

REPORT COMPOSITION

The Final Report of the Study is basically composed of the following three volumes:

VOLUME 1 - EXECUTIVE SUMMARY: is designed to address decision-makers who do not need deep information in technical and financial aspects. It contains brief information on all the major aspects of the Study and concentrates on the major results and outputs of each task. It includes also a more concentrated summary for the main conclusions and recommendations of the Study.

VOLUME 2 - MAIN REPORT: Chapter 1 is an introduction and is followed by the three major parts of:

PART 1 - Transport Demand Forecast: Chapter 2 explains the characteristics of the road transport system in Cairo, including the organizations in-charge, the functional classification, network development and assessment of existing problems. It is followed by the conducted traffic surveys and analysis of collected data in Chapter 3. Chapter 4 gives the future socioeconomic framework that is applied in the process of forecasting the future transport demand is presented in Chapter 5 in addition to the forecast methodology and main results.

PART 2 – Toll Expressway System: Chapter 6 includes the development of Cairo Urban Toll Expressway Network through the selection of the optimum network, routing and alignment, typical cross sections, right-of-way acquisition and environmental assessment. Methods of setting up the toll road are provided in Chapter 7 in addition to the institutional set up and the steps of developing the required organization and its capacity development. Chapter 8 for the maintenance and operation systems presents the toll collection methods, traffic management techniques, maintenance requirements and measures for environmental protection. Next, Chapter 9 gives the rough cost estimates of different elements of the network, prioritization of links, comparative analysis for different toll application scenarios and economic evaluation of the network and high priority sections.

PART 3 – PPP Structure and Financial Plan: Chapter 10 provides a review and analysis of PPP in Egypt and other countries. Chapter 11 discusses the approach of network development with the participation of the private sector. The financing options and an analysis of the cash flow are included in Chapter 12, including the cash flow analysis for high priority expressways. The required improvements in the legislation system and required procedures for successful PPP programs are included in Chapter 13.

Chapter 14 gives the overall conclusions and recommendations.

VOLUME 3 - APPENDIX: contains the necessary base data and information, drawings, calculations and other information produced during the course of the Study.

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ABBREVIATIONS

1. Organization Abbreviations

AASHTO	:	American Association of State Highway and Transportation Officials
ADB	:	Asian Development Bank
AFIT	:	Agence de Financement des Infrastructures
CAPMAS	:	Central Agency for Public Mobilization and Statistics
CASE	:	The Cairo & Alexandria Stock Exchanges
CBE	:	Central Bank of Egypt
CDCP	:	Construction and Development Corporation of the Philippines
CDO	:	Central Development Organization
CEN	:	Committee European de Normalization
CGR	:	Cairo Greater Region
CMA	:	Capital Market Authority
CMO	:	Cairo Metro Organization
CMTB	:	Cairo Metropolitan Transport Bureau
CPT	:	Counterpart Team
CRESME	:	Social Economic Research Institute for Construction
CTA	:	Cairo Transport Authority
CTEB	:	Cairo Traffic Engineering Bureau
DfT	:	Department for Transport
DOH	:	Department of Highways
DONCNC	:	Development Organization for New Cities and New Communities
EDF	:	Electricite de France
EEA	:	Egyptian Electricity Authority
EEAA	:	Egyptian Environment Affairs Agency
ENIT	:	Egyptian National Institute of Transport
ENR	:	Egyptian National Railways
ETA	:	Expressway and Rapid Transit Authority of Thailand
FCC	:	Federal Competence Centre
GAFI	:	General Authority for Investment and Free Zones
GARBLT	:	General Authority for Roads, Bridges and Land Transport
GCBC	:	Greater Cairo Bus Company
GCMA	:	Greater Cairo Metropolitan Area
GCR	:	Greater Cairo Region
GDO	:	Central Development Organization
GOE	:	Government of Egypt
GOPP	:	General Organization for Physical Planning
GOV.	:	Governorate

HC	:	Higher Committee for Greater Cairo Transportation Planning
IBTTA	:	International Bridge, Tunnel and Turnpike Association
ICC	:	International Chamber of Commerce
IMF	:	International Monetary Fund
ISO	:	International Organization for Standardization
ISPA	:	Italian Government Infrastructure Spa
ITU	:	International Telecommunication Union
JICA	:	Japan International Cooperation Agency
MCGCRT	:	Ministerial Committee for Greater Cairo Region Transport
MEA	:	Metropolitan Expressway Authority
MHUUD	:	Ministry of Housing, Utilities and Urban Development
MOE	:	Ministry of Environment
MOF	:	Ministry of Finance
MOI	:	Ministry of Interior
MOT	:	Ministry of Transport
MSCI	:	Morgan Stanley Capital International
MSEA	:	Minister of State for Environmental Affairs
NAO	:	National Audit Office
NAT	:	National Authority for Tunnels
NU	:	National Universities
NUCA	:	New Urban Communities Authority
ODA	:	Official Development Assistance
PEA	:	Public Estates Authority
PNCC	:	Philippines National Construction Corporation
PRC	:	People's Republic of China
RBTS	:	Rapid Bus Transport System
RTD	:	Roads and Transport Directorate
SEMCA _s	:	Sociétés d'Economie Mixte Concessionnaires d'Autoroutes
SPC	:	Special Purpose Company
TPA	:	Transport Planning Authority
TRB	:	Toll Regulatory Board
TRB	:	Transportation Research Board
UNCITRAL	:	United Nations Commissions on International Trade Law
UTPU	:	Urban Transport Planning Unit

2. Technical Abbreviations

AC	:	Asphalt Concrete
AHS	:	Advanced Cruise-Assist Highway System
AMPM	:	Active Management Payment Mechanism
AVC	:	Automated Vehicle Classification System
AVI	:	Automated Vehicle Identification System
BOOT	:	Build, Operate, Own and Transfer
BOP	:	Balance of Payments
BOT	:	Build, Operate and Transfer
CATEX	:	Cairo Urban Toll Expressway
CCTV	:	Closed Circuit Television
CDC	:	Caisse des Dépôts et Consignations
CO	:	Carbon Monoxide
CPI	:	Consumer Price Index
CREATS	:	Cairo Regional Area Transportation Study
CUTEND	:	Cairo Urban Toll Expressway Network Development
D	:	Directional Distribution
DBFO	:	Design-Build-Finance-Operate
DBO	:	Design, Build and Operate
DBOT	:	Design-Build-Own-Transfer
DELTA	:	DSRC Electronics Implementation for Transport and Automotive Applications
DSRC	:	Dedicated Short-Range Communication
EFC	:	Electronic Fee Collection
EIA	:	Environmental Impact Assessment
EIRR	:	Economic Internal Rate of Return
ERP	:	Electronic Road Pricing
ETC	:	Electronic Toll Collection
FIRR	:	Financial Internal Rate of Return
GCMP	:	Greater Cairo Master Plan
GCRRR	:	Greater Cairo Region Ring Road
GDP	:	Gross Domestic Products
Guide	:	Legislative Guide on Privately Financed Infrastructure Projects
GW	:	gagawatts
HCM	:	Highway Capacity Manual
IC	:	Interchange
ICT	:	Information Communication and Technology
IEE	:	Initial Environmental Examination

IPPs*	:	Introduction of Independent Power Producers
ITS	:	Intelligent Transportation System
JICA STRADE	:	System for Traffic Demand Analysis
LABS	:	Local Area Bus System
LAN	:	Local Area Network
LE	:	Egyptian Pound
LED	:	Light-Emitting Diodes
LOS	:	Level of Service
MAD	:	Mean Absolute Value
MCC	:	Manual Classified Count
MPEG	:	Moving Picture Experts Group
MW	:	megawatt
NGOs	:	Non-Governmental Organizations
NOx	:	Nitrogen Oxide
NPV	:	Net Present Value
NSE	:	North-South Expressway
OBU	:	On Board Unit
OD	:	Origin-Destination
PAP	:	Project Affected People
PCE	:	Passenger Car Equivalents
PCU	:	Passenger Car Unit
PFI	:	Privately Financed Infrastructure
PHF	:	Peak Hour Factor
PHV	:	Peak Hour Volume
PIA's	:	Personal Injury Accidents
PPPs	:	Public Private Partnership
PRIV.	:	Private
PTTP	:	Public Transport Training Program
RBA	:	General Authority for Roads, Bridges and Land Transport
RCS	:	Road Communication Standard
RO	:	Rehabilitate and Operate
ROW	:	Right-Of-Way
RR	:	Ring Road
RRTS	:	Rapid Rail Transit System
RSU	:	Road Side Unit
SCUT	:	Sem Cobrança ao Utilizador (no user paid tolls)
SMS	:	Short Message Service
TE	:	Trip-End
TEV	:	Time Evaluation Value
TG	:	Technical Group
TICS	:	Transport Information and Control System

TIS	:	Traffic Information System
TOR	:	Terms of Reference
TP	:	Traffic Police
TTC	:	Travel Time Cost
V/C	:	Volume Capacity
VCR	:	Volume Capacity Ratio
veh	:	Vehicle
VICS	:	Vehicle Information and Communication System
VMS	:	Variable Message Signs
VOC	:	Vehicle Operating Cost
vpd	:	Vehicle per day
WG	:	Working Group
WPI	:	Wholesale Price Index
WTP	:	Willingness-to-Pay

CHAPTER 1

INTRODUCTION

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Greater Cairo Region (GCR) is estimated to accommodate a population of 22 million in 2022 which puts growing pressure on all infrastructure systems, including the road network system. At present, the urban transport situation, in general, is characterized by traffic congestions, constrained resources for public transport and deterioration of air quality. Congestion in GCR is caused by its excessive traffic demand and insufficient road capacity with inefficient traffic flow and ineffective traffic management. Results of previous studies show that everyday there are about half a million pcus (passenger-car units) entering and exiting the Study Area and one million pcus crossing the Nile River mainly between the two Governorates of Cairo and Giza.

With the on-going implementation of the new communities program towards the desert areas in the east and west, GCR requires unique solutions to promote the functional integration of the region, and the needs of inner city development. What the Greater Cairo Region needs is a transport development plan and projects that contribute to an efficient economic structure of the region, strengthen linkage with other parts of Egypt and provide a base for market-oriented transport activity.

Japan International Cooperation Agency (JICA), the official agency responsible for the implementation of the technical cooperation program of the Government of Japan, conducted the “Cairo Regional Area Transportation Study” (CREATS) starting in the year 2000, and a transport Master Plan for GCR was formulated in 2002 as the outcome of CREATS. In this plan, an urban expressway network is proposed.

The urban expressway network, planned in CREATS, requires huge financial resources to be implemented, operated and maintained. Conventionally, road projects have been financed out of the general revenues of the Government. As these sources will not be sufficient for the implementation of the urban expressway projects, new and stable sources of fund are required. This financial gap is expected to be filled by the private sector that is capable of improving the quality of transport infrastructure services. The development of private sector involvement in the provision of public services can be achieved through ensuring private as well as public benefits. The benefits of private sector participation will be greater if the Government clarifies the responsibilities of involved governmental agencies and develops supporting polices on competition and regulation.

In response to the request of the Government of Egypt, the Government of Japan has decided to conduct the study on “Public-Private Partnership (PPP) Program for Cairo Urban Toll Expressway Network Development”. Accordingly, JICA organized and dispatched a Study Team, from Katahira & Engineers International (KEI) and PwC Advisory Co., Ltd. (PwC), a member firm of PricewaterhouseCoopers, to Egypt to commence the Study on April 2005. The Final Report of the Study is scheduled to be submitted to the Government of Egypt by the end of April 2006.

1.2 OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. To review and update the traffic demand, routing and development phasing plan of the Cairo urban expressway network (hereinafter referred to as “Expressway”) proposed in the Master Plan of Urban Transport Projects in Greater Cairo Region (hereinafter referred to as “CREATS Master Plan”) in November 2002:
2. To set up the toll road system for the sustainable development of the proposed Expressway:
3. To formulate a comprehensive program and strategy for the introduction of PPP program for the development of the Expressway: and
4. To enhance the capacity of the new MOT agency that take the responsibility to promote and lead the PPP program and Expressway development, assuring that the Government of Egypt retains ownership in the implementation of the PPP program. The new agency will be suggested by the Study Team and approved by MOT.

1.3 THE STUDY AREA

The Study will cover the area studied in the CREATS Master Plan including the whole length of the proposed Expressway.

1.4 SCOPE OF THE STUDY

In order to achieve the above-mentioned objectives, the Study will include the following components:

1. Review of CREATS Master Plan, other related laws and development plans, and expressway projects
 - 1-1 Review of the Expressway plan in CREATS Master Plan and other planned or implemented projects, including the expressway routes and sections,

- interchanges and parking, right-of-way conditions, cross-sections and viaduct plans.
- 1-2 Review of the socio-economic framework and policy scenario of CREATS Master Plan
 - 1-3 Review of existing PPP projects and their prospects including previous attempts of BOT road projects in Egypt and reasons of faced constraints
 - 1-4 Review of relevant laws and regulations
2. Implementation of traffic survey and forecasts and formation of a priority list
- 2-1 Implementation of traffic survey to update and supplement the traffic OD tables of CREATS Study
 - 2-2 Implementation of road-user interviews, including a question on willingness-to-pay
 - 2-3 Forecast of future traffic demand for the Expressway
 - 2-4 Identification of the methodology of setting out priority list of the Expressway
 - 2-5 Formation of a priority list of the proposed Expressway based on the anticipated impacts of the Expressway, including descriptive environment and social assessment.
3. Estimation of project cost and formulation of future financing plan
- 3-1 Review and analysis of the total construction cost of the Expressway in the CREATS Master Plan in regard to design standards, land acquisition cost and operation and maintenance costs.
 - 3-2 Setting of the toll system reflecting the traffic characteristics and estimated cost
 - 3-3 Economic analysis of the Expressway
 - 3-4 Analysis of the cash flow
 - 3-5 Formulation of a future financing plan and legislative and regulatory reforms
4. Formation of the plan for the Expressway maintenance system and traffic information system
- 4-1 Review of the current system for highway maintenance and traffic information system
 - 4-2 Formation of the plan for the Expressway maintenance system and traffic information system
5. Formation of strategies to promote the participation of the private sector

- 5-1 Comparison and investigation of existing PPP schemes from around the world
 - 5-2 Demarcation of the responsibilities and investment risks between the public and private sectors for the Expressway development.
 - 5-3 Quantitative analysis of the investment risk posed to public and private sectors in the proposed PPP scheme(s).
 - 5-4 Analysis and further refinement of the legislative system to promote the participation of the private sector in the Expressway development.
 - 5-5 Establishment of valid application procedures and the preparation of samples of necessary documents for the PPP project of the Expressway for the private sector, and preparation of selection criteria for identifying the best private investors among the applicants.
 - 5-6 Formulation of the practical PPP Program suitable for Egypt
6. Design of the management body for the Expressway
- 6-1 Identification of the public authority counterpart for the private body for traffic management and maintenance of the Expressway
 - 6-2 Organizational design of the body for the traffic management and highway maintenance of the Expressway
7. Overall Evaluation and Recommendations

1.5 SCHEDULE OF THE STUDY

The Study is commenced in April 2005 and scheduled to be completed by April 2006. Figure 1.5-1 shows the Study Flow Diagram.

