Japan International Cooperation Agency (JICA)
Ministry Of Transport, Socialist Republic of Vietnam (MOT)
Ho Chi Minh City People's Committee (HCMC-PC)

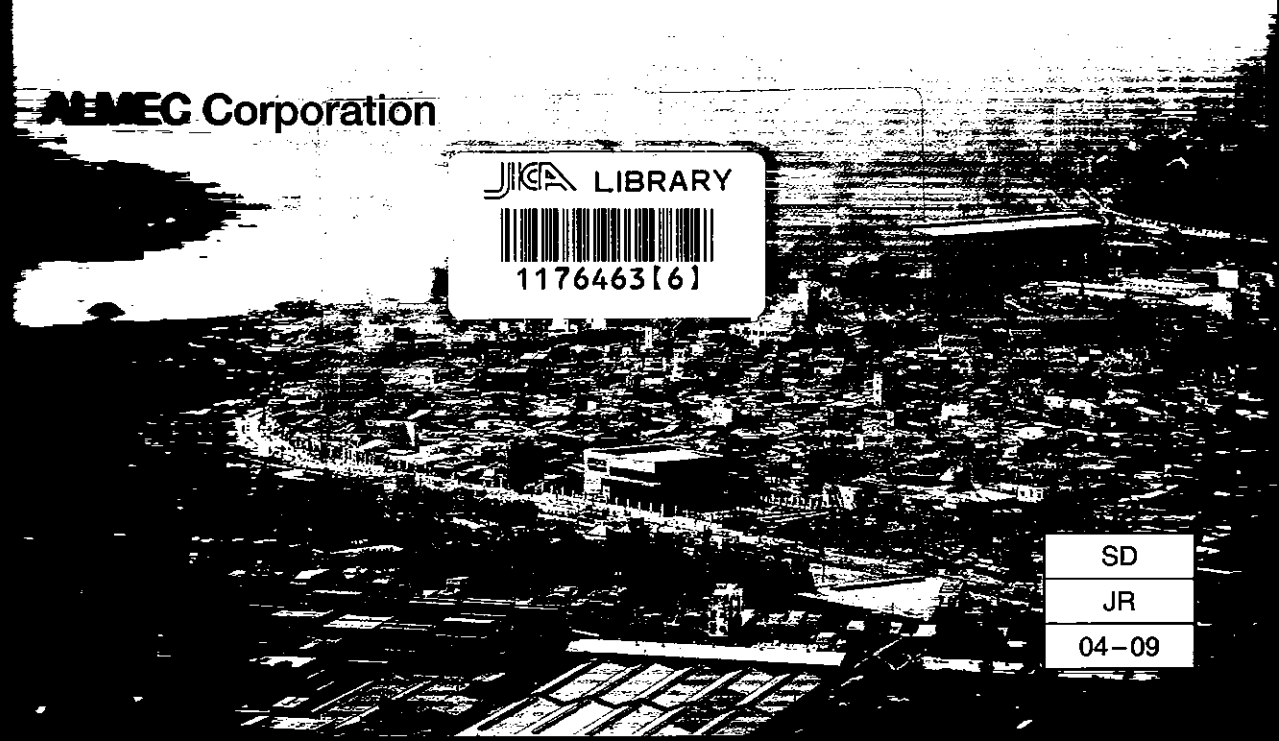
The Study on Urban Transport Master Plan and Feasibility Study in Ho Chi Minh Metropolitan Area (HOUTRANS)

FINAL REPORT

Vol.2 Master Plan Study

June 2004

ALMEC Corporation



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF TRANSPORT, SOCIALIST REPUBLIC OF VIETNAM (MOT)
HO CHI MINH CITY PEOPLE'S COMMITTEE (HCMC-PC)

THE STUDY ON URBAN TRANSPORT MASTER PLAN AND FEASIBILITY STUDY IN HO CHI MINH METROPOLITAN AREA (HOUTRANS)

FINAL REPORT

Volume 2: Master Plan Study

June 2004

ALMEC CORPORATION

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(average in 2003)

PREFACE

In response to the request from the Government of the Socialist Republic of Vietnam, the Government of Japan decided to conduct the Study on Urban Transport Master Plan and Feasibility Study in Ho Chi Minh Metropolitan Area and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a team to Vietnam between August 2002 and June 2004, which was headed by Mr. IWATA Shizuo of ALMEC Corporation.

The team conducted the study in collaboration with the Vietnamese counterpart team including field surveys, traffic demand forecast, formulation of a master plan and feasibility studies on the selected priority projects, and then held a series of discussions with the officials concerned of the Government of Vietnam. Upon returning to Japan, the team duly finalized the study and delivered this report.

I hope that this report will contribute to the development of urban transport in Ho Chi Minh Metropolitan Area and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Vietnam for their close cooperation extended to the team.

June 2004

MATSUOKA Kazuhisa
Vice President
Japan International Cooperation Agency

June 2004

MATSUOKA Kazuhisa
Vice President
Japan International Cooperation Agency
Tokyo

LETTER OF TRANSMITTAL

Dear Sir,

We are pleased to formally submit herewith the final report of the Study on Urban Transport Master Plan and Feasibility Study in Ho Chi Minh Metropolitan Area in the Socialist Republic of Vietnam.

This report compiles the result of the study which was undertaken both in Vietnam and Japan form August 2002 to June 2004 by the Team, organized by ALMEC Corporation.

We owe a lot to many people for the accomplishment of this report. First, we would like to express our sincere appreciation and deep gratitude to all those who extended their extensive assistance and cooperation to the Team, in particular the Ministry of Transport as well as the Ho Chi Minh City People's Committee both in Vietnam.

We also acknowledge the officials of your agency, the JICA Advisory Committee and the Embassy of Japan in Vietnam for their support and valuable advice in the course of the Study.

We wish the report would contribute to the promotion and sustainable development of urban transport in Ho Chi Minh Metropolitan Area.

Very truly yours,

IWATA Shizuo
Team Leader
The Team for the Study on Urban Transport Master Plan and Feasibility Study in Ho Chi Minh Metropolitan Area

VOLUME 2: MASTER PLAN STUDY

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ACRONYM

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
AC	Asphalt Concrete
ADB	Asian Development Bank
APD	Architecture and Planning Department
ASEAN	Association of Southeast Asian Nations
ATC	Area Traffic Control
BOT	Build-Operate-Transfer
BR-VT	Ba Ria-Vung Tau
CAO	Chief Architect Office
CBD	Central Business District
CP	Counterpart
CPRGS	Comprehensive Poverty Reduction and Growth Strategy
DBST	Double Surface Treatment
DCI	Department of Culture and Information
DFID	Department for International Development
DLH	Department of Land and Housing
DOC	Department of Construction
DONRE	Department of Natural Resource and Environment
DOSTE	Department of Science and Technology
DOT	Department of Transport
DPI	Department of Planning and Investment
EIA	Environment Impact Assessment
E&M	Electronics and Mechanics
EIRR	Economic Internal Rate of Return
EPZ	Export Processing Zone
FIRR	Financial Internal Rate of Return
F/S	Feasibility Study
GDP	Gross Domestic Product
GIS	Geographical Information System
GOJ	Government of Japan
GOV	Government of Vietnam
GPS	Global Positioning System
GRDP	Gross Regional Domestic Product
HCM	Ho Chi Minh
HCMC	Ho Chi Minh City
HDI	Human Development Index
HEPZA	HCMC Export Processing and Industrial Zones Authority
HIS	Household Interview Survey
HOUTRANS	The Study on the Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area
HPI	Human Poverty Index
ICD	Inland Clearance/Container Depot
IRR	Internal Rate of Return
IT	Information Technology

ITS	Intelligent Transportation Systems
IWT	Inland Waterway Transport
IZ	Industrial Zone
JICA	Japan International Corporation Agency
JBIC	Japan Bank of International Cooperation
J/V	Joint-venture
HCMC-PC	Ho Chi Minh City People's Committee
IER	Institute of Economic Research
LED	Light Emitting Diode
LS	Learning Session
MOC	Ministry of Construction
MOCPT	Management and Operation Center of Public Passenger Transport
MOF	Ministry of Finance
MOT	Ministry of Transport
MPI	Ministry of Planning and Investment
M/C	Motorcycle
M/P	Master Plan
MRDR	Mekong River Delta Region
NESR	Northeastern South Region
NGO	Non Governmental Organization
NH	National Highway
NMV	Non-motorized vehicle
NPO	Non Profit Organization
NTSP	National Traffic Safety Program
OD	Origin-Destination
ODA	Official Development Assistance
O&M	Operation and Management
PC	People's Committee
PCU	Passenger Car Unit
PBSC	Public Benefit Service Companies
PLC	Public Lighting Company
PMU	Project Management Unit
PMU-IUT	Project Management Unit of Investment in Urban Transport
PPC	Provincial People's Committee
PPP	Public Private Partnership
PR	Provincial Road
PTP	Policy Test Project
RAO	Road Area Occupancy
RFID	Radio Frequency Identification
RND	Road Network Density
ROW	Right of Way
RR	Ring Road
SC	Steering Committee
SFEZ	Southern Focal Economic Zone
SOE	State-owned Enterprise
STRADA	System for Traffic Demand Analysis

S/W	Scope of Work
SWM	Solid Waste Management
TDSI	Transport Development Strategy Institute
TDM	Traffic Demand Management
TMU	Transport Management Unit
TSSV	Transport Science Society of Vietnam
TUPWS	Transportation and Urban Public Works Services
TWG	Technical Working Group
UMRT	Urban Mass Rapid Transit
UNESCO	United Nation Educational, Scientific and Cultural Organization
UNDP	United Nations Development Program
UPI	Urban Planning Institute
VC	Volume-Capacity
VCR	Volume-Capacity Ratio
VITRANSS	The Study on the National Transport Development Strategy in the Socialist Republic of Vietnam
VMS	Variable Message Signboard
VND	Vietnam Dong
VOC	Vehicle Operating Cost
VUTIP	Vietnam Urban Transport Improvement Project
VR	Vietnam Railway

1 INTRODUCTION

1.1 Study Background and Objectives

1) Background

The Ho Chi Minh (HCM) metropolitan area is the major hub of Southern Vietnam and the most important economic region in the country, and it is of paramount importance that this urban area functions efficiently. To achieve this, one of the important issues to address is the transportation system which fulfills the same role as the circulatory system in a living organism.

However, since Doi Moi, the urban transport situation has worsened rapidly, especially in the highly urbanized and emerging urban areas. Increased traffic congestion has led to decreased traffic safety, increased air pollution, deteriorated amenities, and reduced accessibility to urban services. The worsening situation continues to adversely affect the economic activities and daily life of the people.

The significant change in traffic conditions during the last decade was characterized by a rapid growth in the number of motorcycles and passenger cars, a reduction in that of bicycles and a deterioration of bus services. It is estimated that the current number of motorcycles is about 2 million and this is still increasing at a high rate. A 1996 study estimated the number of person trips by motorcycles, bicycles and cars/taxis in HCMC at 64%, 32% and 2% of the total, respectively. Public transport (mostly bus and lambro), on the other hand, shared only 2%.

This situation calls for the development of a modern and efficient public transport system as a critical policy component. This, however, requires careful attention and action and has to be part of a comprehensive urban transport system development strategy.

It is within this context that the Government of Vietnam (GOV) requested the Government of Japan (GOJ) in October 2000 to conduct a study on a comprehensive urban transport master plan including public transport development. The Japan International Cooperation Agency (JICA) thereafter dispatched a Preliminary Study Mission headed by Professor Shigeru Morichi in October 2001 to Vietnam to sign the Scope of Work and the Minutes of the Meeting.

2) Objective

The overall goal of the study, entitled "The Study on the Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area" (HOUTRANS), was to formulate a long-term strategy to ensure mobility and accessibility for the people and to propose concrete measures and actions that would provide the targeted level of urban transport services. This goal is broken down into three operative objectives, to wit:

(1) To formulate a comprehensive Master Plan up to 2010 and 2020 for the urban transport system in the HCM Metropolitan Area;
(2) To formulate a Short-term Action Plan up to 2005 based on the Master Plan and to conduct a feasibility study on selected priority project(s); and,
(3) To conduct technology transfer on database, modeling and plan formulation to the Vietnamese counterpart staff during the course of the study.

