integral part of the formulation of the transport strategy and project design.
- Social Sustainability; this requires that the benefits of improved transport reach all sections of the community. The aim is to target the transport problems of low-income groups, and to protect these groups against the adverse effects of changes in transport policies and programs.

These general objectives are consistent with the macro objectives and should lead to an efficient transport system.

Because of the complexity and variations between the different transport modes, options for each mode are presented separately below.

4.1.2 Land Transport

Land transport covers passenger and freight transport via road and rail modes.

Economics Options Highways 1

At present, the administration of international, primary and secondary roads is the responsibility of the Ministry of Public Works and Transport. Maintenance programs are developed by the Ministry and there are proposals to develop performance-based contracts for road maintenance in the future. Capital investment programs would continue to be sourced from loans and central/local government funds.

The development of a comparative economics based project selection and prioritization system is under way within MPWT. The operational use of such a system will ensure that projects chosen contribute to the national economy.

Economics Options Highways 2

This second option would move toward a situation in which road users pay directly for some or all of the costs incurred from the use of the road network. This would involve a change in the philosophy which currently regards roads as a necessary public service like the Army or the Police Force, to be funded out of general taxation, to one which considers them a service to be paid for when used, like water or electricity supply or telephone.

Motorists and bus and road freight operators are used to paying the costs associated with their vehicle (registration, fuel, repair, etc) together with an appropriate element of tax. They are not used to paying specifically for the provision and upkeep of the roads on which they run. This is in direct contrast to the rail traveler, for example, whose rail ticket must pay towards the costs of providing and running the train as well as those for providing, running and maintaining the track, signaling and station facilities.

This imbalance in the way in which different parts of the costs of the operation of different forms of land transport are charged to the user has played a part in the worldwide transfer of freight traffic from rail to road over the past 50 years. This demonstration of the part that perceived costs play in modal transport is significant in the context of Lebanon, and in particular of the Greater Beirut Area.

The financial problem for the Lebanese road network is a shortage funds. The operational problem in the Greater Beirut Area is traffic congestion due mainly to the high level of private car and taxi use. An increase in the cost of private car use to achieve at least a degree of road network direct cost recovery would both provide increased funds for road maintenance and traffic engineering measures to relieve congestion, and influence modal choice in favour of public transport.

It must be recognized that this measure on its own is unlikely to bring about an immediate increase in bus rideship but it will form part of a package of measures (which it will also help to finance) to ultimately achieve the required modal transfer.

Economics Options Public Transport 1

Options for the targeting of the necessary charges are:

- All road users.
- Road users in the GBA.

This option maintains the status quo of allowing unregulated public transport to take place, with private operators allowed to operate on routes. On this basis, all investment would result in encouraging private car use. Because of the high capital investment costs, no new rail investment should take place.

This option has the advantage of minimizing the use of public funds for the operation of buses. However, an unregulated public transport tends to result in an unattractive system, which in turn leads to greater car use and increased congestion. In terms of the environment, rail transport is more favorable than road vehicle transport.

Economics Options Public Transport 2

The underlying principles for this option are that improved public transport can be used to attract car users, thus reducing congestion, and continue to meet the needs of lower income individuals, in conjunction with Highways Option 2. A regulatory authority needs to be established to set safety standards, performance standards and, initially, to license routes (based on competitive tendering). This should be supported by physical measures, such as bus lanes, and controlled parking in urban areas, to discourage commuting by car. Consideration could be given to guided bus transit, as a forerunner to the introduction of rail rapid transit. The development of an intercity rail network should be re-evaluated and a full cost-benefit analysis and a financial sustainability analysis carried out.

Public Transport Option 2 has advantages because, if some elements are implemented, there are positive environmental benefits and it could lead to a reduction in urban congestion. The culture of car use, particularly in Lebanon, cannot be underestimated, however, and the development of this option must be gradual.

Economics Options Land Freight Transport 1

Development of freight distribution centers funded by the state.

Economics Options Land Freight Transport 2

Development of freight distribution centers, using private sector funding.

Both options build on the need for such freight distribution centers, which are part of the master plan for Lebanon. These regional distribution centers would cover the northern, southern and central areas of the country. Where possible, private sector funds, through the use of BOT type schemes, should be utilized.

Where there is sufficient demand for the transport of bulk cargo within the country or from ports, then a dedicated rail line could be considered. The construction of such lines should be implemented if economic and financial analyses provide good justification.

4.1.3 Airports

Economic Option Airports 1

There is currently an ongoing process to establish a Civil Aviation Authority, through Law 481, which will be responsible for administration, investment and supervision of many aviation sub-sectors. In addition, the new law includes the establishment, after a period of one year, of the Beirut International Airport Company (BIAC), which will be

responsible for services related to air navigation, communications and weather forecasting.

This option has the advantage that some of the efficiencies of the private sector will be introduced, while ensuring that the state, through the CAA, remains responsible for regulation.

