Japan International Cooperation Agency (JICA)
Danang People's Committee, Vietnam

No.

The Study on Integrated Development Strategy for Danang City and Its Neighboring Area in the Socialist Republic of Vietnam (DaCRISS)

FINAL REPORT / Part III

Danang City Situation Analysis

December 2010

ALMEC Corporation
International Development Center of Japan

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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
DANANG PEOPLE'S COMMITTEE

THE STUDY ON INTEGRATED DEVELOPMENT STRATEGY FOR DANANG CITY AND ITS NEIGHBORING AREA IN THE SOCIALIST REPUBLIC OF VIETNAM (DaCRISS)

FINAL REPORT

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INTERNATIONAL DEVELOPMENT CENTER OF JAPAN

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(average in 2008)

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 the Integrated Development Strategy for Danang City and Its Neighboring Area (DaCRISS) and entrusted the program to the Japan International cooperation Agency (JICA)

JICA dispatched a team to Vietnam between June 2008 and December 2010, which was headed by Mr. IWATA Shizuo of ALMEC Corporation and consisted of ALMEC Corporation and International Development Center of Japan.

In the cooperation with the Vietnamese Counterpart Team, the JICA Study Team conducted the study. It also held a series of discussions with the relevant officials 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 sustainable development of Danang City and its neighboring areas as well as Vietnam and to the enhancement of friendly relations between the two countries.

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

December 2010

KIYOFUMI KONISHI
Director General, Economic Infrastructure Department
Japan International Cooperation Agency

December 2010

KIYOFUMI KONISHI
Director General, Economic Infrastructure Department
Japan International Cooperation Agency
Tokyo

Subject: Letter of Transmittal

Dear Sir,

We are pleased to formally submit herewith the final report of The Study on the Integrated Development Strategy for Danang City and Its Neighboring Area (DaCRISS).

This report compiles the results of the study which was undertaken both in Vietnam and Japan from June 2008 to December 2010 by the Team comprising ALMEC Corporation and International Development Center of Japan.

In the course of the study we have conducted various surveys including the Household Interview Survey which targeted at 5,000 households in Danang City, to grasp the situation of the city from various aspects. By considering these results as well as existing policies, and through thorough discussions with the counterpart team, we have proposed “Danang to be an Internationally Competitive Environmental City Beyond being Pollution-free” as the vision statement for Danang City.

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 People’s Committee of Danang City.

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

We hope the report would contribute to the sustainable development of Danang City and its neighboring areas as well as Vietnam.

Very truly yours,
IWATA Shizuo
Team Leader
The Study on the Integrated Development Strategy
for Danang City and Its Neighboring Area (DaCRISS)

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PICTURES

ABBREVIATIONS

3R	Reuse, Reduce, Recycle
AASHTO	American Association of State Highway and Transportation Officials
ADB	Asian Development Bank
AFD	Agence Française de Développement
AIDS	Acquired Immune Deficiency Syndrome
ALTID	Asian Land Transport Infrastructure Development
APEC	Asia-Pacific Economic Cooperation
API	Air Pollution Indices
ARD	Agriculture and Rural Development Department (
AS	Activated sludge
ASEAN	Association of Southeast Asian Nations
AUICK	Asian Urban Information Center of Kobe
AusAID	Australian Agency for International Development
BOD	Biological Oxygen Demand
BOO	Build-Own-Operate
BRT	Bus Rapid Transit
BSE	Bus Service Enterprise

CAD	Computer Aided Design or Computer Aided Drafting
CBD	Central Business District
CBO	Community Based Organization
CDM	Clean Development Mechanism
CDS	City Development Strategy
CEMDI	Center for Environmental Monitoring Data and Information
CEPT	Chemically Enhanced Primary Treatment
CER	Certified Emission Reductions
CFEZ	Central Focal Economic Zone
CG	Central Government
CIE	Capital Investment Expenditure
CMTT	Cach Mang Thang Tam.
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COD	Chemical Oxygen Demand
COWASU	Thua Thien Hue Construction Company
CPCM	Certified Pollution Control Manager
CPU	Central Processing Unit
CS	Commune Survey
CSR	Corporate Social Responsibility
CZIM	coastal zone integrated management
DaCRISS	The Study on Integrated Development Strategy for Da Nang City and Its Neighboring Area in the Socialist Republic of Vietnam
DAIZICO	Danang Industrial Zones Infrastructure Development and Exploitation Company
DARD	Department of Agriculture and Rural Development
DOCST	Department of Culture, Sport, and Tourism
DEIAA	Department of Environmental Impact Assessment and Appraisal
DGN	Design
DHMC	Danang Housing Management Company
DIEPZA	Danang Industrial and Export Processing Zones Authority
DNICT	Danang Information–Communication Technology
DOC	Department of Construction
DOET	Department of Education and Training
DOF	Department of Finance
DOFA	Department of Foreign Affairs
DOH	Department of Health
DOIA	Department of Internal Affairs
DOIC	Department of Information and Communications
DOIT	Department of Industry and Trading
DOJ	Department of Justice
DOLISA	Department of Labor, Invalids and Social Welfare
DONRE	Department of Natural Resources and Environment
DOST	Department of Science and Technology
DOT	Department of Transport
DPC	Danang People’s Committee
DPI	Department of Planning and Investment
DPTA	Danang Public Transport Authority
DSS	Decision Support System

DTCC	Danang Traffic Control Centre
DUT	Danang University of Technology
DVD-RW	Digital Versatile Disc - Rewriteable
DWRM	Department of Water Resources Management
DWSC	Da Nang Water Service Company
DWT	Dead Weight Tons
ECAFE	Economic Commission for Asia and the Far East
EFA	Environmental Flows Assessment
EIA	Environment Impact Assessment
ENTEC	Environment Technology Centre
ENVISAT	Environmental Satellite
EPA	Environmental Pollution Agency
EPC	Environment Protection Center
EPRC	Environmental Protection Research Centre
EPZ	Export Processing Zone
ESCO	Environmental Service Company
EU	European Union
EVN	Electricity of Vietnam
EWEC	East–West Economic Corridor
EZ	economic zone
FAO	Food Agriculture Organisation
FDI	Foreign Direct Investment
FEZ	Focal Economic Zone
FIA	Foreign Investment Agency
FS	Feasibility Study
FSCC	Flood and Storm Control Committee
GB	Gigabyte
GCS	Geographic Coordinate System
GDP	Gross Domestic Product
GEF	Global Environment Facility
GMS	Greater Mekong Sub-regional
GOJ	Government of Japan
GOV	Government of Vietnam
GPS	Global Positioning System
GRDP	Gross Regional Domestic Product
GRT	gross register tons
GSO	General Statistics Office
GSTC	Global Sustainability Tourism Criteria
GTZ	Gesellschaft für Technische Zusammenarbeit
GWh	Giga Watt hour
GWP	Global Water Partnership
GIS	Geographic Information System
GIS-IDEAS	Geo Informatics for Spatial-Infrastructure Development in Earth & Allied Sciences
HACCAP	Hazard Analysis and Critical Control Points
HAIDEP	The Comprehensive Urban Development Programme in Hanoi Capital City
HCMC	Ho Chi Minh City
HDD	Hard Disk Drive
HDQ	headquarter
HEPCO	Hokkaido Electric Power Company
HH	household
HIS	household interview survey

HIV	Human Immunodeficiency Virus
HMC	Housing Management Company
HOUTRANS	The Study on the Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area
HP	Hewlett-Packard
HPC	Hanoi People's Committee
HRD	Human Resource Development
HSBC	Hong Kong and Shanghai Banking Corporation.
HSR	High Speed Railway
ICAO	International Civil Aviation Organization
ICEM	International Centre for Environmental Management
ICM	Integrated Coastal Management
ICT	Information–Communication Technology
ICZM	Integrated Coastal Zone Management
ID	Identification
IDA	International Development Association
IEE	Initial Environmental Examination
IEMS	Integrated Environmental Monitoring System
IERR	Internal Economic Rate of Return
ILO	International Labour Organization
IMF	International Monetary Fund
IMO	International Maritime Organization
IMOLA	Integrated Management of Lagoon Activities
INBO	International Network of Basin Organizations
IT	information technology
IUCN	International Union for Conservation of Nature.
IWRA	International Water Resources Association
IWRM	Integrated Water Resources Management
IYB	Improve Your Business
IZ	industrial zone
JBIC	Japan Bank for International Cooperation
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JPY	Japanese Yen
KCN	industrial estate
KfW	Kreditanstalt für Wiederaufbau
Lao PDR	Lao People's Democratic Republic
LICCPP	Livelihood Improvement in Central Coastal Provinces Project
LIH	low-income housing
LIHAS	Low Income Housing Assessment Study
LoS	length of stay
LRT	Light Rail Transit
LUR	land-use rights
LURC	Land Use Right Certificates
LWR	Law on Water Resources
M/C	Motorcycle
MARD	Ministry of Agriculture and Rural Development
MASSCORP	Malaysian South-South Corporation
MB	megabyte
MICE	Meeting, Incentives, Conference and Exhibition
MIS	Management Information Systems
MLIT	Ministry of Land, Infrastructure, and Transport

MOA	Memorandum of Agreement
MOC	Ministry of Construction
MoCST	Ministry of Culture, Sports and Tourism
MOF	Ministry of Finance
MOI	Ministry of Industry
MONRE	Ministry of Natural Resources and Environment
MOST	Ministry of Science and Technology
MOT	Ministry of Transport
MP	Master Plan
MPA	Marine Protected Areas
MPI	Ministry of Planning and Investment
MRC	Mekong River Commission
MT	metric ton
NARBO	Network of River Basin Organization
NCEST	National Center for Environmental Science and Technology
NEDECO	Netherlands Engineering Consultants
NFEZ	North Focal Economic Zone
NIURP	National Institute for Urban and Rural Planning
NKEZ	Northern Key Economic Zone
NMT	non-motorized transportation
NO_2	Nitrogen Oxide
NPV	Net Present value
N-S	North-South
NSHSR	North-South Highs-Speed Railway
NTSC	National Traffic Safety Committee
NWRS	National water resources strategies
NGO	Non Government Organizations
NH	National Highway
O&M	Operations and Maintenance
OD	Origin-Destination
ODA	Official Development Assistance
OECD	Organisation for Economic Cooperation and Development
PAD	Project Appraisal Document
PAR	Public Administration Reform
PC	People's Committee
PCC	Project Coordination Committee
PCD	Pollution Control Department
PCU	passenger car unit
PDF	Portable Document Format
PEMSEA	Partnerships in Environmental Management for the Seas of East Asia
PIIP	Priority Infrastructure Investment Program
PIT	Personal Income Tax
PMO	Project Management Office
PMU	Project Management Unit
PPA	Participatory Poverty Assessment
PPC	Provincial People's Committees
PPP	Public Private Partnership
PSPO	Pilot Study Project Office
PTA	Public Transport Authority
R&D	Research and Development

RBO	river basin organization
RDF	Refuse Derived Fuel
ROW	Right-of-way
SAGE	Schéma d'Aménagement et de Gestion des Eaux (Water Management Plan)
SAWACO	Saigon Water Corporation
SBR	Sequencing Batch Reactor
SCOTIA	Sustainable Coastal Tourism in Asia
SDS-SEA	Sustainable Development Strategy of the Seas of East Asia
SEA	Strategic Environmental Assessment
SEDP	Socio-Economic Development Plan
SFEZ	South Focal Economic Zone
SIDA	Swedish International Development Cooperation Agency
SKEZ	Southern Key Economic Zone
SME	small and medium-sized enterprise
SOC	State of the Coast
SOE	state-owned enterprise
SOHO	small office/home office
STRADA	System for Traffic Demand Analysis
SWOT	Strengths, Weaknesses, Opportunities, and Threats
SYB	Start Your Business
TCVN	Tieu Chuan Viet Nam
TCXDVN	Tiêu chuẩn xây dựng Việt Nam
TDM	Traffic Demand Management
TEDI	Transport Engineering Design Institute.
TEU	twenty-foot equivalent units
TF	Trickling Filter
TGCH	Tam Giang Cau Hai
TIN	Triangular Irregular Network
TLP	Tropical Low Pressure
UMRT	Urban Mass Rapid Transit
UN	United Nations
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFPA	United Nations Population Fund (formerly United Nations Fund for Population Activities).
UPI	Urban Planning Institute
URENCO	Urban Environmental Company
USA	United States of America
USB	Universal Serial Bus
USD	US Dollar
USP	Utility Service Programme
UTM	Universal Transverse Mercator
VAT	value added tax
VBSP	Vietnam Bank for Social Policy
VCCI	Vietnam Chamber of Commerce and Industry
VCEP	Vietnam-Canada Environment Program
VDR	Vietnam Development Report
VEA	Vietnam Environmental Agency
VEPA	Vietnam Environmental Protection Agency

VHLSS	Vietnam Household Living Standards Survey
VITRANET	Viet Nam Trade Network
VITRANSS 1	The Study on the National Transport Development Strategy in the Socialist Republic of Vietnam
VITRANSS2	The Comprehensive Study on the Sustainable Development of Transport System in Vietnam
VNAT	Vietnam National Administration of Tourism
VND	Vietnamese Dong
VNICZM	Viet Nam Netherlands Integrated Coastal Zone Management
VNRSC	Vietnam Remote Sensing Center
VPSSP	Vietnam Private Sector Support Programme
VRA	Vietnam Road Administration
WANI	Water and Nature Initiative
WB	World Bank
WDESP	Water Drainage and Environmental Sanitation Project
WGS	World Geodetic System
WHO	World Health Organization
WSP	Waste Stabilization Ponds
WTO	World Trade Organization
WWF	World Wildlife Fund
WWTP	Waste Water Treatment Plan

1 INTRODUCTION

1.1 Introduction

1.1 The situation analysis for Danang City was performed in a comprehensive and detailed manner, covering various aspects of the city. The main aspects covered in this part include, among others, socio – economic conditions, spatial development, urban infrastructure, transportation, and environment, supported by other subsectors as well. Both qualitative and quantitative data from related departments and institutions, previous studies, and those collected directly by the Study Team were fully utilized to present these results. An overview is provided at the beginning of each chapter to provide a general view of each subsector.

1.2 While the Study Team paid due attention to available statistical data, several surveys were implemented to supplement to these data by collecting the people's opinions and assessments towards various aspects of the city. Those surveyed for this purposed include; residents of the city (Household Interview Survey), commune leaders of all communes in the CFEZ (Commune Survey), main enterprises in Danang City (Enterprise Survey), and leading tourist operators in Thua Thien Hue, Quang Nam, and Danang (Tourism Operator Survey). Supporting available statistical data by such information provides not only a broader picture of the actual situations, but also concrete establishment for the decision makers to define the future policy of the city.

1.3 The situation analysis presented in this part serves as the solid basis and background for the formulation of the Master Plan presented in Part IV.

1.2 Historical Development of Danang City

1.4 In mid 16th century, Danang was only a small port for goods in transit and ship repair. It gradually developed into a commercial port replacing Hoi An in the early 18th century, when European shipbuilding was improved and large deep draught vessels could easily enter Danang Bay. After 1835, when King Minh Mang designated Han Port as the sole harbor for trading, Danang became the largest commercial port in the central region, and local small – scale industries prospered accordingly. The French colonists, after establishing their domination of the whole Vietnam in 1889, separated Danang from Quang Nam Province and renamed the city Tourane.

1.5 In the early 20th century, Tourane became one of the main trading centers in the country along with Hai Phong and Saigon. Economic activity such as agriculture production, small – scale industries, export product processing, ship building and repair, and services took shape and thrived.

1.6 In 1950, the French gave the authority over the city to the Bao Dai government. In March 1965, American marine units landed and started to set up a big military complex. The city was defined as a centrally governed city in 1967, and accordingly American troops and the Saigon government built up Danang into a political, military and cultural center of the 1st and 2nd tactical zones. Military bases and infrastructure were constructed, and industries flourished. However, the devastating war made thousands of rural people flee in refugee camps. Urban slums appeared, social evils increased and production came to a standstill.

1.7 In 1975, after gaining complete independence, Danang's rehabilitation and development saw some results, especially after the renovation in 1986.

1.8 On July 1996, the 10th session of the 9th National Assembly of the Socialist Republic of Vietnam passed a Resolution separating Quang Nam – Danang Province into Quang Nam Province and Danang City, which was directly managed under the central government. *(Contents cited and summarized from Danang City Website: http://www.danang.gov.vn)*

2 DANANG CITY IN THE REGION

2.1 Geographical Location of Danang City

2.1 Danang City lies between latitudes 15°06' and 16°01' North and longitudes 107°02' and 108°02' East, bordered by Thua Thien Hue Province and Danang Bay in the north, Quang Nam Province in the south and west, and the East Sea in the east. It is strategically located in Asia.

2.2 The distance between Danang City and major growth centers are within a radius of 1,000–2,000km including Bangkok, Malaysia, Singapore, Manila, Taiwan, Guazou/Hong Kong, Nanning, Kunmin, among others. Some of the growth centers are much larger than NFEZ and SFEZ. If direct air routes are opened, they can be connected within 2–3 hours (see Figure 2.1.1).

2.3 Danang's role in the Greater Mekong Subregion (GMS) is also expected to be significant (with the development of the east–west corridor between Vietnam and Thailand via Laos, there is an increasing attention on tourism traffic and logistics services (see Figure 2.1.2).

