

PART 2

INTEGRATED TRANSPORT PLAN

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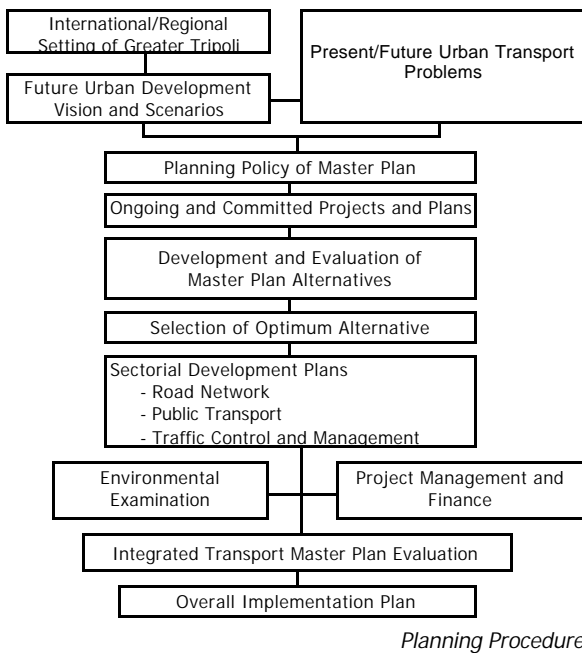
4 URBAN TRANSPORT PLANNING POLICY

Transport Problems

As presented in Part 1, there are many transport problems in Greater Tripoli, especially in the densely developed central areas. Major problems can be summarized as:

- Traffic congestion and pollution (due to bottlenecks of illegal on-street parking)
- Increase in VOC and traffic cost (due to low travel speed, network malfunction and delay)
- Health negative effect (due to the deteriorated urban environment)
- Increase in traffic accidents (due to lack of safety facilities, traffic rule education and enforcement)
- Decrease in tourism industry (due to low accessibility)
- Adverse impacts on socioeconomic activities (due to inferior transport infrastructure)

Planning Procedure



Planning Policy

The principal policies on Master Plan formulation are established from the viewpoints of:

- International and regional settings: intensification of the role of Greater Tripoli through fortification, strengthening and development.
- Urban development strategy: harmonious and spatial distribution of urban activities, as well as the preservation of historical heritage and development potentiality.
- Urban transportation development: promotion of environmentally sounded and health supporting transportation system, and the application of acceptable and serviceable transport measures.
- Realization of the Master Plan: objective and

attainable implementation plan with consensus and informed consent from transport users as well as financial aspects, with the establishment of an efficient organization and system to achieve goals of the transport plan.



Spatial Distribution of Population and Urban Activity

Plan Objectives

Major objectives of the Master Plan are established in accordance with the transport planning policies of agencies in-charge in order to realize the socio-economic development of the Study Area.

- Establishment of transport network in accordance with land-use plan
- Introduction of a modern public transport system
- Development of efficient, comfortable and safe transport network
- Establishment of an efficient transport management system
- Improvement of urban and traffic environment

Plan Targets

- 1) Level of Service: The future target level of service is not less than present average levels of C or D, with an average travel speed more than the present value of 54.7 km/hr.
- 2) Accessibility Coverage: With the employment of spatial distribution pattern in future, the average travel time for zonal population to the city center should be only within 14.4 minutes or 10% increase than the present accessibility coverage rate.
- 3) Traffic Parameters: Vehicle-kilometer, vehicle-hour and volume/capacity ratio are used as indicators for Master Plan evaluation. The alternative plan with lowest values of these parameters and a total average congestion rate less than 0.43 or 10% increase than the present rate, will be adopted.

Environmental Friendly Plan

With the historical, cultural, social and other features of the municipality of Tripoli and its surrounding areas, a major target of the Master Plan is to be environmental

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friendly to improve any existing or expected negative transport impacts and to provide measure for better future environment.

Under the environmental tasks, the process of land use planning includes proposals for sectoral policies that should pay particular attention to the following:

- Protected and preserved historical areas
- Green areas and open spaces
- Spaces for other infrastructure facilities
- Tourism and recreational areas



Image of Old and New Development Areas
[La Villeneuve de Grenoble – France]



Image of Environmental Friendly Arterials
[Charlotte, North Carolina – USA]

Integrated Plan

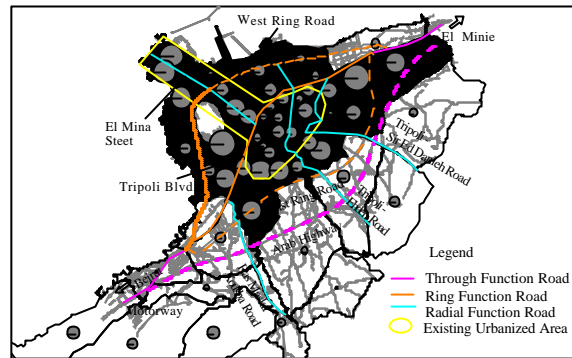
The urban growth of Greater Tripoli and transportation system are viewed as having catalytic effect upon each other. That is, the existence of population and economic activities will tend to attract transportation. On the other hand, Providing good transportation infrastructure will generally cause future economic development. Therefore, the transport Master Plan demonstrates the following two levels of integration:

1. City Planning Integration

The first level of integration is under the city planning concept that integrates transportation, as a part of the city's infrastructure, with other components of:

- Land Use and Urban Structure Planning
- Architectural Planning
- Other Infrastructure Planning

Components of the Master Plan will provide smooth accessibility between zones with integrated activities. For example, the accessibility between commercial areas west of Tripoli Boulevard and historical Old City to the east, is realized by providing grade-separation structures at congested intersections.



Conceptual Plan of Transport System

2. Transport Planning Integration

The second level of integration is related to transport sectors under the Master Plan. This is accomplished by considering several integration concepts that can be applied on the Study Area. In formulating the plans for each sector, the following factors are integrated:

Planning Components: hard and soft components in the plan are integrated to get the most optimum transport plan. In addition, the implementation plans for each component are integrated to provide the most efficient transport system. For example, the consequence of road improvement projects and bus routing are integrated for maximum efficiency.

Transport Facilities: are planned in an integrated system with transport modes. For example, bus terminals will serve city buses, inter-city buses and taxi. It may accommodate also railway station and car parking. In such way, the movement of people and goods throughout the Study Area can be achieved in a convenient manner.

To realize the objectives and targets of the Plan, and to keep it environmental-friendly, the following conditions are necessary to be met:

- Political will and public awareness
- Existence of national strategy.
- Recognition of environmental resources value
- Management capability and adequate human resources
- Financial support

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5 ALTERNATIVES DEVELOPMENT AND EVALUATION

Sectorial Policy and Alternatives

- **Road Network Development:** Based on the present condition of the transport system, future land use planning and forecasted future transport demand, three alternatives regarding the road network are considered.

1. No improvements will be done on the road network
2. Minor improvements will be done: Such improvements include the ongoing projects (detailed design stage) that are expected to be implemented in the near future.
3. Major improvements will be done: Such improvements include all previously planned and expected projects to develop the whole road network.

- **Transport Demand Management:** As the Central Area in Tripoli contains the most congested streets and intersections, two alternatives are considered in regard to the transport demand management.

1. No traffic demand management will be applied
2. Traffic demand management schemes will be applied to improve the traffic flow in the Central Area.

- **Public Transport System:** The existing public transport system that depends on taxi service is not efficient and will not meet the future public transport demand. The committed plan by MOPWT to introduce a bus transport system is included in all plan alternatives, as the most suitable public transport mode for the size and population of the Study Area.

Transport Master Plan Alternatives

Based on the above sectoral planning cases, and in addition to the “Do Nothing” case, the following four transport alternative plans are developed, with the bus transport service as a fixed component, in order to compare with the “Do Nothing” case and to select the optimum alternative that can be applied to develop the urban transport system in the Study Area:

Plan A – “City Bus Service + Road Network with minor improvements”: To apply minor improvements of ongoing road projects on the existing road network without major expressway projects such as ring roads.

Plan B – “Bus Service + Road Network with major improvements”: To apply all committed and proposed development projects of the road network including major expressways.

Plan C – “Bus Service + Transport Demand Management”: To apply traffic control measures and management schemes to improve traffic condition in central areas.

Plan D – “Integrated Transport Plan”: To combine the major road projects, which gives better results than minor improvements, with transport management schemes and city bus service.

Comparative Analysis of Alternatives

A comparative analysis was conducted on the four alternatives when compared with the “Do Nothing” case. The results show that “Plan D”, which integrates and combine the three sectors of road development, traffic management measures and city bus network, will result in the most efficient transport system that can handle the future expected transport demand.

Traffic Parameters of Alternatives - 2020

Plan	Capacity-Km (`000)	Volume/ Capacity	Speed (Km/hr)
Do Nothing	3,583	0.778	37.4
Plan A	3,979	0.661	44.9
Plan B	4,983	0.514	52.5
Plan C	3,653	0.697	40.6
Plan D	5,057	0.464	54.8

Economic Indices of Alternatives - 2020

Plan	PCU-Km (`000)	PCU-Hour	Traffic Cost (LL m)	EIRR %
Do Nothing	2,788	74,557	789	-
Plan A	2,629	58,498	674	18.13
Plan B	2,562	48,755	606	20.59
Plan C	2,547	62,692	695	17.77
Plan D	2,349	42,838	544	27.58

Environmental Impact of Alternatives (kg/year) - 2020

Plan	HC	CO	Nox
Do Nothing	7,529	47,404	2,342
Plan A	7,099	44,698	2,209
Plan B	6,917	43,549	2,152
Plan C	6,877	43,299	2,139
Plan D	6,341	39,925	1,973

Average Accessibility of Alternatives - 2020

Plan	Accessibility (min.)
Do Nothing	19.7
Plan A	17.2
Plan B	14.7
Plan C	19.0
Plan D	14.1

Optimum Transport Plan

Compared with other alternatives, the Plan D decreases the average congestion rate on the whole network and increase the average speed. It gives shorter pcu-km and pcu-hr that will produce more savings in traffic cost. It produces also less emission from vehicles, which contributes, basically, to the improvement of air quality in the Study Area.