Economic Option Airports 2

An extension of the proposed situation, when Law 481 will be in place, would be for all operations within Beirut International Airport to become a concession, tendered for by private companies. This would be through the Beirut International Airport Company and will also mean that such activities as handling of planes on the ground, cleaning of planes, baggage handling and refueling could become part of the concession, supervised by BIAC.

The advantage of allowing greater private sector participation is that any efficiencies can be harnessed while ensuring that the state, through the Civil Aviation Authority, is responsible for regulation. This demarcation of roles takes away any conflict of interest between supply side requirements and the organization providing that supply.

At this present time, there is little to choose between the two options, particularly considering that there is only one major airport in operation and that some of the activities are already handled by the private sector. An interim measure would be to organize the running of the airport along commercial principles by corporatizing the relevant section of the government agency that is currently responsible.

In the long-term, further investment in airport capacity could be financed through a BOT package. This should be preceded by cost-benefit analysis to determine the suitability of differing infrastructure options.

4.1.4 Ports

Economic Option Ports 1

This first option allows the present situation to continue. The ports of Beirut and Tripoli are currently administered by autonomous state agencies. In the port of Beirut, stevedoring and piloting/towage are handled by private companies, although there is currently an excess of manpower and container dwell times are high by international standards. Further investment in Beirut and Tripoli Ports would be financed by the state.

The advantage of such a policy is that port development could be coordinated and that there is much less risk of the duplication of activities in individual ports. The disadvantage would be that inefficiencies in port operations are maintained.

Economic Option Ports 2

Worldwide, there has been a trend to develop 'Landlord' ports and this approach has been the subject of recent studies by HP Rendel Cabinet (2001), BCEOM (2002) and TEAM/Catram (2002, commissioned by OMSAR). Under this format, the development of the infrastructure would remain the responsibility of the ports authority. This is usually necessary because of the high infrastructure costs at implementation and the corresponding inability of private companies to make a reasonable payback on their investment in a shorter period of time. Operations, including loading/unloading, handling and storage are the responsibility of the private sector. All operational activities can be included under one concession to a private company. It is also necessary to establish a ports regulatory authority to ensure that tariffs charged are reasonable and that performance standards are adhered to.

Development proposals for Saida Port should be subject to cost-benefit analysis, particularly to ensure that there is not an over-capacity in the ports sector.

Main advantages of using the 'Landlord' model are that the port authority would need a smaller organization, since it would not be handling day to-day operations, and a strong incentive can be established to allow private companies to cut costs of operation. This will result in lower consumer costs as it will be cheaper to move goods through the ports. A disadvantage is that regulatory authorities need to oversee an acceptable regulatory framework which balances both public and private sector interests.

On balance, it is believed that the second option has more advantages, although it is noted that institutional strengthening is necessary for effective port regulation.

4.2 EXTERNALITIES

Transport, as an economic sector, generates both positive and negative externalities for society. Within the transport sector, the various modes have differing impacts, particularly on the environment.

Positive externalities that generate investment money that can be captured, taxed, etc. include:

- Increase in land values when better access is provided.
- Producers can reach new markets.
- Better employment opportunities.
- Reduced isolation and better access to schools, hospitals, etc.

However, the positive externalities of supporting economic growth and facilitating the movement of people are offset by the following negative externalities:

- Environmental impacts include air pollution and increased noise. Some mitigation measures can be taken such as enforcing road vehicle exhaust emission standards. Public transport with greater vehicle capacities and the ability to move large volumes of people will have fewer detrimental effects on the environment than the private car. This is particularly the case for mass rapid rail transport or the use of

buses with reduced emissions. There is also increasing concern regarding the level of pollution due to aircraft use, particularly for residents living near airports.
- Congestion. Increasing volumes of car traffic on overcrowded urban roads generate traffic delays and worsen the quality of life of a city's inhabitants. Road pricing schemes (such as congestion charging), controlled parking schemes and good public transport alternatives can be used as measures to combat congestion.
- Land acquisition. Particularly for new road and rail schemes in urban areas or agricultural areas with rich, fertile land, the appropriation of land is an opportunity cost that must be taken into consideration. Capacity expansion of airports can also result in considerable land take.
- Energy consumption, particularly by road vehicles, uses up non-renewable natural resources. Fuel imports must also be paid for in hard currency.
- Accidents. Motor vehicle traffic accidents are often the leading cause of accident fatalities. This can be offset by improvements in road geometric design, law enforcement and driver training.
- Road pavement damage. Overloaded trucks can damage road pavements, increasing expenditure on highway maintenance. Good enforcement of axle-load regulations is needed.

4.3 DEMAND AND SUPPLY IMPACTS

Impact of Economic Demand

The provision of transport infrastructure gives employment for varying types of activities including construction and maintenance of the infrastructure and operations on transport networks. Large infrastructure construction projects generate high employment for fixed periods of time and there are often indirect economic effects of the supply of equipment and services. Also, some transport facilities, such as airports, and bus and railway stations, generate business activities e.g. retail shopping.