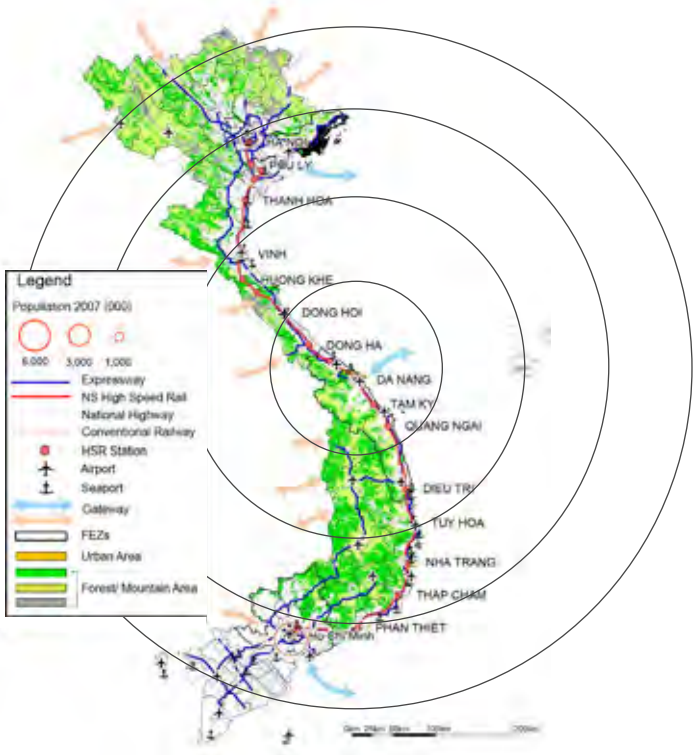
2.4 Situated 764 km south of Hanoi, 964 km north of HCMC is the pivot of integrating the north and south of Vietnam, because Danang is the largest urban center in between the two major growth centers of the country. Unless Danang City grows much more significantly and play a catalytic role to connect the north and south, balanced development of long stretched lands will not be promoted (see Figure 2.1.3).

Figure 2.1.1 Distance of Major Growth Centers from Danang City

Sources: Base map from JETRO's ASEAN logistics roadmap, GDP from ASEAN Secretariat data for 2007, and VITRANSS 2 estimates for 2030.

Figure 2.1.2 Danang City in GMS

Figure 2.1.3 Danang City in Vietnam



2.2 Socio–economic Position of Danang City in Vietnam

2.5 Danang City belongs to the Central Focal Economic Zone (CFEZ) along with the provinces of Thua Thien Hue, Quang Nam, Quang Ngai, and Binh Dinh. Table 2.2.1 shows the profile of Danang City in comparison to that of the FEZs in Vietnam.

2.6 The area in Danang City is small, and its population, mostly urban population, is much smaller than growth centers such as Hanoi and Ho Chi Minh City. However, its socio-economic presence in the region is quite noticeable. The city accounts for one-fourths of the total GRDP of the CFEZ, and nearly 40% of all FDP projects in the CFEZ in the period 1988–2007 have been licensed in Danang City. Economic growth is rapid at an annual growth of 12.3%.

2.7 The total GRDP of the CFEZ is only 26% of that of the NFEZ, and 12.8% of that of the SFEZ. This indicates that the scale of the CFEZ is by far smaller than the other two. For a more balanced development for the whole country, Danang City should lead further development of the region in the future both socially and economically as a central city.

2.8 Growth in GRDP per capita in Danang has consistently outstripped growth in both CFEZ and the country as a whole (see Table 2.2.2). In 2009, per capita GRDP in Danang was nearly 1.4 times the national average. Personal income data obtained through household surveys are slightly more ambiguous. Although nominal income growth has been rapid, it is not clear if Danang is keeping pace with the national average, especially that of NFEZ and SFEZ. The preponderance of low-value-added production, the 'brain drain' in favor of SFEZ, and the dominance of the state sector in industrial production are likely to be contributory factors.

2.9 Tables 2.2.3 and 2.2.4 show the main goods for direct exportation / importation in Danang City. Commodities from Danang City mainly included sewing products, products of fishery, handicrafts goods, and coffee–light industrial goods. Commodities which Danang City imported included machinery and equipment, and inputs to production such as textile material, plastic, and iron and steel.

2.10 The socio-economic activities in Danang City can be inferred from the distribution of interprovincial transportation demand for both passenger and freight. Such demand was estimated in VITRANSS 2[1]. Inter–regional passenger movement as well as freight movement will increase significantly in the region Another important aspect is that the movement within the CFEZ will increase also–the increase for Quang Ngai is especially notable.

[1] A JICA technical assistance for the Ministry of Transport, "The Comprehensive Study on Sustainable Development of Transport System in Vietnam" (VITRANSS 2), started in 2007 and will be completed by the end of 2009.

Table 2.2.1 Profile of Danang City in Vietnam (2009)

Item		Focal Economic Zone			Vietnam	Danang City
		North	Central	South		
Area	km^2	15,594	27,976	28,099	331,051	1,283
	% to Vietnam	5	9	9	100	0.4
Population	000	14,328	6,109	15,535	86,025	890
	% to Vietnam	17	7	18	100	1.0
	Growth (% / year): 00–09	1.35	0.58	2.98	1.15	2.7
Urban Population	000	5,000	2,024	8,304	25,466	773
	% to Vietnam	20	8	33	100	3.0
	Growth (% / year): 00-09	4.33	2.80	3.58	3.48	2.8
GRDP[1)]	VND billion	239,241	62,585	486,366	1,144,015	15,474
	% to Vietnam	21	5	43	100	1.4
	Growth (% / year): 00-07	11.9	11.0	11.8	11.3	12.3
Per Capita GRDP[1)]: VND million		10.2	17.7	36.1	13.8	19.1
FDI	Number of Projects: 88-09	3,106	416	7,665	12,575	164
	USD Mil.: 88-09	36,626	15,755	92,683	194,430	2,640

Note: Most are 2009 data from provincial statistical yearbooks, unless otherwise noted.
1) 2007 figures, 2007 constant price, Real growth (calculated based on 1994 constant price).

Table 2.2.2 Key Economic Indicators, 1996–2006

GRDP/Capita	GRDP/capita, 2000 (VND thousand)		GRDP/capita, 2006 (VND thousand)		Annualized Growth Rate, 2000–2006			
	Value	% national	Value	% national				
Danang	4,733	134	8,713	172	10.7%			
CFEZ	2,481	70	4,293	85	9.6%			
Vietnam	3,525	100	5,052	100	6.2%			
Average Monthly Personal Income	Income (VND 000)					Proportion to National Average		
	1996	1999	2002	2004	2006	2002	2004	2006
Danang	187	317	463	670	853	130	138	134
Vietnam	-	-	356	484	637	100	100	100

Sources: DOS Danang, MPI; results of the 2006 Vietnam household living standards survey, GSO.
Note: All figures in 1994 constant prices.

Table 2.2.3 Main Goods for Direct Exportation in Danang

Goods	Quantity (Ton)	Value (000 USD)	Value (% to total)
Coffee	30,145	47,593	10.1
Products of fishery	-	75,226	16.0
Rice	24,920	8,039	1.7
Agricultural Products	-	11,357	2.4
Sewing products	-	139,769	29.8
Footwear of all kinds	-	17,652	3.8
Handicrafts goods	-	51,608	11.0
Other goods	-	118,339	25.2

Source: GSO, 2007

Table 2.2.4 Main Goods for Direct Importation in Danang

Goods	Quantity (Ton)	Value (000 USD)	Value (% to total)
Wheat flour	21,805	6,492	1.2
Chemical products	-	34,057	6.5
Drug	-	24,864	4.8
Chemical fertilizers	107,512	22,466	4.3
Plastic	50,312	64,786	12.4
Textile fibers	1,855	3,526	0.7
Textile material	-	76,967	14.7
Footwear material	-	8,506	1.6
Iron, steel	74,843	41,644	8.0
Electronic goods	-	1,128	0.2
Motorbike	500	450	0.1
Machinery, equipment	-	237,173	45.4

Source: GSO, 2007

2.3 Danang City in the National Development Context

(a) **Urbanization:** Currently the urbanization rate of Danang City is at 27% (See Table 2.3.1). This is expected to reach 40% in 2025, according to projections by the United Nations. Currently, the urban population in Danang merely accounts for 0.8% to the total population in Vietnam. The country is seeking growth in secondary cities, and as the speed of urbanization in Hanoi and Ho Chi Minh City is much faster than that of Danang, a much accelerated growth of Danang City is needed for balanced development

Table 2.3.1 Urbanization in Vietnam

	1995		2000		2005		2007		2015		2025	
Urban Population												Unit: thousand
Red River Delta	2,689	3.7%	3,445	4.4%	4,356	5.2%	4,622	5.4%	6,112	6.5%	8,074	7.9%
Hanoi	1,275	1.8%	1,587	2.0%	2,057	2.5%	2,182	2.6%	2,885	3.1%	3,811	3.7%
North East	1,337	1.9%	1,619	2.1%	1,805	2.2%	1,823	2.1%	2,411	2.6%	3,184	3.1%
North West	269	0.4%	283	0.4%	356	0.4%	373	0.4%	493	0.5%	651	0.6%
North Central Coast	1,054	1.5%	1,303	1.7%	1,452	1.7%	1,488	1.7%	1,967	2.1%	2,599	2.5%
South Central Coast	1,459	2.0%	1,824	2.3%	2,108	2.5%	2,200	2.6%	2,909	3.1%	3,842	3.8%
Danang	426	0.6%	566	0.7%	670	0.8%	698	0.8%	923	1.0%	1,219	1.2%
Central Highlands	821	1.1%	1,135	1.5%	1,333	1.6%	1,372	1.6%	1,814	1.9%	2,396	2.3%
South East	4,873	6.8%	6,288	8.1%	7,321	8.8%	7,776	9.1%	10,283	11.0%	13,583	13.3%
HCMC	3,466	4.8%	4,381	5.6%	5,035	6.1%	5,426	6.4%	7,174	7.7%	9,477	9.3%
Mekong River Delta	2,437	3.4%	2,876	3.7%	3,606	4.3%	3,717	4.4%	4,915	5.2%	6,493	6.4%
Whole Country	14,938	20.7%	18772	24.2%	22,337	26.9%	23,370	27.4%	30,904	33.0%	40,822	40.0%
Whole Country	71,996		77,635		83,106		85,155			93,647		102,054

Source (Record): General Statistics office of Vietnam
Source (projection): Population Division of the Department of Economic and Social Affairs of the United Nations Medium Variant

(b) **Industrial Development:** Recently in Vietnam, there are more than 131,300 establishments engaged in various industrial production activities. Of this number, 3,706 SOEs and 4,220 foreign-invested enterprises account for small shares in terms of the number of establishments but take up considerable shares of 27.7% and 38.9%, respectively, of the entire industrial outputs.

2.11 Danang's economic development has been mainly driven by the state sector's investment. One of the reasons for this is that Dannag is a militarily strategic city for the country. While non state and foreign invested sectors have become new and powerful driving forces of economic development in HCMC and Hanoi, they still remain weak in Danang.

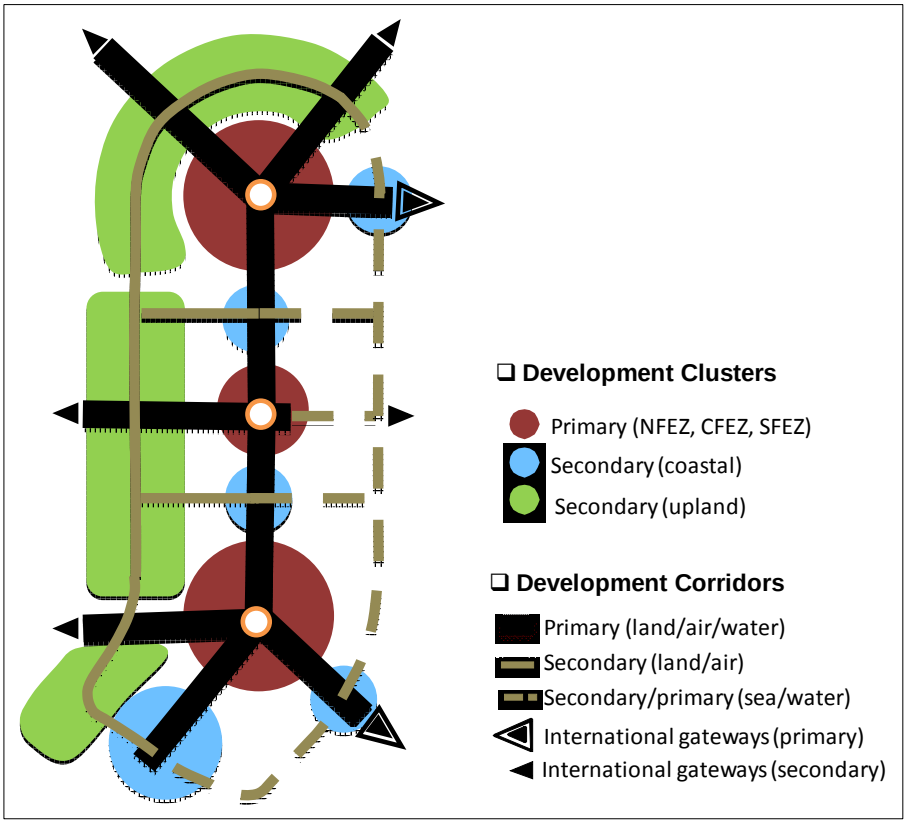
(c) **Transport Development:** The national transportation development strategy includes the following: (i) North-South High Speed Railway, (ii) North-South Expressway, (iii) roads and railways, (iv) ports and shipping, (v) aviation, (vi) inter-modal and logistics services, and vii) cross-border transport.

2.12 Figure 2.3.1 is a conceptual figure of the core national transportation network development concept. The central region is given a role as the region connecting the north and south for land, air, and water transport, and as a secondary international gateway. The purpose behind this concept is the effective integration of development clusters with a strategic transport network.

2.13 Danang Airport is the third gateway airport of the country, and expects a passenger demand of 4 million by 2020. It is one of the important gateways to central Vietnam, and has both domestic and international scheduled flights. The number of flights are being planned to increase, and its destinations may also increase (Singapore, Incheon, Osaka, Phnom Penh, Siem Reap). Currently, a new terminal construction is undergoing to realize these plans.

2.14 The connection of Danang City to the north and south via high speed railway and expressway will definitely change the accessibility of the Danang people to other regions in the country. The Hai Van tunnel, constructed in June 2006 has already proved this by providing easy access to provinces north of Danang.

Figure 2.3.1 Core National Transportation Network Development Concept



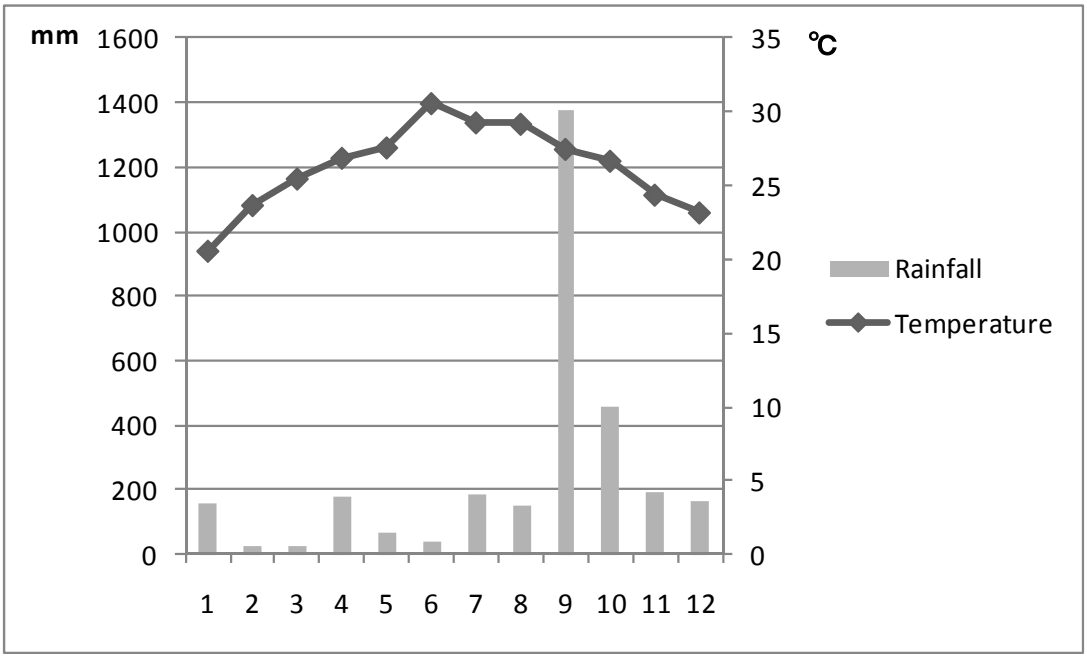
Source: VITRANSS2 Study Team.

3 NATURAL CONDITIONS

3.1 Climate

3.1 Danang City has two seasons, the dry and the wet. The wet, or rainy, season starts around October, lasting till January, usually around *Tet*. The change of dry and wet seasons is exactly the opposite of that of Hanoi City and Ho Chi Minh City. In the dry season, the temperature rises up to nearly 30 degrees Celsius.

Figure 3.1.1 Average Rainfall and Temperature in Danang City, 2009

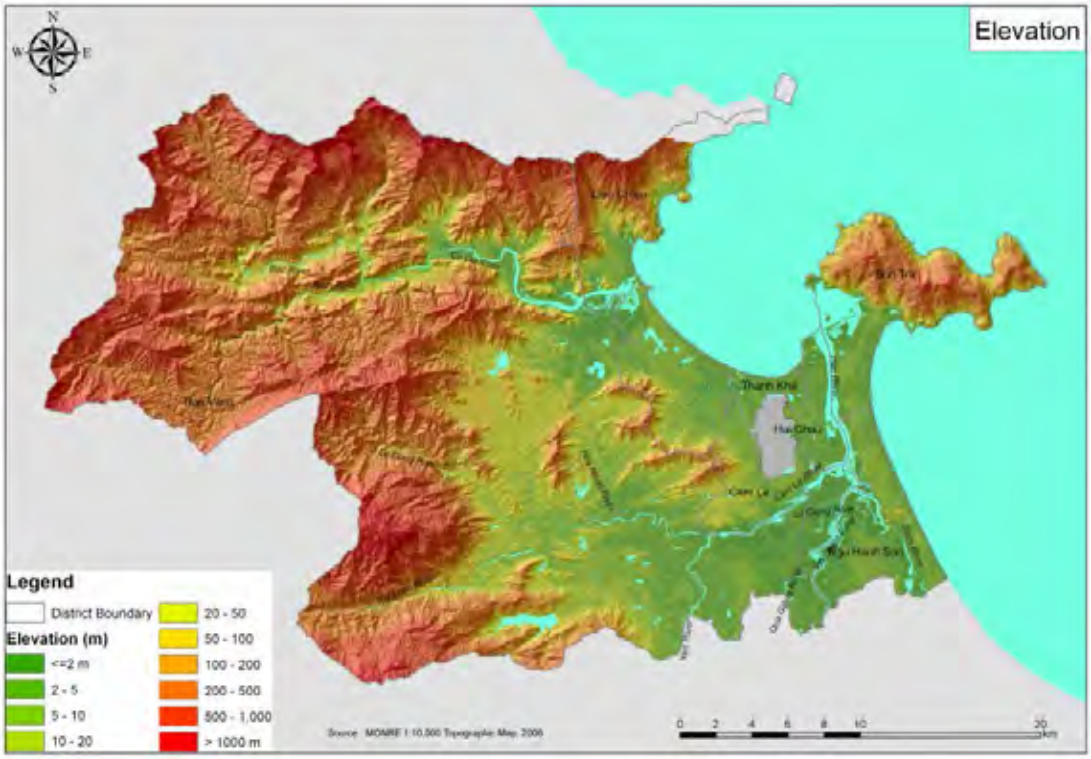


Source: GSO.