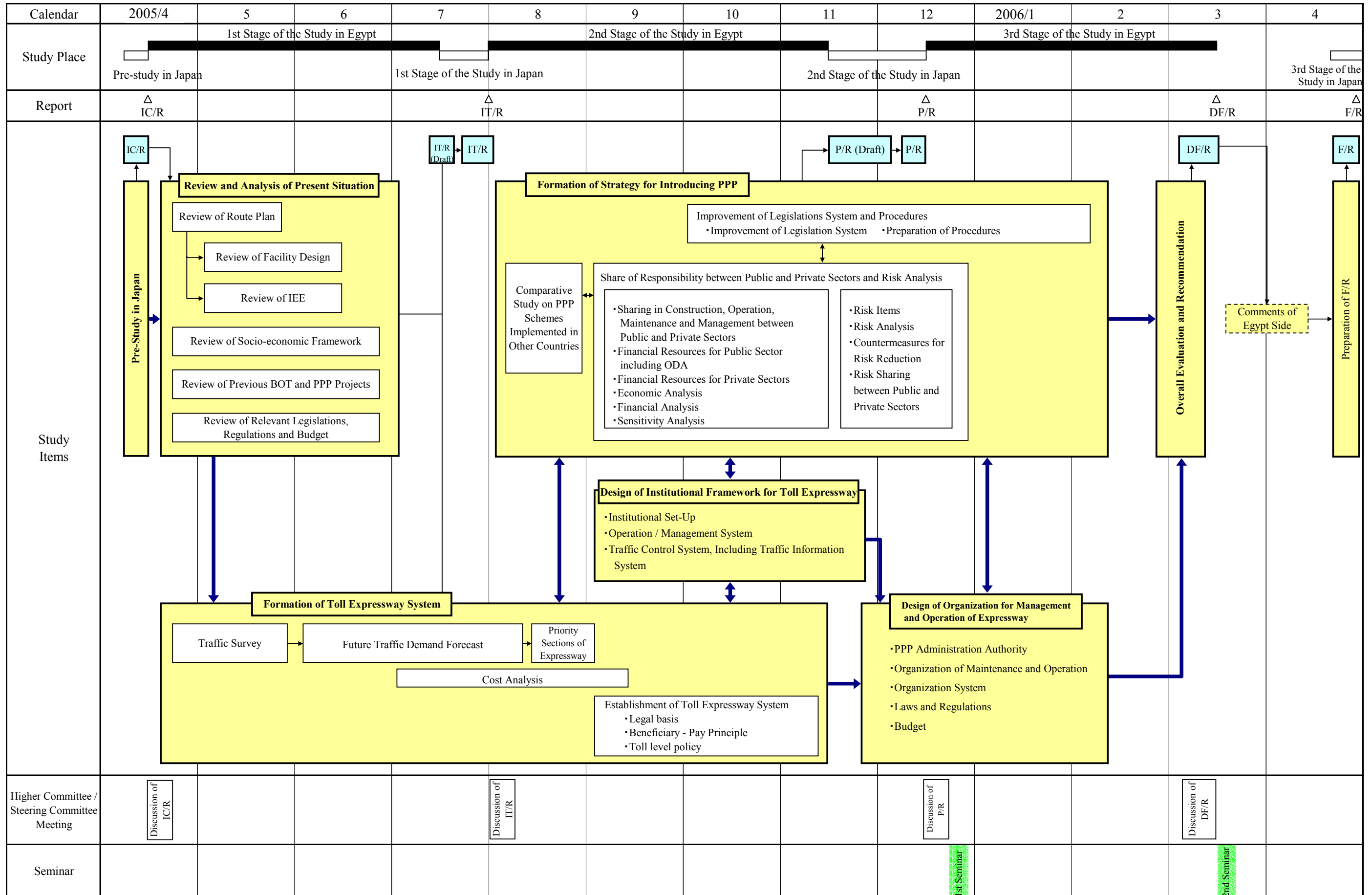


Figure 1.5-1 Study Flow Diagram

1.6 ORGANIZATION OF THE STUDY

The Organization Chart of the Study is shown in Figure 1.6-1.

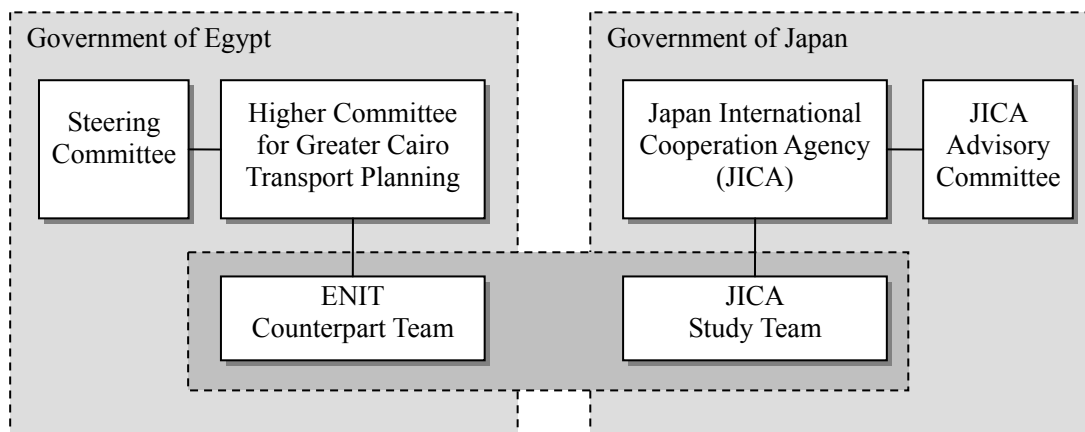


Figure 1.6-1 Organization Chart

The Study was requested to the Government of Japan by the Higher Committee for Greater Cairo Transport Planning. The members of the Higher Committee are:

- | | |
|--|---|
| 1) H.E. Eng. Mohamed MANSOUR
(From Dec. 30, 2005) | Chairman of the Higher Committee,
Minister of Transport |
| 2) H.E. Dr. Essam SHARAF
(To Dec. 29, 2005) | Chairman of the Higher Committee,
Minister of Transport |
| 3) Counselor / Mahmoud Ibrahim
Mahmoud IBRAHIM | State Council, Ministry of Justice |
| 4) Eng. Hassan Ahmed SELIM | Vice Chairman, Transport Planning Authority,
Ministry of Transport |
| 5) Eng. Mohamed FOUDA | Chairman, General Authority for Roads, Bridges
and Land Transport, Ministry of Transport |
| 6) Eng. Saad Hassan SHEHATA | Chairman, National Authority for Tunnels,
Ministry of Transport |
| 7) General / Atef A. MOSTAFA | Chairman, Egypt Holding Company for
Aviation |
| 8) Dr. Hazem EL KOUEDI | Chairman, General Organization of Physical
Planning, Ministry of Housing |
| 9) Eng. Nabil Fathi EL MAZNY | Chairman, Cairo Transport Authority,
Cairo Governorate |
| 10) General / Fawzy A. HASSAN | Director, Cairo Traffic Police Department,
Ministry of Interior |

- | | | |
|-----|------------------------------|---|
| 11) | General /Mohamed MANSOUR | Director, Giza Traffic Police Department,
Ministry of Interior |
| 12) | General /Yousef TEAIMA | Director, Qalyobeya Traffic Police Department,
Ministry of Interior |
| 13) | Eng. Ahmed El Araby SOBAIH | Secretary General, Qalyobeya Governorate |
| 14) | Eng. Ali Abdel-Hafez YOUNES | Director, Roads and Transport Directorate,
Cairo Governorate |
| 15) | General / Mohamed S. HUSSEIN | Head of Giza City, Giza Governorate |
| 16) | Prof. Dr. Mohamed El HAWARY | Professor of Transportation Planning,
Cairo University |
| 17) | Prof. Dr. Ali S. HUZAYYIN | Professor of Transportation and Traffic
Engineering and Planning, Faculty of
Engineering and Director of DRTPC,
Cairo University |
| 18) | Prof. Dr. Galal Mostafa SAID | President, Fayoum University, Professor of
Transportation and Traffic Engineering |
| 19) | Prof. Dr. Mohamed EL MITAINY | Professor of Highway and Traffic Engineering,
Faculty of Engineering, Cairo University |
| 20) | Eng. Mokhtar Mostafa HASSAN | Minister's Consultant, Ministry of Transport |
| 21) | Prof. Dr. Abdallah WAHDAN | Director, Egypt National Institute of Transport |
| 22) | Eng. Magdi EL-AZAB | Chairman, National Authority for Tunnels |
| 23) | Eng. Hanafi M. ABDEL-KAWI | Chairman, National Railway Authority |

The Steering Committee, with representation from the agencies comprising the Higher Committee and other agencies concerned guided the implementation of the Study and solved problems in coordination matters. The members of the Steering Committee are:

- | | | |
|----|------------------------------|---|
| 1) | Prof. Dr. Ali S. HUZAYYIN | Chairman of the Steering Committee
Professor of Transportation and Traffic
Engineering and Planning, Faculty of
Engineering and Director of DRTPC,
Cairo University |
| 2) | Prof. Dr. Galal Mostafa SAID | President, Fayoum University
Professor of Transportation and Traffic
Engineering |
| 3) | Prof. Dr. Mohamed EL MITAINY | Professor of Highway and Traffic Engineering,
Faculty of Engineering, Cairo University |
| 4) | Prof. Dr. Ali S. HEIKAL | Professor of Transportation and Traffic, Faculty
of Engineering, Ain Shams University |
| 5) | Prof. Dr. Abdallah WAHDAN | Director, Egypt National Institute of Transport |

- | | |
|----------------------------------|--|
| 6) Prof. Dr. Moustafa Sabry ALY | Professor of Transportation and Traffic, Faculty of Engineering, Ain Shams University |
| 7) Eng. Mohamed Abdel-Aziz FOUDA | Chairman, General Authority for Roads, Bridges and Land Transport |
| 8) Eng. Nabil Fathi EL MAZNY | Chairman, Cairo Transport Authority |
| 9) Eng. Ali Abdel-Hafez YOUNES | Director, Roads and Transport Directorate, Cairo Governorate |
| 10) Eng. Hassan Ahmed SELIM | Vice Chairman, Transport Planning Authority, Ministry of Transport |
| 11) Eng. Fifi M. ABDEL-GHANI | Executive Director, Traffic Engineering and Management, Cairo Governorate |
| 12) Eng. Shadia M. ABDEL SALAM | Undersecretary, General Organization for Physical Planning, Ministry of Housing, Utilities and Urban Communities |
| 13) General / Fawzy Ahmed HASSAN | Director, Cairo Traffic Police Department, Ministry of Interior |
| 14) General / Mohamed MANSOUR | Director, Giza Traffic Police Department, Ministry of Interior |
| 15) Eng. Enayat Benyamin KOLTA | Director, Productive Services Sector, Ministry of Planning |
| 16) Mr. Nabil ABDEL HAMID | Ministry of International Cooperation |
| 17) Mr. Ahmed ABOU EL-SEOUD | Ministry of Environment |
| 18) Dr. Sherif Arafat OTEIFA | Ministry of Investment |

For the smooth implementation of the Study and to assure optimum technology transfer, the Egyptian side assigned a Counterpart Group from relevant agencies headed by Egypt National Institute of Transport (ENIT) to work closely with The Japanese Study Team. The Counterpart Team (CPT) is headed by Prof. Dr. Abdallah WAHDAN, Director of ENIT (Egypt National Institute Transport) and consisting the following members:

- | | |
|-------------------------------|--|
| Eng. Ahmed Bassyouny SHEHAB | General Authority for Roads, Bridges and Land Transport |
| Eng. Mofeed Fawzy GHALEY | Director, Cairo Roads & Transport Authority, Cairo Governorate |
| Eng. Maram Mahmoud SAUDI | General Authority for Roads, Bridges and Land Transport |
| Eng. Doa'aa Mohamed ABDELLAH | Traffic Planning Organization, Housing and Utilities Authority |
| Eng. Ghonim Abdel Haye GHONIM | Transportation Planning Authority, Ministry of Transport |

Eng. Samy Mahmoud ABU ZEID	General Organization of Physical Planning (GOPP), Ministry of Housing
Eng. Bahy Youssef BESALEY	Productive Services Sectors Center, Ministry of Planning

Guidance for the Study is realized through JICA Advisory Committee consisting of the following Japanese Government Officials:

Prof. Dr. Noboru HARATA	Chairman, JICA Advisory Committee Professor, Graduate School of Frontier Science, University of Tokyo
Mr. Yasushi TANIGUCHI	National Expressway Planning Division, National Expressway Department, Japan Highway Public Corporation

The Study was carried out under Transportation Team II, Group III, Social Development Department, JICA Headquarters in Tokyo:

Mr. Akira NAKAMURA	Group Director
Mr. Yuichi SUGANO	Team Director
Mr. Nobuhiro KAWATANI	Project Coordinator

In Cairo, the Study was supervised by JICA Cairo Office:

Mr. Shigeru OKAMOTO	Resident Representative
Mr. Taro AZUMA	Assistant Resident Representative
Mr. Kenshiro TANAKA	Assistant Resident Representative
Mr. Alfred ZOSER	Project Officer

The Study was carried out by the Study Team organized by JICA which is composed of the following experts:

Dr. Hani ABDEL-HALIM	Team Leader / Transport Plan
Ms. Mariko OGAWA (From September 1, 2005)	Deputy Team Leader / PPP Structure
Mr. Keiichiro IWATA (Up to August 31, 2005)	Deputy Team Leader / PPP Structure
Mr. Tatsuyuki SAKURAI	Deputy Team Leader / Toll Road Institution / Operational Plan
Dr. Ahmed Hamdy GHARIEB	Traffic Survey and Analysis

Mr. Ryuichi UENO	Demand Forecast
Mr. Kiyohito KOBAYASHI	Project Cost Analysis
Mr. Toshio KIMURA	Economic / Financial Analysis
Ms. Yumiko NODA	PPP Guidelines / Bidding Documents (1)
Mr. Alaa El SOUENI	PPP Guidelines / Bidding Documents (2)
Dr. Ahmed El-HAKIM	Toll Road Operation / Maintenance
Mr. Munehiko ETO	Financial Plan
Mr. Tsuneo BEKKI	Transport Policy
Mr. Masakazu ISHIGURO	Fund Arrangement

The traffic surveys of the Study were carried out by:

- The Engineering Consulting Center (ECC), Faculty of Engineering, Ain Shams University

1.7 TECHNOLOGY TRANSFER TO COUNTERPART TEAM

The main functions of the Counterpart Team are;

- (i) Technology Transfer Process
 - Understand the process and conclusion of the Study so that the conclusions, recommendations and other contents of the reports can be practiced as intended.
 - On-the-job training
- (ii) Assistance to the Study Team Members
 - Attend the meeting of the Study Team Members with relevant institutions and persons.
 - Arrange the above meeting.
- (iii) Preliminary Advice to the Study Team
 - Advise on the main issues to be discussed with the Steering Committee and Higher Committee beforehand.
 - Advise or discuss with the Study Team Members on various matters related to the Study.

In this regard, it is recommended that in future studies, the Counterpart Team should be assigned in a full-time basis with the Study Team during all the stages in order to get more practical chance for practicing actual work tasks included in the Study. Such team should formulate the core of a near-future organization that will handle all the activities

of the Greater Cairo Urban Toll Expressway Network from the very early beginning of project implementation.

1.8 MEETINGS AND SEMINARS

During the course of the Study in Cairo, numerous meetings were held with many officials of governmental agencies and private sector representatives, related to the urban toll expressway project, for discussion on project implementation including a meeting with Cairo Governor on August 24, 2005. With the positive response to the project, discussions focused on ways to realize its implementation and measures to be considered for its social acceptance.

In addition, a general stakeholder meeting and two seminars were held in order to provide information on the urban toll expressway network project and to get the opinion and feedback from road-users and officials of different related agencies, including Misr Travel, Association of Land Transportation, Holding Company of MOT, TPA and the Investment Department of GARBLT.

1.8.1 Stakeholder Meeting

A stakeholder meeting was held on October 22, 2005 to discuss with different agencies on the implementation of an urban toll expressway network in Cairo. The meeting was attended by many representatives of transport and road construction companies and road investors as well as members of the counterpart team.

A summary of the Study and its interim results were presented and open discussion was carried out. The major outputs of the meeting can be summarized as follows:

- Roads with alternatives should be subject to applying toll system as the Government expenditures on road infrastructure are very high. Such toll can not be considered as new taxes as road users will practice high level-of-service with savings in travel time and vehicle operation cost. In the mean time, the non-toll alternatives are available for users who do not want to use toll roads.
- A system that provides discounted toll rates should be introduced for frequent road users such as tourism buses, etc.
- Economic and financial feasibility of the expressway projects are important to encourage road investors, including road construction companies, to participate in financing and implementing the project.
- To apply reasonable toll rates, the support of the Government is necessary for the successful implementation of the project. This support can be done by incorporating

existing roads in the network of toll expressways, such as the ring road.