Impact of Economic Supply

As a secondary activity, transport supports the economic growth of a country. This positive externality is produced partly through the movement of freight, both within a country and for import/export. Through better transport infrastructure, less developed areas can be opened up, with subsequent poverty alleviation for the population. Similarly, transport facilitates travel for the general populace and increases leisure opportunities.

5. THE NEW SPATIAL AND SOCIAL APPROACH

Transport infrastructure and transport services play an important role in the spatial development of a country. The proposed spatial policy has been defined in the "Schema Directeur d'Amenagement du Territoire Libanais" dated May 2004. Within an overall objective of providing, in general terms, an equal level of transport services to all parts of Lebanon, but without necessarily decentralizing the production systems of these services, five criteria to design and implement transport projects have been identified:

- For international passenger transport, the recommended policy is to try to increase the role of Beirut Rafic Hariri International Airport for regional traffic, and for freight to give priority to transit through the port of Tripoli.
- A good and efficient road network should connect all cities.
- Congestion in the Greater Beirut Area is an issue to be dealt with as a matter of urgency.
- The road network should be properly maintained and managed.
- New urban streets should be designed in accordance with the zonal development priorities of each municipality.

These important spatial criteria were approved by the Government and should be considered in the planning and economic analysis of all future transport projects.

It should also be noted that the transport sector, by bringing people or freight where and when they are needed, is absolutely necessary for the development of other economic and commercial activities. For example, the SDATL recommends giving priority to the development of tourism, and to the establishment of an industrial zone north of Tripoli.

The transport projects necessary for the development and implementation of these activities in other sectors should be given the same priority as the basic project they are supporting, and possibly even higher priority than projects responding solely to the above spatial objectives.

From an economic point of view, the transport projects should be selected in accordance with their financial and economic rate of return, and not in accordance with their location in the country. However, the importance of achieving a fair and balanced spatial development across the country is recognised. One way to economically address this issue could be to have a different minimum requirement of rate of return for a project to be accepted in different regions of the country.

The draft transport policy recommends fostering a transport system that satisfies various objectives including the following:

> "Social Sustainability: this requires that the benefits of improved transport reach all sections of the community. The aim is to target the transport problems of low income groups, and to protect these groups against the adverse effects of changes in transport policies and programs".

The design and implementation of an efficient urban transport system directly addresses this objective. Transport schemes that consider all sections of the community, and could therefore have a significant impact in spatial and social terms, include the following:

- The improvement of right of way for pedestrians in city centers would improve the mobility of the poorest part of the population. This could include measures such as wider footways, footbridges, and pedestrian phases at traffic signals.
- The building or improvement of rural roads would reduce isolation.
- Minor improvements to road geometry in rural areas could improve safety.

6. PLANNING AND BUDGETING

6.1 INTRODUCTION

Governments need to play an active role in the transport sector because of market failure to adequately take into consideration:

- Economies of scale requiring large investments.
- Externalities (congestion, pollution, developmental impact of new roads).

The size of a government's budget is determined by:

- The availability of finance.
- The role of government in that sector and its willingness to allow greater private sector participation.
- The volume of capital expenditure necessary and the current condition of the existing network, i.e. whether it is in need of rehabilitation or requires only maintenance.
- Levels of private sector participation. The government's encouragement of the private sector to be involved in both investment on new infrastructure and spending on maintenance will be reflected in the levels of finance to be provided through general taxation.

Effective planning and budgeting is essential to ensure that:

- As far as possible, the services provided are paid for by those benefiting from the service ("the user pays" principle).
- Procedures are identified which will prioritise investment, and ensure that only projects beneficial to the country are undertaken, by subjecting projects to economic and financial appraisal.

6.2 DETERMINATION OF TRANSPORT SECTOR BUDGET

6.2.1 Government Funding of the Transport Sector

One argument for financing transport infrastructure and operations from revenues raised through general taxation is that it allows for flexibility of budget and for optimal spending in all sectors of the economy, i.e. finance can be effectively spread over the economy to ensure that marginal allocations of finance, in each sector, produce equal utility. This supports the government's objective of maximising the welfare of society.

Also, the provision of transport infrastructure has largely been left to government because of the economies of scale argument, i.e. investment is often lumpy (with benefits accruing over much longer periods) and, in both developed and developing countries, the public sector often has easier access to public funds than private companies. In addition to this, and because of the economies of scale argument, it is more likely that a public monopoly will enhance the welfare of society than a private monopoly.

6.2.2 The "User Pays" Principle

Although in theory the above arguments hold true, problems with the raising of taxation to pay for the provision of transport infrastructure, particularly in developing countries, indicate that "second best" policies should prevail. Tax collection is a particular problem in Lebanon. At the same time, it should be recognised that governments must take into consideration both efficiency arguments e.g. maximising transport use, and distributional arguments e.g. ensuring that poorer sections of the nation are provided with sufficient means.

It is argued that the cost of service provision can be levied from users i.e. that cost recovery can be used to ensure that the benefits derived by society from transport infrastructure can be financed by the beneficiaries.