3.2 Topography

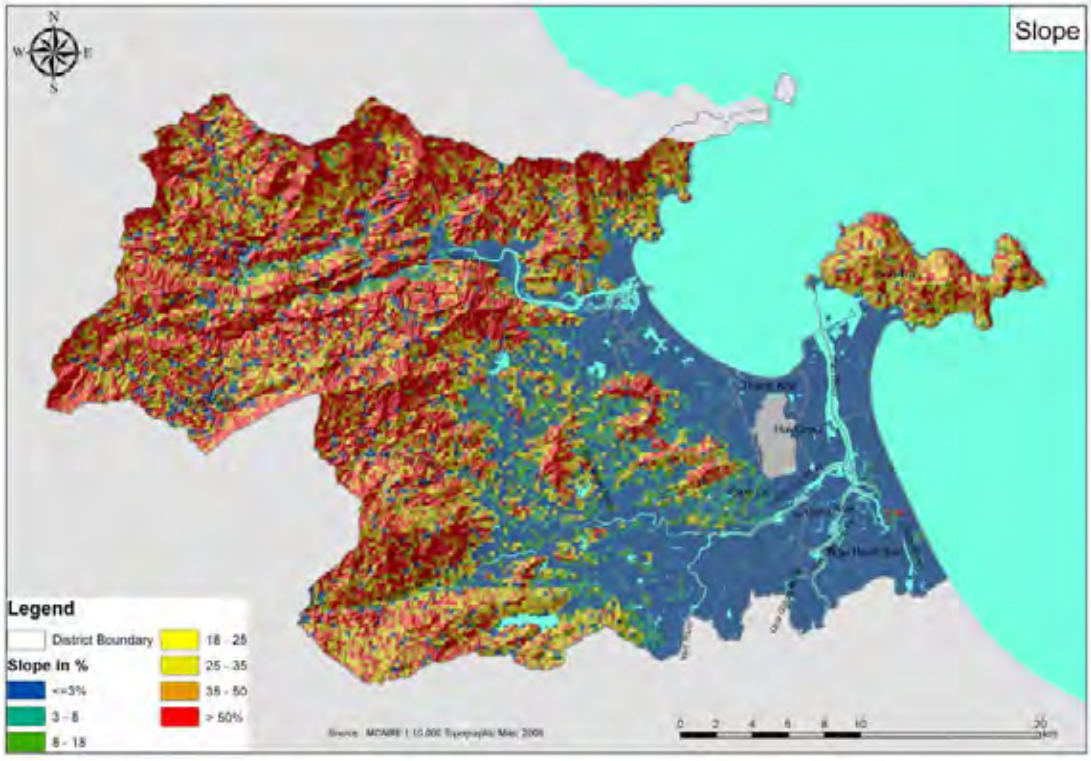
3.2 On average, Danang City is above sea level at 264 m. It is, however, higher on the western side of the city, with the maximum elevation at 1606 m at the westernmost tip. The eastern side of Danang City is mostly low and flat, especially in Cam Le District, where many rivers meet.

Figure 3.2.1 Elevation Map of Danang City



Source: MONRE 1:10,000 Topographic Map, 2006.

Figure 3.2.2 Slope Map of Danang City



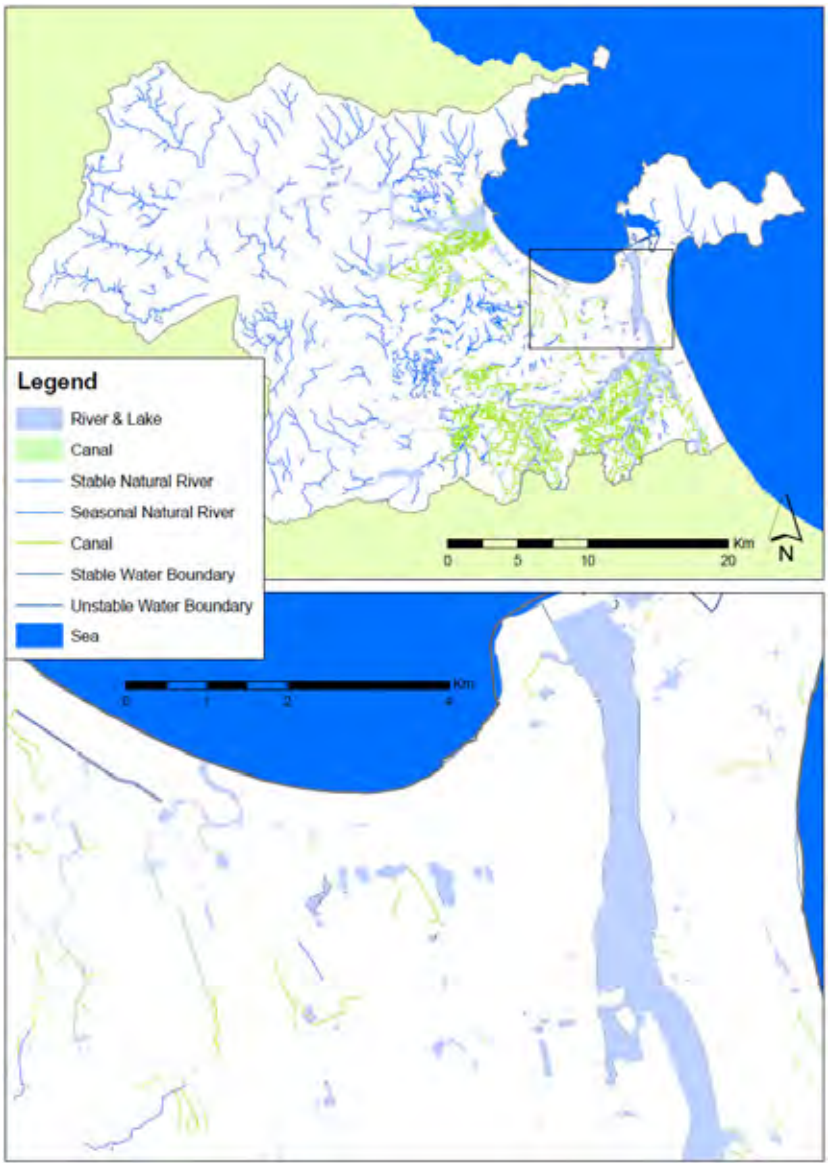
Source: MONRE 1:10,000 Topographic Map, 2006.

3.3 Hydrology

3.3 The Vu Gia–Thu Bon river basin covers two subriver basins, namely Vu Gia (area of 5,180 km^2 and length of 204 km up to Danang) and Thu Bon (area of 3,825 km^2 and length of 152 km). This river basin mostly encompasses Quang Nam Province, but it also covers Kon Tum Province (520 km^2) and the southern areas of Danang City. The two sub-basins are relatively independent, although the Quang Hue River flows from Vu Gia to Thu Bon and the Ving Dien River from Thu Bon to Vu Gia. The months between September and December account for 70% of total annual rainfall, which means it is relatively dry in other months, and dryer even along the coast than in the mountains.

3.4 Han River runs through the center of Danang City, and the current central business district is located at the western side of the river.

Figure 3.3.1 Water System Map of Danang City



Source: DaCRISS GIS Database, 2008.

3.4 Vegetation and Ecosystem

3.5 Forests in Danang City are mainly concentrated in the Son Tra Peninsula, western Hoa Vang District, and northern Lien Chieu District (See Figure 3.4.1). Rich natural forests are rather concentrated in the westernmost area of Hoa Vang District, the area bordering Quang Nam Province. Forests in the Son Tra Peninsula and Lien Chieu District are mainly artificial or restoration forests.

3.6 Coral reefs are abundant around the Son Tra Peninsula and near the northern Lien Chieu District. Some areas are strictly protected as indicated in Figure 3.5.2.

3.7 Precious wildlife especially primates can be seen in Son Tra Peninsula and Bana–Nui Chua area, precious species such as the following: pygathrix nemaeus, macaca artoides, macaca faseicularis, macaca mulatta. Pygathrix nemaeus (see Figure 3.5.1) are being protected in Son Tra Peninsula, however, its habitat is threatened by tourism development, road construction, denizens, and deforestation.

Figure 3.4.1 Pygathrix Nemaeus

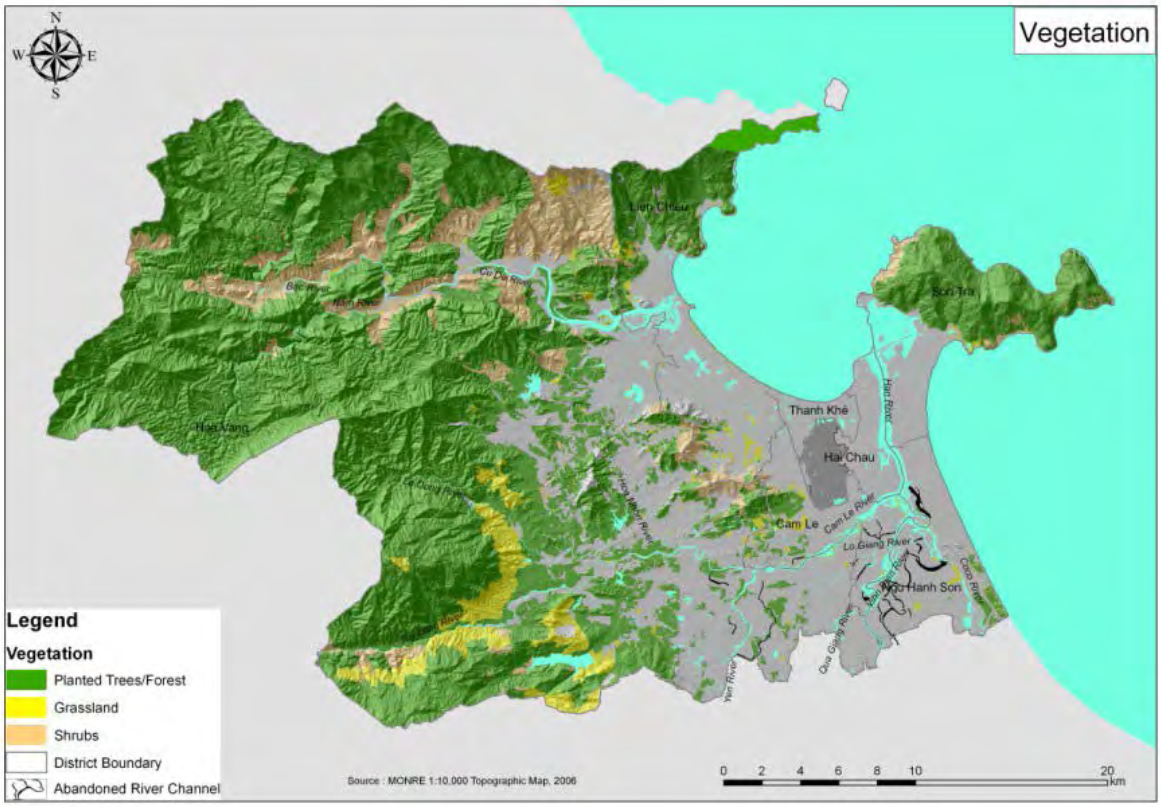
3.8 There are also precious plants under protection as shown in Table 3.5.1.

Table 3.4.1 Plants Under Protection in Danang City

No.	Scientific Name	Family	Status
1.	Capressus turulosa D. Don	Cupressaceae	Endangered
2.	Dacrydium elatum (Roxb) Wall. Ex. Hook	Podocarpaceae	no information
3.	Nageia fleuryi (Hickel) de Laub.	Podocarpaceae	Vulnerable
4.	Dialium cochinchinensis Pierre	Caesalpiniaceae	no information
5.	Sindora tonkinensis A. Chev. Ex K. et S. S. Larsen	Caesalpiniaceae	Vulnerable
6.	Dipterocarpus grandiflorus Blanco	Dipterocarpaceae	Rare
7.	Hopea pierrei Hance	Dipterocarpaceae	no information
8.	Enkianthus quinqueflorus Lour	Ericaceae	Rare
9.	Illicium parviflorum Merr.	Illiciaceae	Rare
10.	Cinamomum parthenoxylum Meissn.	Lauraceae	no information
11.	Amesiodendron chinense Hu	Sapidaceae	Threatened
12.	Madhuca pasquieri (Dub.) H. J. Lam	Sapotaceae	no information
13.	Adixandra megaphyela Hu.	Theaceae	Threatened
14.	Aquilaria crassna Pierre ex Lecomte	Thymelidaceae	Endangered

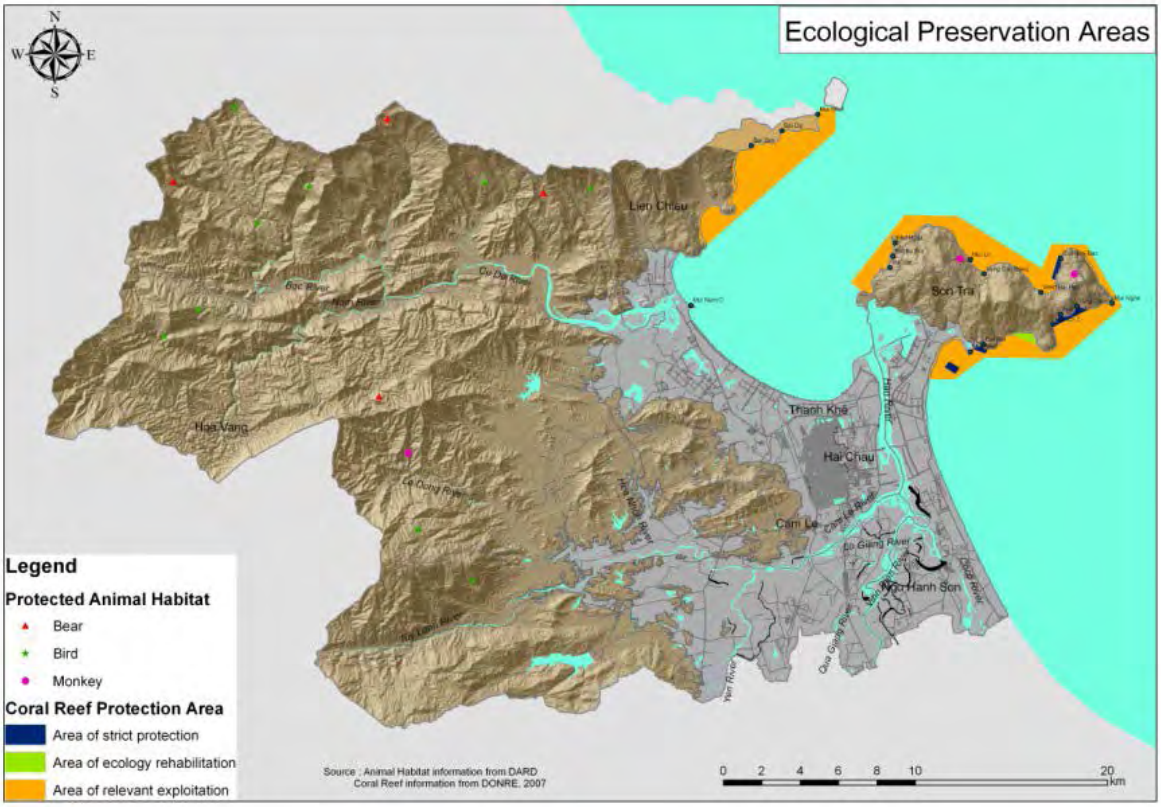
Source: DARD

Figure 3.4.2 Vegetation Map of Danang City



Source: MONRE 1:10,000 Topographic Map, 2006.

Figure 3.4.3 Ecological Preservation Map of Danang City



Source: Animal habitat information from DARD, coral reef information from DONRE, 2007.

4 SOCIAL CONDITIONS

4.1 Demographic Conditions

1) Overview

4.1 The current demographic characteristics in Danang City are as follows:

(i) Official figures on Danang's current population show modest growth rates from 2000 to 2007, i.e., at only 1.70%. However, this does not include migrants to urban areas. If unenumerated migrants which are estimated to comprise 20% of the total population are included, the current population may already be nearly 1 million;

(ii) Danang's population has two peaks, that is, from the late teens to the early twenties and from the late thirties to the early forties. The share of the youngest age groups, the under 15s, is approximately 25%;

(iii) In 2004, the average household size in Danang was 4.6 persons; in 2008, it was around 3.95 based on the DaCRISS HIS results;

(iv) Most immigrants to Danang come from the surrounding provinces, with Hue and Quang Nam accounting for the largest share. A significant number of immigrants also come from Quang Ngai and Quang Tri; and

(v) It has been observed that even when economic growth is low, rural–urban migration continues unabated. Hence, more than economic, migration is regarded as part and parcel of urbanization.

4.2 Based on the trends in the demographic makeup of Danang, the following issues are expected:

(i) Population growth will accelerate due mainly to migration to the city. Immigration rate will be 2.6% up to 2015, accelerating to nearly 3.8% between 2015 and 2020;

(ii) Continued migration to the city will translate to higher demand for affordable housing, increased natural population growth rates, and, possibly, higher unemployed or underemployed rate in case of an economic downturn;

(iii) Household sizes will decline with increasing emigration and changing social conventions;

(iv) A shortage of skilled labor in the city is also expected as other destinations like HMC may appear as a more attractive destination than Danang; and

(v) Immigration will largely depend on the economic growth in CFEZ in both absolute terms and relative to the growth in NFEZ and SFEZ.