- With the implementation of the elevated expressway network, great attention should be also given to improvements in the at-grade road network in order to keep it in a good functioning condition.
- The BOT system is difficult to apply in road and expressway projects and different schemes should be developed through the participation of both public and private sectors (PPP).
- Applying low rates may not cover the required capital investments and will create a financing gap. To cover this gap and in addition to direct Governmental support, other commercial-base approaches should be introduced by the participating private sector.
- A new independent entity or authority is required to implement and manage and operate the project as it has different tasks and characteristics than roads under GARBLT.
- During the different stages of the project, including planning and construction, full coordination with all related agencies and ministries should be done, including the Ministries of Defense, Culture and Tourism.

In general, positive ideas were discussed as all the attendants realize that there are severe traffic and transportation problems in Cairo at present and these problems will increase in the future if serious actions will not be done.

1.8.2 Seminar - 1

This seminar was held on December 26, 2005 and was attended by the Minister of Transport and Cairo Governor in addition to more than eighty guests who share in comprehensive and detailed discussions on different technical and financial aspects of the project. Guests consist of members of the Higher and Steering committees and the Counterpart Team, university professors, traffic police departments, officials in different agencies under MOT, officials from the ministries of Planning, Housing, Finance, representatives of the three governorates of Cairo, Giza and Qalyubeyya, transport authorities and companies, road construction contractors and mass media as well as Japanese Chamber of Commerce in Cairo and representatives of other Japanese governmental agencies.

After an introductory by ENIT Director, the agenda of the Seminar included speeches by the Minister of Transport and the Governor of Cairo. The Minister stressed the need for a ministerial committee that can supervise the transport system of Greater Cairo and to activate the transport plans with an updating and revising mechanism. He indicated also that the value of time should be considered as losses due to traffic congestion

together with the negative environmental impact that deteriorate the quality of life. The Governor called for a fixed policy and scientific vision for the development of the transport system that can be accomplished through partnership between both public and private sectors.

The Chairman of the Steering Committee presented the background of JICA studies on the urban transport system of Greater Cairo as well as the historical concept of collecting toll. Next, a summary of the different components of the Study, including the expressway network planning process, toll setting, institutional set-up, PPP structure and cash-flow-analysis were presented and followed by a special presentation on what makes good PPP and bad PPP. An open discussion was carried out. The major outputs and comments of the meeting are summarized as follows:

- The necessity to immediately start in taking actions toward the implementation of the project by carrying out required feasibility studies.
- The justification of collecting toll from existing links, including the Ring Road that is currently subject to another upgrading study, which will function as a part of the urban expressway network: This issue is considered as a form of subsidy and public partnership for successful implementation of PPP programs. A social study and campaign for road-users' understanding are required. In our Study, it is assumed that toll will be collected separately for the Ring Road.
- Role of private sector in the first phase of high priority sections: As a start, the construction cost of the first phase is recommended to be covered by soft ODA loans, while operation and other activities will be handled by the private sector. Success in implementing the first phase will attract private sector to participate in all activities of the following phases.
- Greater Cairo land use plans: are considered in formulating the integrated transport master plan of CREATS and in the prioritization criteria of expressway links.
- Impact of elevated expressways on at-grade streets: As a portion of traffic will divert to use the expressways, traffic on at-grade streets is expected to reduce.
- Congestion on at-grade streets at expressway exits: It is not expected due to reduction in street volumes and appropriate design and location of ramps.
- Toll rate and vehicle size: Toll for large-sized vehicles is considered as twice the toll of large-sized vehicles and toll depends on size of vehicles rather than the weight.
- Toll exemptions: A legislation system should be established to identify vehicles that are not subject to paying toll on roads, which should be the vehicles under emergency situations.
- Financial viability of expressways with low toll revenue: Political commitment is important for project success and government subsidy will be required.
- Flat toll rate or distance-dependent rate: For urban expressways, flat rate is adopted

due to technical constrains, but with the development of ETC systems it is possible to apply distance-dependant rate as the case of Tokyo.

- More severe congestion on existing links E1 and E2 after completion of the network: At that time, there will be other alternatives that will encourage traffic to divert.
- Mechanical troubles of old vehicles: A social campaign is required for drivers' awareness regarding the optimum use of the network.
- Coordination between different agencies: A new organization to be in-charge of all aspects of the network is required under a ministerial committee that provides better coordination between all agencies related to Cairo transport system and expressways construction and operation.

1.8.3 Seminar - 2

This seminar was held on March 8, 2006. It was attended by the Chairman of JICA Advisory Committee and representative of JICA Headquarters in Tokyo. About one hundred guests attended the Seminar consisting of members of the Higher and Steering committees and the Counterpart Team, university professors, traffic police departments, officials in different agencies under MOT, officials from the ministries of Planning, Housing, Finance, representatives of the three governorates of Cairo, Giza and Qalyubeyya, transport authorities and companies, road construction contractors, engineering consultants and mass media as well as representatives from the Embassy of Japan, Japan Bank for International Cooperation (JBIC), JICA Cairo Office and members of the Japanese Chamber of Commerce in Cairo.

After an introductory by the Director of ENIT, the Chairman of the Steering Committee presented the background of the Study. It was followed by a presentation on JICA's cooperation in Egypt and in the urban transport planning of Greater Cairo. Then, the Chairman of JICA Advisory Committee presented an overall perspective and challenges for the future regarding the urban transport system in Greater Cairo stressing on the need to follow the formulated plans of all sectors. The Study Team clarifies the steps to be followed toward successful PPP schemes in addition to topics, contents and results of the Study. Next, an open discussion was carried out with the following major output:

- Vehicles to be exempted from paying the toll are only under emergency cases for those of police, ambulance, fire-fighting vehicles and MEA vehicles. All other vehicles should be subject to toll charges. Payment arrangements can be done for other special cases such as the expressway closure due to the exclusive use by national guests, etc.
- With a balanced risk sharing between the public and private sectors is the key to successful PPP schemes. Project risks are allocated to the party that is the best

equipped to manage them. PPP contracts often include incentives that reward private partners for mitigating risk factors.

- For network facilities, the asset management is a strategic business process and decision-making approach to managing the on-going maintenance needs of the physical assets and all components of the urban toll expressway network.
- From the private sector business entity perspective, PPPs provide expanded business opportunities to provide services not part of traditional expressway development. Private entities are able to compete on the basis of a broader set of technical skills and expertise.
- Regarding the issue on the possibility of collecting tolls from existing elevated roads not only newly constructed roads, it was clarified by Counselors of the Cabinet, in January 20, 2002, that developing and improving works on existing roads is considered as construction works that allow to collect toll from road-users, as applied in other existing toll roads.
- The governmental finance is recommended for constructing the first sections of the network, through ODA soft loans for example, with private sector participation in operation and maintenance. This approach will attract private sector investments in constructing following sections.
- The urban toll expressway network is not implemented for rich people as it has the objectives of contributing to the national, regional and urban development and to reduce traffic congestion on the existing network.
- The cost of transferring existing utilities is not considered in the cost rough estimation of the Study, however, the cost includes contingency with additional 10% of both construction and engineering costs. A more accurate cost will be estimated in the coming stages of feasibility study and detailed.
- Rather than using existing organization, implementing a high efficiency urban expressway network requires new organization as the “Core Task Force” for promotion of the Project. It should develop new ideas and practice strong energy for promotion of the new infrastructure that covers the three governorates of Cairo, Giza and Qalyobeya.

PART I

TRANSPORT DEMAND FORECAST

CHAPTER 2

CAIRO ROAD TRANSPORT SYSTEM

CHAPTER 2

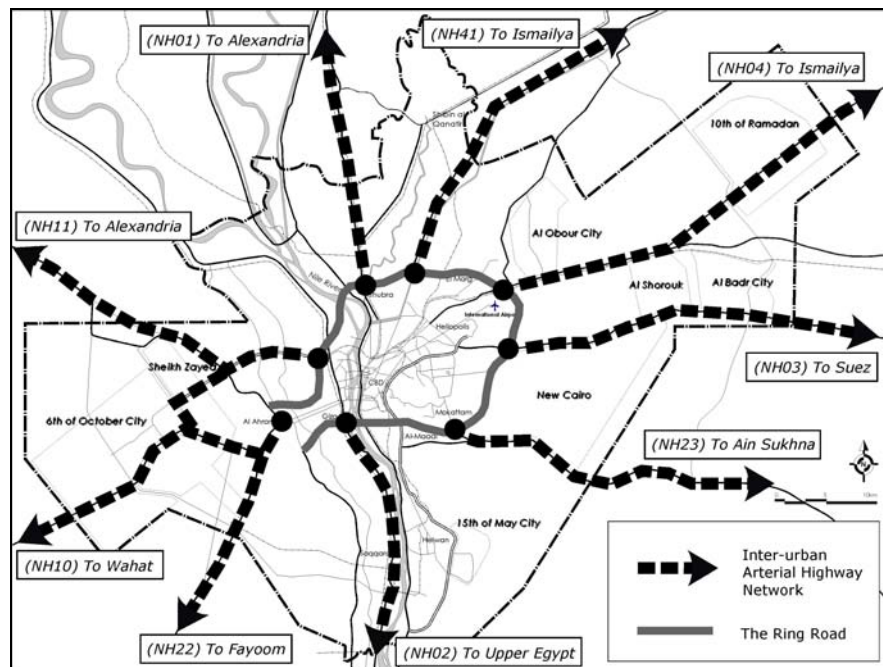
CAIRO ROAD TRANSPORT SYSTEM

2.1 ROAD TRANSPORT SYSTEM*

Cairo and its surrounding (Greater Cairo Region GCR) are the centroid of Egypt. GCR due to its strategic central location, high population density and the high concentration of economic and social activities acts as the heart of the nationwide road network. Several plans and studies related to the development of the transport system of Greater Cairo are presented in Appendix 2.1, including:

- National Development Plans
- Greater Cairo Region Development Plan
- Cairo Regional Area Transport Study (CREATS – Phase I)
- Cairo Regional Area Transport Study (CREATS – Phase II)
- Toll Roads in Egypt
- Development of Greater Cairo Region Ring Road

Along the decades, the road network has formed a radial-circumferential pattern of inter-urban road network (Arterial Highways) around Greater Cairo as can be recognized in Figure 2.1-1.



Source: CREATS, Phase I, Vol.3

Figure 2.1-1 Major Arterial Highways

*The original data of this section are obtained from CREATS, Phase I, Vol.3, Chapter 9. However, updating of data is considered based on Study Team new findings.

The previous studies and traffic counting show that among the arterial highways, Cairo-Alexandria Agricultural Highway is the heaviest corridor, followed by Cairo-Ismailia Desert Highway. Table 2.1-1 presents the inter-urban traffic volumes and estimated annual traffic growths of the major arterial highways where high growth rates are recognizable.

Table 2.1-1 ADT of Major Arterial Highways

No.	Corridor Name	1991 Volume (veh./day)	2000 Volume (veh./day)	2000/1991	Annual Growth %
NH11	Alexandria Desert Road	8,821	17,886	2.03	7.32
NH01	Alexandria Agriculture Road	38,919	55,163	1.42	3.55
NH04	Ismailia Desert Road	8,961	*32,772	3.66	13.83
NH41	Ismailia Agriculture Road	5,724	10,109	1.68	5.35
NH03	Suez Desert Road	4,907	10,962	2.23	8.37
NH21	Upper Egypt Desert Road	8,604	10,349	1.20	1.86
NH22	Fayoom Desert Road	4,846	10,792	2.08	8.34

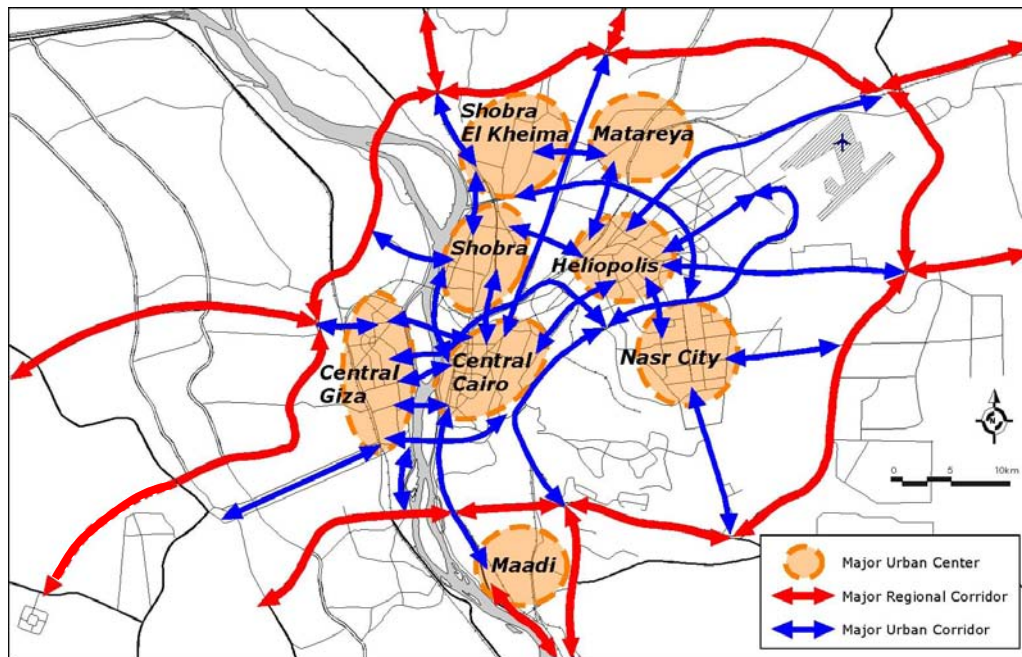
Source: General Authority for Roads, Bridges and Land Transport and CREATS, Phase I, Vol. 3.

*Note: NH04 Year 2000 Volume is an estimated value from 1999 volume due to the change of counting location, which explains the higher annual growth rate.

The road transport system in the Study Area is classified by CREATS Study into two major categories. One is the Regional Corridor Network that is served by the Major Arterial Highways and the second is the Urban Corridor Network that is presented in Figure 2.1-2. The first is characterized by higher design standard to serve the regional traffic movements. The second serves the traffic among the urban centers mostly inside the Ring Road.

The major regional corridors generally are divided highways with high design speed (90 ~ 100 km/hr). The Ring Road is planned as a physical boundary of urban area and as a bypass of urban centers for regional traffic. The Autostrade (Al Nasr Road) is planned to accommodate recognizable traffic volume between Helwan, 15th of May City, Maadi on one side and Nasr City, Heliopolis on the other. The 6th of October corridor is acting as an urban expressway passing the major Cairo CBD and connect the east and west areas of the River Nile. It is the major connection between the major two governorates, Cairo and Giza. The current length of this corridor is about 11.3 km and now it is connected to another major corridor that is 26th of July.

Other urban corridors also generally have wide and divided multi-lane alignment especially in relatively new urban areas of Heliopolis and Nasr City where several expressway corridors are proposed.



Source: CREATS, Phase I, Vol.3

Figure 2.1-2 Urban Corridor Network

However, the rapid increases of the number of vehicles and the growth of urban socio-economic activities have been escalating the traffic volume all over the region that keep creating a lot of traffic problems in the area. Those problems necessitate many of the streets to have complex direction control designations at many of intersections, which create additional turning movements and detours.