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Master Plan Alternative

Alternative Plan	Road Network			Demand Management		Public Transport	
	Without Improvement	With Minor Improvement	With Major Improvement	Without Management	With Management	Without City Bus Service	With City Bus Service
Do Nothing							
A							
B							
C							
D							

Plan D as the optimum alternative plan, technically, economically and environmentally, is selected to be the base of the Transport Master Plan for the future transport network development in Greater Tripoli.

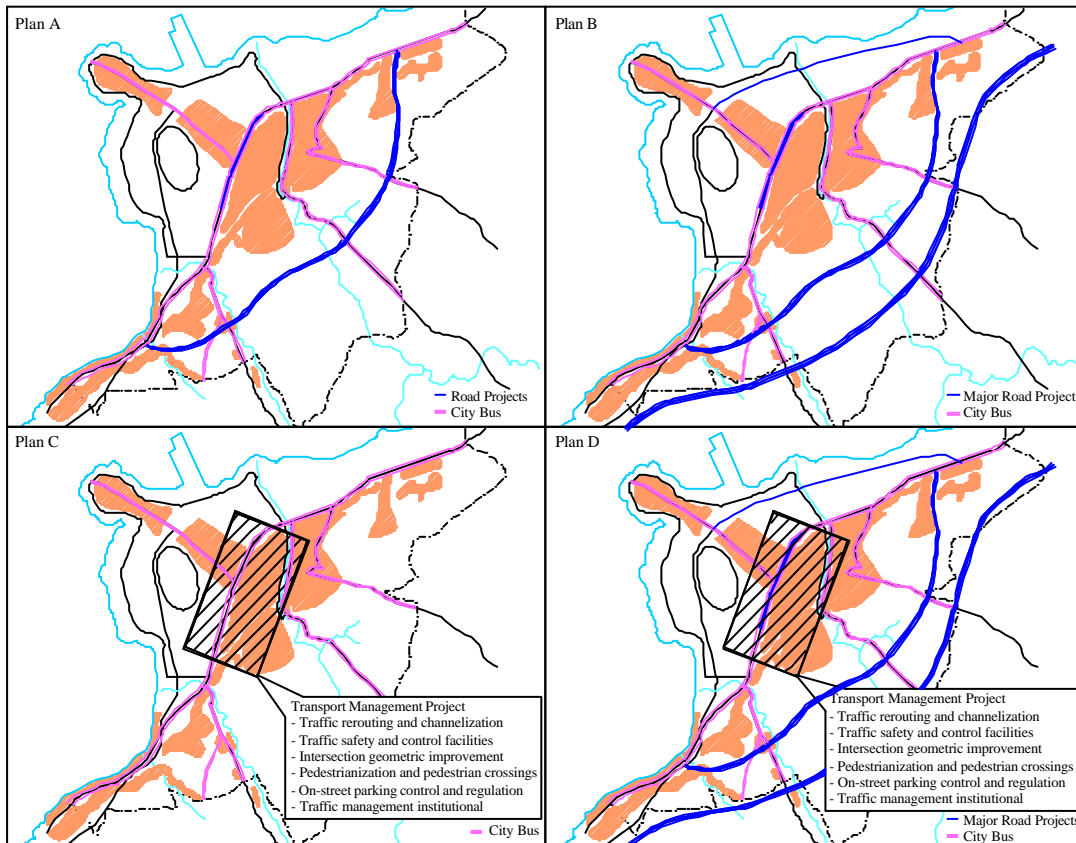
The Plan integrates the hard and soft measures and transport sectors of road network development, transport management measures and bus transport service. In addition, it demonstrates some more integration aspects between transport facilities and management schemes.

Other integration in the Plan is related to the public transport modes. The introduction of an advanced and efficient public transport mode such as the bus system realizes the integration between different transport modes. Environmental friendly buses may replace the old diesel-powered taxis. Other advanced public transport systems of commuting rail systems serve more populated areas with higher transport demand to be economically viable.

The different schemes of traffic management are integrated to decrease congestion and delay, increase capacity and operating speed, minimize transport cost and improve safety level, through an optimum staging implementation of plans for improving intersections, parking control and enforcement measures.



On-going Grade Separation Project



Schematic Plan Alternatives

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6 ROAD NETWORK PLAN

Planning Concept

Objectives

- To strengthen the Greater Tripoli's standing as an international node and the regional capital.
- To guide the urban growth in the planned direction to achieve the spatial development.
- To alleviate traffic congestion in the existing urban area.
- To improve urban environment and amenity and to preserve historical and cultural heritage.

Strategies

- To reinforce international and inter-regional road network in harmony with intra-urban network.
- To enlarge and reinforce the physical foundation of the transport infrastructure to cope with the requirements of the future urban economic growth.
- To provide high quality transport service between existing urban areas and the planned development area and between the planned development areas.
- To provide grade-separation facilities at congested intersections along the primary arterial streets.
- To maintain present road network in the existing urban area where traffic condition shall be improved by traffic management measures.

Proposed Road Network Pattern

Based on the optimum alternative plan that includes major improvements for the road network, the proposed future pattern is as follows:

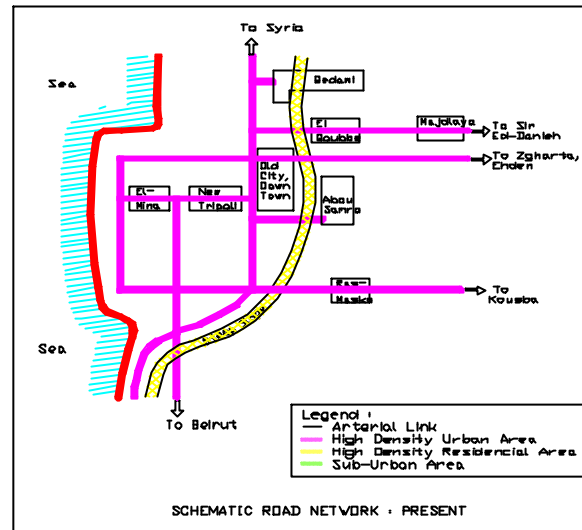
- Ring-and-Radial network pattern to guide the planned spatial urban development
 - To connect east and west ring roads to form a strategic ring.
 - To improve inter-regional roads to function as radials
 - To strengthen Tripoli Boulevard to function as a central backbone
- Full integration between urban development areas and road network through a ring road system connecting also planned development areas.
- Ring roads to handle through traffic outside city center and to distribute traffic on radial roads.
- Strengthening international and regional linkage by a new motorway placed along the boundary of the Study Area that can accommodate the diverted through traffic.



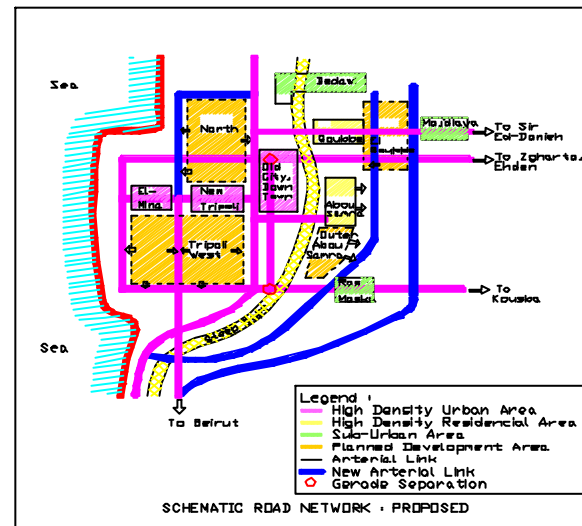
Topographical Constraints

Road Length and Density

Function	2000		2020	
	Length	Density	Length	Density
	km	Km/km ²	km	Km/km ²
Motorway	3.61	0.10	11.08	0.32
Primary Arterial	29.02	0.83	47.53	1.36
Secondary Arterial	29.15	0.83	36.10	1.03
Collector	26.62	0.76	44.64	2.27
Total	88.40	2.52	139.35	3.97