2) Overall Population Growth

4.3 It is important to bear in mind that official figures are wont to underestimate urban populations. Official population counts generally do not include recent migrants to urban areas. Many migrants have temporary or no registration in the urban areas in which they live, making enumeration difficult. Many of these rural–urban migrants travel between rural and urban areas often on a seasonal basis as employment opportunities or personal obligations occur. In HCMC, for example, a recent mid-term census found that temporary migrants (labeled KT4s) made up about 15% of the urban population. Unregistered migrants are likely to account for a higher share. Consultations with administrative officials in Danang City suggest a similar pattern, with unenumerated migrants (both registered tempo-

rary migrants and unregistered migrants) adding about 20% to official population estimates. It should also be borne in mind that some Danang inhabitants with permanent registration in the city move to other locations (e.g., the southeast) without registering such move, and therefore is also not reflected in official statistics. Nevertheless, official figures do offer an estimate of minimum population levels in Danang.

4.4 Table 4.1.1 and Figure 4.1.1 show recent trends in key demographic indicators and projections as given in the Danang SEDP 2020. Official figures suggest relatively modest population growth rates and net immigration rates between 2000 and 2007. The recent SEDP makes a break with these conservative estimates, suggesting population growth rates of over 3.62% between 2007 and 2015, and 4.78% between 2015 and 2020. These estimates suggest that by 2020 Danang's population will be approaching 1.4 million. If the 20% unenumerated migrants are included, the current population may already be approaching 1 million, and may reach about 1.60 million by 2020. The projected figures also suggest that: (i) population growth in Danang is expected to accelerate, and (ii) the majority is expected to be immigrants to the city.

Table 4.1.1 Key Demographic Indicators and Projections

Population	2007	2015	2020
SEDP Figures	806,700	1,078,000	1,369,000
Including 20% Unenumerated1	968,040	1,293,600	1,642,800
Growth		2007—2015	2015—2020
Population Growth Rate		3.69	4.90
Natural Population Growth Rate2		1.02	1.00
Net Immigration Rate3		2.67	3.90
Average Annual Net Immigration4		23,666	45,395

Sources: GSO statistics and SEDP 2020.

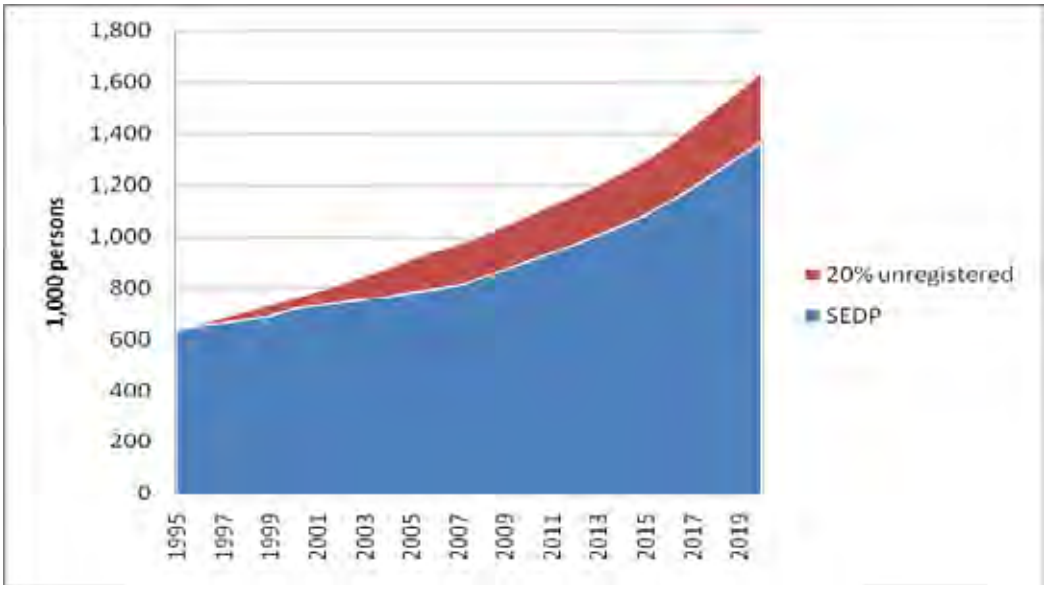
1 Calculated by adding an extra 20% to 2007 population figures. Growth rates for 2015 and 2020 are the same as those given in the SEDP.

2 Crude birth rate minus crude death rate given in GSO statistics.

3 Calculated by subtracting the natural population growth rate from the population growth rate, i.e., population growth not accounted for by births.

4 Average annual net immigration is the average number of immigrants per year for the period.

Figure 4.1.1 Population Growth in Danang City, 1995–2020



Source: GSO, SEDP 2020

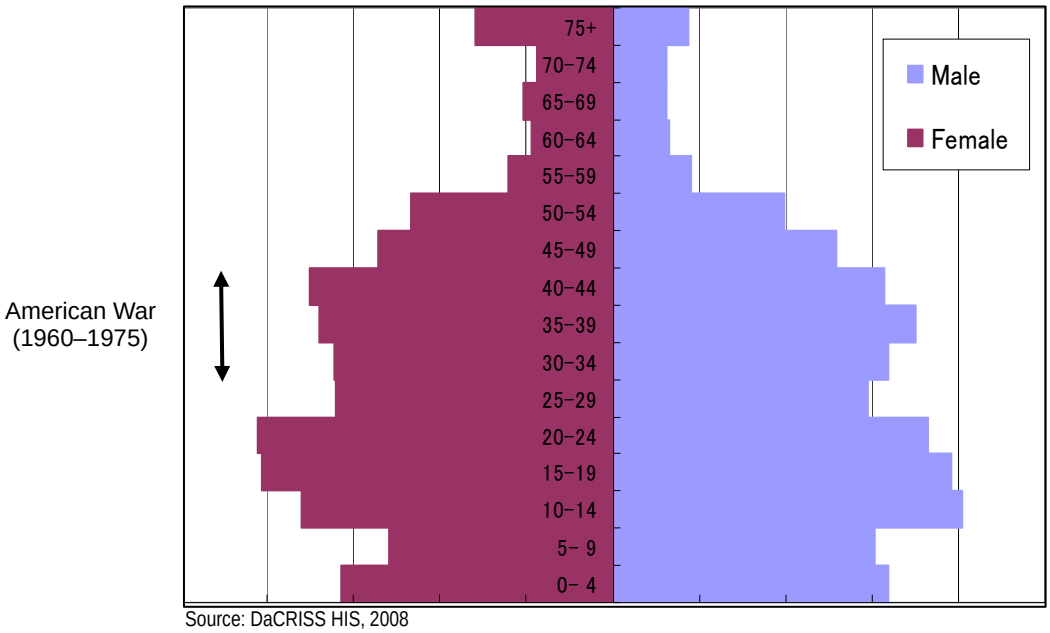
4.5 Population growth rate is composed of natural population growth rate and net im-

migration rate. While the natural population growth rate is expected to decline from its present level of about 1.2% to around 1.0% by 2010, migration rates are expected to increase dramatically. Currently, net immigration rates are estimated to be around 0.51% (around 4,000 immigrants) between 2000 and 2007. This is almost certainly too low due to the exclusion of unenumerated immigrants. However, estimates in the SEDP suggest immigration rates of 2.6% up to 2015, accelerating to nearly 3.8% between 2015 and 2020. These figures break from past official estimates and are certainly more in line with international experiences. It would also seem that efforts have been made to take account of unenumerated immigrants in population projections, although this is not made explicit anywhere in the document.

3) Age Distribution

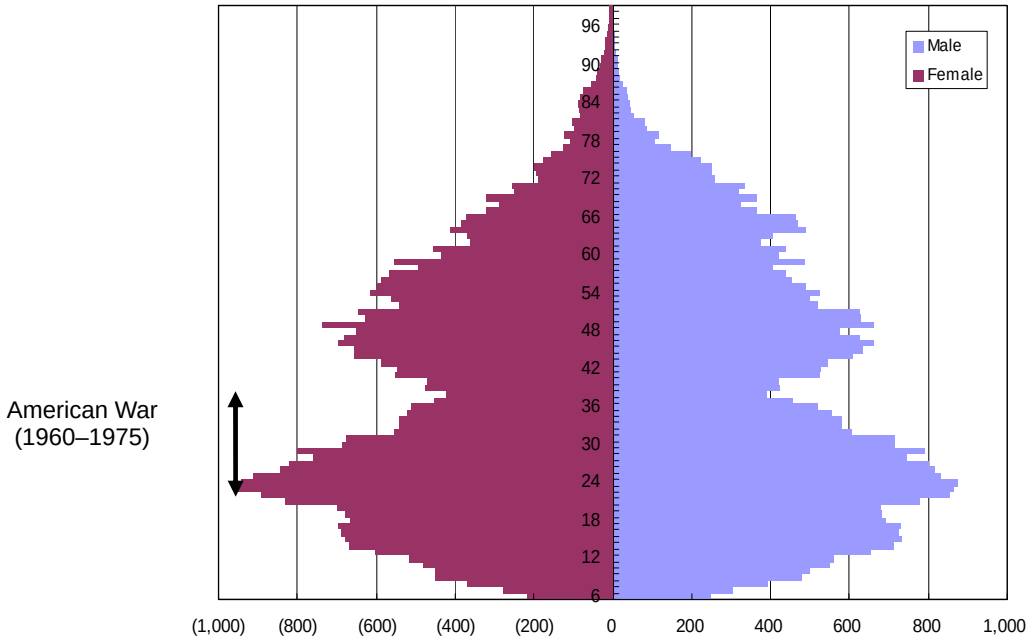
4.6 Figures 4.1.2 through 3.2.4 show the population distribution of Danang, Hanoi, and Ho Chi Minh, respectively. The figures show that Danang and Hanoi have two population peaks. Danang's population peaks from the late teens to the early twenties and from the late thirties to the early forties. Hanoi's peaks from the late teens to the early twenties and from the early to the late forties. Ho Chi Minh has one population peak, which is from the early twenties to the early thirties. The vertical arrows in the figures indicate the generation born during the American War, 1960–1975, and all three cities experienced a post-war baby boom era. In Danang, the ratio of the youngest age groups, the under 15s, is approximately 25%, whereas this is smaller for Hanoi and Ho Chi Minh City. This indicates that the fertility rate in Danang is relatively higher than that in the two major cities in Vietnam.

Figure 4.1.2 Population in Danang City by Age Group, 2008



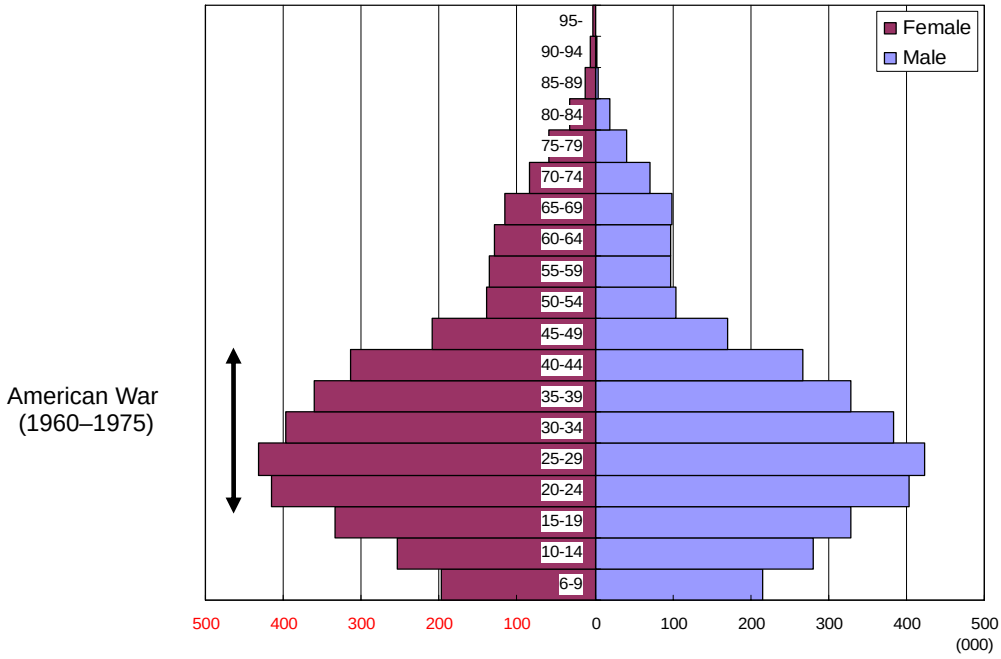
Source: DaCRISS HIS, 2008

Figure 4.1.3 Population in Hanoi City by Age Group, 1999



Source: National Census, 1999.

Figure 4.1.4 Population in Ho Chi Minh City by Age Group, 2002



Source: HOUTRANS HIS, 2002.

Table 4.1.2 Population in Danang City by Age Group and District, 2008

Age Group	Hai Chau	Thanh Khe	Son Tra	Ngu Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Total
0–4	13,693	12,491	9,829	5,783	6,061	5,641	9,909	63,407
5–9	11,778	11,807	8,554	3,923	5,577	4,958	9,584	56,181
10–14	13,590	15,750	11,299	5,750	6,489	9,118	14,565	76,561
15–19	17,207	15,151	12,126	6,799	6,689	9,259	12,578	79,809
20–24	17,614	16,443	13,684	5,581	5,872	9,091	9,445	77,730
25–29	15,938	12,502	9,057	4,125	5,707	8,040	6,269	61,638
30–34	14,480	13,820	10,486	5,603	5,804	5,993	8,047	64,233
35–39	16,422	14,670	10,783	4,400	5,693	6,921	10,164	69,053
40–44	14,370	13,299	10,348	4,720	5,842	7,896	10,093	66,568
45–49	14,336	11,661	7,266	3,619	4,490	5,611	6,105	53,088
50–54	12,269	8,761	6,077	2,961	2,686	4,833	5,649	43,236
55–59	7,369	4,378	2,905	1,109	1,550	2,020	1,929	21,260
60–64	5,159	3,606	2,967	795	1,049	1,375	1,160	16,111
65–69	5,396	3,642	2,401	520	1,341	1,291	2,035	16,626
70–74	5,164	3,735	1,610	417	1,537	1,201	1,505	15,169
75+	8,862	5,880	2,909	598	1,754	1,514	3,295	24,812
Total	193,647	167,596	122,301	56,703	68,141	84,762	112,332	805,482

Source: DaCRISS HIS, 2008.

Table 4.1.3 Distribution of Population in Danang City by Age Group and District, 2008

(%)

Age Group	Hai Chau	Thanh Khe	Son Tra	Ngu Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Total
0–4	7.1	7.5	8.0	10.2	8.9	6.7	8.8	7.9
5–9	6.1	7.0	7.0	6.9	8.2	5.8	8.5	7.0
10–14	7.0	9.4	9.2	10.1	9.5	10.8	13.0	9.5
15–19	8.9	9.0	9.9	12.0	9.8	10.9	11.2	9.9
20–24	9.1	9.8	11.2	9.8	8.6	10.7	8.4	9.7
25–29	8.2	7.5	7.4	7.3	8.4	9.5	5.6	7.7
30–34	7.5	8.2	8.6	9.9	8.5	7.1	7.2	8.0
35–39	8.5	8.8	8.8	7.8	8.4	8.2	9.0	8.6
40–44	7.4	7.9	8.5	8.3	8.6	9.3	9.0	8.3
45–49	7.4	7.0	5.9	6.4	6.6	6.6	5.4	6.6
50–54	6.3	5.2	5.0	5.2	3.9	5.7	5.0	5.4
55–59	3.8	2.6	2.4	2.0	2.3	2.4	1.7	2.6
60–64	2.7	2.2	2.4	1.4	1.5	1.6	1.0	2.0
65–69	2.8	2.2	2.0	0.9	2.0	1.5	1.8	2.1
70–74	2.7	2.2	1.3	0.7	2.3	1.4	1.3	1.9
75+	4.6	3.5	2.4	1.1	2.6	1.8	2.9	3.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: DaCRISS HIS, 2008.

4) Household Number and Size

4.7 The 2004 Vietnam Household Living Standards Survey (VHLSS) reported that the average household size in Danang was 4.6 persons. The DaCRISS HIS, however, reported a lower estimate of around 3.95. This suggests that in 2008 there were about 204,000 households in the province. The difference in estimates may be due to the efforts made in the HIS to enumerate migrants to and from Danang, which would tend to reduce the average household sizes. According to HIS data, only about 30% of households have five members or more, 34% have four, 20% have three, 12% have two, and only 4% have

one household member. In the future, household sizes are expected to decline with increasing emigration and changing social conventions.

Table 4.1.4 Distribution of Households in Danang City by Household Size and District, 2008

Household Size		Hai Chau	Thanh Khe	Son Tra	Ngu Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Total	
									%	No.
1		3.0	4.5	1.3	1.2	3.7	4.1	5.7	3.5	7,123
2		14.5	10.2	9.2	8.2	14.2	10.1	14.3	11.9	24,265
3		21.5	19.6	21.1	20.2	20.6	22.5	17.2	20.4	41,573
4		32.0	34.2	35.5	38.0	35.0	36.7	32.7	34.2	69,832
5		16.7	18.5	19.6	23.2	17.1	15.6	18.9	18.1	37,026
6		7.4	7.0	8.7	6.7	7.1	7.1	7.5	7.4	15,127
7		2.2	3.3	3.3	2.0	1.7	1.6	3.0	2.6	5,263
8 ≧		2.7	2.8	1.3	0.6	0.7	2.3	0.7	1.9	3,826
Total	(%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	204,035
	No	50,842	41,707	29,642	13,693	17,659	21,711	28,781	204,035	

Source: DaCRISS HIS, 2008.

5) Migration

4.8 Population movement is central to determining the speed of Danang's growth. Current estimates from the SEDP suggest a rapid population growth due to migration into the city. Unofficial population estimates have also suggested that the city is already home to a large number of unregistered immigrants, and that official statistics have generally underestimated their number.

4.9 Figures from the Commune Survey (CS) and HIS suggest that most immigrants to Danang come from the surrounding provinces with the largest proportion coming from the surrounding provinces of Hue and Quang Nam. A significant number of immigrants also come from Quang Ngai and Quang Tri. There are few immigrants, however, from Binh Dinh province. Central Highlands and North Central Coastal provinces also see some migration of their populations to the city.