The different transport modes exhibit differing characteristics concerning cost recovery:

- Ports sector: revenues derived from port users, often in hard currency. Cost recovery for operations may be achievable.
- Airports sector: as ports, with charges on airport users contributing a revenue stream (with a reasonable proportion in foreign currency). Revenue also possible from landside retail activities. Cost recovery for operations may be achievable.
- Roads sector: revenues indirectly raised through fuel taxation and directly raised through annual vehicle licenses. With no toll roads operating in the Lebanon, there are no direct revenues for use of any part of the network. For the road sector, therefore, cost recovery is not possible via direct means of revenue collection. In terms of road classification, the division of responsibilities by national and regional/local government assists in allocating costs and benefits to those who are directly affected i.e. local users can contribute by paying municipal taxes and achieve better roads in return.
- Public transport: revenues raised through tickets. However, public transport often benefits lower income groups and, therefore, cost recovery is difficult to achieve, particularly if the renewal of vehicles and rolling stock must be taken into account.
- Railways sector: this sector is not currently operational in Lebanon. In general, rail projects tend not to achieve full cost recovery. One exception is the provision of a dedicated rail freight line, for example, serving the mining industry.

Cost recovery mechanisms have been put into place in many developing countries, for transport modes, particularly concerning the maintenance of infrastructure. Achieving cost recovery following the provision of new infrastructure, usually very costly, is more often difficult.

The main principles that should be taken into consideration, when considering the determination of the transport sector budget, are as follows:

- Is it possible, through the direct levying of taxes, to achieve a reasonable level of cost recovery for a) the provision of infrastructure and b) the maintenance and subsequent renewal of that infrastructure thereafter? If possible, then cost recovery measures need to be identified and established.

- If cost recovery is not attainable, what level of government contribution is needed to support its distributional objective i.e. ensuring that sufficient access is provided for all sections of society?

Based on these principles, two cost recovery options may be available:

Option 1: Where cost recovery is achievable, this need not be a function of central government but can become the responsibility of an autonomous government agency. The establishment of a Road Fund Authority that has, for example, an independent board of trustees, is one example of such an agency.

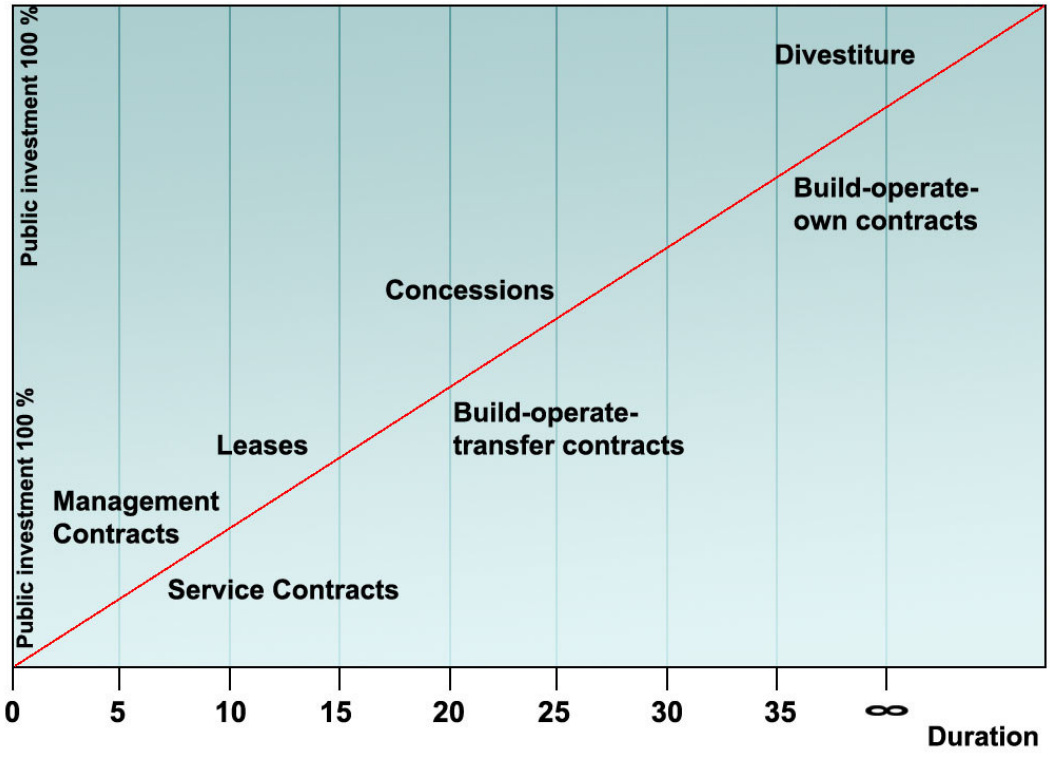
Option 2: Where cost recovery is not attainable, and where it is unlikely that the private sector is able to participate, then any deficit needs to be funded through general taxation revenues. Such examples include the provision of public transport in poorer areas, assisting lower income individuals to travel to work, and the construction or improvement of rural roads to support development objectives.