Schematic Road Network: Present

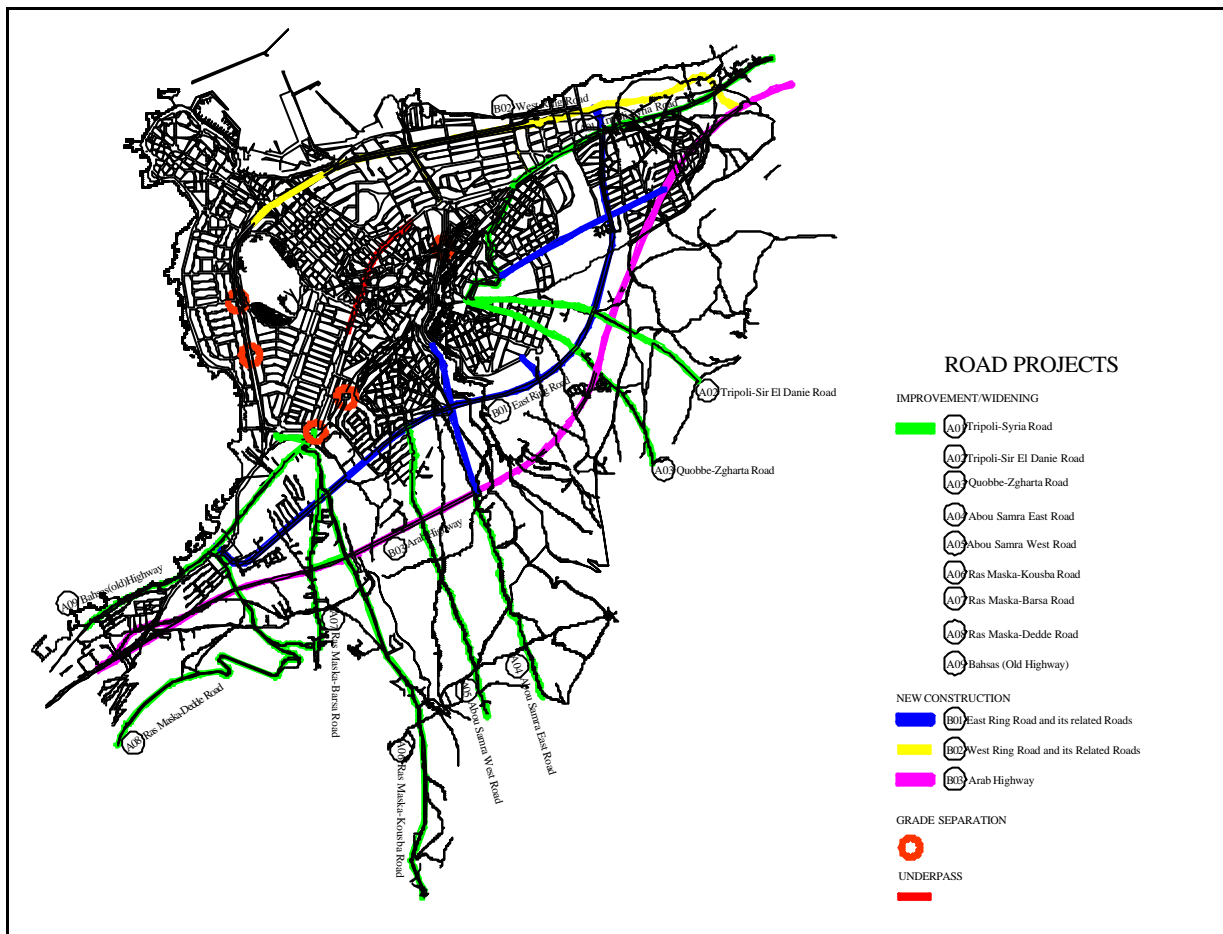


Schematic Road Network: Future

Road Network Development Projects

- Improvement or widening of existing roads outside the built-up area, with a total length of 34.5 kilometers.
- Construction of new roads, mainly as ring roads and radials, with a total length of 32.1 kilometers.
- Five Grade-separation structures at congested intersections to improve accessibility to/from plateau areas and as motorway interchanges.
- Tripoli Boulevard Underpass at the Central Area, with a covered length of about 0.6 kilometer.

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Road Network Projects

Implementation Priority of Road Projects

A criteria was established for the prioritization of road projects that was assessed from the view points of each of the items under the following four aspects:

1. Planning Aspect

- Compatibility with national/regional development Plans
- Impact on land development
- Impact on socioeconomic activities
- Maturity and Status for on-going and committed projects

2. Technical Aspect

- Urgency based on degree and scale of problems
- Improvement scale and the size of project
- Function and role in road network
- Technical difficulty and requirements for special structures or measures

3. Environmental Aspect

- Effect on health in terms of its high impact in mitigating air pollution
- Social impact with low need for land acquisition and resettlement schemes
- Physical impact with low negative effects on nature, flora and fauna
- Social acceptance from affected people and users' groups

4. Benefit Aspect

- High traffic volumes with high level-of-service
- High priority for low cost projects
- Relative benefit scale is assessed by the share of project's benefits to the total benefit of all Master Plan Projects.

Implementation Priority of Road Projects

Term	Road Project	
Short	A06	Ras-Maska – Kousba Road
	A09	Behsass (old) Highway
	B01 (a)	East Ring Road
	C01	Tripoli Blvd. Underpass
Medium	A01	Tripoli – Syria Road
	A02	Tripoli – Sir El-Dannie Road
	A03	Qoubbe – Zgharta Road
	A07	Ras-Maska – Barsa Road
	A08	Ras-Maska – Dedde Road
	B01 (b)	Related Roads of East Ring Road
	B02 (a)	West Ring Road
	B02 (b)	Related Roads of West Ring Road
Long	C02	Grade Separation - 2010
	A04	Abou Samra East Road
	A05	Abou Samra West Road
	B01 (c)	Grade Separation along East Ring Road
	B02 (c)	Grade Separation along West Ring Road
	B03	Arab Highway

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7 PUBLIC TRANSPORT PLAN

To achieve the objectives and targets of the Master Plan, the public transport plan is formulated as follows:

Objectives

- To introduce a modern and environmental friendly city bus system to meet the future socio-economic development in Tripoli and to decrease private car use dependency rate.
- To improve the shared-taxi service as supplement to city and inter-city bus in order to achieve an efficient public transport system.
- To improve the school bus service also as supplement to bus system to achieve an efficient and safe public transport system.

Strategies

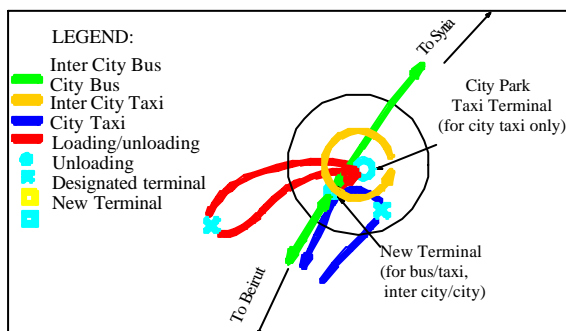
In order to achieve the objectives mentioned-above, the strategy prepared is as follows:

- Introduction of a modern city bus system
- Provision of optimum bus routes to meet public transport demand
- Provision of traffic demand control measures to prioritize public transport system among transport modes
- Integration between city bus network and inter-city one
- Providing bus terminals to promote integration with other modes
- Establishment of taxi terminals and stops to promote bus usage

City and Inter-city Bus system Improvement

Based on the public transport system components and function as well as the location of proposed terminals, different improvement schemes are established and evaluated to select the optimum alternative. The optimum bus transport system is selected and indicated as follows:

- Introduction of a city bus transport service in addition to existing inter-city bus service.
- Inter-city buses would be loaded and unloaded at the north and south bus terminals, but not at the central area.
- Within Tripoli Metropolitan area, the public transport will be serviced as city bus services.
- Taxi services are divided into two (2) types for inter-city taxi service and city taxi service separately.
- Inter-city taxi would be loaded and unloaded, as same as bus system, at north and south bus terminals, not at the central area.



Medium Term Public Transport Scheme

Public Transport Demand

Recently, the share of public transport modes is about 36% that is divided between school bus (10%) and shared-taxi (26%). The target share of public transport is based on the future modal share and estimated demand.

Target Ratios of Public Transport

Year	01	05	10	20
% of Public Transport to Total Trips	36	40	45	50
% of City Bus to Public Transport	0	45	60	70

Public Transport Demand

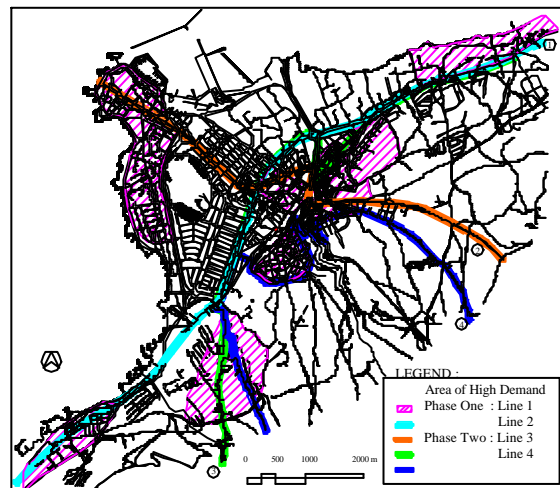
Year	2001	2005	2010	2020
Population	330,930	360,304	390,447	454,174
Total Trips/Day	600,000	699,000	795,000	1,017,000
Public Transport Demand				
Trips/Day	216,000	280,000	358,000	508,000
Public Buses Demand				
Trips/Day	0	60,000	110,000	200,000
No. of Buses	0	85	150	285
City Taxi Demand				
Trips/day	194,000	192,000	212,000	257,000
No. of Taxis	4,600	4,334	5,120	6,000
School Bus Demand				
Trips/day	22,000	28,000	36,000	51,000
No. of Buses	420	560	720	1020

Operating Routes and Terminals

Routes are established based on transport demand by zone as well as origins and destinations of trips. A plan by MOPWT, which is committed to operate bus service in Tripoli, was reviewed and considered in the planning process. As the city center is characterized as a main destination with the highest density of trips, it is considered in all bus lines to achieve the highest occupancy rates. Other main areas are El-Bedaoui, El-Mina, El-Qoubbe, Abou-Samra and Behsass. A city bus terminal will be implemented at the city center (El-Taal Square). The number of buses is estimated based on minibuses of 25 seats capacity.