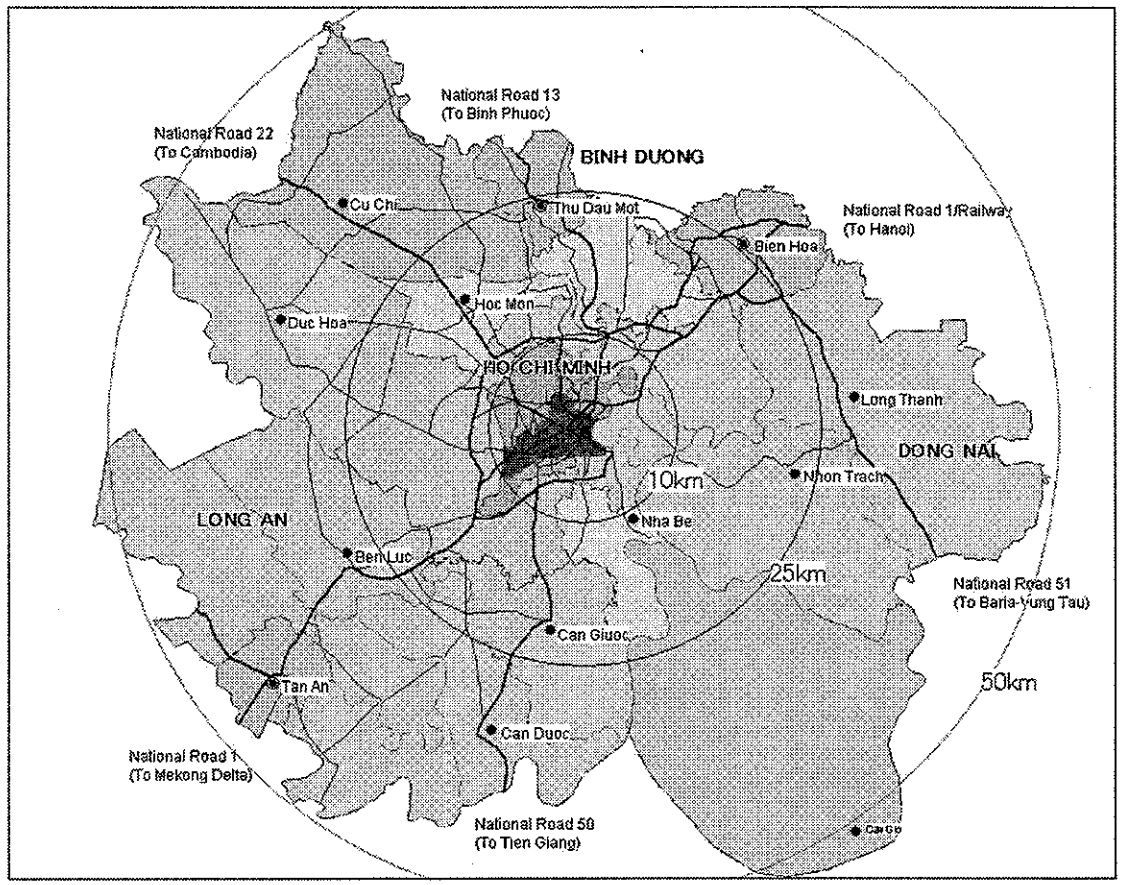
1.2 Study Coverage

1) Study Area

The study area is composed of: (a) HCM City (HCMC), (b) districts of adjacent provinces which form or will form part of the metropolitan area, and (c) other areas related to (a) and (b) from a regional development viewpoint.

In particular, the study area covered the entire HCMC and three districts of Dong Nai province, two districts of Binh Duong province and eight districts of Long An province.. Based on the 1999 census, the study area had a population of 7 million, of which 5 million resided in HCMC (see Figure 1.2.1).

Figure 1.2.1 Study Area Boundary

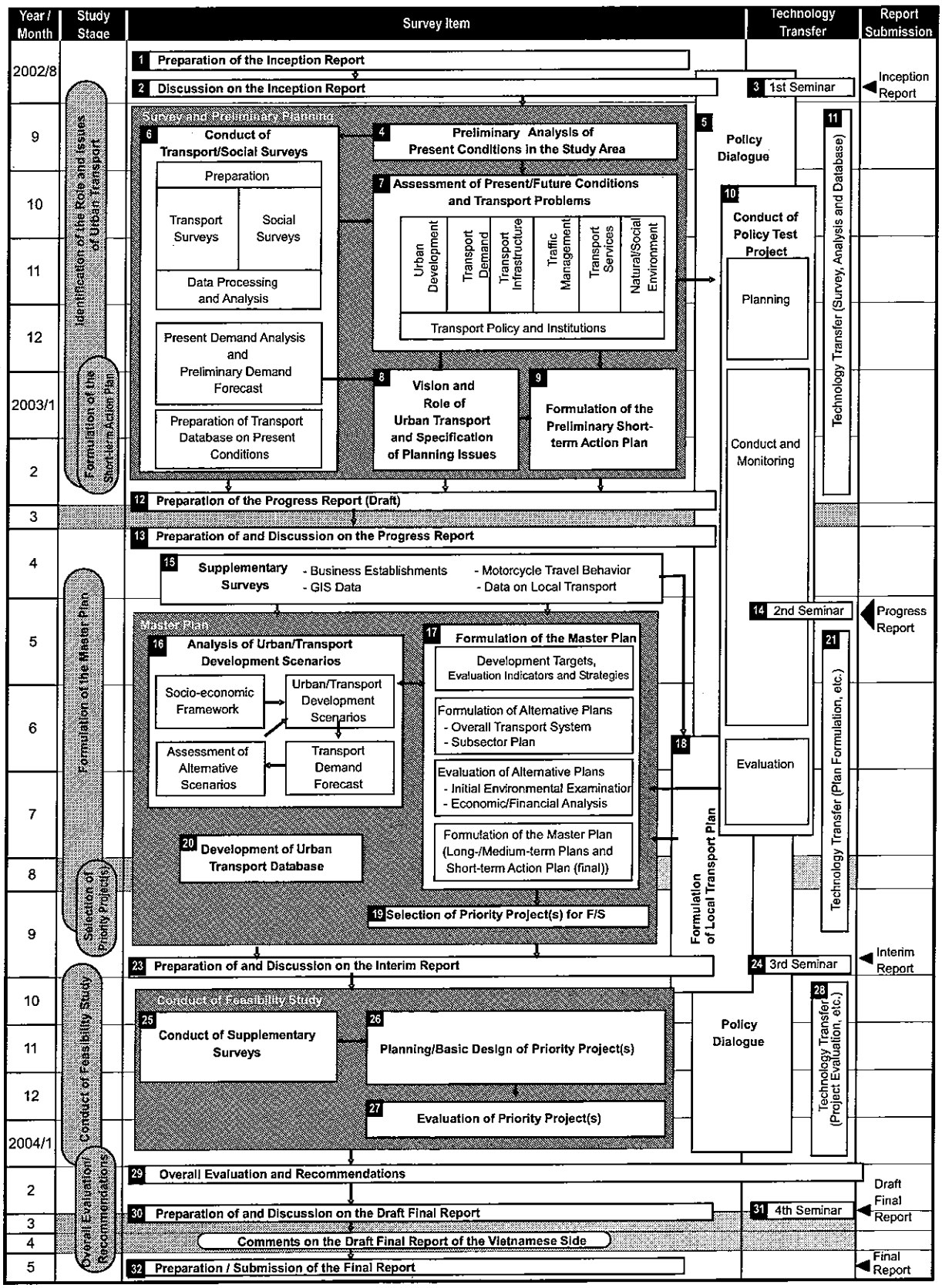


Source: Study Team

2) Study Schedule, Scope and Framework

The study commenced in August 2002 and ended in May 2004. The scope of the study included the entire transport and traffic system of the study area with the exception of internal distribution of goods, solid waste, etc. The overall framework of the study is shown in Figure 1.2.2

Figure 1.2.2 Overall Study Framework



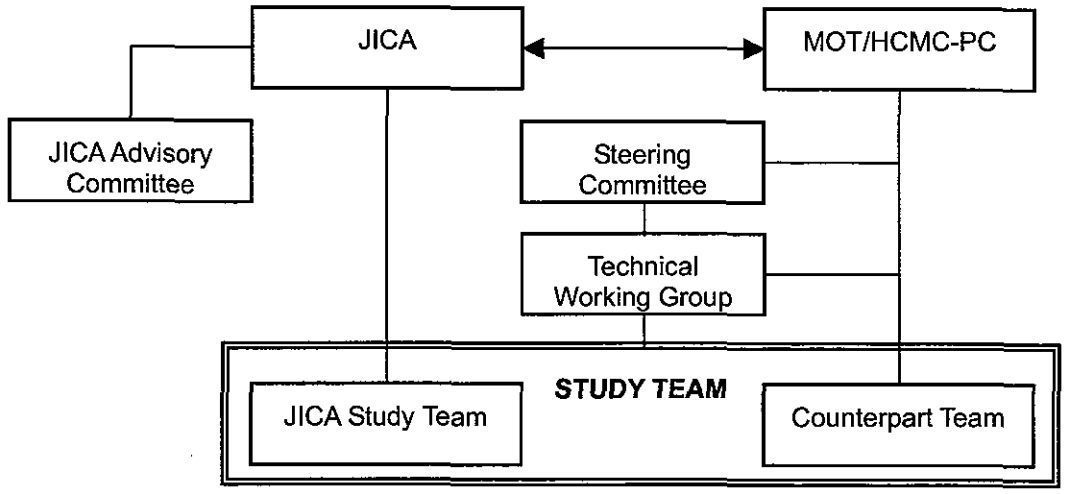
Source: Study Team

1.3 Study Organization and Implementation

1) Study Implementing Organization

The study organization was composed of the JICA Advisory Committee and the JICA Study Team on Japan's side and the Steering Committee (SC), Technical Working Group (TWG), and the Counterpart (CP) Team on Vietnam's side (refer to Figure 1.3.1).

Figure 1.3.1 Study Organization



Source: Study Team

2) Coordination with Vietnamese Side

(1) Steering Committee: The SC, composed of high-ranking officials of major agencies *including the Ministry of Transport (MOT), Ministry of Finance (MOF),* Ministry of Planning and Investment (MPI), and Transport Development Strategy Institute (TDSI), steered the study and decided on key problems. SC meetings were held to coincide with the submission of reports and to discuss important issues.

(2) Technical Working Group: The TWG was organized to discuss in detail technical matters as well as constraints faced throughout the course of the study. To that end, the TWG included members of major agencies which were directly related to the study and based in HCMC for regular and close discussions. Regular meetings with TWG members were held at least once every two months and otherwise whenever and wherever necessary.

(3) Counterpart Team: A mechanism for the Study Team to work closely with the CP Team was formulated to facilitate the study's implementation and to conduct technology transfer effectively through on-the-job training. Upon the commencement of the study, seven CP Team members from key agencies were assigned. The study's progress was monitored and discussed in regular meetings held every Tuesday afternoon.

(4) Task Force for Policy Test Project: In December 2002, a Task Force (TF) was set up for the Policy Test Project conducted within the HOUTRANS project to enhance bus transport. The TF was composed of officers of agencies in charge of public transport operation, traffic management, traffic enforcement, and traffic safety. TF meetings *were frequently held to discuss and formulate the implementation plan for the policy* test.

Table 1.3.1 Members of the Vietnamese Side

Steering Committee

	Name		Agency / Position
1.	Mr. Nguyen Viet Tien	Chairman	Vice Minister, MOT
2.	Mr. Nguyen Van Dua	Vice Chairman	Vice Chairman, HCMC-PC
3.	Mr. Truong Tan Vien	Standing Member	Acting Director, Department of Planning and Investment, MOT
4.	Dr. Nguyen Quang Bau	Standing Member	Director, TDSI
5.	Prof. Dr. La Ngoc Khue	Member	Consultant
6.	Mr. Nguyen Trong Tin	Member	Director, Department of Infrastructure, MPI
7.	Mr. Vu Xuan Hieu	Member	Deputy Director, International Finance, MOF
8.	Mr. Pham Thanh Tung	Member	Deputy Director, International Relation Dept., MOT
9.	Mr. Chu Manh Hung	Member	Deputy Director, Science & Technology Dept., MOT
10.	Mr. Nguyen Ngoc Hung	Member	Deputy Director of Science & Technology Dept, VR[1]
11.	Mr. Ho Trung Hieu	Member	Deputy Director, DPI, HCMC-PC[2]
12.	Mr. Tran Quang Phuong	Member	Vice Director, DTUPW, HCMC-PC[3]
13.	Mr. Tran The Ngoc	Member	Director, DONRE, HCMC-PC[4]
14.	Mr. An Dung	Member	Director, APD,HCMC-PC[5]

Technical Working Group

	Name		Agency / Position
1.	Mr. Tran Doan Phi Anh	Chairman	Director, TDSI South
2.	Mr. Tran Quang Phuong	Vice Chairman	Vice Director, TUPWS, HCMC-PC
3.	Mr. Nguyen Viet Dung	Member	Vice Director, PMU[6], MOT
4.	Mr. Nguyen Tran Thuat	Member	Vice Director, PMU, VR
5.	Mr. Nguyen Kim Lang	Member	Vice Director, TEDI[7]-South
6.	Mr. Trang Trung Son	Member	Vice Manager, ODA[8] Project Management Division, HCMC-PC
7.	Mr. Ho Phuong	Member	Planning Chamber, DONRE, HCMC-PC
8.	Mr. Truong Loi Hue	Member	UPI[9], DA&P, HCMC-PC
9.	Mr. Pham Van Thinh	Member	Director, Traffic Police Department, HCMC-PC
10.	Mr. Le Trung Tinh	Member	Director, MOCPT[10], TUPWS HCMC-PC
11.	Dr. Ho Thanh Phong	Member	Management Division, HCMC National University

Counterpart Team

	Assignment	Agency	Name
1.	Leader/Transport Planning	TDSI-South	Mr. Nguyen Nhu Trien
2.	Transport Survey /Analysis	TDSI-South	Mr. Nguyen Duy Hung
3.	Demand Forecast	TDSI-South	Mr. Vuong Tan Duc / Mr. Dao Trung Nghia
4.	Road Planning/ Facility Design	TUPWS	Mr. Do Diep Gia Hop
5.	Public Transport Planning	MOCPT (TUPWS)	Mr. Nguyen Hoang Tri
6.	Land-Use/ Urban Planning	UPI (DA&P)	Mr. Nguyen Quoc Vinh
7.	Traffic Management /Traffic Safety	Traffic Police Dept.	Mr. Chu Duc Thang

Task Force Members

	Name	Agency	Assignment
1.	Mr. Phan Thai Binh	TUPWS, Transport and Industrial Management Division	Team Leader
2.	Mr. Tran Quoc Khanh	TUPWS, Urban Traffic Management Unit	Sub-leader
3.	Mr. Do Diep Gia Hop	TUPWS, Urban Traffic Management Unit	Member (CP)
4.	Mr. Nguyen Hoang Tri	MOCPT (TUPWS)	Member (CP)
5.	Mr. Dang An Phuc	TUPWS, Transport Management Division	Member
6.	Mr. Ngo Dung Qua Hai	TUPWS, Transport and Industrial Management Division	Member
7.	Mr. Nguyen Huy Pho	Traffic Police	Member
8.	Mr. Phan Vo Thu Phong	Polytechnic University	Member
9.	Mr. Nguyen Duy Hung	TDSI-South	Member (CP)

[1] Vietnam Railway
[2] Department of Planning and Investment, HCMC-PC
[3] Department of Transport and Urban Public Works, HCMC-PC
[4] Department of Natural Resources and Environment, HCMC-PC
[5] Architecture and Planning Department
[6] Project Management Unit
[7] Transport Engineering Design Incorporated
[8] Official Development Assistance
[9] Urban Planning Institute
[10] Management and Operation Center of Public Passenger Transport

3) JICA Advisory Committee and Study Team

The JICA Advisory Committee was formed to support the Study Team and to discuss key planning issues with the Steering Committee. The JICA Study Team, on the other hand, was composed of 23 experts led by ALMEC Corporation.