6.2.3 Contribution of Public and Private Finance

There is an increasing tendency worldwide for encouraging greater participation of the private sector in activities that were originally provided by government. This has the benefit of spreading risk and utilising private capital, where there are scarce public resources.

For large infrastructure projects, Build-Operate-Transfer (BOT) and Build-Own-Operate-Transfer (BOOT) schemes have been implemented with some measure of success. Where infrastructure is already in place then concessions or franchises can be established to operate transport facilities, in order to harness skills that are already prevalent in the private sector. Finally, more limited private sector participation is possible through management contracts, for example in airports or ports, or service contracts, for example for the periodic maintenance of roads. This spectrum of private sector participation is shown in Figure 6.1 below.

Figure 6.1 Potential for Private Sector Participation



The involvement of the private sector is not without problems, however. Establishing a public-private partnership often necessitates large expenditure on legal fees. It is also difficult to demonstrate to the private sector that there are sufficient financial returns in such cases as a toll road through or around a city i.e. the number of entry and exit points make toll collection more expensive. Similarly, in order to attract companies to invest in bus fleets, an adequate regulatory framework must be in place to deter competitors, with unsafe or low quality vehicles, from entering the market.

6.3 APPLICATION OF TRANSPORT SECTOR BUDGET

6.3.1 Division of Transport Budget between Modes

There are generally no clear rules for the division of the transport budget between modes. Transport is, in essence, a secondary activity that exists to support national economic growth, whether this concerns the movement of freight for import and export, or the movement of people to and from work, or for leisure purposes. Therefore, any such decision should be based on governmental priorities that can be distinguished from the National Plan.

It is also difficult to make a distinction between providing funds for, say, freight handled by a port and, for example, establishing a Public Transit Authority

However, within modes, the following should be considered in descending order of priority:

- Carrying out routine maintenance and periodic maintenance of existing transport facilities. Many aspects of routine maintenance can be devolved to regional or local government.
- Completion of on-going investment projects.
- Rehabilitation projects.
- Development of new investment projects subject to satisfactory economic cost-benefit analysis and an evaluation to ensure, where appropriate, that the project is financially sustainable.

6.3.2 Separation and Priority of Maintenance Funding

From experience throughout the world, it has been observed that projects involving maintenance tend to achieve markedly higher rates of economic rate of return than projects involving new infrastructure. The benefits, from maintenance projects, are largely drawn from savings in user costs, which are immediately realised. For example, in the road sector, allowing the pavement condition of a road to deteriorate will result in increased fuel consumption and higher spending on spare parts for road vehicles, which must all be imported and purchased with foreign currency. Often, new infrastructure takes some time for benefits to be seen unless there is a situation of high demand and inadequate capacity.

From the discussion above, transport operations, including maintenance, can be separated from infrastructure provision. This makes it easier to allocate resources effectively, particularly if the resources of the private sector can be utilised. Where maintenance is contracted to the private sector, such as highway maintenance, there are various forms of contract possible including quantity-based contracts, based on unit prices and quantities previously specified, and performance-based contracts, where a contractor is paid on the basis of achieving certain performance conditions.

6.4 SCREENING OF CANDIDATE TRANSPORT INVESTMENTS

6.4.1 Need for Uniform Approach to Project Screening and Evaluation

In the past, there has been little pre-planning and project analysis in Lebanon. Providing that the finance could be secured for a transport investment by the public sector, then there were no constraints on the project implementation; each sector competed for the funds that were available. Projects that were financed by international agencies, such as the World Bank, generally had to demonstrate a positive economic return to the economy but few other conditions were set.

Clearly, there are advantages to be gained from having a uniform system for the screening and selection of projects across the whole transport sector and, to the extent practical, generally conforming with project selection procedures used in other sectors, such as health or education. By this means, the limited investment funds that are available may be deployed to produce the maximum benefit and all competing project promoters will be operating on a level playing field. Also, adopting a formalized project screening procedure can reduce wasted effort on poor transport investments, since these may be eliminated by early screening procedures, without the need for costly feasibility studies. The components of the screening process usually include:

- Conformance with national plans and transport policies.
- Technical feasibility and risks during construction and operation.
- Economic and/or financial viability.
- Environmental impacts.
- Social impacts.

Transport project screening is usually undertaken as a hierarchical process. The early stages involve compliance checking that the investment conforms with pre-established sector and sub-sector rules and requirements, proceeding then through a first evaluation process before finally being subjected to a detailed appraisal. The appraisal is usually a multi factor consideration, often involving both quantitative and qualitative assessments.

A further feature of establishing a national system for project screening and appraisal is that this then permits all projects across the whole sector and country to be ranked in some sort of priority order. This can be useful when budget availability is uncertain, since if actual budget funds are less than expected, then the lowest ranked schemes drop back into the next planning period.

6.4.2 Outline Proposed Multi Criteria Appraisal Framework

As noted above, the screening process is usually a hierarchical process, since this eliminates wasted studies, time and expenditure. The initial stage is generally to verify that the project conforms with current transport sector investment policy in general and with the transport sub-sector policy (e.g. public transport policy) in particular.