City Bus Operation Length

Line No.	1	2	3	4
Length (km)	12.5	9.0	12.0	12.5



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*City Bus Routes
Capacity of City Bus Central Terminal*

Year	2005	2010	2020
No. of Stalls	4	8	12

Measures to increase the bus users may include:

- Bus public-experiment and campaign
- Bus exclusive, priority, exclusive right/left turn and reversible lanes
- Bus priority signal
- Short time interval among buses
- Reasonable walking distance
- Reasonable fare
- Comfort transfer system with other transport modes especially inter-city buses

Inter-city Bus and Transport Center

The plan includes two inter-city terminals to prevent the inter-city bus to enter the city center basically for the purpose of alleviating the severe traffic congestion.

The first terminal, which is planned by the MOPWT to function as a multi-purpose integrated Transport Center with high priority in MOPWT projects for northern Lebanon, is located south of Tripoli at Behsass area. With the availability of the land that is owned by the MOPWT, this project is already committed for implementation by the Office of Rail, Road and Public Transport under the MOPWT during the short-term improvement plan. The second bus terminal is planned to be located in the north of the Tripoli at El-Bedaoui.

No. of Spaces of Intercity Terminals

Year	2005	2010	2020
Southern Terminal			
Large Buses	24	15	17
Minibuses	140	90	95
Northern Terminal			
Large Buses	-	8	10
Minibuses	-	55	60

City and Inter-city Taxi

By introducing the city bus service, a little decrease in the number of taxis is expected till the year 2005 then the required number will increase again.

City taxis will have parking spaces in the central parking, southern and northern terminals. Taxi stands will be constructed at high demand areas such as El-Mina, El-Qoubbe, El-Bedaoui and Ras-Maska.

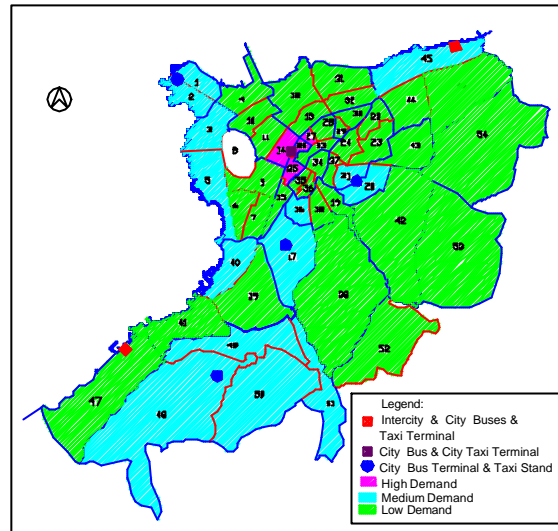
No. of Spaces of City Taxi Terminals

Year	2005	2010	2020
Central	50	25	36
Southern	8	16	24
Northern	-	8	16

Intercity taxi will have parking spaces in the southern and northern terminals where loading will be only allowed at these terminals. Unloading will be allowed at passenger destinations.

No. of Spaces of Intercity Taxi Terminals

Year	2005	2010	2020
Southern	106	87	94
Northern	-	28	30



Transport Terminals and Taxi Stands

School Transport

The M/P policy is to increase the share of school buses. In Tripoli, however, school buses cause recognizable traffic congestion by parking in front of schools.

Alleviating the severe traffic congestion due to school buses is based on the following measures:

- Gradually replace large school bus by minibus
- Create off street parking stalls at schools
- Apply short time shift in the start and end times of the school day
- Built all new schools in new developing areas

Implementation Schedule

Implementation Plan

Plan	Year			Cost Billion LL
	01-05	06-10	11-20	
Public Bus	10.80	4.60	8.15	23.55
Bus Routes 1 and 2	2.00		4.00	6.00
Bus Routes 3 and 4		2.00	4.00	6.00
City Bus Central Terminal	0.20			0.20
Behsass Transport Center*	8.00			8.00
El-Bedaoui Intercity Bus Terminal		2.50		2.50
El-Qoubbe City Bus Terminal	0.15			0.15
El-Mina City Bus Terminal	0.15			0.15
El-Bedaoui City Bus Terminal	0.15			0.15
Abou Samra City Bus Terminal	0.15			0.15
Developed Area City Bus Terminal		0.10	0.15	0.25
Taxi	1.15	0.20	0.15	1.50
Central Terminal	0.15			0.15
El-Mina Taxi Stand	0.25			0.225
El-Bedaoui Taxi Stand		0.10		0.10
El-Qoubbe Taxi Stand	0.15			0.15
Abou Samra Taxi Stand	0.15			0.15
Behsass (Ras-Maska) Taxi Stand*	0.15			0.15
Behsass Intercity Taxi Terminal*	0.15			0.15
Bedaoui Intercity Taxi Terminal	0.15			0.15
Developed Area Taxi Stands		0.10	0.15	0.25
School Bus	0.55	0.20	0.20	0.95
School Bus Parking Stalls	0.15			0.15
Shared Taxi & Private Car Stalls	0.10			0.10
Large Bus Replacement	0.20	0.10	0.10	0.40
New School Parking Facilities	0.10	0.10	0.10	0.30
Cost (Billion LL)	12.50	5.00	8.50	26.00

* Components of Behsass Transport Center

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8 TRAFFIC MANAGEMENT PLAN

Based on the selected optimum Master Plan, the Traffic Management Plan is formulated as follows:

Objectives

- To prepare efficient traffic management plan in order to reduce traffic congestion in the Study Area.
- To prepare comfortable and safely transport system for road users in the Study Area.
- To improve the urban environment through reduction of traffic congestion at the Central Area.
- To provide an efficient, comfortable and safer transport system by integrating road improvement projects and public transport system.

Strategies

To achieve the objectives, the strategy is formulated as follows:

- Strengthening traffic education
- Strengthening traffic enforcement
- Improvement of traffic signal system
- Improvement of traffic safety, control and management facilities
- Introduction of parking control

Education and Public Awareness

The education plan is basically designed to address the following four groups through educational activities, campaigns and safety programs.

- School children and students: education – campaign
- Car drivers: licensing training programs
- General public: mass-media campaigns – safety week
- Traffic management and enforcement personnel: training and educational programs

Enforcement

Traffic policemen and municipality enforcers will be qualified through training programs that include:

- Traffic laws, regulations, control and enforcement techniques
- Traffic management procedures
- Human, vehicle and road system mechanism
- Traffic flow characteristics
- Traffic signal operation and intersection control
- Traffic accidents investigation techniques

Traffic Signalization

There are no signals in the Study Area at present. There is an on-going project to provide signals financed by Saudi Fund. Signals are installed at 15 intersections, which are selected based on judgment and field observations.

Under the Master Plan, there is another signalization phase for 15 more intersections. Priorities of intersections are assessed by a weight analysis procedure based on the following criteria:

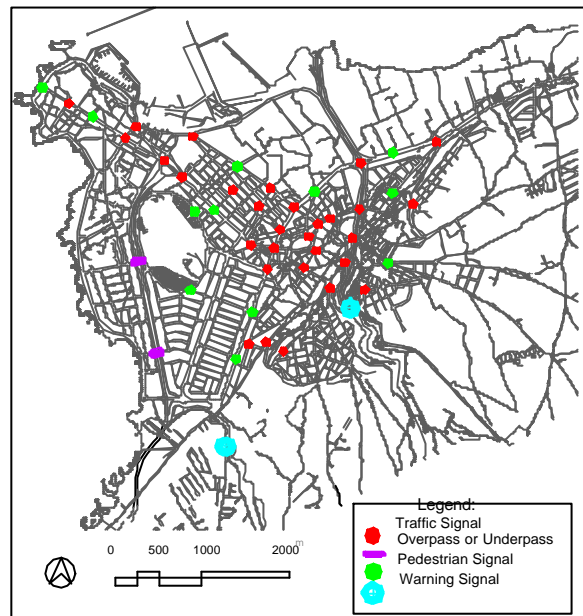
- Level of service
- Heavy traffic volumes
- Heavy pedestrians crossing
- High number of conflict points

- Link with other intersections

Facilities of Traffic Control and Pedestrian

Other than signalization, there are many locations that lack the minimum control facilities even they are characterized with drastic alignment profiles. Applied one-way system at some locations in the Central Area does not show significant impact. Required control facilities include regulatory and warning signs, speed limit signs, guard-rails, warning flashers, pedestrian signals and over/underpass, priority signs and channelization.

The M/P identifies the necessary measures to provide the required facilities and to increase the safety of pedestrian and other road users.



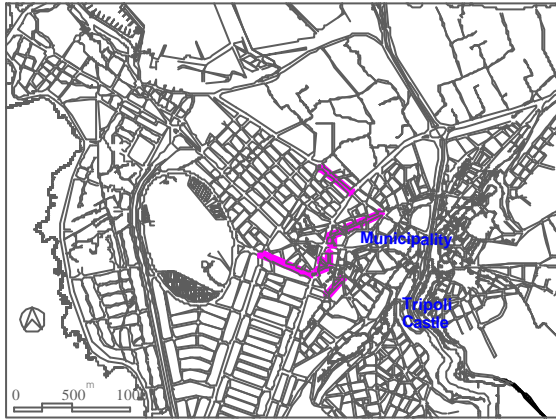
Location of Traffic Signals and Control Facilities

Parking Control

Parking control measures directly affect the volume of traffic, particularly where commuters and shoppers are heavily using on-street parking. Basic control approaches to deal with parking problem are bans, time limits, parking fee and off-street parking. Outside the Central Area, parking demand is within the available spaces. The following procedures are to solve the drastic parking problem in the Central Area.