2.2 ADMINISTRATION AND ORGANIZATIONS*

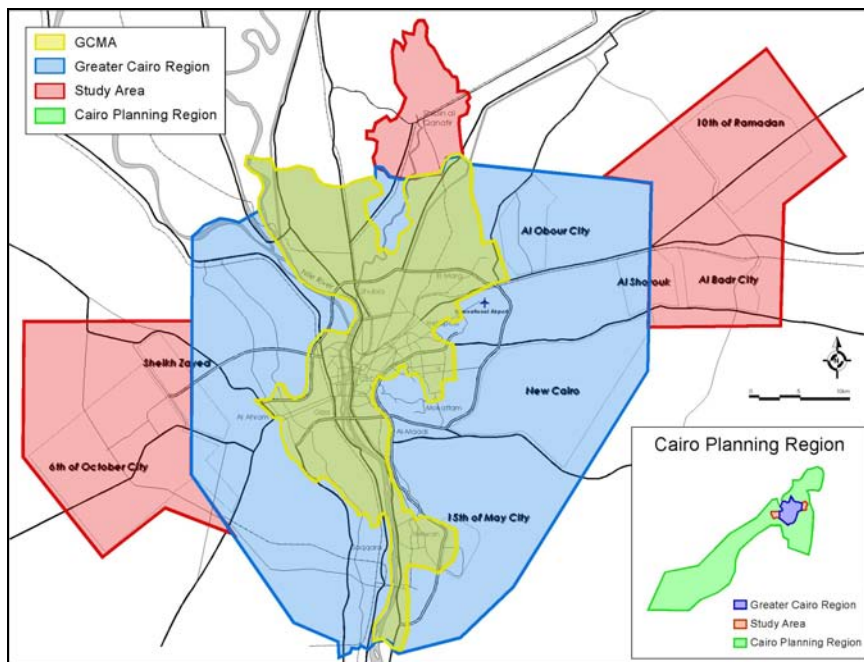
2.2.1 Administration

The Study Area covers primarily the Greater Cairo Region. But the term Greater Cairo Region does not imply the same boundaries for all related parties as can be noticed from Figure 2.2-1. In the Ministry of Planning, Cairo Planning Region encloses all the three Governorates Cairo, Giza and Qalyobeya in addition to the new city of Tenth of Ramadan which is part of Sharqeya Governorate. The total area of the Cairo Planning Region is about 36,570 km², and the majority of this area is a desert land in Giza Governorate. In the Ministry of Housing, Utilities and Urban Development, the term Greater Cairo Region includes mainly the three cities of Cairo, Giza and Shobra El Khiema without including the surrounding new communities. In the Greater Cairo Public Transport Study conducted by the National Authority for Tunnels, the term of Greater Cairo Metropolitan Area

*The original data of this section was obtained from CREATS, Phase I, Vol.3, Chapter 9. However, data is updated based on new findings.

(GCMA) was used to represent urban boundaries of the above mentioned three cities. Such different definitions can be some times a source of misunderstanding. Therefore, concerned authorities are recommended to reach an agreement about a defined boundary of the Greater Cairo Region in order to match the different planning and budgetary efforts. The area of the Greater Cairo Region as defined in this Study follows the previous CREATS Studies and it is about 2,110.94 km².

In Egypt each Governorate is divided into Qisms (in the Urban Governorates) or Markazs (in Rural Governorates). Each Markaz is a local administration unit with regard to police and public services and thus has its local budget, but in Cairo and Giza each several Qisms, makes larger administrative units called “Hay”. Cairo City has 39 Qisms, Giza City has 13 Qisms and Shobra El Khiema City has 7 Qisms. Each Hay has a Head of the Hay appointed by the relevant Governor. Each of the New Cities and New Communities in the Study Area has its development organization which is in charge of the management of all the public services (including transportation) within the new city or new community. Examples are the Tenth of Ramadan Development Organization and the Sixth of October Development Organization. These development organizations are under the Ministry of Housing, Utilities and Urban Development and their budget are channeled to them from the budget of that Ministry. It is supposed that the administration of the new communities will be transferred to the relevant governorate when the new city and/or new community reaches maturity, but so far no such transfer has taken effect.



Source: CREATS Phase I, Vol.3

Figure 2.2-1 Administrative and Planning Boundaries in the Study Area

2.2.2 Organizations

Although transportation is one of the public services, but it differs from other services such as water supply, sewage or telephone communication. The planning, implementation and operation of other services are usually managed by a single authority, while there are many organizations involved in some aspect or another of the transportation service, as presented in Table 2.2-1 which gives an overview of the role of each of the related organizations in the field of urban transportation in the Study Area.

Table 2.2-1 Major Transport Organizations in Greater Cairo

No.	Organization	Roles
Ministry of Transport (MOT)		
1	The Higher Committee for Greater Cairo Transportation Planning (HC)	Established by a Prime Ministerial Decree in 2000. The Committee is headed by the Minister of Transport and is responsible for the overall transport planning projects of the Greater Cairo Region. The Committee supervises the current PPP Program for Cairo Urban Toll Expressway Network Development (CUTEND) and is expected to be responsible about the program implementation plan.
2	Transport Planning Authority (TPA)	Although this Authority is concerned mainly with national level transport planning, it has commissioned several studies about some transport issues in Greater Cairo Region such as: <ul style="list-style-type: none"> - Survey of own Account Passenger Transport by Government Agencies in GCR (1985) - The Development of the Role of the Private Sector in Urban and Inter-city Passenger Transport (1986) - Cairo Metro Interchange Coordination Study (1987) - Greater Cairo Public Transport Fare Policy Study (1992-1995) - Cairo Urban Transport Project (1980) - Greater Cairo Transportation Planning (1973)
3	Egypt National Institute of Transport (ENIT)	<ul style="list-style-type: none"> - The Institute provides higher studies in the fields of transport planning, transport engineering and transport economics. - It provides technical training for the employee in the transport sector. - It conducted limited number of studies such as a study about the effect of underground metro as a transportation mean for the limited income group. - It maintains a library for transportation science. - The Institute is the executive agency for the Higher Committee for Greater Cairo Transportation Planning.
4	The National Authority for Tunnels (NAT)	NAT is in charge of planning and implementation of Metro and tunneling Projects such as Cairo Metro Lines and Car Tunnels.
5	The Cairo Metro Organization (CMO)	CMO is a part of the Egyptian National Railway.
6	The Egyptian National Railways (ENR)	ENR is the Authority in charge of planning, implementation, operation and maintenance of the national railway network including GCR.
7	The General Authority for Roads, Bridges and Land Transport (GARBLT)	GARBLT is the Authority in charge of planning, implementation, operation and maintenance of the intercity national road network. Because the boundaries of Greater Cairo Region extends beyond the limits of the road departments of the three Governorates, parts of the road network of Greater Cairo are under the jurisdiction of GARBLT.
Ministry of Housing, Utilities and Urban Development (MHUUD)		
8	The General Organization for Physical Planning (GOPP)	GOPP is responsible for setting the overall policy for physical planning, preparing urban development plans and the supervision of the implementation of these plans. The GOPP has a Regional Urban Planning Center for the Greater Cairo Region. The GOPP has prepared the development plan for the Greater Cairo Region which is one of the

		main inputs for the preparation of the long term transportation planning for Greater Cairo Region. Beside its role in physical planning, the GOPP has planned some transport projects in the Greater Cairo Region such as the Ring Road, 15 th of May corridor, traffic planning in Roxy Area and traffic planning in Azhar Street.
9	The Central Development Organization (CDO)	The Central Development Organization has several regional executive organizations. One of them is the Executive Organization for Greater Cairo Development. This Organization is the implementing body for the projects related to future developments of the Greater Cairo. It is the Organization in charge of the implementation of the New Communities Projects around Cairo and Giza Cities. Beside the implementation of the new communities, the Executive Organization for Greater Cairo Development has implemented transportation projects such as Cairo Ring Roads, 26 th of July corridor, traffic improvement in Sphinx Square, traffic improvement in El Galaa Square, etc.
10	The New Urban Communities Advisory	Implementation of land use plans.
Ministry of Interior (MOI)		
11	The Traffic Police Directorates for Cairo, Giza and Qalyobeya Governorates	<ul style="list-style-type: none"> - Vehicle inspection and issuance of vehicle operation license - Issuance of driving license - Enforcement of traffic regulations - Traffic management and control - Monitoring of traffic control measures
12	Central Traffic Directorate	<ul style="list-style-type: none"> - Enforcement of traffic regulations and monitoring of traffic control measures on national roads including those leading to GCR
Ministry of Planning (MOP)		
13	Transportation Sector	<ul style="list-style-type: none"> - Preparation of the five-year development plans for the transportation sector on the national and regional levels. - Coordination and preparation of the budget for the five-year development plans.
Cairo Governorate		
14	Cairo Traffic Engineering Bureau (CTEB)	Traffic Engineering and Planning for Cairo Governorate
15	Roads and Transport Directorate (RTD)	Planning, implementation and maintenance of road projects within Cairo Governorate.
16	Cairo Transport Authority (CTA)	Planning, operation and maintenance of busses, minibuses, river busses and tram network in the Greater Cairo Region Monitoring private operators of bus and minibus services
Giza Governorate		
17	Roads and Transport Directorate	Planning, implementation and maintenance of road projects within Giza Governorate.
Qalyobeya Governorate		
18	Roads and Transport Directorate	Planning, implementation and maintenance of road projects within Qalyobeya Governorate.
Other Governmental Organizations		
19	Greater Cairo Bus Company	Subsidiary of the CTA
Non Governmental Organizations and operators		
20	Operators of Microbus Taxi Service	Individual operation of Microbus taxi service
21	Taxi Operators	Operate the taxis equipped with fare meters.
22	Operators of Special Use Buses	These buses are owned by governmental or private bodies for the exclusive transportation of its employee or tourist groups.
23	Operators of Limousine taxi	Limousine Taxis and Metropolitan Taxis are operated by travel companies for transportation between the airport and the hotels and for hotel service.

Source: Modified and updated based on CREATS Phase I, Vol. 3

In GCR the organizations related to transport can be divided into Governmental and Private Organizations. The former can be divided into National Governmental Organizations that belong to one of the Ministries and Local Government Organizations that belong to one of the Governorates. Examples of the National Governmental Organizations are the National Authority for Tunnels (NAT), the General Authority for Roads, Bridges and Land Transport (GARBLT), and Egypt National Institute of Transport (ENIT). Although such organizations are concerned mainly with the issues of national transport, they also deal with many issues at the regional level of Greater Cairo.

The Ministry of Housing, Utilities and Urban Development (MHUUD) has a special role in urban transport of GCR. The Ministry is in charge of the preparation of the land use plans for the whole of Egypt. The development of new urban communities within GCR and around Cairo comes under its role. The development of the new communities started about 20 years ago by the two cities of the Tenth of Ramadan City to the East of Cairo and the Sixth of October City to the West of Giza. The industrial growth of these two cities together with other new communities around Cairo and Giza has, and will have, considerable effects on the transport patterns in the GCR. MHUUD has constructed the Ring Road around Cairo Region (which was later transferred to the Ministry of Transport) in addition to the 15th of May Corridor (it is also transferred to Cairo Governorate) which connects the Sixth of October City to Cairo. Almost half of the national investments in transport in GCR are allocated to projects implemented by MHUUD.

The Traffic Police which is under the Ministry of Interior is responsible for the enforcement of traffic rules, issuance of driving license and vehicle operation license. The Traffic Police is also involved in traffic planning and management. There is a Traffic Police assigned for each Governorate in addition to the Central Traffic Directorate which is in charge of traffic on national roads and those leading to GCR.

Each Governorate has its own Roads and Transport Directorate for road planning, construction and maintenance. Cairo Governorate has established Cairo Traffic Engineering Bureau (CTEB) to be in charge of traffic engineering and planning in Cairo, but other Governorates do not have similar organizations. Cairo Transport Authority (CTA) which is under Cairo Governor is in charge of the operation of buses, minibuses, river buses and tram network for all GCR. Due to pricing ceilings imposed on public transport fares, CTA has not been able to expand its services to meet the demand. To attend partially the demand to improve bus service, Greater Cairo Bus Company (GCBC) has been established as subsidiary of the CTA. The company operates air conditioned buses on selected main routs.

Historically, the Private Sector was involved in bus and tram operation until the Fifties of last century. Since then Public Sector took over and the role of private sector was limited to ownership and operation of taxis within and between cities. The inability of CTA to cope with increasing demand in trips has opened the door to the rapid growth of shared taxis or minibuses. The share of these shared taxis has reached to about 40% of the total public transport trips in GCR. Most of these minibuses are owned and operated by individuals and their irresponsible driving behavior is one of the main reasons of traffic problems in GCR. Taxis equipped with fare meters are mostly owned and operated by individuals mainly because the controlled fares does not make its operation attractive to company ownership. Most of these taxis are more than 10 years old and large portion are more than 20 years old. Cargo trucks are mostly owned and operated by either private companies or private individuals.

2.2.3 Transport Organizations

Figure 2.2-2 shows the current institutional setup of the main organizations related to transport in GCR on the regional level.

The Higher Committee for Greater Cairo Transportation Planning (HC) is chaired by the Minister of Transport, its members are the representatives from related organizations and ENIT is its executive agency.

The functions of HC as defined in the Prime Minister Decree are:

- Defining the boundary of the Greater Cairo Region (GCR) so as to insure the integration of planning and implementation of transport projects.
- Execute the procedures for the preparation of transport plans for the GCR and follow-up of implementation including the preparation of long term comprehensive plan for the region to cope with transport demand and to improve the transportation efficiency and improve service level.
- Preparation of terms of reference for the studies of the comprehensive transport master plan and preparation of all required elements for starting these studies.
- Technical follow-up of the steps and phases of the preparation of the Master Plan.
- Evaluate studies, approve plans and establish the priorities for the implementation of transport projects within GCR. The decision of the Committee will be binding to all organizations related to Transport in the GCR.
- Follow-up of the implementation of the Comprehensive Transport Plan and evaluation of the activities of all transport related organizations in the GCR.
- Coordination between transport and traffic plans submitted from the different Governorates and approval of these plans within the framework of the Comprehensive Master Plan.
- Establishment and continuous updating of transport database.

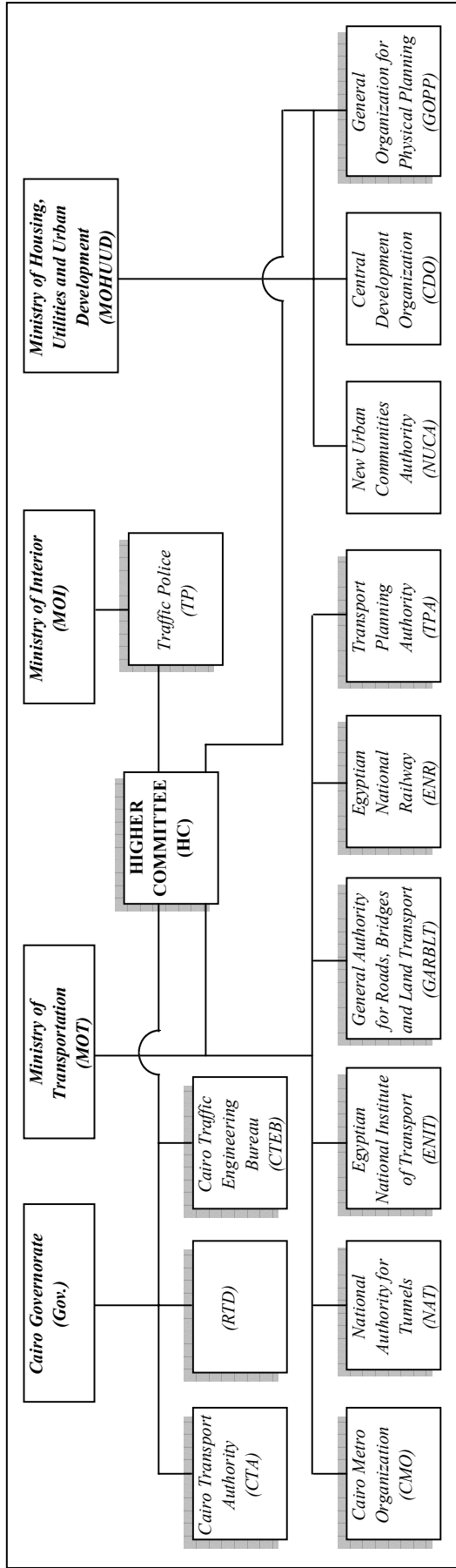


Figure 2.2-2 Current Organizations Setup (Principal Organizations only)

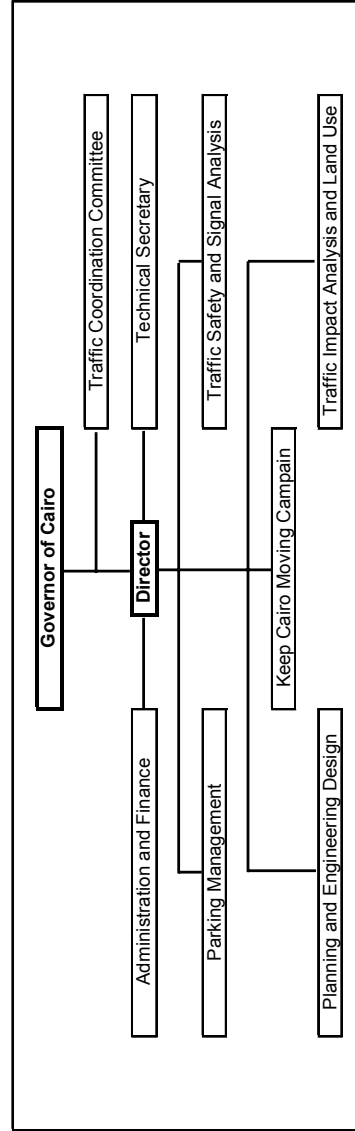


Figure 2.2-3 Organization of Cairo Traffic Engineering Bureau (CTEB)

On the local level, Cairo Governorate has established Cairo Traffic Engineering Bureau in 1997. The organization chart of CTEB is shown in Figure 2.2-3.