The second stage is generally to apply a fairly rapid analysis, using pre-developed systems tailor-made for the sector. Such sub-systems have typically been developed and promoted by major international lenders, such as the World Bank. For example, in the road transport sector, the HDM IV model and the RED model have been developed by the World Bank and others to (a) help investigate alternative investment policies in the roads sector and (b) provide a means of ranking projects on a network wide basis.

Similar analysis and evaluation procedures have been developed for the rail sector but maritime and airport investments tend to be evaluated on a one-off basis. The past attention has rightly been focused on land transport evaluation, since this is where the maximum direct impact on poverty reduction, living and working conditions is likely to be experienced.

The final stage of the screening and evaluation process is usually to devise some framework whereby all the factors that impact on a scheme evaluation and choice (national planning and security objectives: economic, financial, social, environmental, etc) are combined into an agreed evaluation framework. This often involves the balancing of quantitative and qualitative factors through a points scoring and weight allocation system. While all agree that such systems can never provide rigorous comparison of non-homogeneous factors, they do nonetheless enable some form of integrated assessment to be attempted and for the worst combinations of adverse factors to be avoided.

Most countries have developed and published their project appraisal procedures, which are required to be followed by all bodies submitting projects for public finance. It is intended that an assessment and screening procedure manual should now be developed for Lebanon, based upon a distillation of the best international practices and in compliance with the requirements of the main international lending authorities operating in Lebanon, such as the World Bank and the European Investment Bank (EIB).

6.4.3 Concept of Rolling Investment Program with Long, Medium and Short-Term Horizons

A clear distinction needs to be made between the needs and intentions of Master Plans and those of detailed Investment Programs. Master Plans are needed to ensure that a compatible long-term development is achieved, and to establish the general characteristics and nature of proposed development. They should not, however, be rigid straightjackets that are not able to adapt and evolve with time and with the actual unfolding of events.

The SDATL has provided a guiding structure plan for the future development of Lebanon. As noted elsewhere, broadly speaking the concept of this Plan is to create several poles of development, thereby developing sustainable economic growth and minimizing transport demand within the system. The Plan identifies key transport linkages that need to be made or reinforced in order to support such development, and indicates the main international transport routes and corridors proposed.

However, actual transport investments will mainly be needed to respond to high priority needs as these evolve over time. Thus, while transport development is hoped to follow the directions set out in the master plans, actual project investments will be made on the basis of economic priorities, as assessed within a multi-factor assessment process as described above.

It is envisaged that budget plans would be made on a 5-year rolling basis, updated every two years. Whereas, actual investment plans would be on a 2 or 3-year rolling basis, thereby allowing the investment program to respond sensitively to actual national economic conditions, without causing too major disruptions to the planning process. By adopting the evaluation and prioritization procedures proposed, if the out-turn budgets are less than originally envisaged, then the cut-off line is raised, whereas in the event of higher available funds than expected, then more projects can be included in the current rolling program.

It should be noted here that scheduled maintenance work would lie outside the budget revision process. In all cases, budget allocation should never be less than the estimated basic maintenance needs and will always have highest call on the availability of funds.

7. PROPOSED VISION

7.1 INTRODUCTION

The Council for Development and Reconstruction proposes a new approach to the further development and maintenance of the country's transport system in such a way

that it serves the needs of the Lebanese economy, its people and its commercial activity in a comprehensive and cost effective manner. In terms of economics this means that, in the long term, the transport sector should become a net contributor to the economy as a whole. This net contribution should of course include externalities to the sector.

In previous sections of this report, the effectiveness and efficiency of the transport sector have been considered in terms of a range of institutional, technical and economic issues to be addressed. Ways of dealing with these issues have been examined and, from consideration of these, a "Vision for the Transport Sector" for the medium term (7-15 years ahead) has been identified. This vision should, however, take account of the fact that this must be only an intermediate stage in the achievement of longer-term goals for the transport sector.

Consequently, the way forward to achieving the required objectives for the transport sector is seen as comprising the following steps:

1. Comprehension of the Long-Term objectives set out in SDATL in 2004.
2. Formulation of a Medium-Term (7-10 years) Vision.

The components of these two steps are described below.

7.2 LONG TERM PLANNING (SDATL)

The SDATL study (Schema Directeur d'Amenagement du Territoire Libanais) established two main national and economic objectives for the development of the country. These are:

- To create several major poles of development.
- To promote sustainable economic growth while minimizing transport demand.

The transport sector will play an important role in achieving these objectives by:

- Establishing a good road network linking all major centres, and also connecting to the regional road network, which will facilitate commerce.
- The promotion of public transport, which will reduce congestion and reduce costs for industry.
- Better organization of transport authorities, which will improve efficiency within the sector.