- Prohibit on-street parking gradually as substitute off-street spaces are provided up to the end of the short-term. Next, it will be prohibited completely except for spaces with parking meters. At present, 500 parking meters are being installed.
- Utilize vacant lands as off-street parking areas.
- Apply the obligatory regulation of providing garages for night parking in new buildings.
- Provide an off-street parking areas for tourist buses.
- Control taxi over-supply to reduce the number of parked taxis in central areas and provide required taxi stands and terminals.
- Provide off-street parking spaces for school buses.

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Location of On-Street Parking Meters

The plan aims to strengthen the obligatory parking-space regulation, to set-up on-street parking-meter policy and to increase off-street parking areas as well as to prohibit on-street parking in the future. At present, there are 2,950 parking spaces (off-street: 950 and on-street: 2,100) that approximately balances the demand of 3,000 spaces.

Daytime and Nighttime Demand

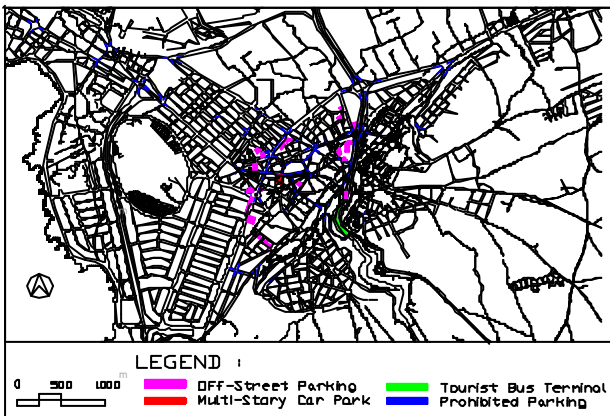
Year	2000	2005	2010	2020
Daytime	3,000	3,250	3,500	4,125
Nighttime	3,150	3,430	3,740	4,330

Forecast of the future demand for daytime-parking and nighttime-garage spaces shows the need for 2,150 spaces by the year 2020 in addition to the available 2,000 spaces of 500 parking-meter, 850 off-street and 650 obligatory garage spaces.

Additional Required Parking Spaces in Central Area

Year	2001-2005	2006-2010	2011-2020
Required Spaces	1,250	250	625

The area required for the additional spaces is about 42,500 m². The survey for vacant lands shows that there are enough lands that can be used by the Municipality under the rental concept. Prohibition of parking along intersection approaches will highly improve the level of service.



Off-Street Supply and Prohibited On-Street Parking Locations

Traffic Safety Measures

Comprehensive efforts and measures for safety components, which are: Education, Enforcement, Environment and Engineering are required. Engineering measures are applied on geometric design and road safety facilities. Major safety measures at intersections and locations with high potentiality for traffic accidents include:

- Appropriate geometric design
- Channelization with optimum safe lane width.
- Marking of all traffic lanes and pedestrian crossing.
- Regulating, warning and guiding traffic signs.
- Traffic signal and Street lighting
- Guardrail
- Pedestrian overpass, underpass and sidewalk

Implementation Schedule

Plan	Year		Cost B. LL
	01-05	06-10	
<i>Signals</i>	1.56	1.00	2.56
Traffic Signal Phase I	0.59		0.59
Traffic Signal Phase II	0.78		0.78
Secondary Traffic Signals		1.00	1.00
Pedestrian Traffic Signals	0.11		0.11
Warning Traffic Signals	0.08		0.08
<i>Signs</i>	0.17	0.17	0.34
Warning Signs	0.04	0.04	0.08
Informatory Signs	0.02	0.02	0.04
Prohibitory Signs	0.11	0.11	0.22
<i>Marking</i>	0.24	0.12	0.36
Intersections	0.05		0.05
Major Corridors	0.19		0.19
Secondary Corridors		0.12	0.12
<i>Pedestrian Overpass/Underpass</i>	0.26		0.26
Major Corridors	0.26		0.26
<i>Parking</i>	1.08		1.08
Prohibition at Intersection	0.10		0.10
Partially Prohibition along Corridors	0.10		0.10
Major Roads Complete Prohibition	0.10		0.10
Paid On-Street	0.30		0.30
Paid Off-Street	0.40		0.40
Multistory Car Park	0.30		0.30
Truck Loading and Unloading	0.05		0.05
<i>Education</i>	3.00	1.00	4.00
<i>Enforcement</i>	0.42	0.71	1.13
Total Cost (LL Billion)	7.00	3.00	10.00

Note: The Master Plan strategy is to complete all projects by the end of the Medium-Term Plan.



Enforcement in Action

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9 ENVIRONMENTAL ASSESSMENT

The development of the urban transport infrastructure and facilities of Greater Tripoli is expected to produce various impacts on the environment, which are investigated and examined in order to simultaneously develop mitigating measures to minimize any possible negative impact.

Environmental Legislation

Lebanon has a large amount of environmental laws with some dating back to the 1930s. However, these laws are characterized by obsolescence and the need to update. In addition, these laws are lacking of clarity, accountability and provisions of mechanism for implementation.

The Ministry of Environment was established in May 1981 aiming at controlling all forms of pollution, the use of pesticides deforestation and forest fires, solid waste disposal, protection of fauna and flora and urbanization. In April 1993, the Ministry issued the new Environmental Law No. 216, marking a significant step forward in the management of environmental affairs. It has the power to:

- Formulate general environmental policy
- Propose measures for law implementation in coordination with other concerned agencies.
- Protect the natural and man-made environment in the interest of public health and welfare.
- Controls and prevent pollution irrespective of the source.

Moreover, the Ministry has suggested, in September 2000, an Environmental Impact Assessment outline, which is still a draft decree under revision by a committee composed of representatives from related ministries and agencies.

Initial Environmental Examination

Environmental items under JICA Guidelines are investigated to carry out an Initial Environmental Examination on the Master Plan projects. Its objectives are to identify the possibility of any negative impact that may result and to propose adequate mitigating measures. The Master Plan projects are categorized into two main groups based on their expected negative environmental impact:

- 1: Projects with high potential negative impact
- 2: Projects with low potential negative impact

In order to determine the importance and potential of each environmental impact, the following points are assessed:

- Number of affected people
- Extent of the impact
- Impact duration and intensity
- Components simultaneously affected

- Cumulative aspect of the impact
- Irreversibility impact
- Mitigating Measures

Scoping Items

Social Environment	Natural Environment	Pollution
Land Acquisition	Topography	Air Pollution
Resettlement	Geology	Water Pollution
Economic Activities	Ground Water and Hydrology	Soil Contamination
Traffic and Public Facilities	Coastal Zone	Vibration and Noise
Communities Split	Flora and Fauna	Land Subsidence
Cultural Property	Metrology	Offensive Odor
Public Health	Landscape	
Waste		
Hazard and Risks		
Overall Environmental Evaluation		

Items for EIA Study

Some projects, such as new construction of roads and facilities, may require an EIA study that includes further detailed environmental examination on items included in the following table. Other projects management and signalization do not require such detailed studies.

Items Required for EIA

Environmental Items	Roads and Intersections	Public Transport	Parking Facility
SOCIAL ENVIRONMENT			
Resettlement	B	D	D
Economic Activities	B	D	C
Traffic Facilities	B	C	C
Split of Communities	C	D	D
Cultural Property	C	C	C
Water Rights of Common	C	C	C
Public Health Condition	B	D	D
Waste	B	C	C
Hazards (Risks)	D	D	D
NATURAL ENVIRONMENT			
Topography and Geology	B	D	D
Soil Erosion	C	D	D
Ground Water	D	D	D
Hydrological Situation	D	D	D
Coastal Zone	D	D	D
Flora and Fauna	D	D	D
Meteorology	D	D	D
Landscape	B	B	B
POLLUTION			
Air Pollution	B	C	C
Water Pollution	C	D	C
Soil Contamination	D	D	D
Noise and Vibration	B	C	C
Land Subsidence	D	D	D
Offensive Odor	D	D	D
Overall Evaluation	C	D	D

Evaluation Categories:

- A: Serious impact is predicted
- B: Some impact is predicted
- C: Extent of impact is unknown
- D: No impact is predicted. EIA is not necessary

Air Pollution Assessment

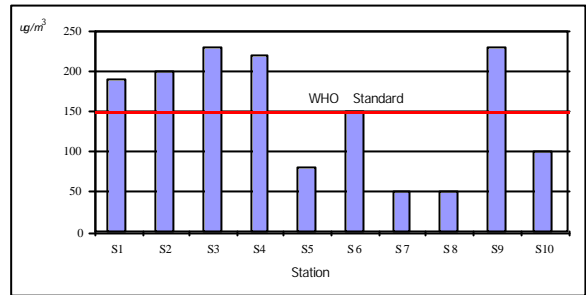
A field monitoring survey was conducted at a total of 10 stations representing different characteristics of the

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Study Area based mainly on the present traffic volumes. Results show that the CO concentrations exceed the WHO standard at most locations during daytime, when there is most of the traffic, and decrease significantly during night-time. It is also noticed that the highest daytime concentrations are measured on Mondays (at stations S3 and S7), when an increased traffic activity is usually occurred. SO₂ concentrations are significantly higher than the equivalent WHO standard, and do not vary much from site to site. TSP concentrations exceed WHO Standard (150 µg/m³) at most of the congested areas. In conclusion, air pollution is considered as a major environmental problem in the Study Area.