4.10 Migration is a complex social and economic phenomenon with a number of contributory factors. Observations indicate a number of key causal factors contributing to rural–urban migration in Vietnam.[1] Firstly, economic factors are paramount in the decision to migrate. This is a result of rural poverty and limited employment prospects in rural areas relative to urban areas. Secondly, in recent years migration has become easier as transportation systems improve, making it more feasible to visit cities temporarily, and as restrictions on population movement (i.e., the household registration system) are relaxed and enforced less vigorously. Thirdly, networks of kinship and community are important in influencing migration. Migrants often join migrant communities from their own area. These networks are important in finding work and accommodation for new immigrants. Established migrant communities in the cities therefore facilitate subsequent immigration.

4.11 Observations and interviews with administrative officials also suggest certain key characteristics of immigrants: (i) they are relatively young; (ii) usually single or have small families; (iii) a significant proportion move to urban areas temporarily based on the availability of work in urban areas relative to labor needs in their hometowns. For example, many of these temporary immigrants return to rural areas for the rice harvesting and planting seasons when labor is required; and, (iv) most immigrants already have relatives or friends in the urban areas they choose to move to.

[1] GSO and UNFPA – 2004 migration survey

4.12 Out of these key determinants are the economic push factor and the perception that urban areas offer better employment opportunities. This suggests that there may be a link among economic growth, labor demand in the urban areas, and immigration. However, the connection is not as close as what might be expected, because although the demand pull is important, it is not a decisive factor in determining the rate of immigration. Even when economic growth is low rural–urban migration continues unabated. This may be due to a number of reasons including the following:

(i) Rural areas could be equally adversely affected in any growth slowdown, and,

(ii) Whatever the actual labor demand situation in the urban areas, if would-be migrants perceive the urban areas as offering better opportunities for employment than the rural areas, then migration would likely continue. Thus evidence suggests that rural–urban migration and urbanization in general are better regarded as an irreversible structural and historical change rather than a policy variable. Migration becomes a better option due to economic factors; but it becomes even more attractive for social reasons (i.e., availability of community support in the target urban areas, better transportation links, and the softening of movement controls for *de facto* and *de jure* populations[2]). Hence, migration is likely to increase. While the rate of increase may be dependent upon economic growth and labor demand in the city, it is unlikely to become negative.

4.13 The implications for the cities are considerable: (i) the demand for cheap housing is likely to increase, particularly for small units suitable for single individuals or small families; (ii) the relative youth of immigrant populations is likely to drive natural population growth rates upwards; and (iii) the possibility of significant numbers of unemployed or underemployed immigrants will become higher with an economic downturn.

4.14 Evidence from interviews also suggests that migration from the city to the southeastern region and, to a lesser extent, to the Red River Delta region is also important. Although there is a net migration to the city, there are indications of significant numbers of emigrants from the city. Unlike the low-skilled immigrants driven from rural areas in search of work, the urban–urban migrants generally move in order to maximize their earning potentials. Interviews with university staff indicated that a large proportion of graduates left the city in search of better work, generally to the southeast. Employers also interviewed during the fieldwork noted the shortage of skilled labor in the city. This often meant they had to source skilled individuals from the northern or southern economic zones at pay levels higher than that of Danang. Moreover, for skilled would-be migrants elsewhere in CFEZ, HCMC, for example, may appear as a more attractive destination than Danang, despite the latter's proximity.

4.15 Bearing these considerations and the experiences of rapid urban growth elsewhere in Vietnam and the region over the last three decades, an immigration rate of around 2.5% does seem feasible, although the higher rate of 3.8% starting by 2015 does seem high. It should be remembered that Danang is not a primary urban center such as HCMC or, to a lesser extent, Hanoi; therefore, it cannot expect to see the same rates of growth being experienced in very large urban centers. As has been argued, while relatively high immigration is almost assured whatever the economic conditions are, it will still

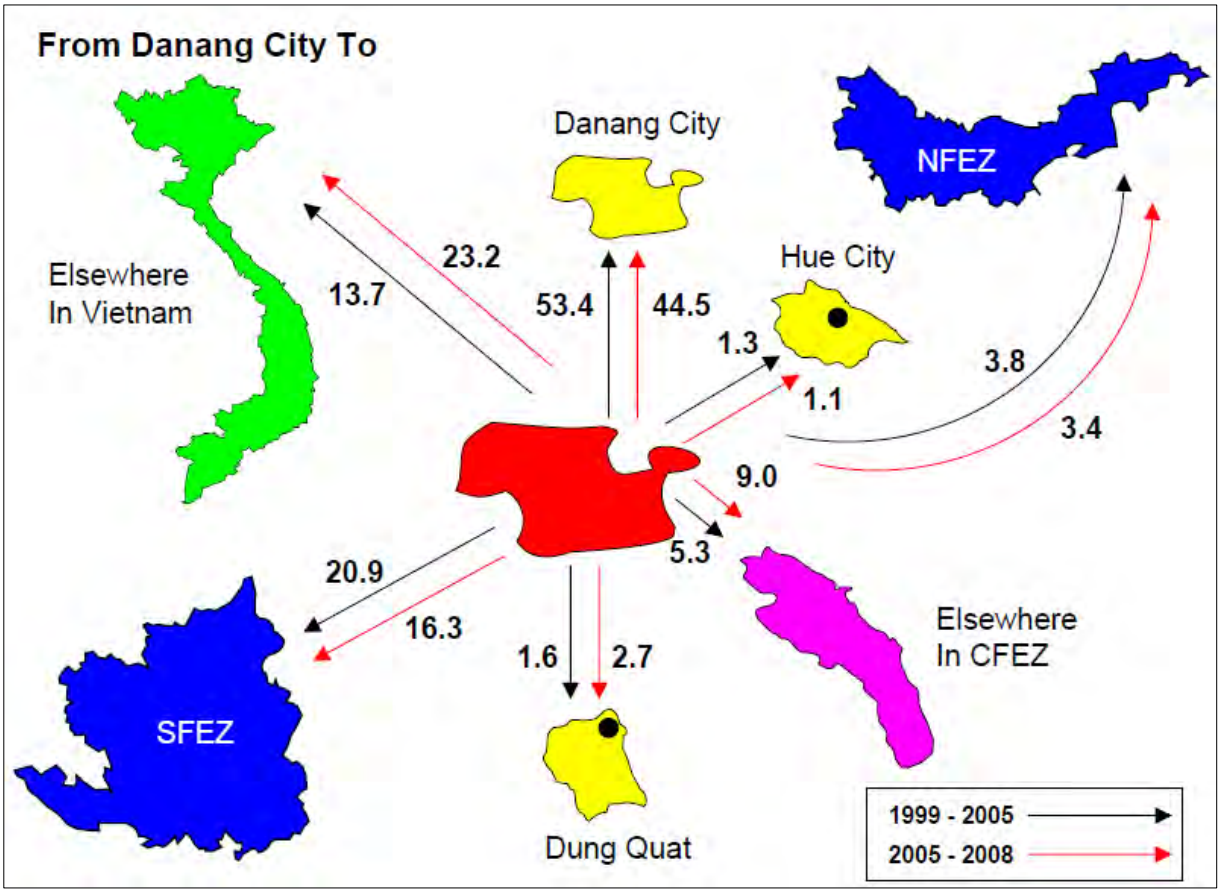
[2] The de facto population consists of all persons who are physically present in the area at the reference date, whether or not they are usual and/or legal residents. The de jure population consists of all usual residents, whether or not they are present at the time of the enumeration and/or legal residents (source: http://unstats.un.org/unsd/demographic/products/vitstats/serANotes.pdf).

largely depend on the economic growth in CFEZ in both absolute terms and relative to the growth in NFEZ and SFEZ.

4.16 Figure 4.1.5 shows the movement of the people from Danang City to other regions in Vietnam. It shows that the people moving within Danang City decreased in recent years from more than half of the total migrating population in 1999–2005. In this period, a considerable share of migrants went to provinces in SFEZ, mainly to Ho Chi Minh City for work, studies, and better living. However, in recent years, destinations of migrants have become diverse, with more people going to other places in the country. Migration itself is generally accelerating over the years.

Figure 4.1.5 Migration from Danang City to Other Regions, 2008

(%)



Source: DaCRISS Commune Survey, 2008.

4.2 Social Conditions

1) Overview

4.17 The social conditions in Danang City can be summarized as follows:

(i) Growth in per capita GRDP in Danang has consistently outstripped that in both CFEZ and the country as a whole;

(ii) Income distribution differs considerably across districts with rural and peripheral districts (i.e., Hoa Vang, Lien Chieu, Cam Le, and Ngu Hanh Son) showing higher shares of low-income households (those receiving below VND 3.5 million/month), while the urban districts of Hai Chau and Thanh Khe have more high-income households. Son Tra shows a mixed pattern;

(iii) About 50% of the labor force in agriculture and forestry belong to the lowest-income class, while 66–81% of all employed in finance and banking, science and technology, real estate, and health and social work have higher incomes;

(iv) Rural and peripheral areas show lower ownership levels for household goods, while inner city areas have higher ownership levels, especially for air-conditioning units, washing machines, refrigerators, and computers which are good indicators of income levels;

(v) About 52–69% of the population in seven of the city's eight districts comprises households that own two or more motorcycles. Only Hoa Vang registered a lower share at 38%; even then, households with motorcycles account for 83% of its population; and

(vi) Using the definition of poverty by DOLISA, results of the 2008 DaCRISS HIS showed that household poverty rate in the city was 5.7%.

2) Occupation

4.18 Danang City has a young and abundant working population. Currently 45% of the total population is engaged in industrial sectors. Table 4.2.1 shows that a high percentage of professional / technical workers reside in urban districts such as Hai Chau and Thanh Khe Districts. A high percentage of skilled workers come Lien Chieu District, which possess the Hoa Khanh Industrial Zone. Workers engaged in the agricultural sector mainly come from Hoa Vang District.

Table 4.2.1 Distribution of Population in Danang City by Occupation and District, 2008

Occupation		Hai Chau	Thanh Khe	Son Tra	Ngu Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Total	
									%	No
Manager		0.8	0.6	0.4	0.3	0.8	0.4	0.1	0.5	3,765
Professional/Technical		15.0	11.9	6.9	13.2	10.4	7.4	6.5	10.6	77,029
Farmer/Fisherman		0.1	1.0	2.6	4.5	7.5	2.0	18.6	4.3	31,243
Military/Police		0.9	0.9	2.5	1.2	1.0	0.5	0.6	1.1	7,928
Skilled Worker		12.7	13.0	13.8	14.7	15.7	19.2	11.1	13.8	99,883
Unskilled Worker		5.5	7.0	9.9	7.6	9.1	5.8	8.5	7.4	53,574
Small-scale Vender		11.0	13.0	11.5	6.7	8.7	13.9	8.5	11.0	79,428
With Own Business		2.9	3.1	2.8	4.7	2.1	4.2	1.3	2.9	21,043
Students (after high school)		6.6	6.8	5.9	6.4	4.2	5.9	3.4	5.8	42,222
School Students		18.8	21.7	22.6	25.8	24.5	24.1	29.6	23.0	166,582
Housewife		6.5	6.5	5.6	4.8	2.9	3.7	1.7	5.0	36,123
Unemployed		4.0	3.2	3.5	1.9	4.3	6.0	4.0	3.9	27,918
Retiree		8.6	4.3	4.5	4.4	2.8	3.7	1.0	4.7	34,326
Too young to work		0.2	0.2	0.3	0.2	0.2	0.1	0.5	0.2	1,773
Other		6.4	6.6	7.1	3.6	6.0	2.9	4.7	5.7	41,407
Total	(%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100	724,244
	No	175,710	150,974	110,202	49,586	60,530	77,675	99,567	724,244	

Source: DaCRISS HIS, 2008.

Table 4.2.2 Distribution of Households in Danang City by Income Level and Household Size, 2008

(%)

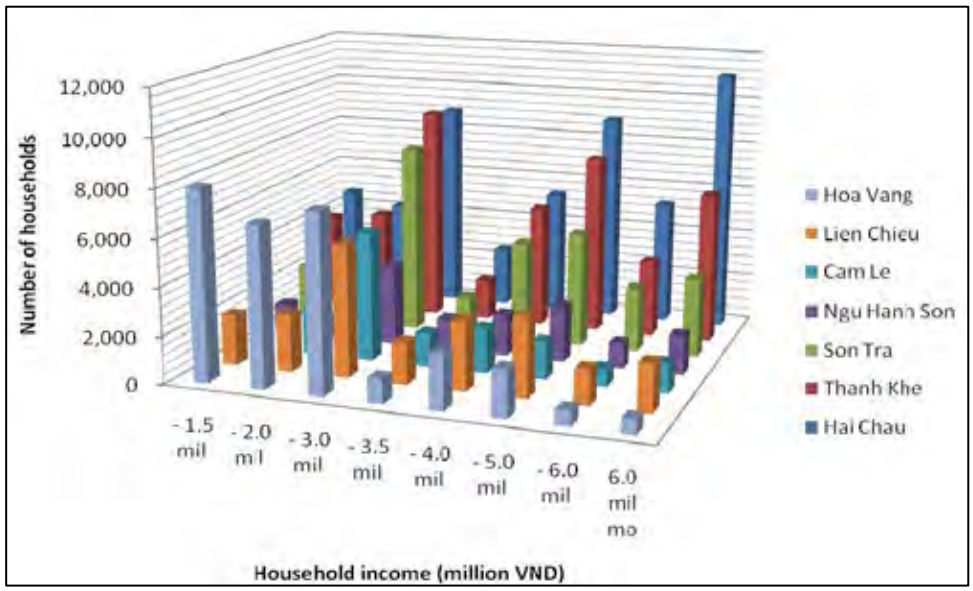
	VND mil/mo.	Hai Chau	Thanh Khe	Son Tra	N. Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Total
Distribution of Households by Income Level (%)	- 1.5 mil	9	10	8	9	19	10	28	13
	- 2.0 mil	8	10	9	7	11	11	23	11
	- 3.0 mil	17	22	27	25	31	25	26	23
	- 3.5 mil	5	4	5	10	8	8	4	6
	- 4.0 mil	10	12	14	13	11	13	8	12
	- 5.0 mil	18	18	16	17	9	15	7	15
	- 6.0 mil	10	8	9	8	4	7	2	7
	6.0 mil <	22	15	11	12	7	9	2	13
Ave. HH Income by Household Size (VND mil /mo.)	1	2.151	2.761	1.255	1.847	0.978	2.406	0.754	1.850
	2	3.370	2.966	3.105	2.723	2.035	3.097	1.639	2.783
	3	4.771	4.108	3.797	4.180	3.061	3.582	2.262	3.868
	4	5.092	4.440	4.350	4.233	3.265	4.058	2.723	4.183
	5	5.628	4.811	4.587	4.166	3.841	4.054	3.225	4.527
	6 ≦	6.574	6.631	4.915	5.061	5.189	4.924	3.408	5.559
Total		100	100	100	100	100	100	100	100
Total Average (VND000/mo)		4,957	4,508	4,199	4,134	3,247	3,886	2,549	4,098

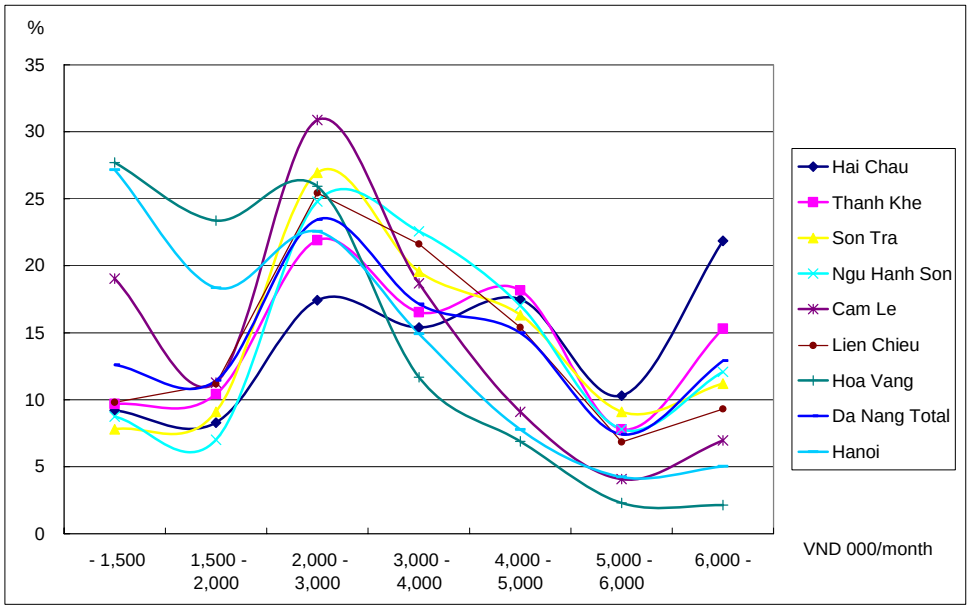
Source: DaCRISS HIS, 2008

4.19 Income distribution differs considerably across districts (see Figure 4.2.1). Rural and peripheral areas (i.e., Hoa Vang, Lien Chieu, Cam Le, and Ngu Hanh Son) all show relatively high proportions of households with low incomes (below VND3.5 million a month), while those in the urban core (i.e., Hai Chau and Thanh Khe) are significantly higher. Son Tra, on the other hand, shows a mixed pattern. The HIS data on household income levels show a distinct structural break at the < VND3.5 million mark. This could be evidence of increasing income inequalities between an emergent middle class and other income groups. However, it could also be due to a response bias in the survey. Households close to the poverty line have an incentive to underreport incomes in order to maintain their poor-household status and the benefits associated with this.

4.20 Income peaks at VND2–3 million a month for most districts. More than 20% of the population in Hai Chau receives an income of more than VND6 million a month, as the better-off population resides in this area. While the city's average income is VND3.9 million a month, that of Hai Chau, Thanh Khe, Son Tra, Ngu Hanh Son, Cam Le, Lien Chieu, and Hoa Vang are VND4.9, 4.5, 4.0, 4.1, 3.1, 3.8, and 2.5 million a month, respectively.