Table 1.3.2 Members of the Japanese Side

JICA Advisory Committee

	Name	Position
1.	Dr. Shigeru MORICHI	Chairman
2.	Dr. Tetsuro HYODO	Vice Chairman
3.	Mr. Eiji EBASHI	Urban Transport Planner
4.	Mr. Masahiro YOSHIMI	Rail-based Public Transport Planner
5.	Mr. Atsushi IWABUCHI	Road-based Public Transport Planner

JICA

	Name	Position	Division/Office
1.	Mr. Akira NAKAMURA	Director	First Social Development Study Div.
2.	Mr. Yodo KAKUZEN	Deputy Director	First Social Development Study Div.
3.	Mr. Kenichi KONYA		First Social Development Study Div.
4.	Mr. Fumio KIKUCHI	Representative	Vietnam Office
5.	Mr. Hiroshi SHIRAKAWA	Deputy Representative	Vietnam Office
6.	Mr. Katsutoshi KOMORI	Assistant Representative	Vietnam Office

JICA Study Team

	Name	Assignment
1.	Dr. Shizuo IWATA	Team Leader / Urban Transport Policy
2.	Mr. David SHELLEY	Institutions
3.	Mr. Shigehisa MATSUMURA	Urban / Regional Planning
4.	Mr. Takashi SHOYAMA	Transport Funding, Economic / Financial Analysis
5.	Dr. Tetsuji MASUJIMA	Road-based Public Transport Planning
6.	Mr. Kosei TANIWAKI	Rail-based Public Transport Planning
7.	Mr. Tomoaki TAKEUCHI	Road Planning
8.	Mr. Yasunori NAGASE	Transport Facility Design
9.	Mr. Clive HOLMAN	Traffic Management Planning (1)
10.	Mr. Seiya MATSUOKA	Traffic Management Planning (2)
11.	Mr. Rene SANTIAGO	Operation and Management
12.	Mr. Hans ORN	Bus Operation Planning
13.	Dr. Akira HOSOMI	Transport Survey (1) and Demand Forecast
14.	Dr. Ian ESPADA	Transport Survey (2)
15.	Mr. Masayuki ISHIYA	Data Analysis and Database
16.	Mr. Joji TERAHARA	Social Environment
17.	Dr. Phung Chi SY	Natural Conditions and Environment
18.	Ms. Beulah PALLANA	Resettlement
19.	Dr. Ricardo SIGUA	Traffic Safety
20.	Mr. Masato KOTO	Local Traffic Management Planning and Policy Test
21.	Mr. Masayoshi IWASAKI	PPP Technique
22.	Mr. Kazuya URANO	Bridge Planning
23.	Ms. Motoko KAWAKUBO	Project Coordination

4) Study Implementation

(1) Discussion with Study Team Members

Coordination and involvement of the Vietnamese side were significant during the course of the study. There were regular discussions with the SC, TWG and CP, while various related agencies were directly involved in the study.

Table 1.3.3 List of Meetings

	Date	Venue	Participants
Steering Committee			
1st S/C	27 Aug. 2002	MOT Branch Office	36
Briefing in Hanoi	7 Jan. 2003	Hanoi, MOT	15
2nd S/C	21 May 2003	HCMC-PC	40
3rd S/C	16 Jul. 2003	New World Hotel	44
4th S/C	16 Sept. 2003	Sofitel Plaza	19
5th S/C	4 Mar. 2004	Legend Hotel	-
Technical Working Group			
1st TWG	26 Aug. 2002	TUPWS	19
2nd TWG	1 Nov. 2003	TUPWS	29
3rd TWG	9 Dec. 2003	TUPWS	25
4th TWG	18 Apr. 2003	TDSI-South	18
5th TWG	10 Jul. 2003	TUPWS	32
6th TWG	11 Sept. 2003	TUPWS	22
7th TWG	25 Nov. 2003	MOT Guesthouse	19
8th TWG	13 Jan. 2004	TUPWS	20
9th TWG	3 Mar. 2004	TUPWS	-
Counterpart Meeting			
1st – 55th	8 Oct 2002 – 17 Feb. 2004	TDSI-South	CP

Source: Study Team

(2) Seminars / Workshops

Moreover, workshops and seminars were organized frequently on specific planning issues in order to discuss them in detail with all related persons. Resulting discussions and suggestions were incorporated in the study. Major workshops and seminars are listed in Table 1.3.4.

(3) Intensive Training in Demand Forecasting

An intensive training in demand forecasting was conducted for CP Team members and TDSI staff on 14-16 January 2004 and 13-20 February 2004.

(4) Website and Newsletter

In addition to the above activities, the Study Team developed a website (http://www.houtrans.org) and published three issues of the newsletter "HOUTRANS" in English and Vietnamese. The first issue of the newsletter explained the overall framework of the study. The second issue presented the outline of transport surveys, meetings, activities, and the Policy Test Project. The third issue presented an assessment of the Policy Test Project.

Table 1.3.4 Workshops and Seminars Conducted in the Study

	Date	Venue	Participants
Seminars			
1st HOUTRANS Seminar	27 Aug. 2002	Caravelle Hotel	28
2nd HOUTRANS Seminar	22 May 2003	Caravelle Hotel	156
3rd HOUTRANS Seminar	17 Sept. 2003	Continental Hotel	133
4th HOUTRANS Seminar	5 Mar. 2004	Legend Hotel	
Technical Workshops			
No.1 "Impact of Motorbikes on Traffic Flow"	15 Jan. 2003	New World Hotel	70
No.2 "Bus Operation and Management"	6 Jun. 2003	Metropolitan	48
No.3 "Urban Growth Scenario"	8 Jul. 2003	New World Hotel	48
No.4 "Urban and Regional Development Vision and Strategy for HCM Metropolitan Area"	25 Jul. 2003	New World Hotel	52
No.5 "Urban Transport Development"	30 Jul. 2003	Metropolitan	38
No.6 "Assessment of Policy Test Project and Corridor Management Plan"	11 Nov. 2003	Duxton Hotel	37
No.7 "Social Considerations in M/P & F/S"	9 Feb. 2004	Metropolitan	28
No.8 "Implementation in PPP"	10 Feb. 2004	TDSI-South	10
Learning Sessions			
No.1 "Bus Operation, Traffic Safety, and Resettlement"	12 Feb. 2003	Metropolitan	32
No.2 "Traffic Accident Database"	10 Jun. 2003	TDSI-South	12
No.3 "Traffic Demand Analysis"	21 Jul. 2003	TDSI-South	10
No.4 "Analysis of Transport Policy using Modal Split Model"	30 Dec. 2003	TDSI-South	13

Source: Study Team

2 CURRENT TRANSPORT SITUATION, PROBLEMS AND ISSUES

2.1 Generation of Transportation

2.1.1 Study Area in the Southern Region

1) Socio-economic Characteristics

The study area is located in the south of Vietnam and serves as a socio-economic hub not only for the southern region but for the entire country as well. At the regional level, the study area is situated mostly in the northeastern south region (NESR) and partly in the Mekong River delta region (MRDR). More importantly, the study area forms the core of the Southern Focal Economic Zone[1] (SFEZ) which is being designed to be the country's engine for economic growth and into which sizeable public, private, domestic, and international investments are being directed (refer to Figure 2.1.1).

Thus, national and domestic growth contributions of the study area are paramount. Although it encompasses only 9.5% of the national population, its contribution to the gross domestic product (GDP) is large at 41% and 72% for the combined region of the NESR and the MRDR, and the SEFZ, respectively. With its high level of economic development, the study area also demonstrates high human development index (HDI)[2] and low human poverty index (HPI)[3] (refer to Table 2.1.1).

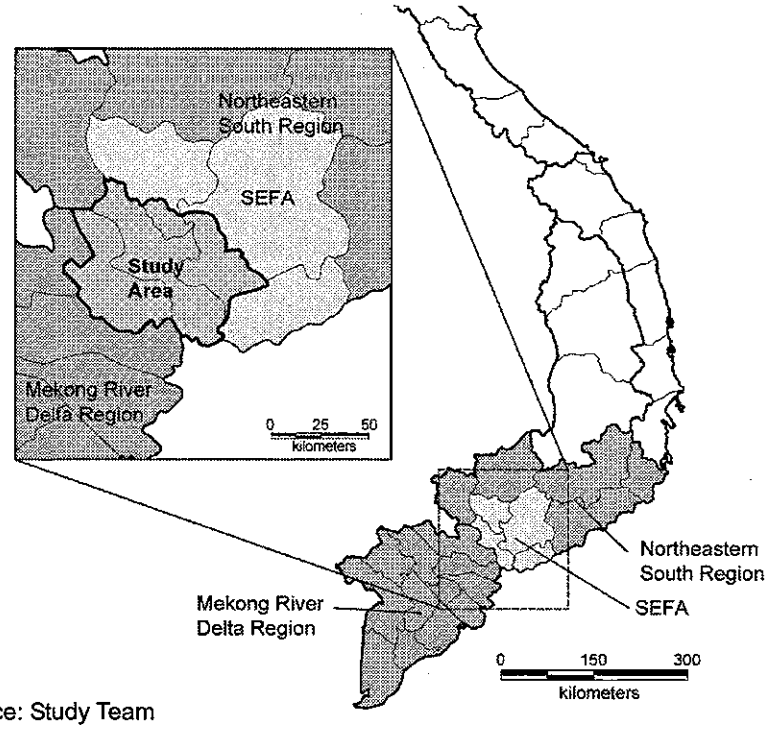
Table 2.1.1 Socio-economic Indicators by Area

Area		Population			Economy		Industry Structure (%)			Social Aspect	
		1995 (000)	2001 (000)	Growth Rate (%/year)	GDP[5] (VND Bil.)	Per Capita GDP (VND 000)	Primary	Secondary	Tertiary	HDI	HPI
Study Area	HCMC	4,640	5,285	2.2	52,342	9,904	1.9	46.0	52.1	0.798	10.6
	Adjoining Areas[1)]	1,949	2,193	2.0	9,282	4,233	26.2	43.3	30.5	-	-
	Total	6,589	7,478	2.1	61,624	8,241	5.6	45.6	48.8	-	-
SEFZ[2)]		7,833	9,052	2.4	85,862	9,485	4.9	56.7	38.4	-	-
Northeastern South Region[3)]		10,695	12,362	2.4	95,112	7,694	8.7	53.1	38.2	0.751	14.8
Mekong River Delta Region[4)]		15,532	16,519	1.0	55,365	3,352	40.7	22.2	39.1	0.669	25.5
Vietnam Total		71,996	78,686	1.5	273,582	3,477	23.1	35.9	39.1	0.696	20.1
Share of Study Area	SEFZ	84	83	-	72	-	-	-	-	-	-
	NESR+MRDR	25	26	-	41	-	-	-	-	-	-
	Vietnam	9	10	-	23	-	-	-	-	-	-

Source: Worked out by the Study Team based on various data.
1) including 3 districts of Binh Duong, 3 districts of Dong Nai and 8 districts of Long An.
2) including the 4 provinces of HCMC, Binh Duong, Dong Nai and Ba Ria - Vung Tau (BR-VT)
3) including the 8 provinces of HCMC, Binh Duong, Dong Nai, Ninh Thuan, Binh Phuoc, Tay Ninh, Binh Thuan, BR-VT
4) including the 12 provinces of Long An, Dong Thap, An Giang, Tien Giang, Vinh Long, Ben Tre, Kien Giang, Can Tho, Tra Vinh, Soc Trang, Bac Lieu and Ca Mau
5) at constant 1994 prices

[1] The other two FEZs are in the northern and central parts of Vietnam.
[2] HDI captures three essential dimensions of people's well-being, namely: (a) life expectancy at birth; (b) a combination of adult literacy rate (two-third weight) and the combined gross primary, secondary and tertiary enrolment rate (one-third weight); and (c) GDP per capita (PPP $).
[3] HPI is calculated based on five basic indicators, namely: (a) the probability of dying before age 40, (b) the adult illiteracy rate, (c) the proportion of the population not having access to clean water and basic sanitation, (d) under-five malnutrition.