Environment Survey Stations

Traffic Volume	Stations
High	2, 3, 4, 5 and 6
Medium	1, 7 and 10
Low	8 and 9

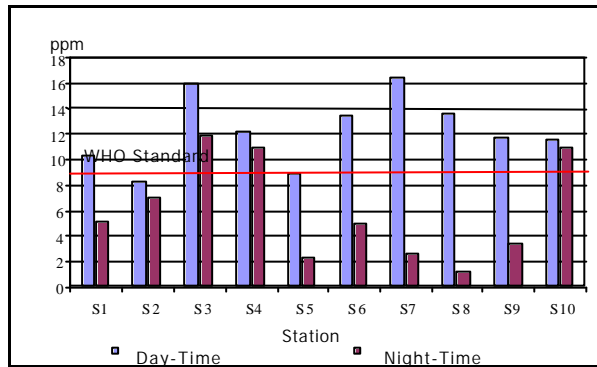


Average Concentration of TSP

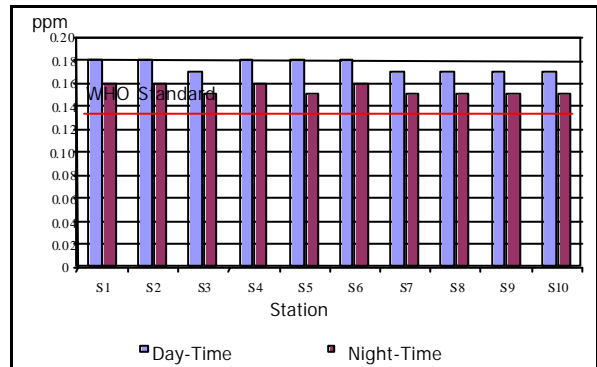
Master Plan Impact on Pollution

Air pollution is one of the main elements that are greatly affected by traffic congestion and transport modes; therefore, the impact of the Master Plan projects on air pollution reduction is predicted for the target years. Based on the forecasted values of future traffic volumes and speeds, composite emission factors are estimated through an air quality simulation modeling process as pollutants exposure levels.

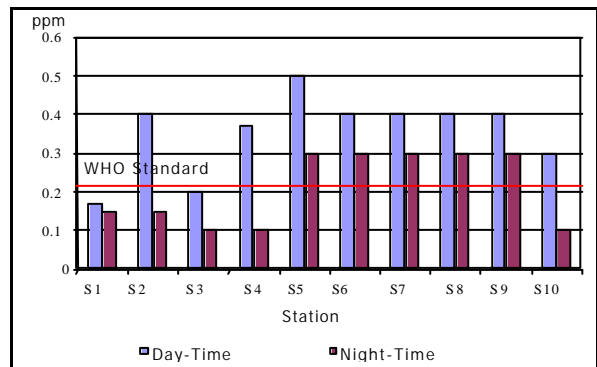
Results show that the Master Plan measures do not affect the emission factors. This is mainly attributed to types of proposed projects, namely road improvement, enhancement of public transport service and traffic management measures. When compared with the "Do Nothing" case, results show great reduction in CO emissions and air pollution in the Study Area.



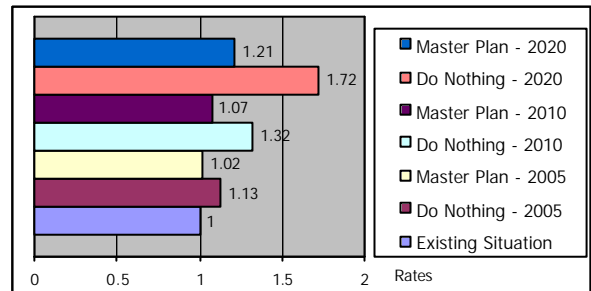
Average Concentrations of CO (ppm)



Average Concentrations of SO₂ (ppm)



Average Concentrations of NO₂ (ppm)



CO Emission Reduction of Master Plan

Mitigating Measures

For few road widening projects that are located outside areas subject to readjustment plans, a resettlement plan is required for land acquisition. When applying readjustment plans, the government is entitled to acquire 25% of the land for infrastructure projects which is the normal procedure for implementing infrastructure projects. Other negative social or natural impact is not expected as the Master Plan will promote living style and environment as well socioeconomic development. In addition, it will support tourism activities and increase traffic safety levels.

A proper air quality management system is required to further improve the environment and to keep emission levels under international standard. Such system may include fuel improvement, vehicle inspection, emission regulation and the introduction of unleaded gas (ULG) and less emission vehicles (LEV) for taxis and buses.

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10. PROJECT MANAGEMENT AND FINANCING

Transport Legislation

- The legislation related transport in Lebanon seems to be well established when compared with international levels. However, drivers due to inappropriate applied enforcement under the scarce officials situation and budgetary constraints do not properly observe most of the traffic laws and regulation.
- On legislation related transport, new legislation is not basically required, but strict enforcement on the traffic regulation such as raising of fines to violations of traffic laws and regulations especially for illegal parking should be practiced.

Management Agencies

Category	Name	Organization/s
Road Traffic (Overland Traffic control, Drivers Licenses, Automobile registration, etc)	Traffic Laws of Lebanon 67/77 (1968) (Revised and amended various times)	- Ministry of Interior - Internal Security Force - MOPWT - Police Force, Tripoli Municipality
Transportation Business (Taxi services, bus services, Truck transportation services, etc)	Code of Commerce (Legislative Decree No. 304 dated 24 Dec. 1942)	- MOPWT - Commercial Court - Chamber of Commerce and Industry
Investment (BOT, Privatization of public transport entities)	Code of Commerce (Legislative Decree No. 304 dated 24 Dec. 1942)	- Ministry of Finance - Municipalities - Commercial Court - Chamber of Commerce and Industry
Insurance (Mandatory automobile liability insurance)	Mandatory Insurance Law - None. Insurance Law: Decree 9812 (1968) (revised 1993 and 1999)	- Ministry of Economy and Trade
Road administration and management	None (Toll on the Road is not applied for the Master Plan Projects as it is a Government Policy except BOT investment.)	- MOPWT - Ministry of Municipalities and Rural Affairs (MOMRA) - Tripoli Municipality
Urban Planning (Land utilization, Building restrictions, Obligatory Parking Lot Construction)	Real Estate Property Code Building Laws and Regulations Real Estate Laws for Foreigners (1969)	- MOPWT - Ministry of Finance, - Urban Planning Office, Tripoli Municipality
Environment (Noise, Vibration, Air pollution, Water pollution)	Environment Law	- Ministry of Environment - Tripoli Municipality

Implementation Organization

- The administrative system of Lebanese Government and Municipalities is based on the notion of a small

organization. This is understandable when considering the country is still under the process of reconstruction and the human resources are very scarce. For instance, CDR has only about 190 officials working for about 800 large-scale projects including technical assistance, averaging 4.2 projects per official in 1999. Ministries and Municipalities have the same situation.

- It is practical to hire professional in-house adviser/staff/engineer, and to contract out with private contractor/consultant for successfully implementing the projects. The applied system of project implementation, which is principally based on the open competitive tendering procedure, is economical, practical and realistic.
- Projects and measures recommended in the Master Plan are composed of, 1) road improvement and widening, 2) new road construction, 3) grade separation and underpass, 4) public transport, and 5) traffic management.
- It is recommended that each organization relevant to project implementation should employ necessary professional staff/engineer/expertise. For instance, road construction projects:
 - 1) Implementing Agency: CDR
 - 2) Consultant:
 - Right of way acquisition expert(s)
 - Detailed Engineering expert(s)
 - Construction Supervision expert(s)
 - 3) Construction: Contractor
 - 4) Operation and Maintenance: MOPWT or the Municipality (local road)
- From the practical viewpoints, the same procedure will be applied for the implementing the Short-term Plan projects of underpass and public transport.
- Public Bus Transportation project will be implemented by MOPWT utilizing private investment and management under a BOT (Build-Operate-Transfer) scheme. Policy issues will be managed by the present organization of MOPWT.
- For the traffic management and other listed projects, the following system is recommended.
 - 1) Implementing Agency: MOPWT or Municipality
 - 2) Consultant and Contractor: same as above.
 - 3) Operation and Maintenance: A Transport Management Unit will be established, composed of Municipality police force and Internal Security Force of the Ministry of Interior as an integrated unit to perform traffic management and control tasks.

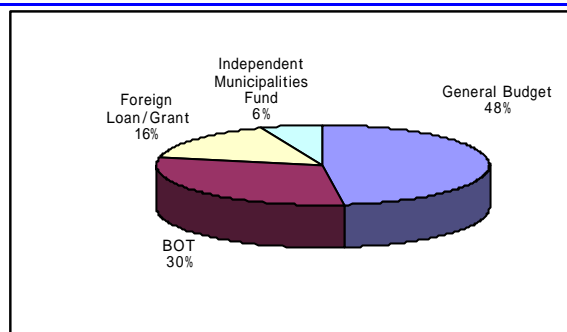
Project Financing

- It is of generally prevailed principle for the Government to pay out of its fiscal revenue and to construct public infrastructure which is used by and brings benefit to people in general. The bridges and roads, which are exclusively used by local people, should be constructed and maintained by local tax and levies. Some limited transport facilities such as bus transport and highways

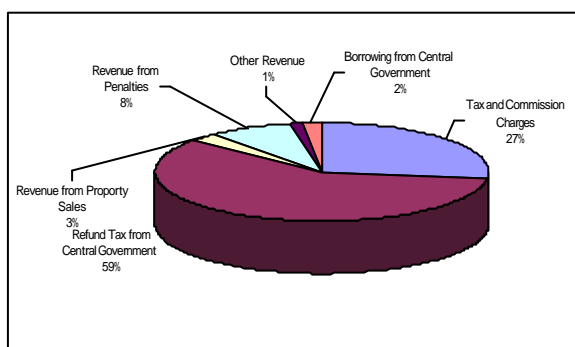
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should be constructed and maintained by collecting fees from passengers or users.