SDATL specified a number of major developmental objectives, outside the transport sector, that should be in place in 25-30 years time in order to achieve the Government's economic aims for the nation. These consist of urban, touristic, industrial, agricultural, educational and environmental-protection developments. In order to facilitate these developments, and the development of the country as a whole, the key long-term transport network elements that should be in place are as follows:

Roads

- Autoroutes along the coast and on international links, (Beirut-Damascus and Saida-Qnaitrah, the latter pending the outcome of the peace process).
- Good roads linking all major towns.

Public Transport in Dedicated Right-of-Way

- A mass transit scheme from Tripoli-Nabatieh, using the existing Right-of-Way along the coast, and with limited stops in cities along the line.
- Efficient urban transport systems in the Greater Beirut Area and in the urban areas of Tripoli and Zahle/Chtaura.
- The protection of rail R.O.W. in the inland regions in order to preserve it for when the need arises.

Rail Transport

- Two links should be implemented for the transport of goods, one from Tripoli to the Northern Borders and the other from Riyaq to the Eastern Borders.

Air Transport

- Beirut Rafic Hariri International Airport handling all passenger traffic for the next 30 years.

Maritime Transport

- The main maritime activities are to be distributed between Beirut and Tripoli Ports.
- In case of substantial growth, a third port can be considered in the south, preferably at Zahrani.

Freight Transport

- Three logistics centres for the inter-modal transfer of freight, at Tripoli, Zahle and Saida.

7.3 MEDIUM TERM PLANNING (7 TO 15 YEARS VISION)

7.3.1 General

By the end of the medium term (7 to 15 years), the target situation should be to have all the necessary institutional structures in place and staffed, and all the necessary procedures operational. By this time also the change from the transport sector being a net recipient, to a contributor to the national economy, should be in progress and be visible. In particular, it is proposed that the following new policies and procedures will be operational in the medium term:

- Adoption of the “User-Pays” principle, and increased funding for the transport sector.

- Better management of the transport sector through the clarification and integration of responsibilities, and systematic planning, budgeting and monitoring.
- Clear demarcation of national and local responsibilities between the transport authorities.
- The separation of supervision of transport from operations.
- A framework for private sector involvement in the transport sector.
- Maximization of the capacity of urban and inter-urban road systems by encouraging a shift from the private car to public transport.
- Adoption of the new spatial approach to planning.
- Adoption of a uniform system of planning and budgeting.

7.3.2 Roads

Due to the intensive development that has occurred in the Greater Beirut Area over the past 20-30 years, there has been a rapid growth in vehicle numbers, leading to severe delays and congestion on many parts of the urban road network. This problem has been dealt with over the years through the construction of a number of new roads but, due to various constraints, opportunities for further expansion of the road network are mainly limited to those schemes for which a dedicated right-of-way has already been reserved.

Consequently, alternative ways of dealing with travel demand have been examined and, as with other cities around the world, a "package" of measures will be necessary. In addition, the road network outside the capital area needs to be improved and extended so that the Government's objective of providing good links to all parts of the country can be met. Accordingly, a broad range of both physical measures, and the institutional measures needed to facilitate their implementation, should be in place by the medium term, as described below:

- All proposed road and traffic laws should be operational, such as the law on the Authorities for Land and Maritime Transport.
- All proposed transport authorities, such as the LTA and TAVMA, should be established and operational.
- The means of raising additional funding (user-charging) should be operational.
- The mechanism for managing transport finance, such as through the Ministry of Finance or through a Road Fund, should be operational.
- The involvement of the private sector should be established in such activities as the operation of parking, performance-based maintenance, wheel clamping and towing.
- The separation of regulatory and operational responsibilities should be established.
- The classification of the entire road network should be complete, national and local responsibilities defined, and coordination of national strategies for planning and budgeting operational.
- The Highway Management Systems should be up-to-date and operational within the MPWT.
- The extended use of performance-based contracts should be in place.
- The practice of prioritizing investments should be established, with priority given to maintenance works.
- High priority, missing links should be completed and operational.

- Traffic engineering and management measures should be in regular use in Beirut, and elsewhere through assistance by a central organization, and a Master Plan for Beirut should be completed.
- The proposals of the UTDP should be completed and operational, including the establishment of a metropolitan traffic agency.

7.3.3 Public Transport

Since public transport vehicles (buses, taxis, minibuses and service taxis) can carry considerably more passengers than private cars, expansion of the public transport system will be necessary in order to make the best use of available road space. However, the sector is characterised by such factors as lack of organisation and the poor condition of many vehicles, so a number of changes will be needed to achieve the required improvements by the medium term. Government policy should therefore concentrate on encouraging a modal shift from the private car to public transport, and this can be achieved through the following:

- The Law on Public Transport, and the LTA should be operational.
- The recommendations of the study on "Revitalisation of the Public Transport Industry in Lebanon"» should be operational.
- A national transport company should be operational.
- The participation of the private sector should be defined and implemented.
- The number of public license plates in issue should be restricted to need.
- Proper termini should be in place for serving bus operations.
- All illegally developed buildings should have been removed from bus and rail Right-of-Way.
- The Mass Transit starter project (busway) along the coast from Beirut to Jounieh should be in operation.
- The use of dedicated lanes for public transport should be operational.