Figure 2.1.1 Location of Study Area in the Region



Source: Study Team

2) Interface with Inter-city Transport

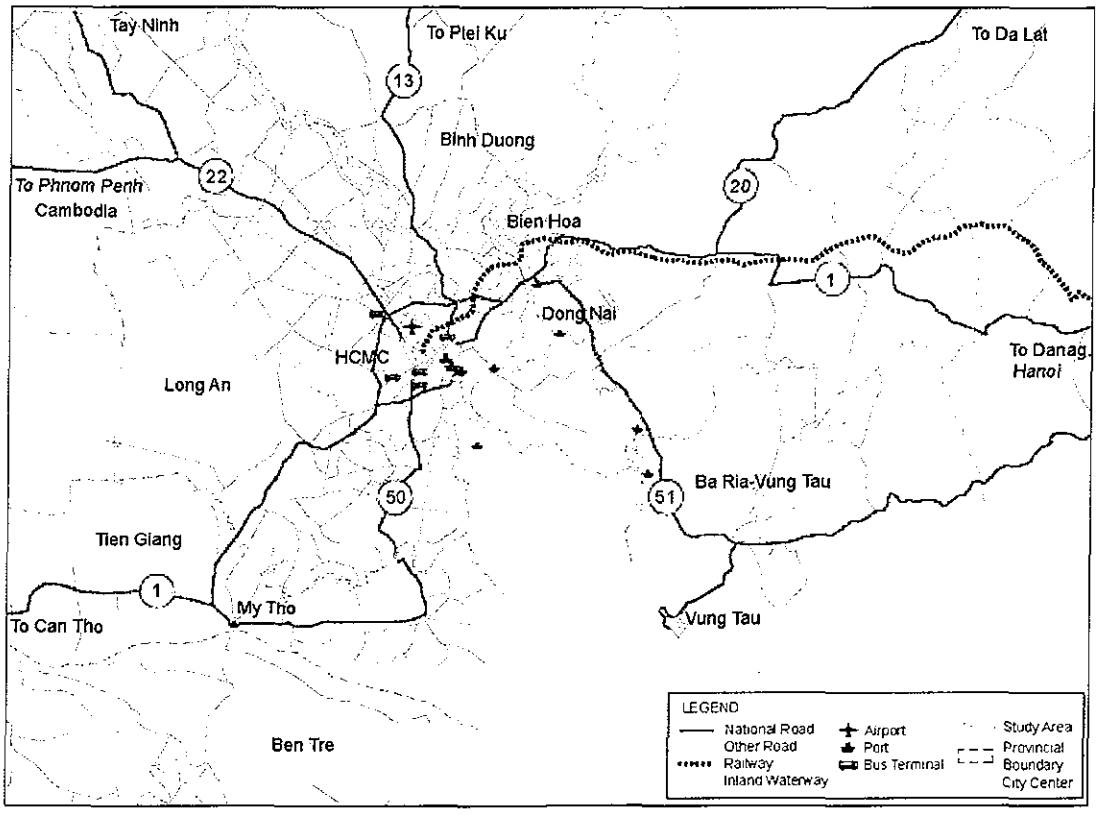
The study area's significant role in regional development requires the effective integration of its urban and inter-city transport systems. For this purpose, a long-term development strategy was proposed in "The Study on the National Transport Development Strategy in the Socialist Republic of Vietnam" (VITRANSS) (refer to Figure 2.1.2and Figure 2.1.3). This aspect is important because:

- Strengthening linkages among the study area, growth centers and rural areas in the hinterland is expected to promote regional development and poverty reduction efforts in contiguous rural areas.
- Inter-city through traffic as well as access traffic to/from strategic transport nodes, such as international ports/airport, must not adversely affect city traffic.
- An integrated transport network will contribute to better management of urban development and growth in the study area.

Interface between urban and inter-city transport is particularly important in terms of the following aspects:

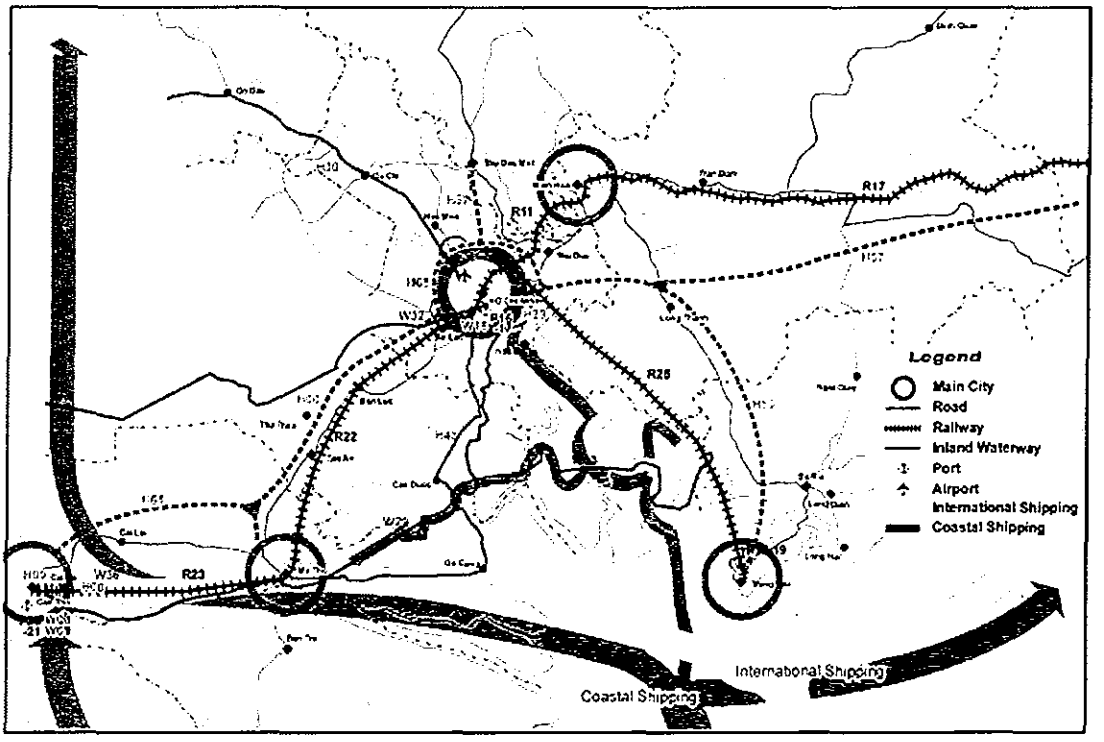
- Development of bypass roads to separate inter-city transport and logistics network.
- Integration of existing railway line with future urban rail lines.
- Development of the road network and road transport services between the study area and the areas in the influence zone.
- Development of an effective inland waterway transport (IWT) link between the study area and the Mekong region.
- Development of an ASEAN transport network, especially between the study area and Cambodia.

Figure 2.1.2 Existing Transport Network in the Region



Source: Study Team

Figure 2.1.3 Long-term Transport Network Development Strategy Proposed in VITRANSS



Source: VITRANSS

2.1.2 *Socio-economic and Urban Development Characteristics*

1) Economic Development

Economic Development in HCMC

Ever since the introduction of Doi Moi, Ho Chi Minh City has led the economic growth of the country. According to the 2001 HCMC Statistical Yearbook, the city produced 20% of the national GDP, and the GDP per capita for the city reached US$ 1,460 compared with the national figure of US$ 410 (this was calculated using the 2001 national statistical data).

(1) Current GRDP Trend: HCMC has been experiencing the highest gross regional domestic product (GRDP) growth rate in Vietnam. The annual growth rate between 1996 and 1999 was 15% which, however, declined to 11% between 1999 and 2001. The GDP per capita reached US$ 1,460 in 2001 after growing at a rate of 6.8% per year between 1996 and 2001 (refer to Table 2.1.2).

The city's economy relies primarily on the secondary sector (manufacturing and construction) and the service sector (refer to Table 2.1.3). The secondary sector constantly increased, reaching almost 47% in 2001. In contrast, the service sector slightly decreased to around 50%, and the primary sector (agriculture, forestry and fishery) shrunk to less than 2% in 2001.

Table 2.1.2 HCMC's GDP Growth

	GDP[1]						Growth Rate (%)		
	1996	1997	1998	1999	2000	2001	96-99	99-01	96-01
VND billion	45,545	52,765	61,226	69,002	76,660	83,810	14.8	11.1	13.0
USD billion	3.14	3.63	4.22	4.75	5.28	5.78	14.8	11.1	13.0
GDP per Capita (US$)	1,050	1,152	1,230	1,277	1,365	1,460	6.7	5.9	6.8

Source: HCMC Department of Planning and Investment home page
[1] at current prices with conversion rate of US$1.0 = VND15.000

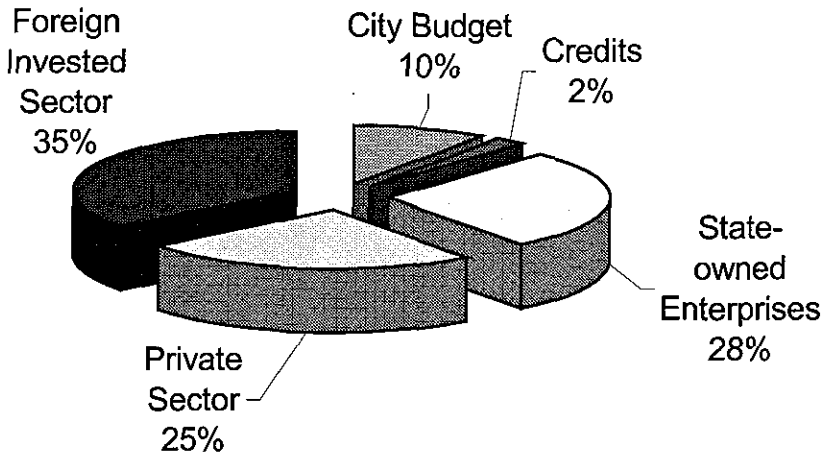
Table 2.1.3 GDP by Economic Sector (%)

	1996	1997	1998	1999	2000	2001
Agriculture, Forestry & Fishery	2.2	2.4	2.2	2.2	2.0	1.8
Industry and Construction	42.3	41.4	42.2	44.4	45.0	46.9
Service	55.2	56.2	55.6	53.4	53.0	51.3

Source: HCMC Department of Planning and Investment home page (2002)

(2) Investments in HCMC: The total investment in the city in the period 1991-1995 was VND 37,889 billion, or US$ 3.5 billion. For 1996-2000, the investment further increased to VND 101,486 billion, or US$ 8 billion. Foreign investments accounted for the largest share, followed by state-owned enterprises (SOEs) and the private sector (refer to Figure 2.1.4).

Figure 2.1.4 Sources of Investment Capital in HCMC, 1996-1999



Source: HCMC Socio-economic Development Plan for 2001-2005 (2000)

Up to 2000, there were 900 projects being implemented in the city, with a total investment of US$ 10.5 billion, of which the joint-venture type accounted for 40.3% of the total number and 62.2% of the total investment value. The 100% foreign-owned type accounted for 54.4% of the total number and 27.2% of the total investment value.

In the period 1996-2000, the total fund from official development assistance (ODA) sources, of which the main part comprises concessionary loans under the charge of the city government, amounted to US$ 478 million. Eighty percent (80%) of this fund was used for investment in infrastructure (water, transportation, etc.), 15% for environmental protection, and 5% for public health and education.

(3) GDP Forecast in Socio-economic Master Plan: In the socio-economic development master plan of HCMC prepared in 2001, the city's GDP was forecast to grow at 11.0% per year between 2000-2005 and 13.0% per year between 2005-2010 (refer to Table 2.1.4).

Table 2.1.4 GDP Forecast for HCMC

	2005		2010	
	Million VND (%)[1)]	Growth Rate (2000-05)	Million VND (%)[1)]	Growth Rate (%) (2005-10)
Total	89,080,000 (100.0)	11.0	164,125,000 (100.0)	13.0
1. Primary	1,275,000 (1.4%)	2.0	1,390,000 (0.8)	1.7
2. Industry & Construction	42,865,000 (48.1)	13.0	77,930,000 (47.4)	12.7
3. Service	44,940,000 (50.4%)	9.6	84,810,000 (51.7)	13.5

Source: Socio-economic Master Plan of HCMC (2001)
[1)] at constant 1994 prices

Economic Development in Three Adjacent Provinces

Rapid economic growth has also been experienced in the adjoining areas of HCMC, mainly in the east and northeast, especially in Binh Duong and Dong Nai provinces. Such economic growth resulted in a decreased share of the primary sector and an increase in that of the secondary sector, although the former is still predominant in Long An province (refer to Tables 2.1.5 and 2.1.6).