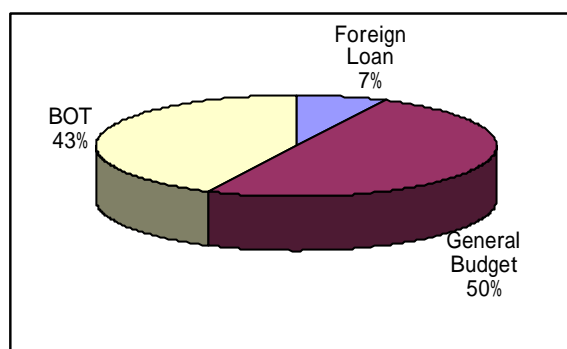
- Lebanon is still rehabilitating and reconstructing after prolong civil war. The Government is struggling every year to rehabilitate, reconstruct and develop the land with borrowing money twice as much as the general fiscal revenue. The Government is continuing not collect toll in highways as a political decision. Tax rate on fuel gasoline and diesel oil is high (58.4% on gas and 36.52% on diesel oil), of which 90% is allocated to general revenue of the Central Government and 10% is refunded to the local government.



National Infrastructure Investment (2000 - 2004)



Tripoli Municipality Budgetary Resources



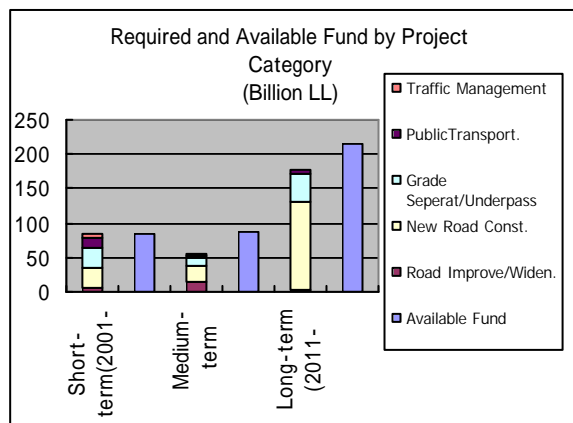
National Transport Sector Investments (2000 - 2004)

- The budgetary size of Tripoli Municipality is only 0.32% of that of the Government, and 3.5% of MOPWT budget (average of five years). Municipal autonomous revenue is limited to only 30% of total and no increase is expected. About 60% of the total budget is refund from the Government, and mostly taking two years to receive. Tax collection system is instituted in the Municipality organization and well functioned.
- The Master Plan projects are not expected to be financed by Municipality, but should be financed by Government budget, reconstruction and development finance through CDR and private investment finance (BOT). This means that the project implementing agencies are CDR, MOPWT (BOT) and Tripoli Municipality. However, final source of funds should be the people (government tax revenue) and the users (BOT).
- According to the Government's Five Year Development Plan (Year 2000 to 2004), total financial resources for the infrastructure investment is b. 13,560 LL (US\$ 9.043 billion), of which the government general budget is 48%, private participation (BOT) 30%, foreign loans and grants 16% and municipality fund 6%.
- The Plan allocates b. 4,936 LL (US\$ 3,291 million) to transport sector investment, of which general budget plus foreign loan is 57%, and BOT is 43%. Private participation is strongly expected.

- Fund availability for the Master Plan Projects is derived from applying the allocation criteria, which is based on the share of population and road network (Km) of Tripoli Municipality, to the national transport sector investment. Taking into consideration routine maintenance works, the estimated fund availability is found to cover the implementation of the Master Plan projects.

Required and Available Fund (b. LL)

Items	Short-term (2001-2005)	Medium-term (2006-2010)	Long-term (2011-2020)
Fund requirement for the Master Plan Projects	84.23	56.49	178.85
Fund availability estimated	85.00	86.00	215.00



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11 MASTER PLAN EVALUATION

Evaluation Methodology

The optimum Master Plan formulated as mentioned above is evaluated from the national economy of Lebanon, technical parameters of traffic efficiency, and accessibility coverage of population and environmental stand points. The method of evaluation is based on a comparative with "Master Plan" and principal for the two cases of "Do Nothing".

Technical Evaluation

Traffic Demand Forecast: Traffic assignment results show that the "Do Nothing" case provides low speeds (less than 20 km/hr) on most of the network especially on the northern and eastern parts of the city. After the completion of the Master Plan, almost all the major links on the network will have speeds higher than 30 km/hr.

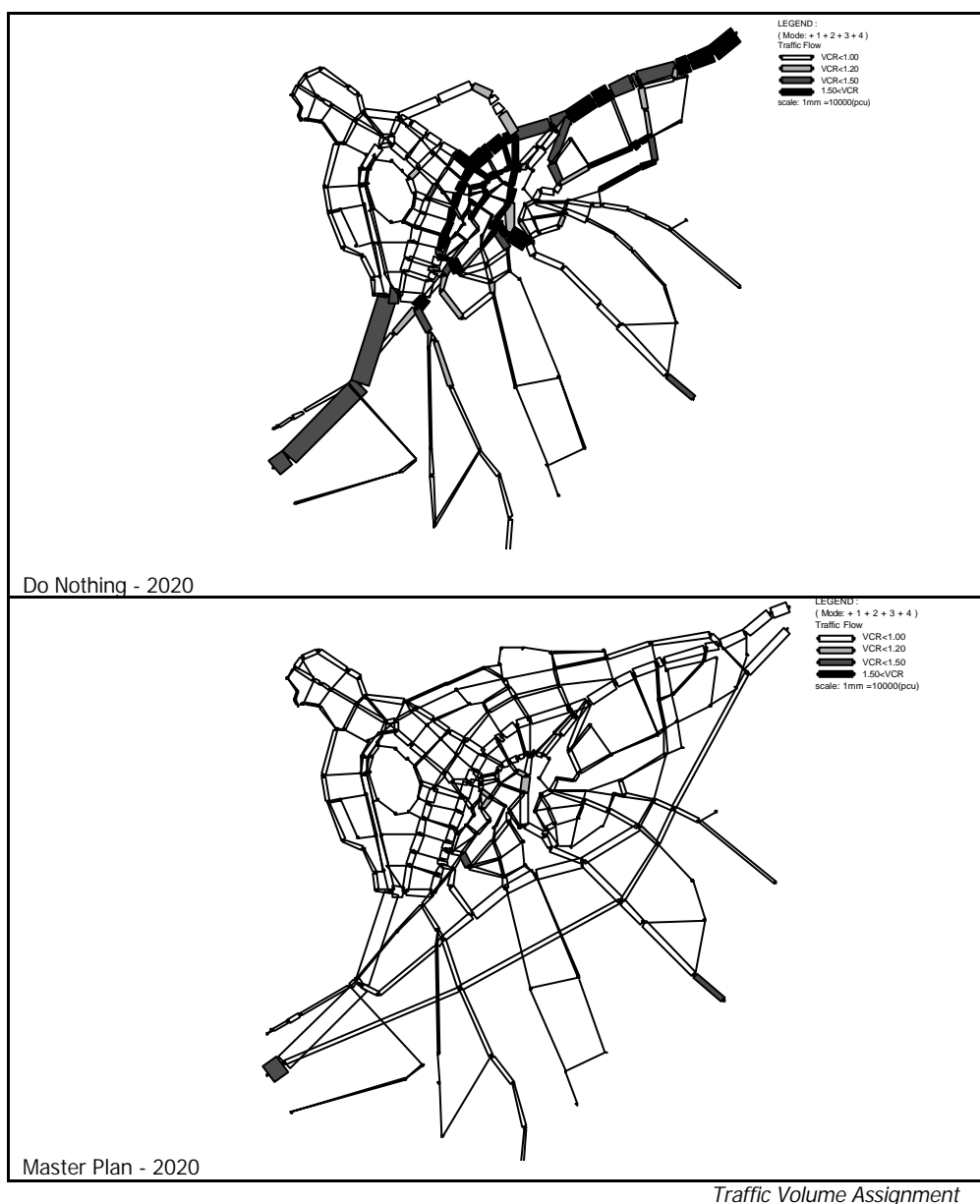
Network Efficiency: Traffic parameters of average

speeds and congestion rates are used to assess the efficiency of the network. Low speeds and high levels of congestion on the "Do Nothing" case are widely spread on when compared with the "Master Plan" case.

Speed and Congestion

Parameter	2000	2005	2010	2020
Average Speed (km/hr)				
Do Nothing	54.7	46.9	45.4	42.2
Master Plan		54.5	54.8	56.7
Average Volume/Capacity Ratio				
Do Nothing	0.384	0.545	0.585	0.655
Master Plan		0.459	0.439	0.424

Accessibility Coverage: With the spatial distribution of population and urban structure, the Master Plan provides an average accessibility coverage to the city center of 14.4 minutes, which does not exceed 10% of the present accessibility coverage of 13.1 minutes.