The principal responsibilities of CTEB as defined in the Governor's Decree are:

- Planning & Engineering Design: Study and improvement of road network including traffic design and signal design.
- Traffic Safety & Signal Analysis: Preparing traffic data base, conducting traffic surveys and Monitoring of traffic condition.
- Parking: Establishment and enforcement of parking policies.
- Keep Cairo Moving Campaign: Design and implementation of public awareness campaign to help improvement of traffic conditions in Cairo.
- Traffic Impact Analysis & Land Use: Approval of Building permissions and other activities with impact on traffic.

The staffing schedule of the technical departments mentioned above as defined in CTEB's establishment decree is 14 persons including its director, but the current technical staff is 7 persons only (Nov. 2002).

The institutional functions of regional and local levels are investigated during the MP Phase I of CREATS. The regional level means the functions that should be undertaken for the whole region of Greater Cairo and the local level means the functions that should be undertaken by local agencies on the City or Ward levels. Tables 2.2-2 and 2.2-3 show the agency responsibility matrices for these two levels.

2.2.4 CREATS Recommended Organization Setup

An organizational setup is recommended here for transportation and management in the GCR in line with the view of the World Bank expressed in Cairo Urban Transport Note, to form the Ministerial Committee for GCR Transport. It is expected that such committee will have to deal with some difficult tasks regarding the coordination between the different Ministries and Governorates. The current situation is analogous to an orchestra where each member is playing without note and without conductor. The similarity is that the note resembles a transportation master plan and the conductor resembles the function of coordination between the different organizations. Without the note and the conductor there is no symphony and without the master plan and a coordinating body there is no efficient reliable transport system. Without good coordination, the different institutions or actors operate under different incentives, and they have no inducement to collaborate with each other. Developing institutional capacity to attain effective and efficient transport system is probably the most important task for the Government and it merits high-level attention.

Table 2.2-2 Regional Agency Responsibility Matrix

Responsibility	Urban Transport ¹⁾ Policy Coordination ¹⁾		Road Infrastructure			Public Transport Infrastructure		Public Transport ⁵⁾ Coordination ⁵⁾	Traffic Management	Road Safety ⁶⁾	Traffic Enforcement	Traffic & Road Safety ⁷⁾ Coordination ⁷⁾	Accident Recording ⁸⁾	Vehicle Licensing	Vehicle Safety ⁹⁾	Traffic/Transport Training	Traffic/Transport ¹⁰⁾ Research	Urban Planning	Environment Monitoring
	(A)	(B)	Gov. ³⁾		New ⁴⁾	Rail & Metro		(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
			National ²⁾	Gov.		Gov.	Bus & Tram												
1. Policy Formulation	H.C.	GARBLT	GOV.	MOH	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
2. Program Finance	MOT	MOT	GOV.	MOH		MOT	GOV.	-	MOI	TP	MOI	NRSB	-	MOI	-	MOT	NU	MOH	MOE
3. Project	-																		
A) Identification	-	GARBLT	GOV.	MOH		E-N	GOV.	-	TP	TP	TP	NRSB	-	TP	-	ENIT	NU	MOH	MOE
B) Preparation	-	GARBLT	GOV.	MOH		E-N	GOV.	-	TP	TP	TP	NRSB	-	TP	-	ENIT	NU	MOH	MOE
C) Appraisal	-	GARBLT	GOV.	MOH		E-N	GOV.	-	TP	TP	TP	NRSB	-	TP	-	ENIT	NU	MOH	MOE
D) Implementation	-	GARBLT	GOV.	MOH		E-N	GOV.	-	TP	TP	TP	NRSB	-	TP	-	ENIT	NU	MOH	MOE
E) Supervision	-	GARBLT	GOV.	MOH		E-N	GOV.	-	TP	TP	TP	NRSB	-	TP	-	ENIT	NU	MOH	MOE
F) Monitoring ¹¹⁾	-	-	-	-		-	-	-	TP	TP	TP	NRSB	-	TP	-	-	-	-	MOE
G) Evaluation ¹¹⁾	-	-	-	-		-	-	-	TP	TP	TP	NRSB	-	-	-	-	-	-	MOE
4. Standards ¹¹⁾	-	MOH	MOH	MOH		-	-	-	-	-	-	-	-	-	-	-	NU	-	MOE
5. Regulation ¹¹⁾	-	MOT	GOV.	GOV.		-	-	-	TP	-	TP	-	-	-	-	-	NU	-	MOE
6. Control ¹¹⁾	-	MOT	GOV.	GOV.		-	-	-	-	-	TP	-	-	-	-	-	-	-	-

H.C. – Higher Committee for GCR Transportation Planning

MOT – Ministry of Transport

GARBLT – General Authority for Roads, Bridges and Land Transport (GARBLT)

GOV. – Governorate

MOH – Ministry of Housing, Utilities and Urban Development

E – N – ENR & NAT

MOI – Ministry of Interior

TP – Traffic Police

NU – National Universities

MOE – Ministry of Environment

NRSB – National Road Safety Board

Table 2.2-3 Local Agency Responsibility Matrix

Responsibility	Transport Planning ¹⁾	Road Construction ²⁾	Road Maintenance ²⁾	Road Safety Education ³⁾	Traffic Enforcement	Road Marking ⁴⁾	Traffic Signals ⁴⁾	Traffic Signs ⁴⁾	Public Transport ⁵⁾ Coordination	Public Transport Operation			Planning of Pedestrian Movement ⁶⁾	Parking Planning ⁷⁾	Tariff Control ⁸⁾	Vehicle and Fuel Taxes ⁹⁾
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	Rail & Metro (J)	Bus & Tram (K)	Micro Bus (L)	(M)	(N)	(O)	(P)
1. Policy Formulation	GOV.	GOV.	GOV.	-	TP	GOV.	GOV.	GOV.	-	E-N	CTA	CTA	-	-	GOV.	MOF
2. Program Finance	GOV.	GOV.	GOV.	-	MOI	GOV.	GOV.	GOV.	-	MOT	GOV.	PRIV.	-	-	-	MOF
3. Project																
A) Identification	GOV.	GOV.	GOV.	-	TP	GOV.	GOV.	GOV.	-	E-N	CTA	PRIV.	-	-	TP	-
B) Preparation	GOV.	GOV.	GOV.	-	TP	GOV.	GOV.	GOV.	-	E-N	CTA	PRIV.	-	-	TP	-
C) Appraisal	GOV.	GOV.	GOV.	-	TP	GOV.	GOV.	GOV.	-	E-N	CTA	PRIV.	-	-	TP	-
D) Implementation	GOV.	GOV.	GOV.	-	TP	TP	TP	TP	-	E-N	CTA	PRIV.	-	-	TP	-
E) Supervision	GOV.	GOV.	GOV.	-	TP	TP	TP	TP	-	E-N	CTA	PRIV.	-	-	TP	-
F) Monitoring	-	-	-	-	TP	-	-	-	-	-	-	-	-	-	-	-
G) Evaluation	-	-	-	-	TP	-	-	-	-	-	-	-	-	-	-	-
4. Standards	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Regulations	-	-	-	-	TP	-	-	-	-	-	-	-	-	-	-	-
6. Control	-	-	-	-	TP	-	-	-	-	-	-	-	-	-	-	-

GOV. – Governorate

TP – Traffic Police

E-N – ENR & NAT

MOI – Ministry of Interior

CTA – Cairo Transport Authority

MOF – Ministry of Finance

PRIV. – Private

MOT – Ministry of Transport

The committee will be the highest decision making body with regard to policy making for all functions related to the transport sector in Greater Cairo Region. The Committee members will be:

- Minister of Transport (MOT)
- Cairo Governor
- Giza Governor
- Qalyobeya Governor
- Minister of Interior (MOI)
- Minister of Housing, Utilities and Urban Development (MHUUD)
- Minister of Environment (MOE)

The functions of the Committee could be:

- 1) Approval and ownership of the Greater Cairo Transportation Master Plan. By ownership we mean that the Committee will be in charge of the overall implementation of the Master Plan. It will seek the approval of the Master Plan by the cabinet. It will take active steps to include the projects components of the Master Plan into the successive five year plans and seek the required approval of the Ministry of Planning, Ministry of Finance and The People's Assembly.
- 2) Take the necessary steps for the establishment of Cairo Metropolitan Transport Bureau (CMTB) and the local traffic management bureaus.
- 3) Charting the policies for the operation of CMTB and local traffic management bureaus.
- 4) Supervise and monitoring of the functions of CMTB.
- 5) Approval of the recommendations of CMTB
- 6) Coordination and integration between the related ministries and governorates.
- 7) Budget allocation for the related organization in coordination with the Ministry of Planning and the Ministry of Finance

Table 2.2-4 shows a typical organization for the performance of the required functions together with the responsibilities and resources requirements of the agencies at the metropolitan level. The contents of this table have been formulated using the current and recommended organizations.

The recommended organization setup for the regional level is shown in Figure 2.2-4. In that figure only Cairo Governorate is shown to represent any of the Governorates in the Region.

The rationale for the establishment of CMTB is that it will be the main player in integrating and coordinating of all transport related activities in the Greater Cairo Region.

Table 2.2-4 Professional Organization for Metropolitan Transport Functions (applied for GCR)

	Principal Responsibilities	Policy Functions	Professional Skills	Relationship to Other Organizations	Organization in Charge	Remarks
Urban Structure Planning	Prepare and maintain metropolitan structure plan.	Shape development structure, create basis for development controls	Land-use planners Environmental specialists, sociologists	Responsible to the MHUUD. Close cooperation with H.C for the strategic Transport Planning	GOPP – MHUUD	Existing
Strategic Transport Planning	Conduct strategic transportation studies. Prepare comprehensive transportation plans for the metropolitan area	Prepare broad strategies that other organizations should follow	Transport planners, economists, civil engineers	Responsible to the MOT. Coordinate with GOPP. Receives input from other transport organizations for the preparation of the strategies and plans.	- H.C - Urban Transport Planning Unit (ENIT)	- Existing - To be established
Traffic Management	Prepare traffic management plans. Review development proposals with traffic impacts. Operate traffic control and ITS Systems. Manage inspection and maintenance scheme. Monitor environmental impacts	Determine traffic priorities consistent with general strategy. Create parking and traffic management schemes	Traffic engineers, economists, parking specialists, electric engineers	<i>Regional Level</i> -Responsible to the Ministerial Committee for GCR Transportation. <i>Local Level</i> - Responsible to each Governorate Must work in coordination with police departments.	- <i>Regional Level</i> - CMTB - <i>Local Level</i> – ZTEB	-To be established - To be established
Public Transport	Plan and regulate public transport systems including buses, trams & light rail, taxis, and metros. Coordinate implementation	Prepare passenger transport policies consistent with strategy and financial capabilities. Set parameters for procurement agency	Public Transport and regulatory specialists	Responsible to the Ministerial Committee for GCR Transportation. Should be separate from any passenger transport operations	CMTB	- To be established
Traffic Enforcement	Enforce traffic regulations. Manage traffic events and incidents. Collect accident data	Collaborate in traffic management system design. Enforce traffic management policy	Police Officers	Traffic police provide traffic accident and traffic incidence information to MTB and ZTEB	Traffic Police	Existing
Road Design Construction Maintenance	Designing, constructing and maintaining roads and streets	Maintenance prioritization	Civil Engineers	Responsible to the Governorates. Work closely with MTB and ZTEB	Road Departments in the Governorates	Existing
Traffic Safety	Road traffic safety strategy, Coordinate all departmental inputs, including those from health, education, etc.	Analyze safety data. Orchestrate inter-departmental collaboration to implement strategy	Statisticians Traffic engineers	Responsible to the Ministerial Committee for GCR Transportation. Relationship with health authorities necessary	CMTB	- To be established

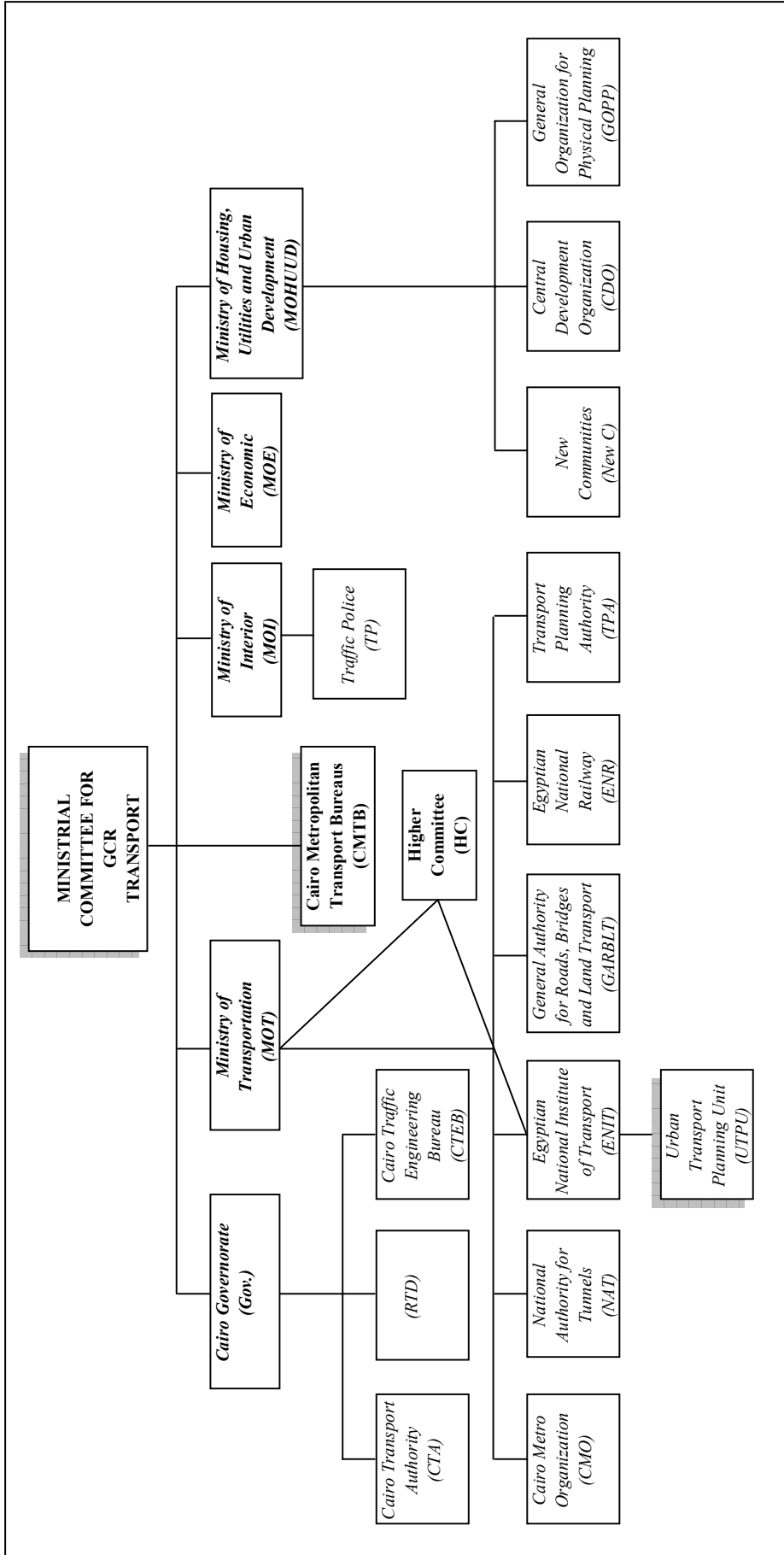


Figure 2.2-4 Recommended Organization Setup on the Regional Level

The key elements for the sustainability of such a regional level transport institution are:

- 1) It should be based on a permanent structure, designed to outlive executive or legislative mandate periods.
- 2) It should be accepted by the parties as an additional asset and not a threat to their autonomy or decision-making powers (even though the balance of power may shift at its inception or over time).
- 3) It will not interfere with jurisdictions that belong to the concerned parties, notwithstanding the fact that it will be granted a specific political status and its own specific powers.
- 4) It should not assume the functions of a public enterprise nor should it be in charge of operation of any kind.