7.3.4 Rail Transport

At present there are no railway services operating in Lebanon, but the administration of railways continues to exist in the form of the Office des Chemins de Fer et des Transports en Commun (OCFTC). Three main routes were operational in the past, but the existing rail infrastructure is now largely defunct and many parts of the railway right of way have been encroached upon. However, in order to relieve congestion on the road network, motorists and freight transporters need to be encouraged to transfer to public transport, including the railways. This will require that certain issues relating to rail transport are addressed by the medium term, including the following:

- The General Authority for Land Transport (LTA) should be operational.
- Passenger and freight demand on the priority section, Beirut-Jounieh-Tripoli, should be monitored and the phasing/timescale for implementation for reintroducing services established.
- The viability of extending rail links from Tripoli to the northern borders should be established.
- Actions taken could include: clearance of encroachment from rail R.O.W., studies, design and implementation.

7.3.5 Air Transport

Beirut Rafic Hariri International Airport (BRHIA) is the main airport in Lebanon, capable of handling all classes of aircraft currently in use. The airport has undergone considerable upgrading and expansion in recent years, so that now capacity is adequate to meet demand for some years to come. The findings of the current study, and of previous studies, have identified a number of issues that should be dealt with by the medium term, and these include the following:

- The Civil Aviation Authority (CAA) should be operational through Law 481 of December 12, 2002.
- The Beirut International Airport Company (BIAC) should be operational, in accordance with Law 481, with the participation of the private sector in providing services.
- The updated Master Plan recommendations for Beirut Rafic Hariri International Airport should be completed, and the potential for hub operations established.
- Planning controls around BRHIA should be operational and enforced.
- The need for, and implications of and additional emergency runway to serve aircraft when BRHIA is closed, should be identified, based on an assessment of existing and required facilities, costs and benefits in an emergency.

7.3.6 Maritime Transport

Beirut Port is the main port in Lebanon, with other commercial ports at Tripoli, Saida and Tyre, and a number of small ports primarily used for fishing and leisure purposes.
Most traffic through Beirut Port comprises imported goods, with only moderate passenger traffic and, in recent years, there has been little transhipment of goods through the port. The main ports are characterised by some deficiencies, such as over-manning, ineffective operations, and poor organisation. In order to improve the effectiveness of the sub-sector, the following principal issues that need to be addressed by the medium term have been identified:

- The General Authority for Maritime Transport (MTA) should be operational after clarifying its function relative to port operation.
- A Ports Act should be in operation and a Port agency should be in operation for Beirut and Tripoli Ports.
- A system for recording port activities should be operational.
- Improved procedures for managing safety at ports should be operational.
- For Beirut Port:
  - Efficiency improvements should be operational.
  - The Master Plan, covering the area up to Nahr Beirut for a second container terminal/trans-shipment traffic, should be completed.
  - Land access improvements should be completed.
- The improved configuration of Tripoli Port should be complete.

7.3.7 Freight Transport

Land freight can generally be characterized as having poor logistics and inefficient operations. In order to improve land freight operations, the SDATL study proposed three main regional distribution centers for the storage and inter-modal transfer of goods at Tripoli, Zahle and Saida. In addition, previous studies have also considered the establishment of one or more inland or dry ports; these would remove some of the customs procedures that are currently carried out at the main ports and thereby speed up the throughput of cargo. Issues to be dealt with by the medium term include the following:

- The viability of proposed inland ports and logistics centres (at Tripoli, Zahle and Zahrani) should be established.
- Actions taken could include: studies, design, and involvement of the private sector in implementation and operations.

7.4 FURTHER WORK

This phase (Phase II: Development of "Vision" Concept) forms the second of five study phases. The subsequent study phases will use the "Vision" as the basis for progressively working towards the formulation of the study's ultimate objective of preparing a Development Programme for the period 2006-2009. The steps involved in the subsequent phases are as follows:

Phase III: Sectoral Options. The principal objective of this phase will be to develop an Action Plan for the short term (1-7 years) that will detail the steps needed in the coming years to reach the Medium-Term objectives set out in this report. This phase will also include the development of sectoral options, and of performance indicators to be used in assessing the effectiveness of various aspects of the transport sector.

Phase IV: Implementation Framework. The financial, institutional and regulatory measures needed for the implementation of the Development Programme will be studied during this phase. The responsibilities of stakeholders, in terms of project programming, financing, construction and operation will be defined, and the relationships between stakeholders clarified. Areas of institutional deficiency will be identified, and proposals developed for resolving these deficiencies.

Phase V: Development Programme 2006-2009. During the final study phase, the methodology and criteria for prioritizing projects will be established, taking into account the technical, financial and institutional factors identified during the course of the study as being of particular relevance. Summary profiles of the candidate projects will be prepared, a prioritized list will be drawn up in accordance with the approved selection criteria, and a Final Report summarizing the conclusions and recommendations of the study will be submitted to CDR.