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Accessibility Coverage of Population

Travel Time to City Center (minutes)	2000	2020	
		Do Nothing	Master Plan
0.0- 4.0	18,850	3,600	3,473
5.0-9.9	159,202	112,640	108,604
10.0-14.9	77,564	142,266	258,104
15.0-19.9	43,248	74,667	62,154
20.0 or more	32,065	121,001	21,839
Total	330,930	454,174	454,174
Average Time	13.1	19.7	14.1

Economic Evaluation

The traffic system performance of the Master Plan is assessed based on savings in traffic parameters and traffic cost between the two cases of "Do Nothing" and with "Master Plan".

Traffic and Economic Parameters

Year	Do Nothing	Master Plan	Savings
1,000 PCU-kilometer/day			
2000	1,454,932		
2005	1,789,023	1,638,469	150,554
2010	2,136,209	1,856,863	279,346
2020	2,788,483	2,348,516	439,967
1,000 PCU-hour/day			
2000	27,192		
2005	36,341	28,412	7,929
2010	48,435	33,476	14,959
2020	74,557	42,838	31,719
Traffic Cost in LL Billion/year			
2000	135		
2005	169	142	27
2010	209	160	49
2020	288	198	90
Economic Parameters			
EIRR (%)		27.75	
NPV (LL Billion)		180.57	
B/C		2.52	

The Master Plan will provide an annual savings in traffic cost of LL 90 Billion by the target year 2020. Results of the sensitivity analysis show that the Master Plan is feasible under higher costs with lower benefits.

Sensitivity Analysis Results

Case	Cost	Benefit	EIRR %
1	+10%	±0	25.78
2	±0	-10%	25.58
3	+10%	-10%	23.70

Environmental Evaluation

Projects incorporated in each sector of the Master Plan promote an environmentally sound and health supporting transport system in the Study Area. The

road network is developed to provide direct access between zones and to reduce unnecessary detouring traffic. In the Short-term Plan, introducing an advanced and effective public transport system with transport management schemes and an underpass in the densely developed areas will result in eliminating traffic congestion that will have considerable improvement of environmental conditions.

Indirect benefits

- Improving living environment with a smooth flow on the transport network
- Improving traffic safety by applying strict measures for transport management, increasing enforcement capabilities and providing education programs for different groups of road users.
- Promotion of economic development with an efficient transport network and more employment opportunities will be generated to activate the economic and light-industry sectors. In addition, the commercial sector will be improved especially in the Central Area due to improved accessibility and alleviation of traffic congestion.
- Promotion of tourism to historical heritage and resort areas that will be preserved with an efficient transport system that includes an advanced public transport service.
- Promotion of trade and international traffic through a high-efficiency transport network of the Master Plan.

Master Plan Components

The selected optimum transport plan is combining major road projects with transport management schemes and public transport of city bus service. In the planning process, policies as well as tasks and solutions for existing and expected problems, for each transport sector, are developed to meet the objectives of the Study. The table presents a summary of major projects under the short, medium and long term plans.

Plan Integration

The projects included in the transport Master Plan demonstrate the integration concept either with other city planning components, such as land use activities and urban structure as well as other infrastructure and architectural planning, or between the different hard and soft sectors composing the plan. Integration is also provided between different transport facilities and modes with management schemes and safety measures.

Summary of Major Projects

Sector	Major Projects	2001 - 2005	2006 - 2010	2011 - 2020
Road Network	Widening and Improvement	6.2	22.1	6.1
	New Construction	8.5	12.5	11.1
	Grade Separation	1	5	
Public Transport	Bus Operation			
	- Distance	21.5 km	24,5 km	-
	- Number of Buses	85	150	285
Intercity Terminal	City Terminal	1 (South)	1 (North)	
		4	1	
Traffic Management	Signalized Intersections	15	15	
	Parking Control	Applying Prohibition and Control Measures		
	Off-street Parking	Installing 2,000 Parking-meters		
	Safety Measures	Area required: 81,250m ²	6,250m ²	15,625m ²
	Enforcement Measures	Providing Education and Facilities		
Legislation System	Strengthening Manpower and Equipment			
	Applying Vehicle Registration System			

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MASTER PLAN PROJECTS - 2020

ROAD PROJECTS(2005)

IMPROVEMENT/WIDENING

- (A06) Ras Maska-Koutba Road
- (A09) Bahsas (Old Highway)

NEW CONSTRUCTION

- (B01a) East Ring Road
- (C01) Underpass(Tripoli Blvd)

PUBLIC TRANSPORT

- Bus Route NO.1
- Bus Route NO.2
- Intercity & City Buses & Taxi Terminal
- City Bus & City Taxi Terminal
- City Bus Terminal & Taxi Stand

TRAFFIC MANAGEMENT

- Traffic Signal
- Overpass or Underpass
- Pedestrian Signal
- Warning Signal
- Off-Street Parking
- Tourist Bus Terminal
- Prohibited Parking

ROAD PROJECTS(2005-2010)

IMPROVEMENT/WIDENING

- (A01) Tripoli-Syria Road
- (A02) Tripoli-Sir El Danie Road
- (A03) Quobbe-Zgharta Road
- (A07) Ras Maska-Barna Road
- (A08) Ras Maska-Dedde Road

NEW CONSTRUCTION

- (B01b) East Ring Road
- (B02a) West Ring Road
- (B02b) West Ring Related Roads

GRADE SEPARATION

- (C02) Inter Change

PUBLIC TRANSPORT

- Bus Route NO.3
- Bus Route NO.4
- Intercity & City Buses & Taxi Terminal
- City Bus Terminal & Taxi Stand

TRAFFIC MANAGEMENT

- Traffic Signal

ROAD PROJECTS(2010-2020)

IMPROVEMENT/WIDENING

- (A04) About Samra East Road
- (A05) About Samra West Road

GREAT SEPARATION

- (B01c) East Ring Road
- (B02c) West Ring Road
- (B03) Arab Highway

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12 OVERALL IMPLEMENTATION PLAN

Implementation Strategy

The planning period, 2001 ~ 2020, is divided into the following three (3) stages;

- Short Term Planning Period: 2001 ~ 2005
- Medium Term Planning Period: 2006 ~ 2010
- Long Term Planning Period: 2011 ~ 2020

The administrative and technical capacities for implementing the proposed Master Plan projects will be developed with governmental human resources and reinforced with professional engineers, in order to implement projects in accordance with proposed technical standards and implementation schedule.

For most efficient implementation of internationally financed projects, international engineering services

will be employed in accordance with rules and regulations of lending agencies.

Implementation Schedule

The implementation timing of road projects is scheduled in accordance with the prioritization criteria. Public transport projects are proposed based on the MOPWT plan of bus transportation. Establishment of the legislation and system on traffic management is scheduled at the earliest possible time.

Enforcement measures will be put into practice just after the declaration of traffic management legislation. In the mean time, facilities such as safety and control devices, traffic signal, marking, etc., including meters for on-street parking systems will be installed.

Overall Implementation Schedule

Project Code	Project Name	Length Km	Cost LL B.	Short Term					Medium Term					Long Term										Agency/Fund	Status		
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
A	Road Improvement and Widening																										
A01	Tripoli-Syria Road	3.0	2.93																							MOPWT/Local	
A02	Tripoli-Sir El-Danie Road	5.4	2.43																							MOPWT/Local	Ongoing
A03	Qoubbe-Zgharta Road	4.2	1.89																							MOPWT/Local	
A04	Abou Samra East Road	2.5	1.58																							MOPWT/Local	
A05	Abou Samra West Road	3.6	2.27																							MOPWT/Local	
A06	Ras-Maska-Kousba Road	5.0	6.40																							MOPWT/Local	
A07	Ras-Maska-Barsa Road	2.6	2.54																							MOPWT/Local	
A08	Ras-Maska-Dedde Road	2.8	1.26																							MOPWT/Local	
A09	Behass (Old) Highway	3.6	3.51																							MOPWT/Local	
	Sub Total	32.70	24.81																								
B	New Road Construction																										
B01 (a)	East Ring Road	8.5	28.33																							CDR/Islamic Bank	Design
B01 (b)	Related Roads	4.8	6.87																								
B01 (c)	Grade Separation	(n =10)	22.50																							CDR	
B02 (a)	West Ring Road	6.4 (n=2)	15.06																							CDR	Planning
B02 (b)	Related Roads	1.25	1.50																								
B02 (c)	Grade Separation	(n = 4)	9.00																							CDR	
B03	Arab Highway	11.1	95.00																							CDR	Planning
	Sub Total	32.05	178.26																								
C	Grade Separation / Underpass																										
C01	Tripoli Blvd. Underpass	0.985	29.40																							CDR	
C02	Grade Separation	(n = 5)	51.10																							CDR	
	Sub Total	80.50	80.50																								
D	Public Transport																										
D01	Public Bus		23.55																							MOPWT	Committed
D02	Taxi		1.50																							Municipality	
D03	School bus		0.95																								
	Sub Total	26.00	26.00																								
E	Traffic Management																										
E01	Signals		2.56																							CDR/Saudi Fund	Ongoing
E02	Signs		0.34																							Municipality/Local	Ongoing
E03	Marking		0.36																							Municipality/Local	Ongoing
E04	Ped. Overpass/Underpass		0.26																							Municipality	
E05	Parking		1.35																							Municipality/BOT	
E06	Education / Safety		4.00																							MOE/MOI	
E07	Enforcement		1.13																							MOI	
	Sub Total	10.00	10.00																								
	Total Investment in 2001 Prices	319.57	319.57																								
	Expected Budget in 2001 Prices	386.00	386.00																								