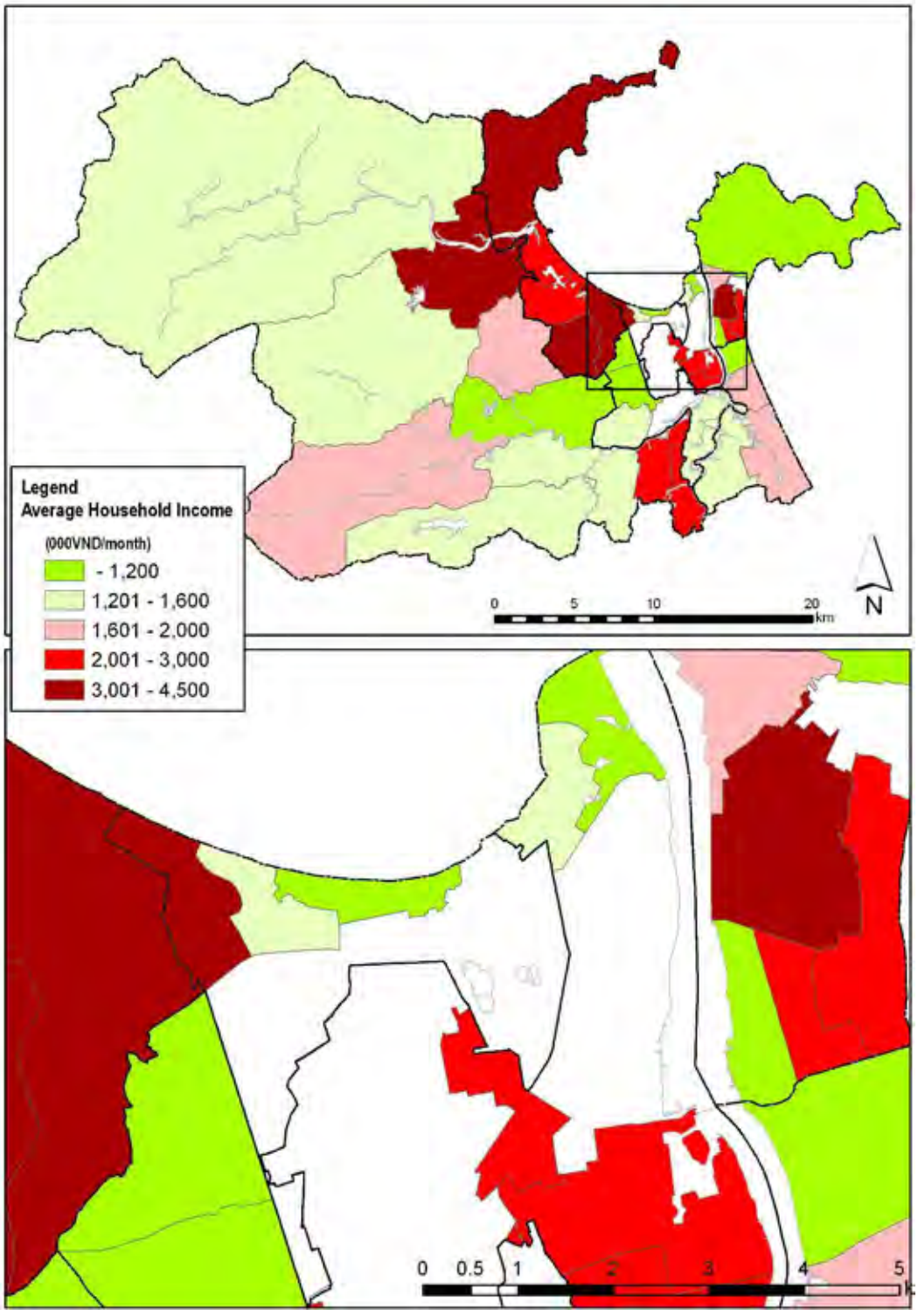
Figure 4.2.1 Household Incomes in Danang City by District, 2008





Sources: DaCRISS HIS, 2008; HAIDEP HIS, 2005.

Figure 4.2.2 Average Household Income in Danang City by District, 2008



Source: DaCRISS HIS, 2008.

4.21 Table 4.2.3 shows the distribution of employment by income class in five quintiles, from lowest to highest, based on the HIS survey. In agriculture and forestry, the lowest-income class accounts for 50% of its labor force. On the other hand, the "high" and "highest" income levels account for 66–81% of all employed in finance and banking, science and technology, real estate, and health and social work.

Table 4.2.3 Household Incomes in Danang City by Employment Sector, 2008

Employment Sector	Quintile (%)					Average
	1: Lowest	2: Low	3: Middle	4: High	5: Highest	VND 000 / mo
Agriculture and Forestry	50	25	14	8	3	2,571
Fishery	19	32	15	15	19	4,669
Mining & Quarrying	5	16	20	31	28	4,974
Manufacturing	14	28	22	18	18	4,298
Electricity, Gas & Water Supply	8	19	19	23	32	5,389
Construction	16	26	22	16	19	4,366
Wholesale & Retail Trade	18	25	20	18	19	4,341
Hotels & Restaurants	9	20	22	19	30	5,370
Transport'n, Storage, Communications	9	21	17	21	32	5,484
Finance and Banking	3	7	8	20	61	7,619
Science and Technology	5	8	22	20	46	5,994
Real Estate	6	11	13	29	41	6,852
Public Administration	6	15	24	26	30	5,078
Education and Training	7	11	17	27	39	5,500
Health and Social Work	3	10	19	27	40	6,144
Recreation	4	25	16	19	36	5,658
Activities of Party	20	21	19	12	27	4,322
Community Activities	12	15	25	19	30	5,231
Other Industries	16	23	20	18	24	4,582
Services	11	28	21	19	21	4,802
Not applicable	17	22	21	21	19	5,009
Total	16	23	19	19	23	4,656

Source: DaCRISS HIS, 2008.

3) Ownership of Household Goods

4.22 HIS data on the ownership of durable goods (see Table 4.2.4) have a similar pattern, with rural and peripheral areas showing lower levels of durable goods ownership, and inner city areas showing higher levels of ownership. This seems especially the case with air-conditioning units, washing machines, refrigerators, and computers which seem particularly good indicators of income levels.

Table 4.2.4 Goods and Vehicle Ownership among Households in Danang City by District, 2008

(%)

Item		Hai Chau	Thanh Khe	Son Tra	Ngu Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Total
Goods (%)	Air-con	23	15	9	4	4	6	1	11
	Washing Machine	61	47	39	31	20	30	10	39
	Refrigerator	88	80	76	72	58	67	38	72
	TV	98	98	98	98	97	97	91	97
	Radio	13	7	30	8	22	7	5	13
	Computer	53	39	37	31	30	29	11	36
	Mobile phone	83	78	81	81	69	77	52	75
Vehicles (%)	None	3	3	2	0	4	4	8	4
	Bicycle	3	4	5	4	8	5	8	5
	Single MC	24	29	34	27	31	37	45	32
	Multi MC	67	61	59	69	56	52	38	58
	Car/Van	3	2	1	1	1	2	0	1
	Others	0	0	0	0	0	1	0	0
	Total	100	100	100	100	100	100	100	100

Source: DaCRISS HIS, 2008.

4) Safety and Security

4.23 Table 4.2.5 shows the results of the HIS survey on safety and security in Danang City. More than 60% of the population felt that the current security situation in the city is good or very good. Although a considerable number of people felt unsafe during the night, especially in Lien Chieu district, a remarkable point is that most people felt that the general situation, both during the day and night, has improved in the past five years. While the police area coverage for the city is 76%, that of Hai Chau, Thanh Khe, Son Tra, Ngu Hanh Son, Cam Le, Lien Chieu, and Hoa Vang are 100, 99, 85, 85, 71, 35, and 17 respectively.

Table 4.2.5 Safety and Security Conditions in Danang City by District, 2008

(%)

Item			Hai Chau	Thanh Khe	Son Tra	N.Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Total
Current Security Situation	In the City in General (%)	Bad	3.2	6.1	2.1	1.7	3.8	4.2	3.4	3.7
		So-so	29.9	27.3	40.4	46.8	34.4	53.1	35.2	35.6
		Good	62.0	60.3	50.5	40.4	58.9	42.1	46.1	53.9
		Very good	4.9	6.2	7.0	11.0	2.9	0.6	15.4	6.7
		Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	In Your Community During the Day (%)	Bad	3.2	5.1	6.1	4.7	5.0	3.6	3.9	4.4
		So-so	33.9	22.4	29.3	40.4	19.9	33.9	26.9	29.1
		Good	59.1	67.3	58.2	43.9	63.6	57.1	61.1	60.1
		Very good	3.8	5.2	6.4	11.0	11.5	5.3	8.0	6.4
		Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	In Your Community At Night (%)	Bad	6.6	8.0	9.2	4.7	8.9	9.5	6.6	7.6
		So-so	42.5	32.5	30.9	42.7	36.1	50.5	29.1	37.2
		Good	48.7	55.3	56.0	41.6	46.7	35.0	56.6	50.2
		Very good	2.3	4.2	3.9	11.0	8.4	5.0	7.7	5.1
		Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Security Situation Compared to 5 Years Ago	In the City in General (%)	Worsened	6.0	9.5	5.4	4.4	5.0	7.8	3.4	6.3
		So-so	23.5	14.7	17.5	27.3	10.3	37.5	18.3	20.7
		Improved	70.5	75.8	77.0	68.3	84.7	54.7	78.4	73.0
		Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	In Your Community During the Day (%)	Worsened	3.6	5.3	7.7	9.9	6.5	5.0	4.1	5.5
		So-so	29.5	21.6	14.9	22.1	7.4	26.1	20.8	21.8
		Improved	66.8	73.1	77.4	68.0	86.1	69.0	75.1	72.8
		Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	In Your Community At Night (%)	Worsened	7.2	6.4	9.0	7.8	10.3	9.5	7.0	7.8
		So-so	31.6	25.0	15.3	23.3	10.3	38.9	20.0	24.6
		Improved	61.2	68.6	75.7	68.9	79.4	51.6	73.0	67.6
		Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: DaCRISS HIS, 2008.

5) Poverty

4.24 In terms of poverty alleviation, Danang's SEDP reports a rapid decline in poverty from 5.1% in 2001 to zero by 2005. DoLISA defines poverty by a poverty line of VND 260,000 per person per month in urban areas and VND 200,000 per person per month in rural areas (criteria for 2006 - 2010, based on Decision No. 170/2005/QD-TTg dated July 8, 2005), which is currently under revision[3]. HIS estimates of household poverty levels in the city are lower, at 2.0%. While Cam Le has the highest poverty rate, Thanh Khe, Lien Chieu, and Hoa Vang also show relatively high levels of poverty. In terms of absolute numbers of the poor, Thanh Khe stands out. This is one indication—despite rapidly rising incomes in urban areas—of persistent inequality. It is also important to remember that recent increases in food prices relative to other goods, as well as the preponderance of food expenditure in the consumption bundle of poorer groups, is likely to have an adverse effect on the poor in particular.

Table 4.2.6 Poverty Levels in Danang City by District, 2008

District	Poor Households		Poverty Density (no. / km2)1	Share in Total
	Number	Rate (%)		
Hai Chau	408	0.8	19	10
Thanh Khe	1,024	2.6	115	26
Son Tra	345	1.2	6	8
Ngu Hanh Son	199	1.5	5	5
Cam Le	897	5.1	27	22
Lien Chieu	608	2.8	7	15
Hoa Vang	602	2.1	1	15
Danang	4,123	2.0	4	100

Source: DaCRISS HIS, 2008.
[1] Poverty density is the number of poor households in a unit area.

Table 4.2.7 Distribution of Poor Households in Danang City by Household Size, 2008

Household Size		Urban Area						Rural Area	Total
		Hai Chau	Thanh Khe	Son Tra	Ngu Hanh Son	Cam Le	Lien Chieu	Hoa Vang	
Households below Urban Poverty Line by Household Size[1]	1	0.0	7.0	0.0	0.0	20.0	10.2	13.2	7.9
	2	1.1	4.9	1.3	0.0	6.9	2.0	16.7	5.1
	3	0.8	0.5	0.6	0.0	4.7	2.4	4.5	1.6
	4	1.0	1.6	0.4	1.5	5.5	2.6	4.7	2.2
	5	0.0	3.0	2.0	3.7	2.8	4.6	6.2	2.8
	6	1.1	2.6	3.2	0.0	0.0	0.0	9.7	2.7
	7	0.0	5.3	0.0	0.0	0.0	0.0	9.5	3.0
	8 ≧	2.9	6.1	9.5	0.0	0.0	0.0	0.0	3.8
	Total	0.8	2.6	1.2	1.5	5.1	2.8	7.6	2.8
Households below Rural Poverty Line by Household Size[2]	1	0.0	4.8	0.0	0.0	13.2	10.2	2.7	4.3
	2	1.1	1.0	0.0	0.0	6.9	2.0	5.2	2.3
	3	0.4	0.0	0.0	0.0	2.4	0.8	1.7	0.6
	4	0.5	0.3	0.4	0.0	0.7	1.1	0.5	0.5
	5	0.0	1.6	0.7	2.6	2.8	1.1	0.8	1.1
	6	0.0	2.6	0.0	0.0	0.0	0.0	5.8	1.3
	7	0.0	2.8	0.0	0.0	0.0	0.0	4.9	1.5
	8 ≧	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.4	1.0	0.3	0.6	2.7	1.3	2.1	1.0

Source: DaCRISS HIS, 2008.
[1] Poverty line in urban areas defined by DOLISA is VND260,000 per person per month
[2] Poverty line in rural areas defined by DOLISA is VND200,000 per person per month.

[3] The poverty line currently under discussion in DoLISA for 2011 - 2015 is VND 450,000 per person per month in urban areas and VND 350,000 per person per month in rural areas.

Table 4.2.8 Distribution of Poor Households in Danang City by Household Size, 2008

		Poor HHs[1)]	Quintile					Total
			1	2	3	4	5	
Demography	Population	15,811	138,866	171,237	137,472	129,406	148,173	725,154
	Ave. HH Size	3.83	2.83	3.58	3.75	3.85	4.03	3.56
Ave. HH Income (VND 000)		734	1,482	2,773	3,802	4,957	8,841	4,109
Top 5 Employment Sector	1st	Wholesales & retail trade	Wholesales & retail trade	Wholesales & retail trade	Wholesales & retail trade	Wholesales & retail trade	Wholesales & retail trade	Wholesales & retail trade
	2nd	Agriculture and forestry	Agriculture and forestry	Manufacturing	Manufacturing	Manufacturing	Manufacturing	Manufacturing
	3rd	Fishery	Manufacturing	Agriculture and forestry	Construction	Education and training	Education and training	Agriculture and forestry
	4th	Construction	Construction	Construction	Agriculture and forestry	Construction	Transport, storage and communications	Construction
	5th	Manufacturing	Fishery	Local Services	Public Administration	Transport, storage and communications	Construction	Transport, storage and communications
Spatial Distribution by District	Hai Chau	408	8,899	8,860	8,150	9,972	14,961	50,842
	Thanh Khe	1,064	8,384	9,133	7,163	8,471	8,468	41,619
	Son Tra	345	5,007	7,989	6,196	4,981	5,469	29,642
	Ngu Hanh Son	199	2,157	3,395	3,284	2,654	2,203	13,693
	Cam Le	897	5,353	5,453	3,426	1,902	1,525	17,659
	Lien Chieu	608	4,559	5,522	4,854	3,582	3,108	21,625
	Hoa Vang	602	14,706	7,460	3,558	2,032	1,025	28,781
Vehicle Ownership (% of HH)	Bicycle	66.9	61.2	65.4	67.7	65.5	60.9	64.0
	Motorcycle (>= 50cc)	48.4	66.4	90.4	95.0	95.0	96.8	87.4
	Car (<= 5 pax)	0.0	0.1	0.3	0.6	1.0	4.6	1.2
Ownership of Housing (%)		98.1	96.8	94.9	97.7	97.7	98.4	96.9
Access to Services (% of HH)	Piped Water	47.9	50.9	57.6	69.4	77.5	87.5	66.8
	Electricity	99.0	99.2	99.5	99.7	99.8	99.7	99.5
	Sewage System	44.9	44.1	52.1	57.6	66.6	73.3	57.4
	Solid Waste Collection	73.0	69.6	84.7	89.4	93.3	95.4	85.3
	Telephone	58.0	65.8	79.1	87.2	88.1	92.5	81.3
	Internet	7.0	6.8	9.0	16.4	27.2	45.7	19.4
Household Goods (% of HH)	Air conditioner	1.0	3.7	5.6	7.0	14.9	30.6	11.4
	Washing machine	7.0	14.3	28.5	39.6	52.9	72.7	39.1
	Refrigerator	32.1	43.5	67.1	79.5	85.4	95.5	71.8
	TV	72.7	91.8	97.8	98.7	98.5	99.7	97.0
	Computer	7.8	13.3	22.3	37.4	49.8	69.8	35.9
	Mobile Phone	8.0	43.6	73.1	86.1	92.1	95.0	75.4

Source: DaCRISS HIS, 2008. 1) Poor HHs by DoLISA definition.

Table 4.2.9 Distribution of Households by Income Class and District (no.)

	Quintile					Total
	1	2	3	4	5	
Hai Chau	8,899	8,860	8,150	9,972	14,961	50,842
Thanh Khe	8,384	9,133	7,163	8,471	8,468	41,619
Son Tra	5,007	7,989	6,196	4,981	5,469	29,642
Ngu Hanh Son	2,157	3,395	3,284	2,654	2,203	13,693
Cam Le	5,353	5,453	3,426	1,902	1,525	17,659
Lien Chieu	4,559	5,522	4,854	3,582	3,108	21,625
Hoa Vang	14,706	7,460	3,558	2,032	1,025	28,781
Total	49,065	47,812	36,631	33,594	36,759	203,861

Source: DaCRISS HIS, 2008.