Table 2.1.5 GDP Growth in Adjoining Provinces

Province	GDP[1] (VND Bil.)						Growth Rate 1995-2000 (%/year)
	1995	1996	1997	1998	1999	2000	
Binh Duong	2,290	2,451	2,830	3,036	3,385	3,751	10.4
Dong Nai	6,204	7,327	8,172	8,724	9,343	10,422	10.9
Long An	3,552	3,926	4,064	4,215	4,342	4,567	5.2
Total	12,046	13,704	15,066	15,975	17,070	18,740	9.2
Per Capita GDP (VND 000)	3,225	3,599	3,882	4,040	4,234	4,562	7.2

Source: Development Strategy Institute, MPI
[1] at constant 1994 prices

Table 2.1.6 GDP Growth in Adjoining Provinces by Sector (%)

Province	Sector	1995	1996	1997	1998	1999	2000
Binh Duong	Primary	20.3	19.4	17.3	16.6	15.8	14.8
	Secondary	49.1	48.9	53.8	54.2	57.8	60.0
	Tertiary	30.6	31.7	28.9	29.2	26.4	25.3
Dong Nai	Primary	22.8	22.2	20.5	18.9	19.5	18.7
	Secondary	43.6	47.7	51.0	53.0	53.9	56.5
	Tertiary	33.6	30.1	28.5	28.1	26.6	24.9
Long An	Primary	40.4	41.2	38.7	39.8	41.2	41.4
	Secondary	16.9	16.6	22.7	18.9	18.4	18.8
	Tertiary	42.7	42.2	38.6	41.3	40.4	39.8
Total	Primary	27.5	27.1	24.8	24.0	24.3	23.4
	Secondary	36.8	39.0	43.9	44.2	45.7	48.0
	Tertiary	35.7	33.9	31.3	31.8	30.0	28.6

Source: Development Strategy Institute, MPI

The economic characteristics of these provinces are further described as follows:

Binh Duong Province: During 1997-2001, the GDP growth rate of Binh Duong province was 15% per year, one of the highest rates in Vietnam. The secondary sector accounted for 59.3% of the total GRDP in 2001, while the primary and service sectors accounted for 15.2% and 25.5%, respectively. During this period, industrial production increased at an annual growth rate of approximately 30%. In terms of investment sources, foreign investments accounted for the largest share of 56% in 2001. Up to October 2002, Binh Duong province received 588 foreign-invested projects with a total investment value of US$ 2.9 billion.

Seven administrative units of Binh Duong province, including Thu Dau Mot town and the two districts of Thuan An and Di An that are included in the study area, produced about

90% of the gross industrial output in the province. Most of the large-scale manufacturing facilities and industrial parks are located along or near the main transportation corridors, National Highway No.1 and No.13. Food and beverage, chemicals, rubber, and construction materials were the main industrial outputs.

Dong Nai Province: Dong Nai province also experienced a high economic growth, at an average annual rate of 12% in 1996-2000. In 2001, the secondary sector accounted for 52%, which increased from less than 30% in 1990. Foreign investments, in particular, have contributed considerably to industrial development. In 2000, investments by foreign enterprises comprised more than 60% of the total investment in the industrial sector.

It was mainly Bien Hoa City, the province's center for economy, politics and culture, which contributed to the province's economic development. Two districts along National Highway No. 51 – Long Than and Nhon Trach – also showed rapid industrial growth. Most of the large-scale industrial parks in the province are located in these areas.

Long An Province: The annual GDP growth rate of Long An province for 1991-1995 and 1996-2000 was 7.5% and 7.7%, respectively, which was lower than the average figure in the Mekong Delta region and the whole country. The primary sector (agriculture, fishery and forestry) accounted for the largest share, although the share decreased from 64% in 1991 to 46% in 2002. In contrast, the share of the secondary sector increased from 14% in 1991 to 26% in 2002. The food processing industries based on the province's agricultural and fishery products contributed to industrial development.

There are ten officially approved and planned industrial zones with a total area of about 4,600ha. All are, or will be, located along major transportation corridors connecting directly to HCMC. Most of them are located in the study area.

2) Population Growth and Distribution

Ho Chi Minh City, which celebrated its 300th anniversary in 1998, is the largest city in Vietnam in terms of population and economic activities. Currently, HCMC accounts for about three quarters of the urban population in southern Vietnam, and is eight times larger than the city of Can Tho, the second-largest in the south.

During the period between 1893 and the end of World War II, Saigon (then independent, now part of HCMC) grew from 33,000 in 1897 to 498,000 by 1943. Historically, Cho Lon developed at the same time but somewhat independently from Saigon, then officially joining it in 1954. HCMC grew further from 1.42 million in 1961 to 1.75 million in 1968 and to 5.3 million in 2001. In addition to the registered population, it was estimated that there were temporary residents of about 1.2 million.

Along with the growth of HCMC, adjacent provinces have also grown rapidly in recent years, particularly in the north and northeast directions from the central area of HCMC. Many housing and manufacturing facilities have developed in the southern areas of Binh Duong province and in and around Bien Hoa City of Dong Nai province.

Table 2.1.7 Population Growth in the Study Area

Year	Population (000)					Population Growth (%/year)				
	HCMC	Adjoining Area			Study Area Total	HCMC	Adjoining Area			Study Area Total
		Binh Duong	Dong Nai	Long An			Binh Duong	Dong Nai	Long An	
1989	3,924	-	-	-	-	-	-	-	-	-
1995	4,640	316	697	936	6,589	2.8	-	-	-	-
1996	4,749	325	715	946	6,735	2.3	2.8	2.6	1.1	2.2
1997	4,853	335	731	957	6,876	2.2	3.1	2.2	1.2	2.1
1998	4,958	346	748	969	7,021	2.2	3.3	2.3	1.3	2.1
1999	5,064	357	765	983	7,169	2.1	3.2	2.3	1.4	2.1
2000	5,175	363	788	996	7,322	2.2	1.7	3.0	1.3	2.1
2001	5,285	381	803	1,009	7,478	2.1	5.0	1.9	1.3	2.1

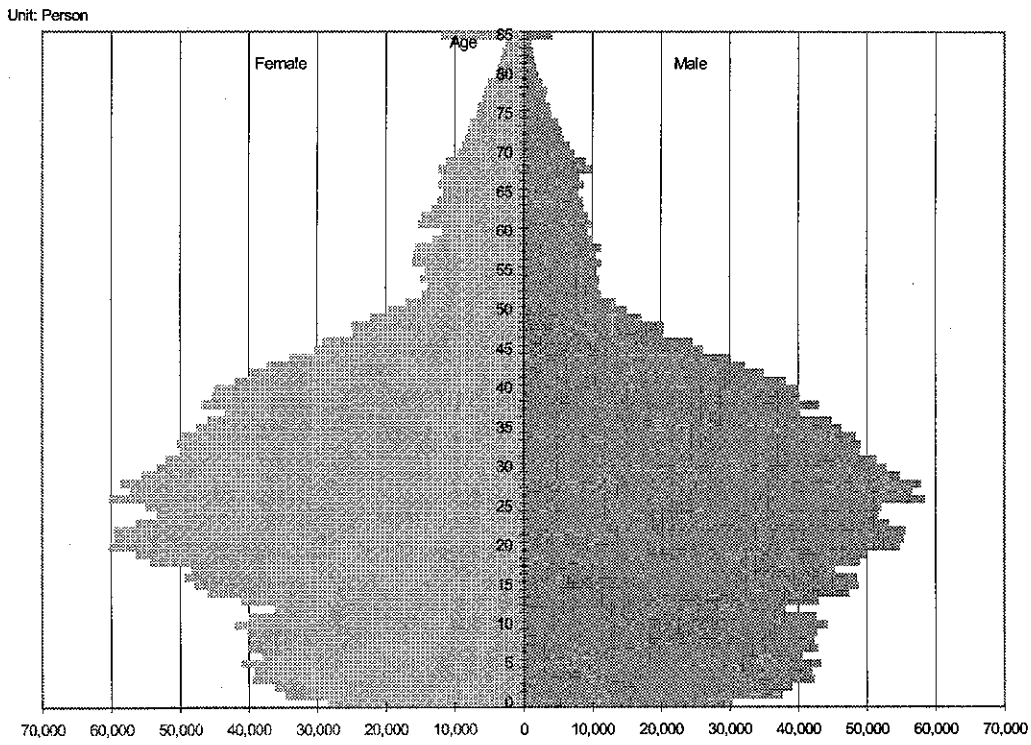
Source: Statistical Yearbooks of HCMC, Binh Duong, Dong Nai, and Long An

3) Demography

Compared to other developing countries with similar level of economy, the population structure of the study area is fairly different. For example, the population pyramid of HCMC shows the following notable characteristics (refer to Figure 2.1.5):

- The age bracket of fifties was shrinking. In addition, the male population in this age group was much smaller than the female population.
- The peak of population brackets is the age of twenties.
- Significant drop from 'baby boomer' generation was observed in younger generation, especially for those younger than five years old.

Figure 2.1.5 Population Pyramid of HCMC



Source: HCMC 1999 Census

It is likely that the natural growth rate in HCMC is decreasing (refer to Table 2.1.8). This implies that the government policy on migration will be a more important strategic tool to manage urban population growth.

Table 2.1.8 Population Growth Factors, 2001

Factor	Rate or Number	Trend
Natural birth rate	1.70%	Decreasing
Natural death rate	0.40%	Stable
Social increase (migration)	41,012 person	30,000-50,000 per year

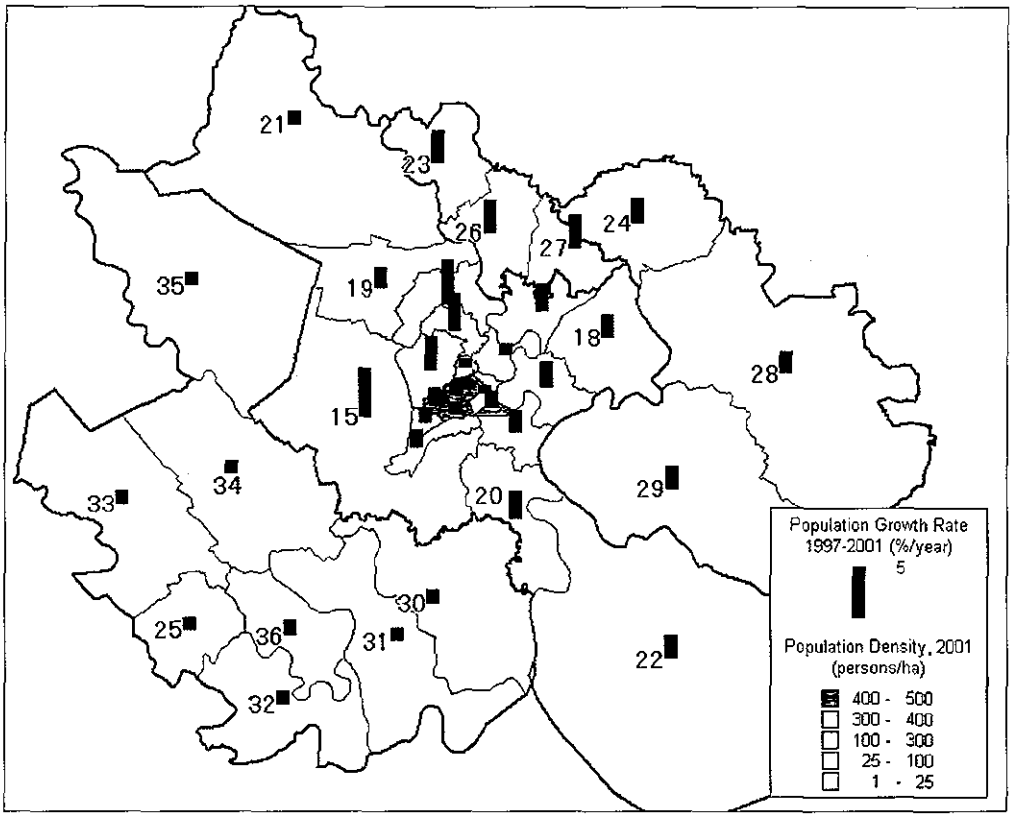
Source: Statistical Yearbook Ho Chi Minh City, 2001

4) Population Density and Growth by Area

From 1997 to 2001, HCMC's population increased by 430 thousands to 5.3 million at an annual rate of 2.2% (increasing by about 100 thousands annually). The areas which experienced rapid population growth (annual rate of about 4-5%) were the western and northwestern districts (Tan Binh, Go Vap, Binh Chanh, and District 12). Several inner-city districts which already reached a high density of more than 400 persons/ha (Districts 3, 4, 5, 10, and 11) showed an annual growth rate of about 0-1%. Most of the newly developed inner-city and suburban districts showed a lower annual growth rate of about 2% (refer to Table 2.1.9 and Figure 2.1.6).

During the same period, three administrative units of Binh Duong province showed a high annual population growth rate of about 5%, accompanying the recent industrial parks development in the area. Bien Hoa City and two districts of Dong Nai province showed steady growth at approximately 2.4% per year from 1997. Meanwhile, the eight administrative units of Long An province showed a low growth rate, at approximately 1.3% per year.