The organization of the CMTB should be as depicted in Figure 2.2-5.

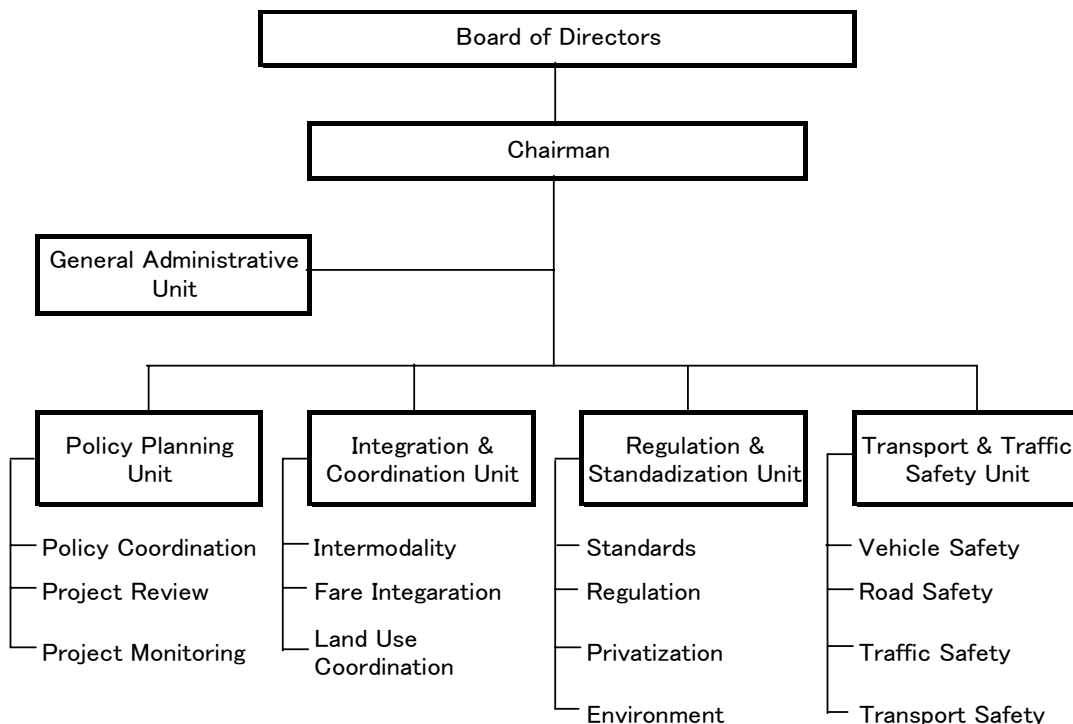


Figure 2.2-5 Organization Chart of (CMTB) – Principal Functions only

The functions of a regional transport planning institutions are:

- 1) Develop, maintain and run regional transportation and land-use simulation models.
- 2) Conduct periodical surveys of households for their daily movement, and of firms for their logistical needs.

- 3) Run simulation models to evaluate outcomes to significant changes to facilities.
- 4) Evaluate large changes to traffic signal timing schema to enhance system performance.
- 5) Conduct traffic counts / gather information on road facility performance as part of real-time traffic information network.

ENIT as the executive agency for the Higher Committee for Greater Cairo Transport Planning (H.C.) has provided the core counterpart team for the activities of CREATS Phase I and II and recently this on-going Cairo PPP Study. It has provided the office facilities for JICA Study Teams. It is maintaining a reasonable library for transport related science. It has the qualified personnel to operate and maintain computer simulation models. Through these close activities with JICA Study Team and the resulted on-the-job training; ENIT has got the required jump-start to be the institution in charge of continuing the transport planning process for Greater Cairo Region. Accordingly, it is recommended that ENIT should establish an Urban Transport Planning Unit (UTPU). UTPU will be responsible for the above mentioned regional transport planning functions. UTPU should continue to be the executive agency for the H.C. which should continue its role as the Regional Transport Planning Committee. UTPU should own, operate and develop the region transport model in cooperation with other organizations, in particular the Ministerial Committee and CMTB.

2.3 NETWORK HIERARCHY AND FUNCTIONAL CLASSIFICATION

2.3.1 Administrative and Functional Classification

Currently the road network in the Study Area is classified into several administrative or jurisdictional responsibilities in terms of road maintenance. Figure 2.2-1 (in Sec. 2.2) shows the administrative classification of the existing road network in the Study Area.

Most of the inter-city roads are under the responsibility of General Authority for Roads, Bridges and Land Transport (GARBLT). The boundary of responsibility under GARBLT on these roads terminates at certain location at or inside of the Ring Road. All the other road network is under the responsibility of each Governorate, namely Cairo, Giza, Qalyobeya and Sharqeya. The exceptions are in the new communities, where all the roads are under the responsibility of the Ministry of Housing, Utilities and Urban Development (MHUUD). In GCR there have been many cases that MHUUD constructed the roads and transferred to the MOT or the Governorates. The examples are the Ring Road, of which the transfer to the MOT is still being done, and the 26th of July St., which was transferred to Giza Governorate, and Autostrad, which was transferred to Cairo Governorate.

In contrast with these administrative classifications, the road classification by function is the indicator of importance for planning/design purposes.

2.3.2 Functional Classification for GCR Urban Road System

The recommended functional classification of CREATS Study, Phase I (MP) is:

National Primary Arterial

- The highest level of national corridor which carries major portion of long distance trips with highest level of travel speed and minimum mileage attained by higher design standard and higher control of access.
- It will have an access to urban area through urban expressway, regional primary arterial, urban primary arterial, and will not have a direct connection to the lower classes of streets.

Regional Primary Arterial

- The highest level of regional corridor which carries major portion of trips between central metropolitan area and suburban new settlement areas in and around the Greater Cairo Region.
- It will have an access to urban area through urban primary and secondary arterials, and will not have a direct connection to the lower classes of streets.

Urban Expressway

- The special type of urban primary arterials with full access control which carries major portion of urban trips in the metropolitan area with highest level of travel speed and minimum mileage attained by higher design standard and full control of access.
- It will have a grade separation to all other structures attained by, most of the cases, a viaduct or tunnel structure above or below existing urban primary arterials, and will have an access to urban primary arterials through ramps only.

Urban Primary Arterial

- The highest level of at-grade urban corridor which carries major portion of trips inside urban area.

Urban Secondary Arterial

- Interconnects and augments the urban primary arterial system to provide services to trips of moderate length in urban area.

Collector/Distributor

- The main street in a residential or commercial unit surrounded by the primary and secondary arterial network which collects and distributes the local traffic to/from the primary and secondary arterial street network.
- The passing trips across the residential and commercial area will be excluded.

Local Street

- The lowest level of urban street in the residential or commercial unit surrounded by arterial street network. The main function will be full accessibility to the adjacent land space, and traffic volume and speed will be controlled for local residential/commercial activities.
- Direct connection to higher classes of urban streets will be provided through collector/distributor streets so that the residential/commercial environment will be highly protected against passing traffic.

The proposed hierarchical relationship among these classes of roads is shown in Figure 2.3-1.

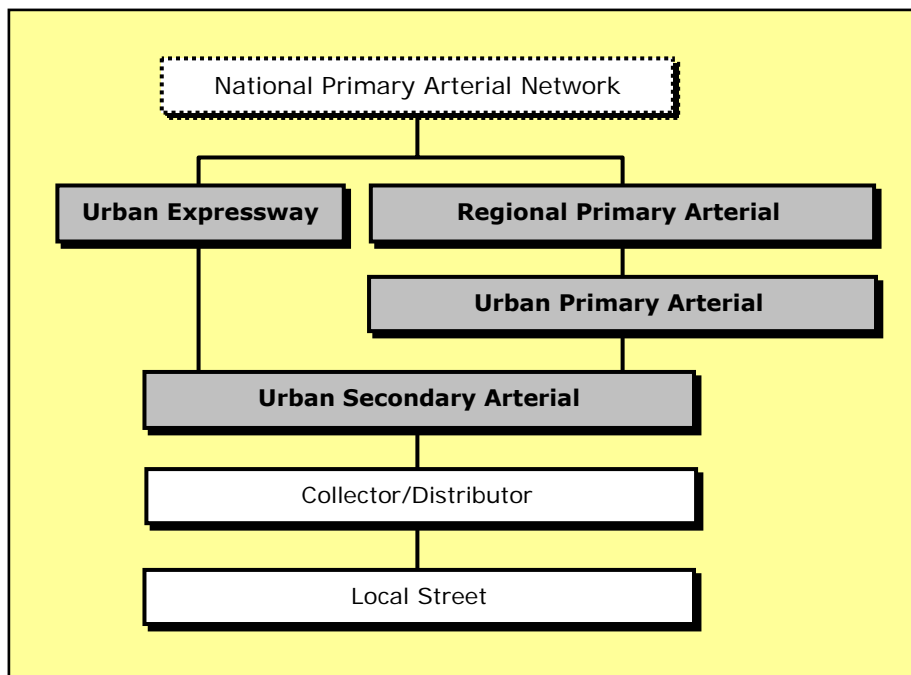


Figure 2.3-1 Proposed Hierarchy of Functional Classes of Roads

2.3.3 Road Network Hierarchy and Development Policies

CREATS Phase I as a regional Master Plan Study focused to propose the road management policy for four major classes of the hierarchy, Regional Primary Arterial

Highway, Urban Expressway, Urban Primary Arterial Streets and Urban Secondary Arterial Streets among the others.

In the conventional functional classification category, Urban Expressways are included in Urban Primary Arterial Streets, since the difference is mainly in road structure, rather than function. In the modern urban road system, Urban Expressway has unique functions compared with other Urban Primary Arterials. It has much higher capacity with full control of access, and it can attain much higher operational speed on the roadway due to the elimination of all traffic conflict points. Particularly when Urban Expressway is developed as a network system in urban area, it obviously provides a higher level of service to the vehicular traffic, which necessitates a different transport policy for its function from other classes of roads. It is therefore recommended that Urban Expressway be given an independent functional class.

In the context of Greater Cairo Region, or the Study Area, it is recommended that the road network be classified as in Figure 2.3-2 for the entire Study Area, and in Figure 2.3-3 for within the Ring Road Area.

2.4 ROAD NETWORK DEVELOPMENT

2.4.1 Findings of CREATS Phase I

CREATS Transport and Traffic Surveys have identified that traffic volumes on most streets of Cairo are enormous, which are expected to keep increase in the future.

The 6th of October Expressway give a large impact on traffic movement in Cairo. It offered a bypass route from Giza CBD through Helipolis and Nasr City without passing through the congestion in Cairo CBD. The CREATS Traffic Count shows that the 6th of October Expressway carries 177,000 – 127,000 pcu/day between Abdel Minim Riyad Squere and Nasr Road, and the 6th of October Bridge carries by far the dominant traffic volume of 261,000 pcu/day among the bridges over the Nile.

The recent condition of the expressway, however, suggests that this single 11.3 km stretch cannot solve all the traffic problems in the Urban Area. The viaduct is always full of cars, and chronic congestion is observed all through the day. Drivers often choose other congesting routes because it sometimes can be better.

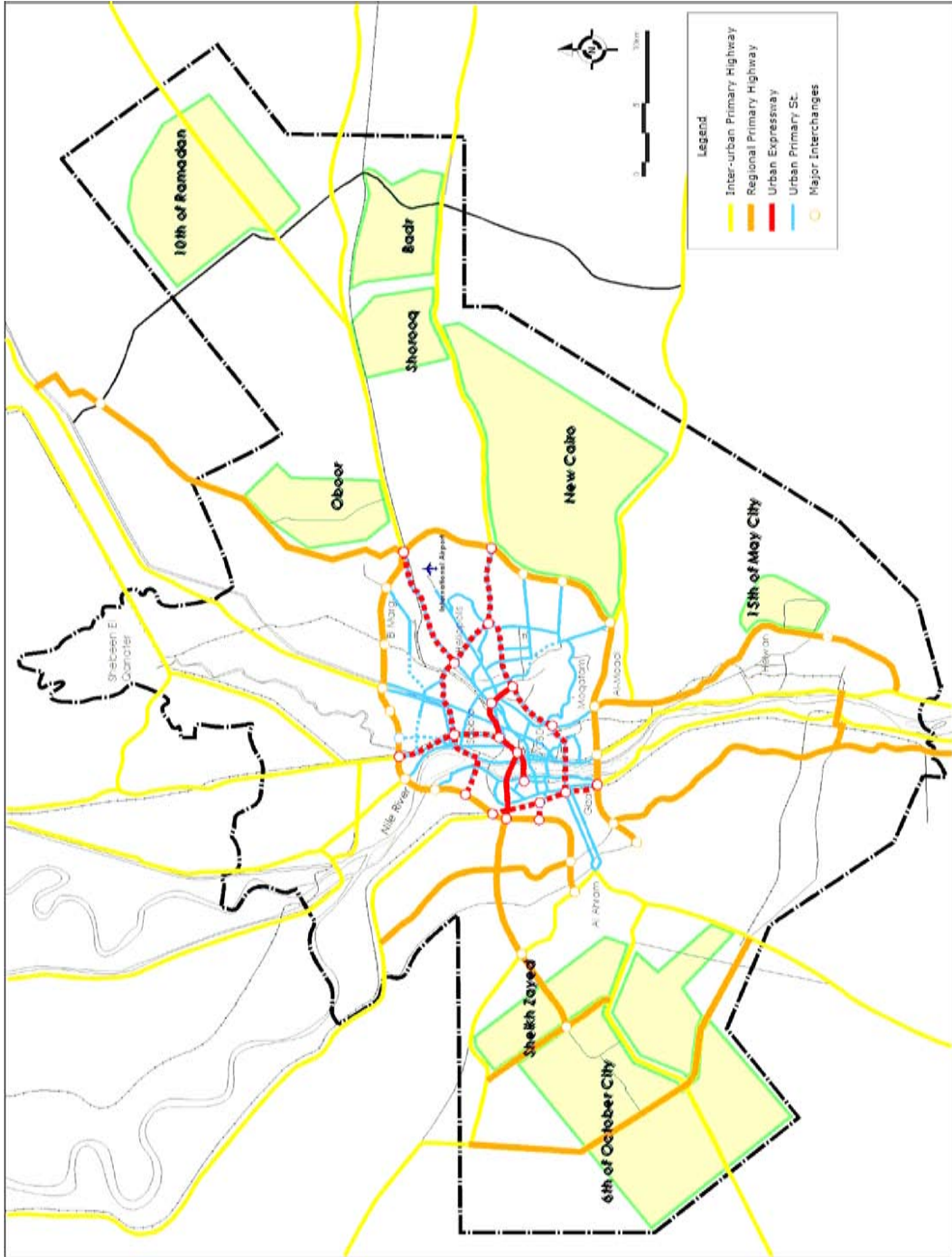


Figure 2.3-2 Recommended Functional Classification of Existing Road Network
(for Study Area)