Table 4.2.10 Distribution of Households by Income Class and District (%) (1)

	Quintile					Total
	1	2	3	4	5	
Hai Chau	17.5	17.4	16.0	19.6	29.4	100.0
Thanh Khe	20.1	21.9	17.2	20.4	20.3	100.0
Son Tra	16.9	27.0	20.9	16.8	18.5	100.0
Ngu Hanh Son	15.8	24.8	24.0	19.4	16.1	100.0
Cam Le	30.3	30.9	19.4	10.8	8.6	100.0
Lien Chieu	21.1	25.5	22.4	16.6	14.4	100.0
Hoa Vang	51.1	25.9	12.4	7.1	3.6	100.0
Total	24.1	23.5	18.0	16.5	18.0	100.0

	Quintile					Total
	1	2	3	4	5	
Hai Chau	18.1	18.5	22.2	29.7	40.7	24.9
Thanh Khe	17.1	19.1	19.6	25.2	23.0	20.4
Son Tra	10.2	16.7	16.9	14.8	14.9	14.5
Ngu Hanh Son	4.4	7.1	9.0	7.9	6.0	6.7
Cam Le	10.9	11.4	9.4	5.7	4.1	8.7
Lien Chieu	9.3	11.5	13.3	10.7	8.5	10.6
Hoa Vang	30.0	15.6	9.7	6.0	2.8	14.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: DaCRISS HIS, 2008.

Table 4.2.11 Household Income by Household Size

Household Size	Households		Income: VND 000/month	Vehicle Ownership (% of HH)		
	No.	%	Household	Bicycle Only	Motorcycle	Car
1	7,036	3.5	1,850	25.1	72.7	2.2
2	24,178	11.9	2,783	16.3	82.6	1.1
3	41,573	20.4	3,868	4.9	93.9	1.2
4	69,832	34.3	4,183	2.4	96.2	1.5
5	37,026	18.2	4,527	3.5	94.5	2.0
6	15,127	7.4	5,317	3.5	94.7	1.8
7	5,263	2.6	5,286	4.9	95.1	0.0
8	1,979	1.0	6,705	0.0	93.9	6.1
9	1,364	0.7	7,500	0.0	100.0	0.0
10 ≦	483	0.2	5,911	0.0	100.0	0.0
Total	203,861	100.0	4,098	5.2	93.3	1.5

Source: DaCRISS HIS, 2008.

Table 4.2.12 Distribution of Households by Income Class and District (%) (2)

HH Income: VND mil./month	Hai Chau	Thanh Khe	Son Tra	Ngu Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Total
- 1.5	4,688	4,038	2,312	1,198	3,363	2,131	7,976	25,706
- 2.0	4,211	4,346	2,695	959	1,990	2,428	6,730	23,359
- 3.0	8,860	9,133	7,989	3,395	5,453	5,522	7,460	47,812
- 4.0	7,830	6,898	5,795	3,089	3,301	4,695	3,361	34,969
- 5.0	8,900	7,575	4,838	2,330	1,605	3,341	1,981	30,570
- 6.0	5,236	3,251	2,695	1,068	718	1,488	658	15,114
- 7.0	2,830	1,705	898	473	298	418	126	6,747
- 8.0	2,830	1,705	898	473	298	418	126	6,747
8.0 <	5,458	2,968	1,522	709	634	1,184	363	12,838
Total	50,842	41,619	29,642	13,693	17,659	21,625	28,781	203,861
Average	4,957	4,498	4,197	4,133	3,247	3,870	2,549	4,095

Source: DaCRISS HIS, 2008.

Table 4.2.13 Per Capita Income Level by District (VND 000/month)

Per Capita Income: VND 000/month	Hai Chau	Thanh Khe	Son Tra	Ngu Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Total
- 100	164	121	82	81	85	0	42	575
- 150	0	203	40	0	302	165	347	1,057
- 200	121	191	226	38	168	280	995	2,019
- 300	922	1,152	848	202	935	641	2,296	6,996
- 500	5,864	5,335	4,795	1,872	3,387	3,133	9,135	33,521
- 1,000	18,324	18,300	13,210	6,392	8,964	9,753	12,748	87,691
- 1,500	11,017	8,841	6,411	3,020	2,504	4,398	2,434	38,625
- 2,000	7,378	4,250	2,387	1,380	769	1,726	538	18,428
- 3,000	4,705	1,967	1,283	353	502	1,057	166	10,033
- 4,000	1,406	662	201	155	43	343	41	2,851
-5,000	529	124	40	161	0	129	39	1,022
5,000 ≦	412	473	119	39	0	0	0	1,043
Total	50,842	41,619	29,642	13,693	17,659	21,625	28,781	203,861

Source: DaCRISS HIS, 2008.

Table 4.2.14 Per Capita Income Level by District (%)

Per Capita Income: VND 000/month	Hai Chau	Thanh Khe	Son Tra	Ngu Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Total
- 100	28.5	21.0	14.3	14.1	14.8	0.0	7.3	100.0
- 150	0.0	19.2	3.8	0.0	28.6	15.6	32.8	100.0
- 200	6.0	9.5	11.2	1.9	8.3	13.9	49.3	100.0
- 300	13.2	16.5	12.1	2.9	13.4	9.2	32.8	100.0
- 500	17.5	15.9	14.3	5.6	10.1	9.3	27.3	100.0
- 1,000	20.9	20.9	15.1	7.3	10.2	11.1	14.5	100.0
- 1,500	28.5	22.9	16.6	7.8	6.5	11.4	6.3	100.0
- 2,000	40.0	23.1	13.0	7.5	4.2	9.4	2.9	100.0
- 3,000	46.9	19.6	12.8	3.5	5.0	10.5	1.7	100.0
- 4,000	49.3	23.2	7.1	5.4	1.5	12.0	1.4	100.0
-5,000	51.8	12.1	3.9	15.8	0.0	12.6	3.8	100.0
5,000 ≦	39.5	45.3	11.4	3.7	0.0	0.0	0.0	100.0
Total	24.9	20.4	14.5	6.7	8.7	10.6	14.1	100.0

Per Capita Income: VND 000/month	Hai Chau	Thanh Khe	Son Tra	Ngu Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Total
- 100	0.3	0.3	0.3	0.6	0.5	0.0	0.1	0.3
- 150	0.0	0.5	0.1	0.0	1.7	0.8	1.2	0.5
- 200	0.2	0.5	0.8	0.3	1.0	1.3	3.5	1.0
- 300	1.8	2.8	2.9	1.5	5.3	3.0	8.0	3.4
- 500	11.5	12.8	16.2	13.7	19.2	14.5	31.7	16.4
- 1,000	36.0	44.0	44.6	46.7	50.8	45.1	44.3	43.0
- 1,500	21.7	21.2	21.6	22.1	14.2	20.3	8.5	18.9
- 2,000	14.5	10.2	8.1	10.1	4.4	8.0	1.9	9.0
- 3,000	9.3	4.7	4.3	2.6	2.8	4.9	0.6	4.9
- 4,000	2.8	1.6	0.7	1.1	0.2	1.6	0.1	1.4
-5,000	1.0	0.3	0.1	1.2	0.0	0.6	0.1	0.5
5,000 ≦	0.8	1.1	0.4	0.3	0.0	0.0	0.0	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: DaCRISS HIS, 2008.

5 ECONOMIC CONDITIONS

5.1 Overview

5.1 The characteristics of Danang's economy can be summarized as follows:

(i) In 2006 and 2007, the GDP growth rate did not achieve the target indicated in the Danang SEDP 2006–2010, which was 14% a year. The low GDP growth rates are thought to be caused by the poor performance of the industrial and construction sector, despite the high growth of the service sector;

(ii) The growth rate in Danang's export turnover did not reach the target of over 20%. It was only in 2007 when the actual rate was higher than the target;

(iii) In 2006 and 2007, the service sector became the biggest economic sector in the city, sharing 50% and 49%, respectively, of the total GDP; and

(iv) Unlike other major cities in Vietnam, the state sector in Danang in 2007 had a large share in industrial production (57%) and employment (40% of industrial workforce).

5.2 Meanwhile, the issues and challenges that the city faces are the following:

(i) Unless the city expands its export-oriented industries to a considerable extent after 2008, it is unlikely that the SEDP 2006–2010 targets will be achieved by 2010;

(ii) Based on HIS data and the migration rate projected in the SEDP, over 40,000 new jobs a year would be required for the next five years. With increasing migration to the city and declining numbers of city dwellers entering the workforce, over 50,000 new jobs a year should be generated till 2020;

(iii) Unemployment rates have shown a slow but steady decline in recent years, and the size of the workforce employed in regular, stable jobs has also increased in absolute terms, although this does not fully present a clear picture of the employment situation;

(iv) Creating higher-value-added employment is another challenge that the city will face, as it has to compete with the industrial areas of the north and southeast for a relatively small pool of trained workers; and

(v) There is a need to promote domestic private and foreign investments, especially in the secondary sector, not only to generate more employment but to promote a dynamic business climate. The issues to address in are: use of ICT; high shipping costs, infrequent ship calls, poor transportation, and rising transportation costs; inadequate, unskilled, and rising costs of manpower; poor infrastructure; inadequate electricity supply; weak institutions; limited access to financing and land; high taxes; and low security.

5.2 Economic Growth and Structure

1) Development Targets and Their Achievement

5.3 Danang City is located in the center of Vietnam and has an important role in the country's socio-economic development, defense, and security.[1] Danang is expected to be built up to become one of the country's large cities and the major socio-economic hub in central Vietnam. To achieve these objectives, Danang is required to develop its economy to a large extent within a short period of time.

5.4 The Danang SEDP 2006–2010 presents several quantitative targets of economic growth. GDP growth rate would increase to 13% per year in the period 2001–2005 and 14% in 2006–2010. Per capita income would reach USD2,000 by 2010. Export turnover would increase by 21–23% per year from 2001 to 2010 and would reach USD1,720 million by 2010. Industry would grow by 16.62% from 2001 to 2005 and by 15.5% from 2006 to 2010.

Table 5.2.1 Actual and Target GDP Growth Rates in Danang City

Sector	Actual				Target	
	2004	2005	2006	2007	2001–2005	2006–2010
Agriculture, Forestry & Fishery	4.8	10.2	-10.2	4.0	n.a.	n.a.
Industry and Construction	20.3	16.6	1.3	9.1	16.1	15.5
Service	7.1	11.1	21.3	14.4	n.a.	n.a.
All	13.2	13.8	9.0	11.4	13.0	14.0

Source: Table 19, Danang City Statistical Yearbook 2007, "Danang City socio-economic development plan for 2010."

5.5 Tables 5.2.1 and 5.2.2 compare the actual and target figures of economic growth in Danang City. With regard to GDP growth ratio, the city achieved higher growth than the target rate until 2005. However, the GDP grew at lower rates after 2006, and the city was not able to achieve the target. The low GDP growth rates after 2006 is thought to be caused by the poor performance of the industrial and construction sector. This sector achieved very high growth until 2005, but failed to keep the momentum after 2006. The actual growth rate of the industry and construction sector was much lower than the target rate for the period 2006–2010. The growth rate of the service sector, on the other hand, remained high during the whole period, reaching 21.3% in 2006 and 14.4% in 2007.

Table 5.2.2 Actual and Target Figures of Export Turnover in Danang City

Item	Actual					Target	
	2003	2004	2005	2006	2007	2001–2010	2010
Value (mil. USD)	261	309	349	377	470	n.a.	1,720
Growth Rate (%)	5	19	13	8	24	21—23	n.a.

Source: Table 70, Danang City Statistical Yearbook 2007, "Danang City socio-economic development plan for 2010."

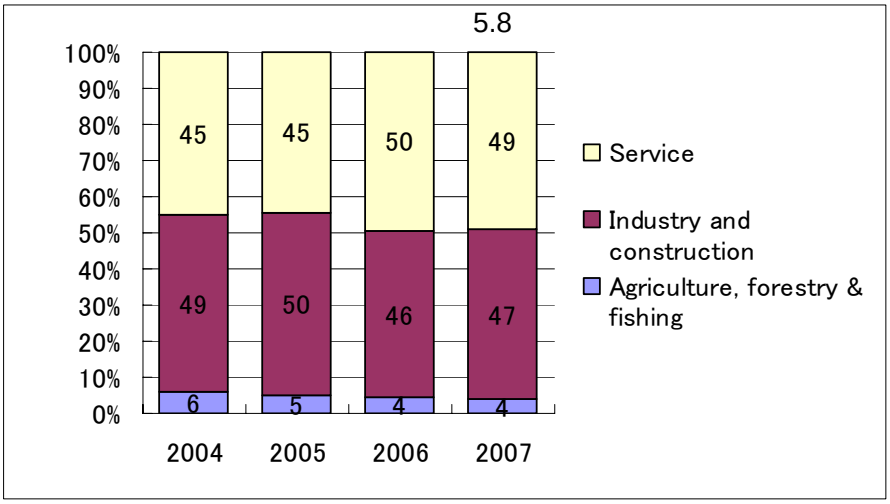
5.6 Danang has ambitious targets for export turnover. The export turnover should grow by over 20% in the 2000s, and reach USD1.7 billion by 2010. Unfortunately, the growth rate of export turnover did not reach the target level. It was only in 2007 when the actual rate was higher than the target, and even then, the value of export turnover was only USD470 million, which is less than a third of the target value for 2010.

[1] Resolution of the Vietnamese Politburo 'on the building up and development of Danang City in industrialization and modernization process', No.33-NQ/TW"

2) Economic Structure

5.7 Danang City also expects that it would have structural changes in its economy in the 2000s. The city is requested to "devise plans to change the economy into an Industry –Service–Agriculture structure by 2010 and Service–Industry–Agriculture after 2010."[2] For this purpose, it is expected to rapidly develop the service sector, including rail and road transportation, seaport, international airport, finance, banking, insurance, post and telecommunications, consultancy, and technology transfer. There is also a plan to invest in tourism to make it a key economic sector and build up the city to be a major national tourist center. It seems that the city has already made this structural change: the share of the service sector in the GDP gradually expanded, becoming larger than that of industry and construction after 2006 (Figure 5.2.1). Now service is the biggest economic sector in the city in terms of gross output. Considering the high growth rate of the service sector and the recent poor performance of industrial production, it is expected that the service sector will continue to be the largest economic sector in the city.

Figure 5.2.1 Structure of Danang's GDP by Sector, 2004–2007



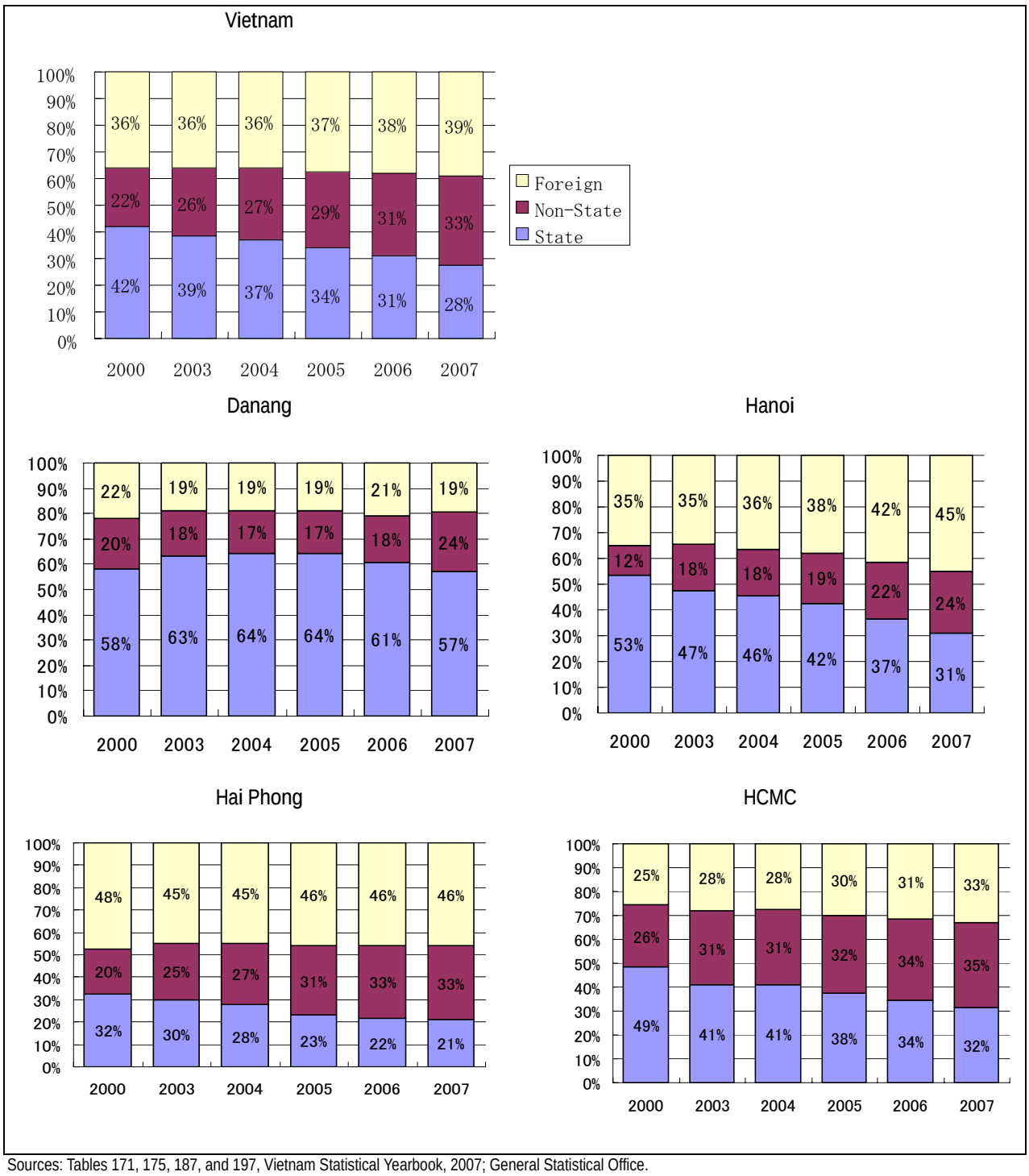
5.9 Danang has a very unique economic structure with regard to ownership in comparison with Vietnam's other industrial cities. State sector in the city has played a significant role in industrial development and maintains the biggest share in the total gross output. Fifty-seven percent (57%) of industrial growth output was generated by the state sector in 2007, while that of non-state and foreign-invested sectors are 24% and 19%, respectively (see Figure 5.2.2). This large share of state industrial production remained the same in the 2000s, when around 60% of industrial growth output was produced by the state sector. The shares of non-state and foreign sectors were around 20%.