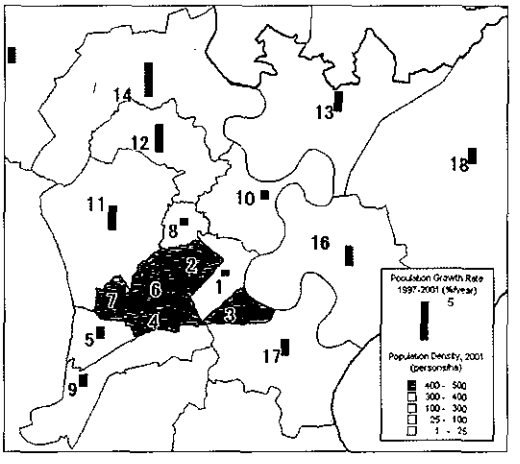
Figure 2.1.6 Population Growth and Density in the Study Area by District



HCMC

1	*District 1*	12	*Go Vap*
2	District 3	13	Thu Duc
3	District 4	14	District 12
4	District 5	15	Binh Chanh
5	District 6	16	District 2
6	District 10	17	District 7
7	District 11	18	District 9
8	Phu Nhuan	19	Hoc Mon
9	District 8	20	Nha Be
10	Binh Thanh	21	Cu Chi
11	Tan Binh	22	Can Gio

Central Area of HCMC



Binh Duong

23	*Thu Dau Mot*	26	*Thuan An*
27	Di An		

Dong Nai

24	Bien Hoa	28	Long Thanh
29	Nhon Trach		

Long An

25	Tan An	31	Can Duoc	33	Thu Thua	35	Duc Hoa
30	Can Giuoc	32	Chau Thanh	34	Ben Luc	36	Tan Tru

Source: *Statistical Yearbooks of HCMC, Binh Duong, Dong Nai, and Long An*

Table 2.1.9 Population Growth and Density in the Study Area by District

District			Population (000)		Population Growth (%/year)	Area[1] (ha)		Population Density 2001 (persons/ha)	
			1997	2001		Gross	Net[2]	Gross	Net[2]
HCMC	1	District 1	221	228	0.8	769	718	296	317
	2	District 3	217	224	0.8	482	474	465	472
	3	District 4	185	198	1.6	426	353	465	561
	4	District 5	203	211	1.0	431	420	490	503
	5	District 6	247	262	1.5	715	665	366	394
	6	District 10	233	246	1.4	587	584	419	421
	7	District 11	230	244	1.5	524	516	466	473
	8	Phu Nhuan	178	184	0.9	473	470	389	392
	9	District 8	320	342	1.7	1,934	1,706	177	201
	10	Binh Thanh	390	408	1.1	2,123	1,785	192	229
	11	Tan Binh	560	635	3.2	3,833	3,818	166	166
	12	Go Vap	299	345	3.6	2,010	1,963	172	176
	13	Thu Duc	202	224	2.6	4,833	4,582	46	49
	14	District 12	163	193	4.4	5,283	5,028	37	38
	15	Binh Chanh	304	366	4.7	31,135	30,418	12	12
	16	District 2	98	108	2.5	5,441	4,175	20	26
	17	District 7	108	117	2.1	3,482	2,125	34	55
	18	District 9	144	157	2.2	11,330	9,037	14	17
	19	Hoc Mon	194	210	2.0	10,828	10,541	19	20
	20	Nha Be	60	67	2.7	9,985	7,771	7	9
	21	Cu Chi	242	256	1.4	43,788	42,414	6	6
	22	Can Gio	55	60	2.2	74,336	46,797	1	1
Binh Duong	23	Thu Dau Mot Town	134	152	3.2	8,761	8,347	17	18
	26	Thuan An	107	122	3.3	8,381	8,100	15	15
	27	Di An	94	107	3.2	5,919	5,793	18	18
Dong Nai	24	Bien Hoa City	448	495	2.5	15,251	14,127	32	35
	28	Long Thanh	182	197	2.1	54,205	52,971	4	4
	29	Nhon Trach District	102	111	2.3	39,554	33,513	3	3
Long An	25	Tan An Town	111	117	1.2	8,891	8,570	13	14
	30	Can Giuoc	148	157	1.4	23,880	21,319	7	7
	31	Can Duoc	157	165	1.3	23,123	20,662	7	8
	32	Chau Thanh	95	100	1.4	16,222	15,461	6	6
	33	Thu Thua	82	87	1.4	27,540	27,003	3	3
	34	Ben Luc	121	127	1.3	27,214	26,490	5	5
	35	Duc Hoa	185	194	1.3	40,582	40,106	5	5
	36	Tan Tru	58	61	1.5	10,265	9,651	6	6
Total Study Area			**6,876**	**7,478**	**2.1**	524,534	468,473	14	16
HCMC	Urban Districts (12)		3,283	3,527	1.8	14,306	13,472	247	262
	Suburban Districts (8)		1,273	1,442	3.2	82,317	73,677	18	20
	Rural Districts (2)		297	316	1.6	118,124	89,212	3	4
	HCMC Total		**4,853**	**5,285**	**2.2**	214,747	176,361	25	30
Adjoining Districts	Binh Duong (3)		335	381	3.2	23,060	22,240	17	17
	Dong Nai (3)		731	803	2.4	109,009	100,611	7	8
	Long An (8)		957	1,009	1.3	177,717	169,261	6	6

Source: Statistical Yearbooks of HCMC, Binh Duong, Dong Nai, and Long An

[1] Study Team's GIS data.

[2] Excluding river areas.

5) Present Land Use

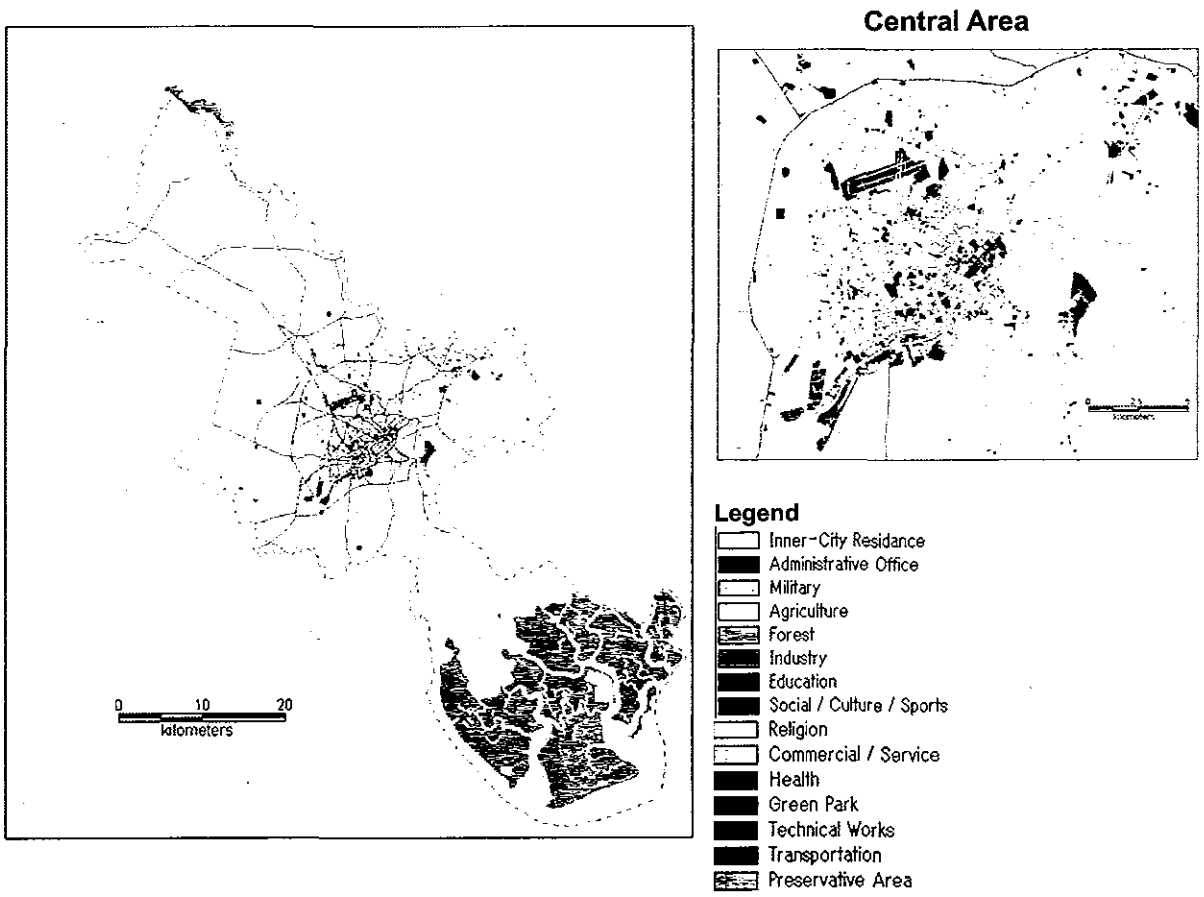
(1) Land Use in HCMC: The current land use in HCM City consists mainly of residential, industrial, agricultural areas and of inland waterways (rivers and canals) (refer to Figure 2.1.7). The characteristics are as follows:

Inner City: Almost all areas are already built up either as residential or commercial areas, except for some fringe areas in Go Vap, Binh Thanh, Tan Binh, and Districts 6 and 8. Some agricultural areas can still be found in the border between the inner city and the suburbs. There are two major commercial and service areas: District 1 and the area between District 5 and 6. Ben Nghe Ward facing Saigon River in District 1 is the largest commercial and tourist zone, and is also a civic center having a lot of government and government-related offices. Binh Tay market is another commercial center in District 6. Most of the buildings in the inner city are used for both commercial and residential purposes.

Suburbs: In the suburbs, a majority of land is being used for agriculture. Compared with the inner city, suburban residential areas are mostly scattered, except for the areas around the district centers. Along major arterial roads and some canals, ribbon-shaped settlements have also developed. There are three major industrial areas in the suburban districts. One is located along Provincial Road No.15 connecting to the southern area of the city through District 7 and Nha Be district. The second is located along National Highway No.1 through Districts 1, 9 and Thu Duc. The third is located along the outer ring road (National Highway No.1) from Binh Chanh district to District 12 and Thu Duc district.

(2) Land Use in Adjacent Provinces: In the adjacent three provinces covered by the study, urbanized areas are small. Most are concentrated in the provincial capitals of Thu Dau Mot, Bien Hoa and Tan An and along major arterial roads connecting to HCM City. It is only in Bien Hoa City, which has about 460 thousand population, where the urbanized area is relatively large. In Binh Duong and Dong Nai, many industrial parks are developed along the provincial and national roads, but in Long An, only a small portion of the planned industrial parks have materialized. Besides these comparatively small urban and industrial areas, vast agricultural areas dominate the landscape.

Figure 2.1.7 Current Land Use in HCMC



Source: Study Team (GIS data)

6) Housing Development

(1) HCMC: During the last decade, housing conditions in HCMC improved considerably. The total housing area in the city reached 52 million m^2 in 2000 from 31 million m^2 in 1990. This means that the average living area increased from 7.5 m^2/person in 1991 to 10.27 m^2/person in 2000.[4] With regard to housing quality, although semi-permanent houses still account for the largest share, the number of permanent houses more than doubled between 1989 and 2000 (refer to Table 2.1.10).

Table 2.1.10 Types of Houses in HCMC in 1989 and 2000

Types of House	1989		2000	
	Unit	%	Unit	%
Permanent	94,371	12.8	203,448	20.2
Semi-permanent	501,790	68.0	643,990	64.0
Others	141,373	19.2	159,583	15.8
Total	737,534	100.0	1,007,021	100.0

Source: 10-year development program for housing and the direction of housing development up to 2010 (2001)

[4] The figure indicates that conditions are starting to compare with other Asian cities such as Jakarta (10.2m^2), Manila (12.0m^2) and Bangkok (16.5 m^2) (in 1999 figures).

With the introduction of the Doi Moi policy in 1986, the government housing policy also changed. The State abandoned its housing subsidy policy and instead tried to create conditions to encourage people to build their own houses. The private sector has become a major player. Currently, there are more than 1,700 real estate companies in HCMC, which implemented a total worth of about VND 4,200 billion for housing projects in 2000. Government housing decreased its share from 16% in 1989 to 9% in 2000, while the share of private housing increased from 76% in 1989 to 90% in 2000.

The city government has implemented a housing policy focusing on resettlement and housing programs for the poor. So far, nearly 7,000 households living along Nhieu Loc-Thi Nge canal, which has a length of over 10km, have been resettled. Over 40ha of land have also been cleared and provided with various infrastructures, including roads and sewerage system. These resettlement projects gained great support from central government agencies and international donor agencies.

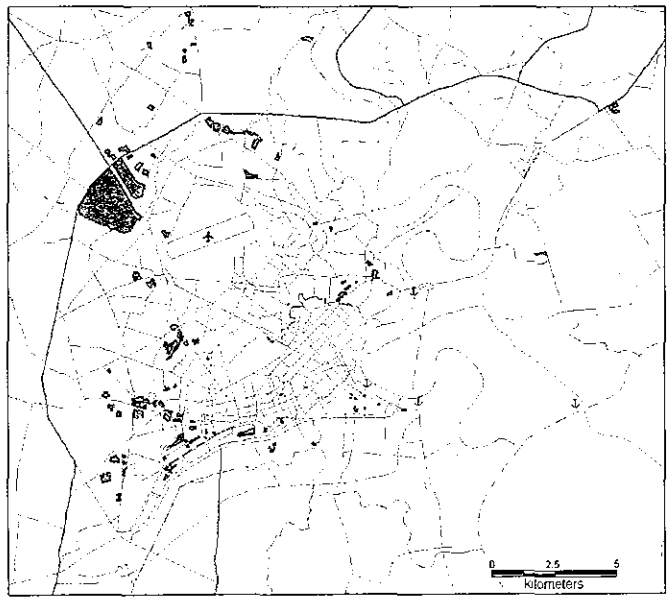
Up to now, 32% of the people in HCM City live below the average living standard (under 296,665 VND/person/month). About 3.5 million people are living in slums and squatter areas (refer to Figure 2.1.8 and Table 2.1.11). The city government is now trying to improve these areas by implementing various measures with the support of the respective communities and international donor agencies.