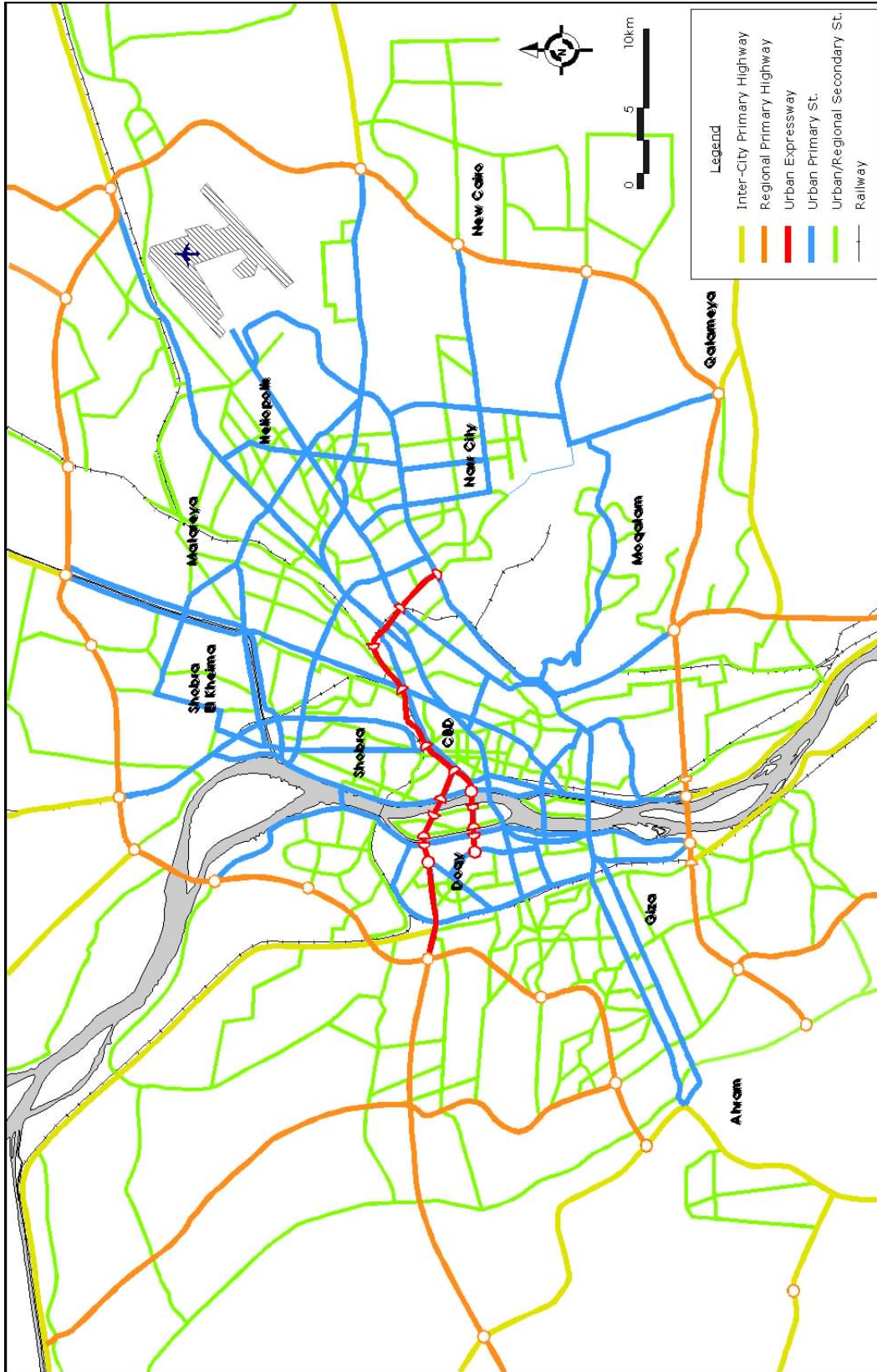


Figure 2.3-3 Recommended Functional Classification of Existing Road Network
(for within Ring Road area)

For the long-term road sector transport planning for Greater Cairo, the extension of urban expressway network will be an important alternative. It will give a bypass function to major vehicular trips with the better level of service. Increase of road capacity by an extensive urban expressway network should give a way to better cargo flow.

From engineering point of view, there is no major difficulty to construct urban expressway network in Cairo. In fact, Cairo has a greater advantage in this opportunity compared with other mega cities in the world, which is the wide road space. Generally, many of the arterials in Cairo have a wider cross section than those of other mega cities. The most of the problems arising in other cities for constructing urban expressways is the difficulty in obtaining necessary right-of-way. In this regard Cairo has a better opportunity of realizing urban expressway network over the available space in existing arterials in general.

The traffic volume on the road network will be influenced by the changes of other network modes, such as the rail based public transport. Particularly mass railway transit such as Metro will give a huge impact on entire traffic flows in the urban area. That is why it is important to analyze the road traffic flows with other high capacity modes in the transport model.

CREATS transport model analysis is based on the person trips. Each trip will choose the pattern of the trip modes. The vehicle trips will be distributed on the road network, and they are compared with the results of traffic count surveys, which are about 100 locations all over the Study Area.

The modal choice of the person trips in the future will be influenced by various elements. One of the most important elements is the future vehicle ownership. As is already discussed, it is expected that the current 1.05 million vehicles in the Study Area will increase up to 2.5 million in Year 2022. This means the GCR will have to accommodate 2.5 times more number of vehicles in the area.

As a result of such sharp increase of vehicle ownership, more people will have a choice of using vehicles on the road. The construction of Metro and other high-capacity rail-based public transport will certainly increase the average trip speed for entire modes, but it does not mean the traffic on the road will drastically decrease. It is because of the nature of the people, when they have a modal choice between public transport and private transport (cars) with both in reasonably comfortable trip speed, they will choose the private transport at most of the times, simply because it is more comfortable and more convenient. That is why whenever the road congestion decreases, additional vehicle traffic will come to the less congested roads, which eventually does not decrease the congestion at all.

The importance is that people will have a choice of modes. Even if the congestion level on the road does not seem to be very different, if people have a choice of using Metro for faster trip, it will promote the trips, and economic activities.

To test the road and public transport network alternatives in the multi-modal transport model, the alternative network scenarios are structured. The scenarios are first developed at a long term view based on the target year of 2022 situation, taking into account the urban development evolution and the expected transport demand structure. The final road development plan will be tested in the alternative scenario settings with the public transport development plan alternatives. However, the alternative scenarios are structured mainly to compare the public transport alternatives, and the road development alternatives are limited compared with the public transport alternatives.

The road network improvement plans were categorized as follows:

- a) Regional Primary Improvements
- b) Primary Arterial Improvements
- c) Secondary Arterial Improvements
- d) Intersection Grade Separation Projects
- e) Urban Expressway Projects

In terms of the multi-mode network improvement plans, the alternative scenarios are structured as follows:

Scenario A: Committed Network Scenario tested the 2022 transport demand with the network that the committed projects are completed.

Scenario B: Do Maximum Network Scenario tested the 2022 transport demand with the most extensive public transport and road network plans from capacity building point of view.

Scenario C: Core Network Scenario was structured mostly to test the public transport network alternatives, and in the road network plans, it is identical to Scenario B. It is therefore considered only as a transit scenario for identifying the preferred master plan scenario.

Scenario D: Master Plan Network Scenario is the result of the testing procedure, and it is eventually the proposed master plan. The road network is slightly modified based on the results on Scenario B and C.

The improvement plans from a) to d) are necessary improvements from the network point of view no matter which public transport alternative is followed, so these plans are identical from Scenario B through D.

The plan for e), the urban expressway projects are necessary from volume-capacity viewpoints to satisfy the 2022 traffic demand, and tested in Scenario B and C, and it is optimized in Scenario D by eliminating a few unpopular expressway links.

The second scenario, Scenario B, consists of the projects which are proposed by CREATS to satisfy the traffic demand forecast in the planning horizon of Year 2022. These projects consist of the network improvements and urban expressway projects discussed in the previous section. The proposed projects are summarized in Table 2.4-1, and shown in Figure 2.4-1.

The third scenario, Scenario C, is structured in the course of analyzing the public transport network, and the road network in Scenario C is identical with that of Scenario B. The fourth scenario, Scenario D, is also almost the same road network in Scenario B in terms of the road network, since most of the proposed projects are planned from the network viewpoint.

The difference between Scenarios B and D, in the road network plan, is structured in order to fine-tune the urban expressway network. In accordance with the testing results of Scenario B and C, it was identified that the urban expressway link of HE-10: Autostrad Route of 10 km and the 6 km section of HE-7 Gesr El Suez Route between Abu Bakr El Sedeeq and the 6th of October are not popular route. Since the diverted traffic is particularly small on these two routes compared with other routes, these sections are omitted from the Scenario D network. It can be considered as a future extension, when the network is almost completed and the next stage construction is discussed.

The proposed urban expressway projects are summarized in Table 2.4-2, and shown in Figure 2.4-2. The projects other than the urban expressway shown in Table 2.4-2 are identical to Table 2.4-1 (Do Maximum Plan).

2.4.2 Necessity of Urban Expressway Network

Urban expressway network extension is better to be implemented to improve or, at least, maintain the traffic situation in Cairo. The CREATS plan of urban expressway network is shown in Figure 2.4-1. It coded the existing 6th of October Expressway and 26th of July Expressway as HE-1 and HE-2, respectively, and proposes seven routes (HE-3 through HE-9) as new proposed routes. If one of the important purposes of the extended urban expressway is to ease the traffic congestion, it must give a bypass function to the existing and future busy corridors.

Table 2.4-1 Scenario B (Do Maximum) Projects Investment: Summary

CREATS Proposal		Length (km)	Unit Cost (LE mil)	Cost (LE mil)	Remarks
Regional Primary Highway Improvements		66.8		327	
HR-9	Ring Road (on Maryooteya Road)	3.8	50	190	New Road
HR-10	Ismailya Desert Rd.	36.0	2	78	Widening
HR-11	Suez Desert Rd.	27.0	2	59	Widening
Primary Arterial Street Improvements		28.3		200	
HP-2	Saft El Laban Axis	3.8	10	37	Widening
HP-3	Rod El Farag Axis	3.0	10	29	Widening+New
HP-4	15th May St. Extension	4.0	10	39	Widening+New
HP-5	Ahmed Oraby St.	3.0	10	29	Widening
HP-6	Moasaset El Zakah St.	10.5	3	28	Widening
HP-7	Ain Sukhna-Nasr City Rd. Extension	4.0	10	39	New Road
Secondeary Arterial Street Improvements		17.2		121	
HS-1	New Masala St.	6.0	5	30	New Road
HS-2	Tereat El Gabal St.	3.0	1	3	Improvement
HS-4	Tereat Tirsa St.	3.2	2	5	New Road
HS-5	Khafra St.	2.5	2	4	New Road
HS-6	Tereat El Zumur St.	2.0	2	3	Improvement
HS-7	Imbaba Br. Reconstruction	0.5	150	75	New Nile Bridge
Intersection Grade Separation Projects		---		525	
HG-15	Alex. Dst. Rd. / 15th May Ext.	---	35	35	Flyover
HG-16	15th May Ext. / Ahmed Oraby	---	35	35	Flyover
HG-17	Ring Road / Ahmed Oraby	---	35	35	Connection
HG-18	Moasasat El Zakah / Talaat El Gabal	---	35	35	Flyover
HG-19	Saad Sleam / Shobra	---	35	35	Flyover
HG-20	Madrasit El Mamaleek / Shobra	---	35	35	Flyover
HG-21	Thawra / Nozha	---	35	35	Flyover
HG-22	Autostrad / Ismailya El Fangary	---	35	35	Flyover
HG-23	Autostrad / Nozha-Abbas El Aqad	---	35	35	Flyover
HG-24	Dr. Abdallah El Araby / Dr. Zaker Hussein	---	35	35	Flyover
HG-25	A. Mohamed El Zumur / Hassan El Mamoun	---	35	35	Flyover
HG-26	Gaish / Port Said	---	35	35	Flyover
HG-27	Salah Salem / Tareq Magra El Ayon-Ain El Hayah	---	35	35	Flyover
HG-28	Malek Feisal / Maryooteya	---	35	35	Underpass
HG-29	Haram / Maryooteya	---	35	35	Underpass
Urban Expressway Projects		91.8		9,132.7	
HE-2	New Eastward Ramp from HE-2 to HE-1	1.2	61	73	New Ramp
HE-3	Expway No. 3 (Autostrad-Salah Salem Route)	24.3	93	2,270	New Viaduct
HE-4	Expway No. 4 (Abu Bakr El Sadeeq Route)	17.5	93	1,635	New Viaduct
HE-5	Expway No. 5 (Alex. Agriculture Rd. Route)	11.0	93	1,095	New Viaduct+Nile Br.
HE-6	Expway No. 6 (Suez Rd. Route)	7.5	93	1,118	New Viaduct+Tunnel
HE-7	Expway No. 7 (Gesr El Suez Route)	18.0	93	1,681	New Viaduct
HE-8	Expway No. 8 (Tereat El Zumur South Route)	3.0	93	280	New Viaduct
HE-9	Expway No. 9 (Tereat El Zumur North Route)	4.0	93	374	New Viaduct
HE-10	Expway No. 10 (Autostrad Route)	6.5	93	607.1	New Viaduct
Total for CREATS Project Proposals				10,305.9	

Source: CREATS, Phase I

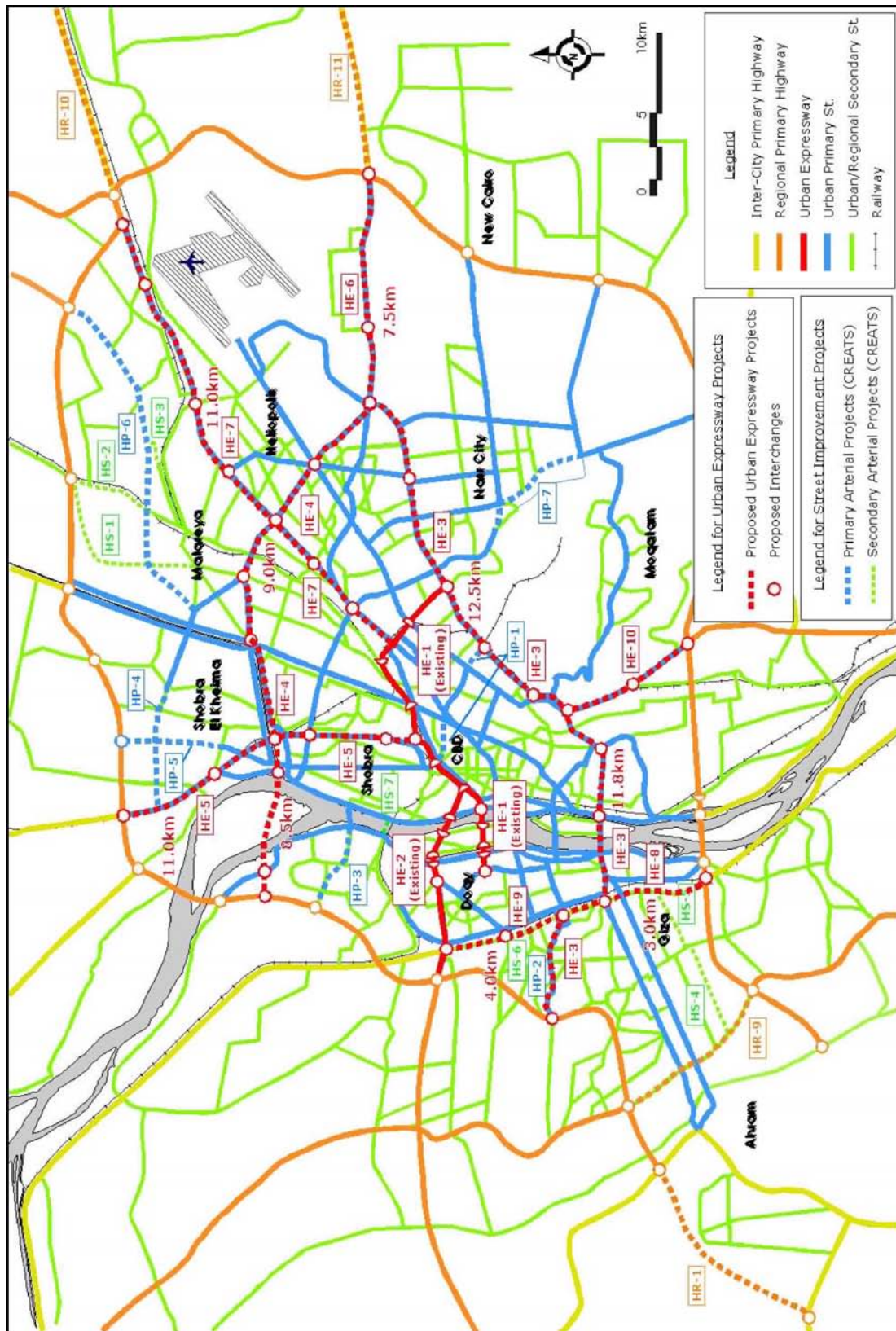


Figure 2.4-1 Scenario B (Do Maximum)