Table 2.1.11 Locations of Slums and Squatter Areas in HCMC

Area	Number of Houses	Area (m^2)
5 Inner-city Districts	29,731	1,536,915
5 New Inner-city Districts	12,107	1,755,616
Suburban Districts	33,039	2,629,089
Total	74,877	5,921,620

Source: 10-year development program for housing and the direction of housing development up to 2010 (2001)

Figure 2.1.8 Distribution of Slums and Squatter Areas in HCMC



Source: Study Team (GIS data)

7) Industrial Development

(1) HCMC: In HCMC, 10 industrial zones (IZs) and two export processing zones (EPZs) with a total area of 1,650ha (refer to Table 2.1.12) have been, or are being, developed. In order to manage these IZs and EPZs and promote investment in these areas, the HCMC Export Processing and Industrial Zones Authority (HEPZA) was established according to the Prime Minister's decree in 1996. As for the development situation, a large portion of IZs and EPZs located relatively close to the city center have already been occupied, while IZs in remote areas have difficulty attracting investors. Besides IZs and EPZs, the first software park in Vietnam was established by the city government at Quang Trung in District 12 in 2001. Currently, more than 30 software enterprises have already opened their offices in the park.

But many factories are still located within the inner city. According to the announcement by the city government, there are 23,000 factories whose activities have degraded the environment because of air, water and noise pollution. In order to relocate these facilities, the city government is planning to develop industrial parks with a total area of 6,000ha, including residential and commercial areas, in the northwestern outskirts of the city. The project will cost US$ 1.52 billion and is planned for completion in three phases from 2003 to 2015. Despite the practicability of the project, however, it is not so easy to realize all *project schemes of 6,000ha within the proposed schedule.*

Table 2.1.12 Development Situation of IZs and EPZs in HCMC

	Location	Total Area (ha)	Area for Rent (ha)	Occupied Area (ha)	Occupancy Rate (%)
1. Tan Thuan EPZ	District 7	300	195	135	69
2. Linh Trung EPZ	Thu Duc	62	45	43	95
3. Binh Chieu IZ	Thu Duc	27	21	20	95
4. Hiep Phuoc IZ	Nha Be	332	198	18	9
5. Tan Tao IZ	Binh Chanh	181	90	52	58
6. Tan Binh IZ	Tan Binh	155	95	13	14
7. Vinh Loc IZ	Binh Chanh	207	119	30	25
8. Tan Toi Hiep IZ	District 12	215	135	9	7
9. Tay Bac Cu Chi	Cu Chi	220	140	11	8
10. Le Minh Xuan	Binh Chanh	100	66	10	15
11. Cat Lai	District 2	134	78	–	–
12. Linh Trung II EPZ	Thu Duc	63	42	–	–

Source: HEPZA Home Page, DPI Provided Information

(2) Adjacent Provinces: In Binh Duong province's southern area, 13 industrial parks have been, or are being, developed along the provincial and national roads, almost all of which are located in the study area. These industrial parks have locational advantage to offer investors, such as their relative proximity to HCMC, a land that is favorable to factory construction and government support for infrastructure development. Among these 13 industrial parks, five have already been fully occupied and others are being rapidly developed.

In the study area of Dong Nai province on the outskirts of Bien Hoa City along National Highway No.51, there are eight industrial parks developed, or being developed. Many parts of these industrial parks are already occupied by foreign and domestic enterprises.

This is because the industrial parks are on an important transportation corridor that connects HCMC and Ba Ria-Vung Tau where deep port facilities are developed, and because the area has land and topography favorable for industrial activities. In addition, land rental fees in these industrial properties are relatively inexpensive compared with those in HCMC.

In Long An province, 10 industrial parks are planned by the provincial authority with a total area of 1,523ha. All of the industrial parks are planned to be located along major transportation corridors, national and provincial roads and waterways that connect to HCMC. However, the amount of investments in the province, although gradually increasing for several years, is still low compared to that of other provinces in the study area, and many of the planned industrial areas are either vacant or not yet developed.

8) Urban Services

This section gives an outline of the existing condition of physical infrastructure in the study area, including water supply, sewerage and solid waste systems. In HCMC as a whole, the water supply system and drainage facilities, which require a certain amount of investment capital for construction, are developed mainly in the city's high-density inner city, while in suburban districts and newly developing outskirts, such infrastructures have not yet been developed sufficiently. Solid waste management service covers almost the entire city area, but cannot catch up with the recent rapid population increase.

While detailed information on urban services in the adjoining provinces of the study area has not yet been provided, it can be said that existing urban services are unable to meet the growing demand in general.

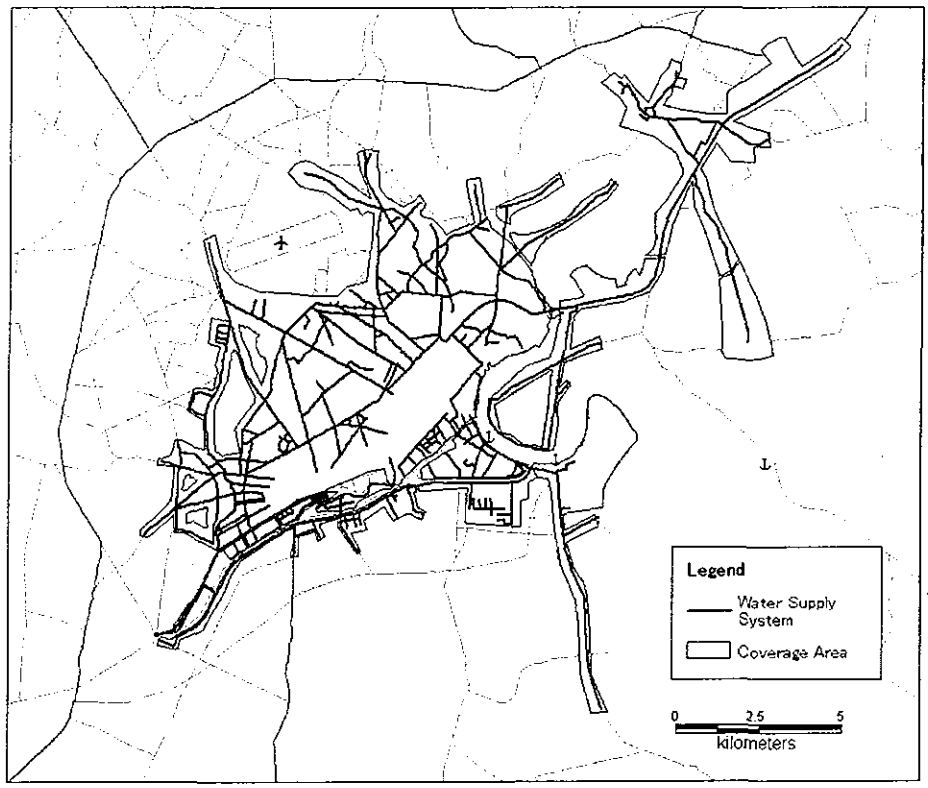
Water Supply System

(1) HCMC: HCMC's water supply system urgently needs expansion and improvement, as indicated by a survey conducted in 1995, entitled Water Supply Master Plan. Coverage of the public water supply system is relatively good in the older area of the inner city, declining in the newly developed inner-city areas (refer to Figure 2.1.9), and serving less than half of the population in the remaining suburban districts. As a whole, households that are currently connected to the supply system account only for 40-45% of households in the city. This figure is much higher than the national average (20-30%), but compared with other large cities in Vietnam, it is much lower (e.g. Hanoi is about 80%).

Households who do not have connections to a piped water supply system rely on a combination of private wells and water vendors. In addition, there are a relatively large number of households that share water connections with nearby households. In general, households with higher incomes live in areas where coverage and service are better than in low-income areas.

(2) Adjoining Areas: While the water supply system is provided in some urban areas, the quality and quantity of water supply system are generally poor and are not able to meet the demand of growing urban population. Many residents outside of the system's coverage depend on untreated water such as water from shallow wells and rainwater.

Figure 2.1.9 Water Supply Coverage Area in HCMC



Source: Study Team (GIS data)

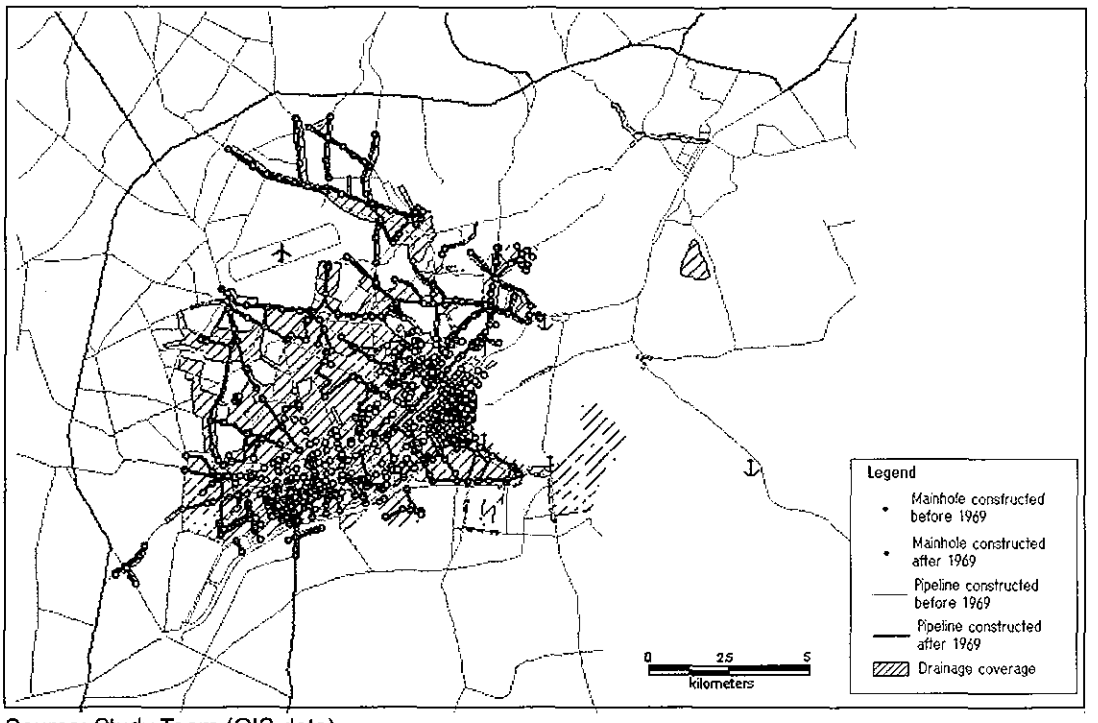
Sewerage System in HCMC

(1) HCMC: HCMC has an extensive sewerage system built in the colonial era and expanded during the war years. The city's inner core in particular has a combined system for the collection of wastewater and storm water. It consists of a network of underground culverts, sewers and open drains, which collect and convey both wastewater and storm water runoff to natural streams and manmade canals, ultimately flowing into the main rivers.

Although the sewerage density in the city center is high, it is less so in border areas between the inner city and the suburbs (refer to Figure 2.1.10). Because of this inconsistency, most of the population in the north is affected by the lack of sewers. According to the JICA Drainage Study conducted in 1999, the total coverage area of these systems is approximately 62 km^2. The coverage rate of the urban center was estimated at 100%, but in rural districts, the rate is less than 0.5%. During the monsoon season, flooding usually occurs several times in the urbanized and agricultural areas, causing severe damage to production. In addition, domestic and industrial wastewater is discharged daily into rivers and canals without any treatment.

(2) Adjoining Areas: Drainage and sanitation systems are generally not well developed in the adjoining areas. In the urban center, wastewater and storm water are discharged through combined networks without treatment. Due to the lack of an organized drainage system, flooding is common especially in the low level area. Many urban residents have no available sanitation facilities. Such a poor situation has deteriorated the urban environment.

Figure 2.1.10 Sewerage Coverage Area in HCMC



Source: Study Team (GIS data)

Solid Waste Management System

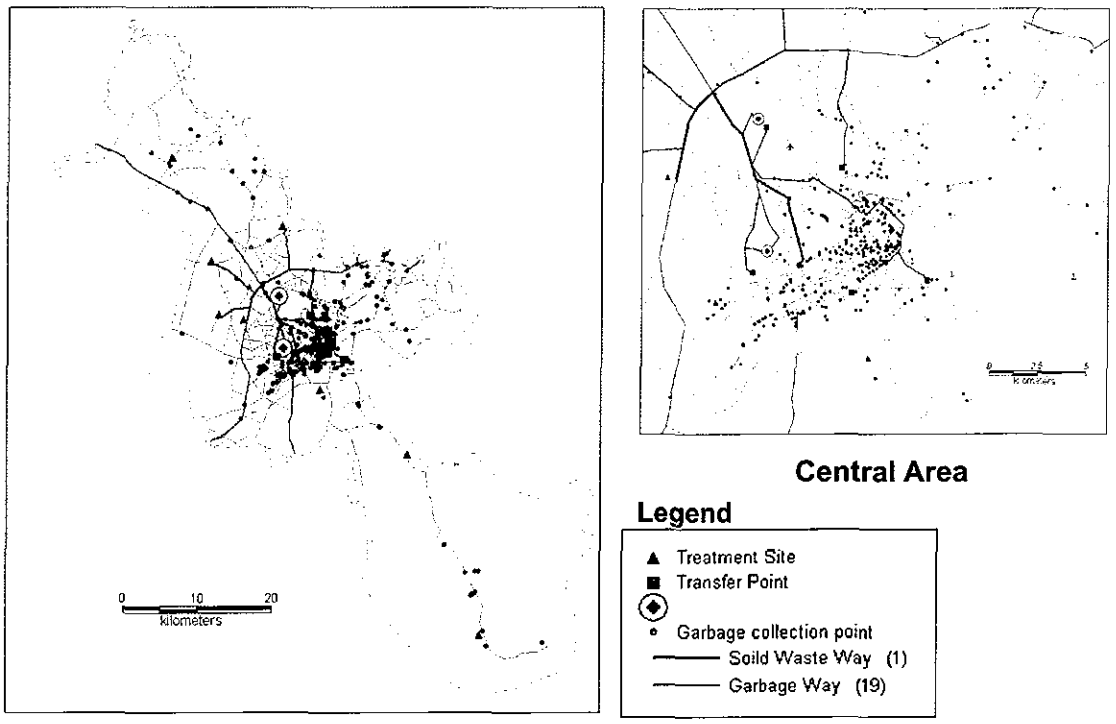
(1) HCMC: The solid waste management issue in HCMC is a pressing problem not only for the government; it is also affecting the citizen's health and the city's aesthetic values. Currently, solid waste is the source of the most contamination in the city's canal system. From the early 1990s, solid waste management has always been the subject of heated debates in the city, but has not been managed because of a lack of investment capital, equipment, technical knowledge, and citizen's awareness of its importance.

Solid waste from households is often kept in the house and stored in plastic bags or other containers for 24 hours or 2-3 days. But it is difficult for the present solid waste management capacity to cover the whole residential area in the city. The development of low-income residential areas within the city also aggravates the problem of waste collection, wherein adequate infrastructure facilities are not developed and residents are usually reluctant to bear the cost of waste collection.

According to a recent report, the city has generated solid waste at about 1,200,000-1,400,000 tons yearly (about 3,500 tons/day), increasing at an annual growth rate of 20%. The present dumping sites do not have enough receiving capacities for these generated wastes, and at the landfill, there is just a simple solid waste classification which does not comply with the sanitary process.

(2) Adjoining Area: Some form of solid waste management system is developed in most of the area, while the coverage is still low. While industrial waste has increased, most solid waste still comes from domestic activities. Collected solid waste is generally brought to landfills, which are not well designed and operated, causing environmental problems, such as leakage into ground water.

Figure 2.1.11 Location of Solid Waste Facilities in HCMC



Source: Study Team (GIS data)

9) Urban Environment

Along with rapid urbanization and population growth in HCM metropolitan area, environmental problems have become serious, in particular, for water and air in the urban areas. In this section, the following major environmental issues confronting the study area are discussed below:

- Environmental pollution (water and air)
- Degradation of natural ecosystem
- Lack of environmental planning and management in urban development, and
- Lack of environmental monitoring facilities.

Water Environment

Almost all canals in the study area are being used as part of the drainage system. These canals receive stormwater and wastewater generated from urban areas of the HCM metropolitan area and discharged mainly into Saigon River and Dong Nai River and then to Nha Be River (most part of the study area in Long An province are into Vam Co Dong River). Apart from the partial treatment of toilet wastes in septic tanks, wastewater treatment is practically absent, resulting in seriously polluted canals. River pollution is also rising to alarming levels, as indicated below.

(1) Water Quality of Rivers: According to the monitoring result by the Department of Science and Technology (DOSTE) of HCMC, water pollution level of Dong Nai River and Nha Be River is still low, but water quality of Saigon River has been deteriorating. Due to organic pollution and salt intrusion, Saigon River has become unsuitable as water supply source.

(2) Water Quality of Canals: Almost all the canals in the study area are polluted. DO

(dissolved oxygen) is zero in almost all canals in the urban area, making it virtually impossible for fauna to survive. Fecal contamination is severe, which has already resulted in the spread of water-borne diseases such as diarrhea, typhoid, and dysentery. Sludge has accumulated and most of the canals have not been dredged for a long time. Canal fillings disturb the hydraulic drainage system and may cause flooding, which will heighten the spread of infectious diseases.

Air Pollution

Main sources of air pollution are motor vehicle emissions, industrial emissions, and domestic air emissions. Population growth, urbanization and industrial park development with weak and overloaded infrastructure generally cause serious air pollution in cities in Vietnam and in HCMC in particular.

Air pollution in HCMC has been monitored by the DOSTE since 1996. The results of the monitoring show that air pollution is a major environmental concern in HCM City and is likely to be causing significant health problems. The levels of particulates, lead, and carbon monoxide (CO) at the monitoring points are several times higher than Vietnam's standards. In particular, pollution levels near major arterial roads are serious, while pollution levels near minor roads are less serious. This implies that emissions from motor vehicles are the key pollution sources. It is widely believed that 2-stroke engine vehicles are the primary emission sources. Other factors, such as the poor condition of these vehicles, poor road quality, and traffic congestion, exacerbate the situation.

In areas surrounding oil-fired power plants, H_2SO_4 plants and industrial combustion sources, pollution levels of sulfur dioxide (SO_2) are higher than Vietnam standards. Large- and small-scale factories outside industrial parks seem to be significant SO_2 pollution sources, which also emit CO. High concentrations of SO_2 can damage vegetation, crop and residents' health. Motor vehicles are also causes of SO_2.

Domestic activities related to cooking in and outside housing properties also cause air pollution. These activities are likely to emit significant quantities of particulates and hydrocarbons, including PAHs (polycylic aromatic hydrocarbons). Although total domestic emissions are lower than many other sources, this source seems to be crucial as it leads to significant exposure for residents.

Biodiversity Ecosystem in Can Gio

The Can Gio Mangrove Biosphere Reserve with a total area of 33,000ha and designated by the UNESCO in 2000, is located in the southern part of Can Gio District. The reserve includes the tidal-affected area, wetland and highland areas, where many rare species are living. The ecosystem of the reserve has restored quickly after it had been completely destroyed by chemicals during the war years. This capacity to recover comes from nutritious aquatic systems on the accumulating alluvium and merging rivers.

However, the ecosystem of the reserve is very sensitive to environmental changes related to water quality and stream, and is especially susceptible to negative impacts by humans. Based on the data from the People's Committee of Can Gio District, the gross output of aquatic products has increased, following the increased area of the restored mangrove forest. From 1978 to 1997, the gross output of aquatic products in the survey area increased from 2,215 tons/year to 38,333 tons/year. In the period between 1990 and 1992,

however, this output decreased, because the seawater was polluted by spilled oil and industrial wastes. After this period, the gross output of products has been increasing again.

Currently, the ecosystem of the Can Gio mangrove forest produces natural resources with very high economic value. But today due to rapid industrialization and urbanization and exploitation of natural resources in the HCM metropolitan area, the ecosystem has been slowly deteriorating. If appropriate measures to protect and restore the reserve are not adopted, its ecosystem will be completely spoiled in the near future.

Environmental Planning, Management and Monitoring

Environmental planning and management in the HCM metropolitan area need to be improved significantly to ensure that urban development is environmentally sound and sustainable. Currently, many industrial parks are planned purely for financial gain, with little consideration of environmental needs. Besides, actual construction may vary considerably from approved plans in terms of development and building applications. In some cases, while the original submission for approval included wastewater detention facilities, actual construction of these facilities is a long way off, or may never happen.

The lack of environmental monitoring facilities is another problem. Enforcement of national and provincial environmental law is rather limited, and is hampered by the lack of monitoring equipment. The timing of the environmental monitoring currently being undertaken is random or intermittent. This is not effective, because of the varying nature of rainfall and dilution effects, and data obtained in this manner can often be misleading. The relevant authorities, therefore, need to expand and improve environmental monitoring networks and set up monitoring stations to maintain a close check on the state of the environment and to ensure compliance with environmental regulations.

10) Urban Poverty[5]

Poverty reduction became a significant national priority issue with the issuance of the Comprehensive Poverty Reduction and Growth Strategy (CPRGS) in May 2002. As in many other developing countries, the level of poverty in urban areas in Vietnam is far better than in rural areas. The National Poverty Reduction Program defined the poverty line in the urban areas for the period 2001-2005 as having an income level of less than VND 150,000 per capita. Following this definition, the population of the poor in urban areas is estimated at 7.8% of the total urban population in Vietnam.

Although it is not based on the definition of poverty, 7.9% of the total population in HCMC live in miserable condition and, in 2001, spent less than VND 294,000 per capita. Based on these numbers, it is estimated that 3-5% of city population is poor.

The residential area for the poor is not the city center but the marginal areas developed after 1975. In addition, many poor households reside along the banks of canals. Although their houses have become permanent structures, their residential status remains temporary. Because households without permanent residential status are excluded from fully accessing public services, they are more socially vulnerable.

[5] This section owes largely to the "A Participatory Poverty Assessment–HCMC" undertaken by the Save the Children (UK) in 1999.

Issues Related to Poverty

Poor people without health care, education and capital leads to lost opportunities and to a waste of human potential. Reducing, if not eradicating, poverty is difficult. A number of critical issues identified with regard to poverty reduction are as follows:

(1) Rural-to-Urban Migration: The issue of migration is a serious concern of HCM city authorities. It is estimated that about 10% of its total population do not have the right to settle there[6]. Migrants are often among the poorest and most socially disadvantaged people in any given area; they are not entitled to many of the basic services or rights enjoyed by all local residents, such as piped water and electricity, house ownership, permanent employment in a state enterprise and quite often the admission of their children into mainstream school classes. In addition, migrant families are excluded from most of the projects and services that target the poor. Unregistered migrants face other problems. They might not be accepted for jobs because of lack of registration. Many schools (particularly secondary schools) require registration of students.

(2) Education: Many children have to drop out of mainstream primary school, because their families cannot afford or are unwilling to pay the expenses involved: books, clothing and the various contributions demanded by the school. It is especially difficult for poor families to raise all the money needed at the beginning of each school year. These expenses are usually affordable for a family with only one school-going child, but when there are three or more children of primary school age, the costs are often prohibitive. Sometimes one or more children drop out of school for this reason, and go to special, free classes, usually lasting for only 2 or 2.5 hours per day, sometimes only 3 days a week, often in the evening. Many drop out of these classes as well, since they are generally perceived as being inferior in quality, especially by employers. It very rarely happens that such children go back into mainstream education again.

When poor children drop out of school, they become much more vulnerable to the negative influences of the street, such as petty theft, gambling, and drugs. Parents, and the children themselves, are worried that these influences might prove to be too strong to resist, as social trends among the young clearly demonstrate.

(3) Microfinance: Indebtedness was identified as being a common cause, as well as a symptom, of poverty. This is because interest rates charged by moneylenders are often extortionate, running as high as 60% or 70% per month. These rates are generally imposed on migrants and/or very poor families who need money urgently, but have no collateral to offer. Such moneylenders are not only making money out of other people's poverty, but also compounding it. Local people and authorities are reluctant to intervene in cases where poor borrowers are being hounded, threatened or beaten up by loan sharks or their hoodlums. The cost of credit is highest for the poorest.

(4) Job Creation and Enterprises Promotion: Many poor people will not be able to run their own businesses and will have to rely on paid jobs. More needs to be done to create new jobs, to stimulate the market and to promote small and medium enterprises that offer

[6] There are two different categories of temporary residents in Ho Chi Minh City (K2 and K3), each having rules and restrictions. A third one, (KT4) which is supposed not to exist any longer (but still does in many areas), gives no right of abode at all in Ho Chi Minh City. People under this last category are in the worst situation, since they are entitled to nothing, and dependent on everything and everybody. They do not even appear in many of the official statistics. It is as if they do not exist.

jobs for poor people. This could be achieved by removing disincentives, lowering the investment risk and improving the environment for the creation and growth of private enterprises by providing easier access to formal credit for enterprises (without collateral) and by simplifying the licensing system for private enterprises. Private sector should be recognized as one of the most dynamic sectors of the economy rather than as competitors of SOEs.

(5) Urban Development, Land Clearance, Relocation and Housing[7]**:** Important development plans are scheduled or being implemented in all districts of HCMC. Families living on land that is earmarked for clearance are mostly very poor. When they are forced to leave their homes, those who have legal ownership of their houses are given compensation, which may or may not be enough to enable them to move into a reasonable house or apartment in a reasonable locality. Tenants and those who bought or put up houses unofficially receive no compensation at all. That was the risk they took when they settled in the area, and so they have no grounds for complaint.

(6) Public Utilities and Infrastructure: *The present government policy on the supply of* water and electricity, as well as infrastructure maintenance, favors the better-off, who tend to live along, or close to, main thoroughfares. Water and electricity connection charges depend on how far houses are from the main lines, which are situated along these thoroughfares. As a result, most poor families, who live in small alleyways far from the street, have to pay more. It is recommended that fixed connection charges could replace the present system, regardless of the distance involved, even if the (better-off) households situated close to the main water and electricity lines have to pay more than they do at present. Water and electricity connections could be provided to all households, so that poor (migrant) families no longer have to buy them from other (better-off) people in the neighborhood at inflated rates.

(7) Street Vendors and Cyclo Drivers: One of the few ways open to poor families to earn a living is to sell things to people on the street. The livelihood of street vendors, however, has been dealt a major blow by Decree 36, which prevents them from having a fixed place on the pavement to sell their goods. The reason for this is to ensure, for the benefit of the general public, that all pavements and roads are kept free of any obstacles.

Driving cyclos is another occupation done by the poorest members of society. Restrictions on cyclos have driven many cyclo drivers off the streets and out of business. As a general rule, restrictions on the economic activities of poor people should go hand-in-hand with the development of new employment for those whose livelihoods are being threatened.

(8) Health: When a member of a poor family becomes seriously ill and requires expensive treatment that is not provided free of charge, the result is usually disastrous. Either the family has to take a large private loan, causing severe indebtedness and hardship, or else the sick remains untreated, with obvious consequences to her/his health and earning potential. This is a sufficiently widespread problem to merit serious reflection and action.

(9) Information and Transportation: Many poor households lack awareness about the services that exist in their area. Even if they are, lack of mobility and access to affordable transport services hinders them from availing themselves of the needed services.

[7] A technical report on resettlement was prepared in the Study.