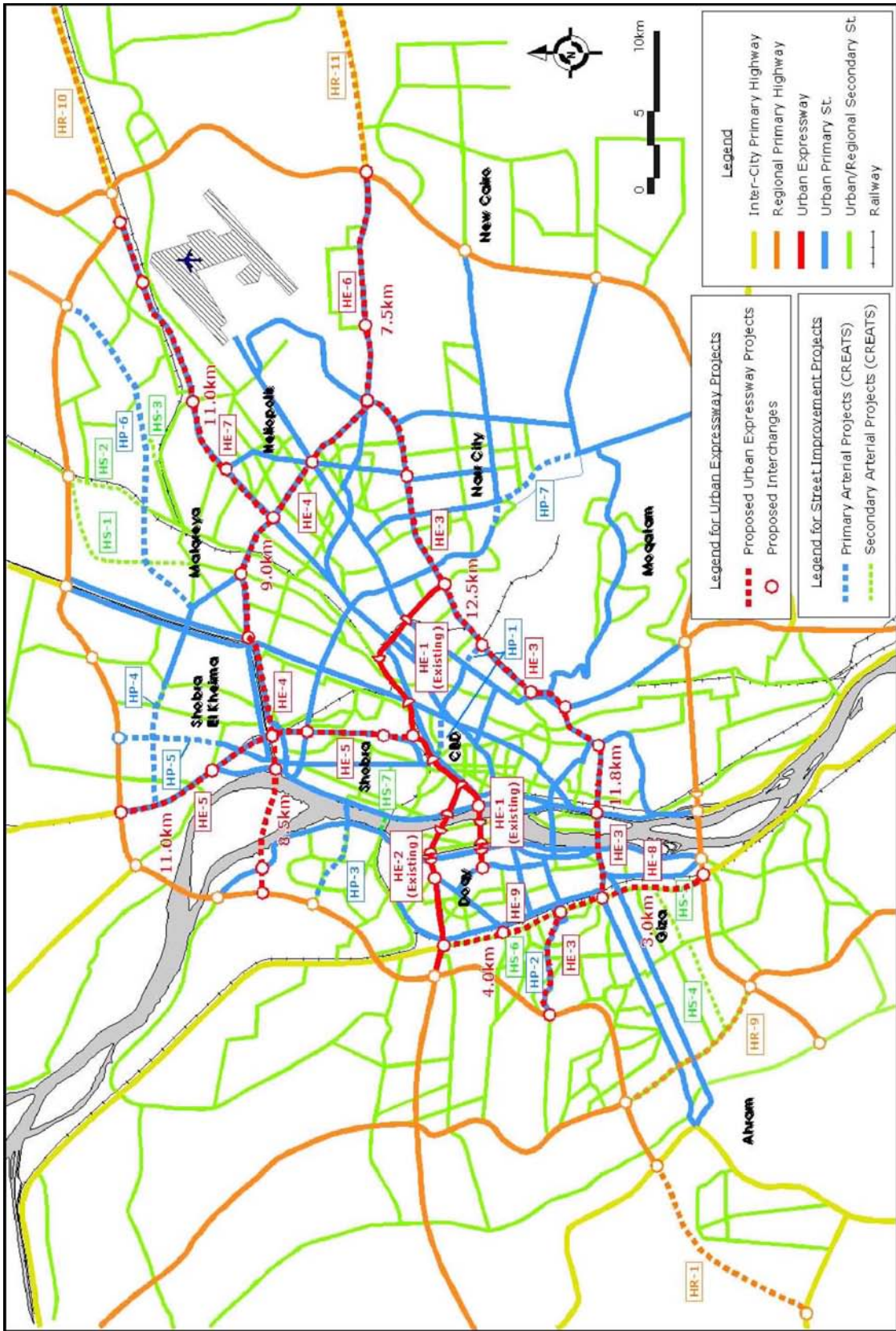


Figure 2.4-2 Scenario D (Optimum Network)

Table 2.4-2 Scenario D (Master Plan) Urban Expressway Projects

CREATS Proposal		Length (km)	Unit Cost (LE mil)	Cost (LE mil)	Remarks	Implementation Period				Agency
						02-07	08-12	13-17	18-22	
Urban Expressway Projects		78.3		7,872		0	2,652	2,432	2,788	MEA *
HE-2	New Eastward Ramp from HE-2 to HE-1	1.2	61	73	New Ramp		○			MEA
HE-3	Expway No. 3 (Autostrad-Salah Salem Route)	24.3	93	2,270	New Viaduct		○			MEA
HE-4	Expway No. 4 (Abu Bakr El Sadeeq Route)	17.5	93	1,635	New Viaduct		○			MEA
HE-5	Expway No. 5 (Alex. Agriculture Rd. Route)	11.0	93	1,095	New Viaduct+Nile Br.			○		MEA
HE-6	Expway No. 6 (Suez Rd. Route)	7.5	93	1,118	New Viaduct+Tunnel			○		MEA
HE-7	Expway No. 7 (Gesr El Suez Route)	11.0	93	1,027	New Viaduct				○	MEA
HE-8	Expway No. 8 (Tereat El Zumur South Route)	3.0	93	280	New Viaduct				○	MEA
HE-9	Expway No. 9 (Tereat El Zumur North Route)	4.0	93	374	New Viaduct				○	MEA
Total for CREATS Project Proposals				9,045		545	2,956	2,651	2,893	

Source: JICA Study Team

* MEA: Metropolitan Expressway Authority

Source: CREATS, Phase I

The first important corridor is HE-3: Autostrad-Salah Salem Route and HE-4: Abu Bakr El Sadeeq Route, which will form de facto the Inner Ring Road function. This Inner Ring Road will function as a bypass to the existing HE-1: 6th of October, and HE-2: 26th of July, and it will ease their congestions.

Once the Inner Ring Road is provided, it will give a way to develop radial connection from the Ring Road to the Inner Ring Road, and eventually downtown area through the 6th of October and 26th of July corridors. It should not be the other way (i.e. radial routes first, then the Inner Ring Road), because it would simply escalate the congestion on the 6th of October and 26th of July corridors.

Finally the Giza connection (HE-8 and 9) will complete the network, and give an alternative function of the Ring Road Closing.

This urban expressway network will have two important functions.

- 1) It will provide alternative routes to various origin-destination combinations in the city. If, for example, a driver intending to travel from Nasr City to Doqy found that the HE-1 Route is too congested, he will choose HE-3 through HE-9 to avoid such congestion. If a driver in Giza Square would like to travel to the airport, he can choose either HE-3, HE-4 and HE-7, or HE-9, Ring Road, HE-4 and HE7, depending on the condition on the expressway. When such alternatives are given, it will be important how to provide traffic information to the drivers, which is discussed in Chapter 8.
- 2) Each element of the elevated expressway will work as a “Mini Ring Road” for each urban center so that the through traffic is mostly eliminated from the at-grade arterial system. It is, for example, considered very difficult to provide a new bypass to solve the traffic congestion at Haram Street and Malek Faysal Street in the Haram Area, but

the completed Ring Road and HE-3 with HE-8 will form a Mini Ring Road in this area, which will be able to alleviate the chronic congestion in this area.

The urban expressway link of HE-10: Autostrad Route of 10 km, the 6 km section of HE-7 Gesr El Suez Route between Abu Bakr El Sedeeq and the 6th of October are not popular route and others links as shown in Figure 2.4-3 will be also studied as future extensions, when the network is almost completed and the next stage construction is discussed.

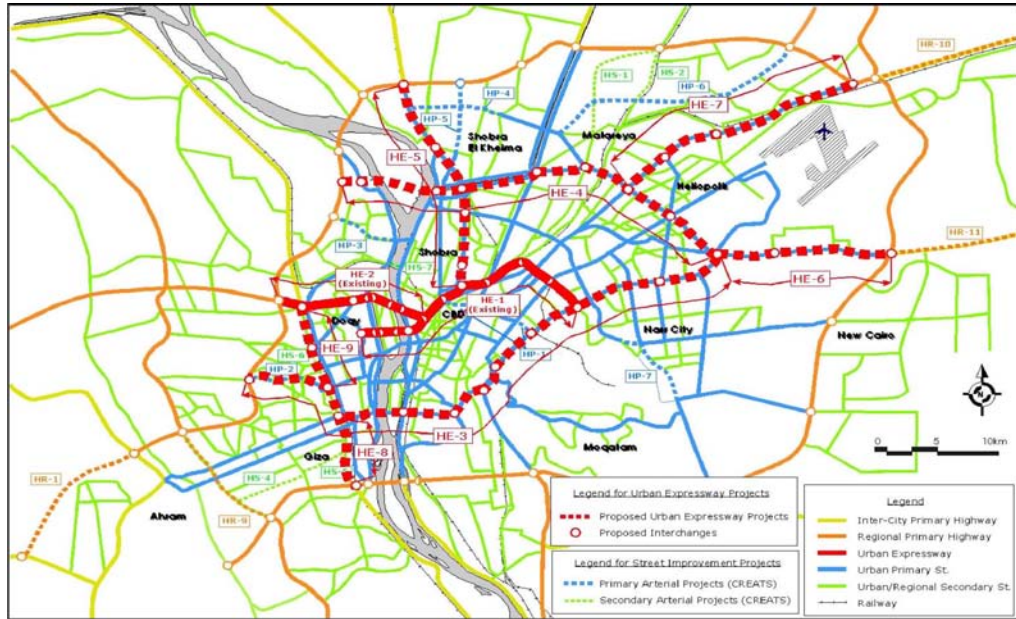


Figure 2.4-3 CREATS Proposed Urban Expressway Network

2.5 PROBLEM IDENTIFICATION AND EVALUATION

2.5.1 Completion and Extension of Ring Road

The Ring Road is basically complete except for the closing of the link in southwest Giza. It has been a major struggle for how to close the Ring Road since its early days of construction. The alignment of the Ring Road in the southwest link shows that it has been critically difficult to close the link at the Pyramids Area (Haram Area). The RR now is under the influence of MOT. The MOT planned to upgrade the RR to an expressway RR and its implementation plan must be integrated with the implementation plan of the Urban Expressway Network and Regional Expressways Plan.

The MHUUD was planning to extend the Ring Road from Interchange IC22 as shown in Figure 2.5-1 to the 6th of October Road. However, it was finally cancelled due to the demands for protecting the cultural heritage preservation area. The Ministry is now planning to extend the road from IC01 to the 6th of October Road by the plan shown in

Figure 2.5-1. It also has a branch link toward westward to bypass the traffic from the Ring Road (IC01) to Alexandria Desert Road.

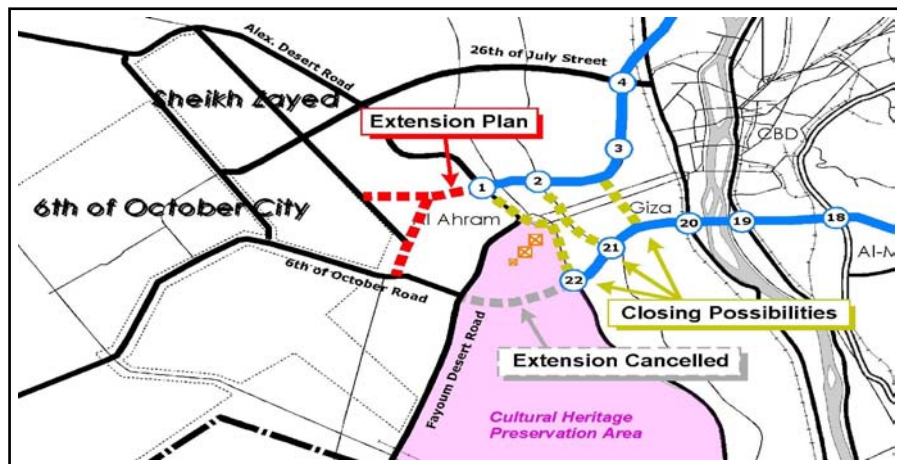


Figure 2.5-1 Ring Road Extension Plans

Unclosed Ring Road is a problem in the network since north-south traffic demand on the Ring Road at the western part of Cairo remains in an inconvenient condition without direct linkage of the Ring Road.

The possibility of closing the Ring Road in this area has several alternatives. The MHUUD is still planning to close the ring with Maryotia St. (IC02-IC21). In this area, it is neither appropriate nor possible to have a viaduct structure from environmental (aesthetic) viewpoint in protecting the view of the Pyramids. Remaining alternatives will be at-grade or underpass (tunnel) structure. At-grade structure, however, will not satisfy the traffic demand or level of service that the Ring Road should be able to offer unless full access control is provided by all of the crossing roads to be in grade separation. This would only be possible by making all of crossing roads to underpass, which seems to be unrealistic. The underpass structure of the Ring Road itself, either by full tunnel or open-box structure will be the only possible alternative.

Between the possible alternatives for closing the Ring Road in Giza, which are Mansooreya Street (IC01-IC22) or Maryooteya Street (IC02-IC21), the Maryooteya Street has obviously higher advantages in terms of right-of-way. Due to the difficulty of viaduct structure in this historic area, it is justifiable to construct the high-order expressway facility at underground level.

2.5.2 Network Alignment and Existing Infrastructures

The proposed alignment of the Urban Expressway Network will need to plan some untraditional solutions to avoid the conflict between the existing viaduct, ramp, loop

and other existing utilities at several locations. The construction of tunnel sections at certain corridor like HE3 seems to be the only solution. Reconsidering of the existing ramp and loop seem to be also necessary along certain corridors like HE1, HE3, etc. Such untraditional solutions are expecting to increase the construction costs especially at tunnel section where reallocation of existing utilities or deep tunnel under existing utilities must be considered. The proposed Expressway will cross the River Nile at several locations. In the new locations like HE4 a reasonable design can be planned. However, in case of existing corridor like HE3, the condition will more sophisticate.

The rapid increases of the number of vehicles and the growth of urban socio-economic activities have been escalating the traffic volume all over the region that keep creating a lot of traffic problems in the area. Those problems necessitate many of the streets to have complex direction control designations (U-Turns) at many of intersections, which create additional turning movements, detours and blocking due to sub-standard weaving lengths.

2.5.3 Connection between Existing Expressways HE1 and HE2

The existing alignment of HE1 (6th of October) and HE2 (15th of May) allow the traffic to move easily from HE1 to HE2 in the direction to Giza. In the way back the direct connection between the two links is missing which means there is a one-way section on HE2 between HE1 and Zamalek. The traffic in direction to East Cairo have to go first to the surface level either along the Cornish Street or Al Galaa Street then can go back to HE1 through others indirect connection. Therefore, to improve the function of HE2, as a link in the urban expressway network, a new link for the opposite direction should be provided. On the other hand, HE1 terminates in front of the Agricultural Museum in Giza. To improve its function in the expressway network, it is recommended to extend it to meet HE9 and HE11 to handle the traffic directly to the Ring Road. These two corridors are very important ones within the expressway network and a solution should be find out to create the direct connection between HE1 and HE2 in direction to East Cairo.

2.5.4 Administration and Organization

The expressway network will be shared among three major Governorates and also MOT. Under such conditions, it is not clear which authority will take the responsibility of construction, operation and maintenance. Introducing the private sector through the proposed PPP Program should be also considered. This Study investigates the optimum PPP scenario to organize the construction, operation and maintenance tasks of the new urban expressway network.