5.10 State sector had a relatively smaller role in other industrialized cities, and its shares were generally declining. The share of Hanoi's state sector was over 50% in 2000, and kept declining in the 2000s. Only 31% of Hanoi's industrial output was generated by the state sector in 2007, while foreign-invested sector produced 43%. In Haiphong, the foreign-invested sector seems to be the biggest player in industrial production, generating 46% of the gross output in 2007. State share in industrial output in this city also kept shrinking from 32% in 2000 to 21% in 2007. In HCMC, non-state sector had the biggest share in industrial output, reaching 35% in 2007. Just like Hanoi and Haiphong, state sector in HCMC significantly decreased its share from half to one third in the 2000s. Reduc-

[2] Resolution, No.33-NQ/TW

tion in state share and expansion of non-state and foreign shares in industrial production seemed to be the trend in the whole country. The share of state sector in industrial output reduced from 42% in 2000 to 28% in 2007 in Vietnam, while that of non-state sector expanded to a large extent during the period. Thus, it can be concluded that the high share of state sector in industrial production is a very unique feature of Danang City.

Figure 5.2.2 Share of Industrial Gross Output in Vietnam and Selected Cities by Ownership



Sources: Tables 171, 175, 187, and 197, Vietnam Statistical Yearbook, 2007; General Statistical Office.

5.11 The state-dominated economic structure of Danang is also found in the shares of industrial employment (see Figure 5.2.3). Around 40% of industrial labor was employed in Danang's state sector. The shares of state employment in industrial labor force in Hanoi and HCMC were only 31% and 10%, respectively. In HCMC, non-state sector seems to play the most important role in generating industrial employment.

Figure 5.2.3 Percentage of Labor in Industrial Establishments in Selected Vietnamese Cities by Ownership

Source: 2007 Statistical Yearbook(s) of the provinces concerned

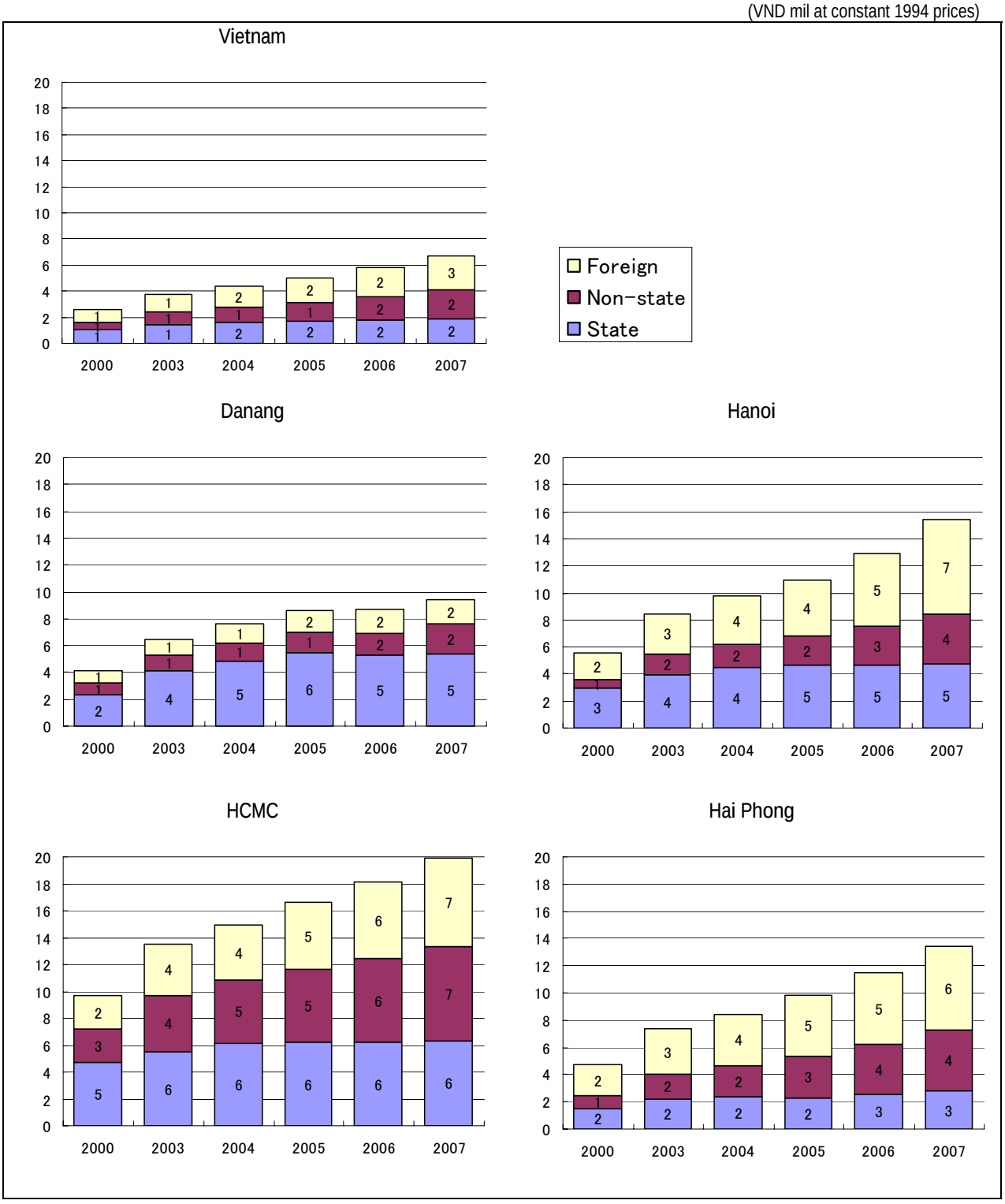
5.12 The state sector has a large share in industrial production and employment in Danang in comparison with other industrial cities. How large then is the state sector in Danang in absolute value?

3) Productivity of the Sector

5.13 Figure 5.2.4 shows the amount of industrial output per capita at constant 1994 prices by types of ownership in Vietnam and in its four cities. In 2007, state industrial sector in Danang produced VND5 million per capita. State industrial sector in Hanoi and HCMC generated a similar level of output per capita in that year, which was VND5 million and VND6 million, respectively, while that in Haiphong was much less, reaching only VND3 million. The amount of state industrial output in the whole country in 2007 was VND2 million. This suggests that the size of state industrial production in Danang could be as large as that in Hanoi and HCMC, and nearly three times bigger than the national average. It seems that Danang received a massive amount of state investment in the industrial sector to produce significant industrial output, just like Hanoi and HCMC.

Figure 5.2.4 Per Capita Gross Output of Industry in Vietnam and Selected Cities by Ownership

(VND mil at constant 1994 prices)



Sources: Tables 12, 171, 175, 187, and 197, Vietnam Statistical Yearbook, 2007; General Statistical Office.

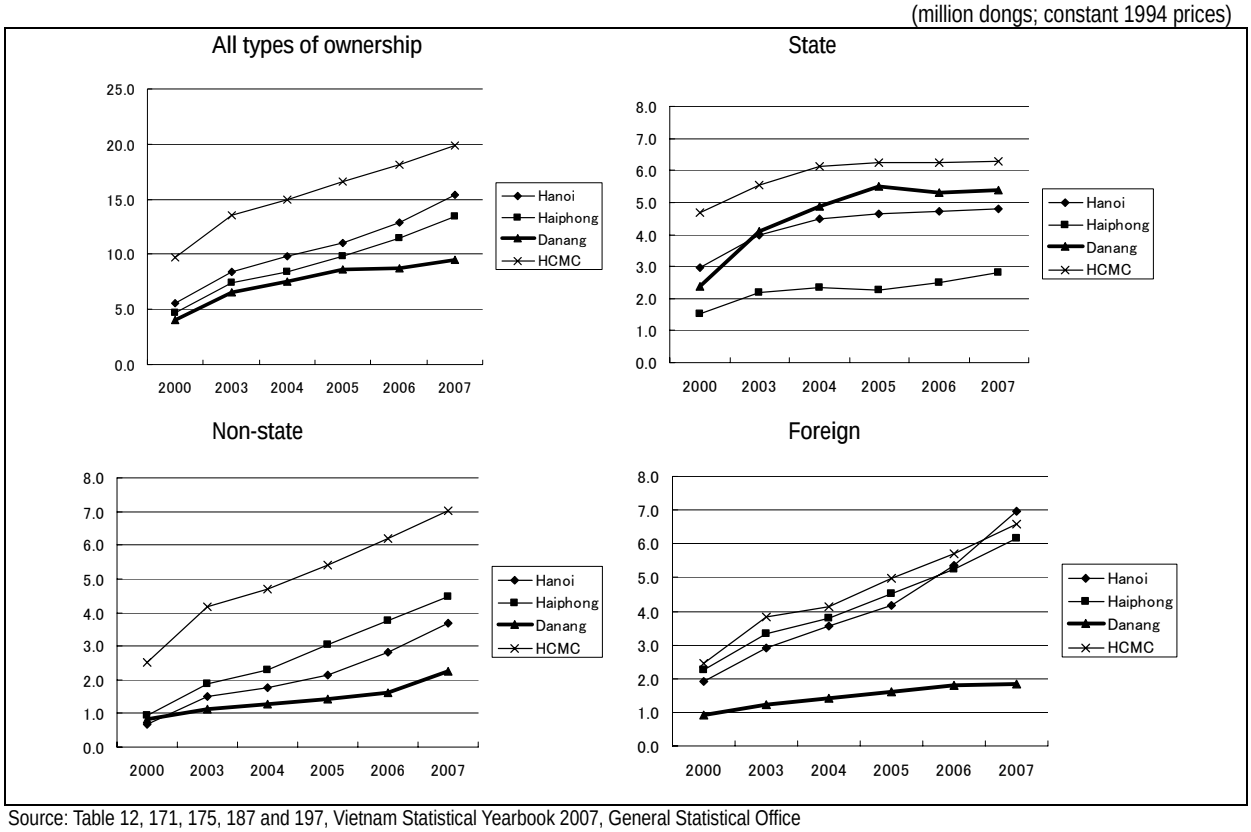
5.14 Non-state and foreign-invested sectors in Danang, on the other hand, generated only a small amount of industrial output per capita. In 2007, Danang's non-state sector produced VND2 million per capita, which is nearly the same value as the output of non-state sector for the whole country. Non-state sector in Hanoi, Haiphong, and HCMC produced two to three times more in that year. Per capita industrial output of the foreign sector in Danang was also small, reaching only VND2 million in 2007, which was even lower

than the national average. Foreign-invested sector in Hanoi, Haiphong, and HCMC generated a much bigger value of industrial output per capita.

5.15 Based on the same data, Figure 5.2.5 compares the size of per capita industrial output of four cities by types of ownership. It is clearly shown that the large volume of per capita industrial output in Danang was mainly contributed by the state sector. The growth of non-state and foreign-invested sectors in Danang in the 2000s was very modest in comparison with that in the other cities. There is a need to expand non-state and foreign-invested sectors in Danang if the city intends to develop its industrial sector the way other cities did.

Figure 5.2.5 Per Capita Gross Output of Industry by Ownership

(million dongs; constant 1994 prices)



Source: Table 12, 171, 175, 187 and 197, Vietnam Statistical Yearbook 2007, General Statistical Office

5.3 Employment

5.16 According to the results of the HIS survey, Danang has a very young population with 52% below 30 years of age and only 9% above 60 years of age. This is in turn reflected in a low dependency ratio[3] of around 0.46, which is a potentially significant advantage for the city, if the benefits of a young labor force can be realized. Unemployment rates have shown a slow but steady decline in recent years, and the size of the workforce employed in regular, stable jobs has also increased in absolute terms (see Table 5.3.1). Nevertheless, there are a number of qualifications to this otherwise positive picture, to wit:

(i) The proportion of the workforce in "stable employment" declined slightly between 2000 and 2006 from 74.5% to 74.2%;

(ii) The unemployment rate underestimates underemployment, both in rural and urban areas (estimates suggest that in rural areas in particular underemployment can be a significant problem with farmers typically using only 70–80% of their productive time);

(iii) Much of the labor force is still engaged in low-value-added production; and

(iv) Twenty-three percent (23%) of HIS respondents were studying full time, while many of those between 15 and 65 were not working.

Table 5.3.1 Danang Labor Force, 2000–2006

Category	2000	2006	Growth rate
Potential Labor Force[1]	413,900	522,507	3.88
Labor Force[2]	330,827	387,277	2.63
Stable Employment[3]	311,143	368,208	2.81
Student	70,400	97,021	5.35
Others	12,673	38,209	18.39
Unemployed (derived from Given Rate)	19,684	19,069	–0.53
Unemployment Rate (%)	6.0	4.9	

Source: DOS Danang

1 Potential labor force is the sum of labor force, students, and others.

2 Labor force refers to the economically active population, i.e. persons aged 15 to 65 including employed and unemployed.

3 Stable employment are employees 15 to 65, working in national economic organizations and having working time not less than the standard level stipulated for the employee (8 hours).

5.17 Sectoral employment data (see Table 5.3.2) in 2006 shows the largest sectors to be: (i) wholesale / retail trade, sale of personal goods, and vehicle repair (23%); (ii) manufacturing (20%); (iii) agriculture and forestry (11%); construction (10%); (v) transportation (8%); and (vi) hotels and restaurants (7%). While manufacturing and construction are important, the figures show the predominance of employment in relatively low-skilled, low-value-added sectors such as agriculture and trade. Nevertheless, significant employment generation is taking place in sectors that offer the potential for greater productivity such as manufacturing, hotels and restaurants, and education.

5.18 It should be noted that the city workforce is probably larger than is suggested here due to unenumerated immigrants. Inclusion of this "missing" labor force may also change the sectoral breakdown of labor: migrants are likely to be disproportionately employed in sectors such as construction and manufacturing. It is estimated that there are over 150,000 unenumerated immigrants in Danang. If most of them are working, the labor force would increase by about 40%. It is therefore likely that official figures on the distribution of sectoral employment are misleading due to the failure to include these workers.

3 Dependency ratio is an age–population ratio of those typically not in the labor force (the dependent part or those under the age of 16 and over the age of 64) and those typically in the labor force (the productive part or those 16 to 64 years old).

5.19 Future employment creation is likely to be a critical issue for Danang City. HIS data suggest that for the next five years at least 15,000 people a year from the city will be entering the workforce. Adopting the migration rate projected in the SEDP, jobs for a further 25,000 migrants will also be required[4], which suggests the need for over 40,000 new jobs a year. This figure is expected to increase toward 2020 with increasing immigration more than compensating for a gradual decline in the numbers of city dwellers entering the workforce. Projections suggest that up till 2020 the city will need to generate over 50,000 new jobs a year. This is a significant jump compared to official employment generation figures which suggest that around 18,000 jobs have been generated per year in the city. However, if the rate of immigration is understated and most immigrants are employed, actual employment generation in both officially recorded and "unofficial" sectors is perhaps closer to the figures required by the population projections. Sectoral breakdown of employment by investment type is looked at in more detail in the following sections.

Table 5.3.2 Employment by Sector

Sector	DOS			2000–2006		Danang (2008)[1]		Other Reference Cities (%)		
	1996	2000	2006	Growth Rate	Increase / year	No.	%	Hanoi, 2005[2]	HCMC, 2002[3]	Japan[4]
Agriculture and Forestry	60,145	60,573	40,430	–6.74	–3,357	29,065	9	25	-	-
Fishing	11,137	10,751	6,870	–7.46	–647	10,517	3	0	-	-
Mining and Quarrying	437	665	630	-0.9	-6	1,335	0	0	-	-
Primary Total	71,719	71,989	47,930	–6.55	–4,010	40,917	13	26	8	4
Manufacturing	40,137	51,134	72,700	5.86	3,594	52,189	16	11	-	-
Electricity, Gas, Water	1,242	930	4,030	24.44	517	7,265	2	2	-	-
Construction	20,495	27,702	36,750	4.71	1,508	27,384	8	6	-	-
Secondary Total	61,874	79,766	113,480	6.05	5,619	86,838	27	19	34	32
Wholesale and Retail Trade	31,986	41,753	82,460	11.34	6,785	97,401	30	14	-	-
Hotel and Restaurants	7,841	9,929	26,840	16.57	2,819	7,069	2	2	-	-
Transportation & Communication	18,622	19,906	28,330	5.88	1,404	21,657	7	6	-	-
Financial intermediation	1,027	1,292	3,560	16.89	378	7,761	2	3	-	-
Science and Technology	365	438	370	–2.81	–11	4,043	1	3	-	-
Real Estate	801	1,148	6,280	28.32	855	7,124	2	3	-	-
Public Administration	3,044	3,032	11,340	21.99	1,385	16,720	5	4	-	-
Education	9,824	10,587	19,320	10.03	1,456	18,649	6	7	-	-
Health and Social Work	3,027	3,011	6,330	12.38	553	7,733	2	4	-	-
Recreational	565	834	2,840	20.42	334	2,642	1	2	-	-
Activities of Party	723	827	1,990	14.63	194	3,990	1	3	-	-
Community Activities	3,137	7,391	12,720	9.05	888	3,398	1	4	-	-
Territorial Organizations	342	750	1,270	8.78	87	-	-	-	-	-
Tertiary Total	81,304	100,898	203,650	12.42	17,125	198,187	61	55	58	64
Total	214,897	252,653	365,060	6.13	18,735	325,942	100	100	100	100

Source: DOS Danang.

1 Survey conducted in 2008, DaCRISS HIS, excludes "other industries (16,927)", "services (13,564)", "not applicable (18,655)."

2 Survey conducted in 2005, HAIDEP HIS, excludes "other industries (93,272)", "services (73,363)", "unknown (143)."

3 Survey conducted in 2002, HOUTRANS HIS.

4 Based on Statistics Bureau, Director-General for Policy Planning & Statistical Research and Training Institute.

[4] This depends upon how responsive migration rates are to job prospects. It may be the case that migrants only move in response to employment opportunities. However, evidence from elsewhere in the world suggests that this is unlikely; migrants move due also to perceived better employment opportunities, rather than more concrete work prospects.

Table 5.3.3 Number of Workers by Employment Sector and Educational Attainment

Employment Sector	(Master / Doctoral)	University	Junior College	High School or Below	Total
Agriculture and Forestry	77	205	173	28,540	28,995
Fishery	33	575	403	9,310	10,321
Mining & Quarrying	0	123	127	1,059	1,309
Manufacturing	194	4,356	4,952	42,349	51,851
Electricity, Gas & Water Supply	40	1,671	1,970	3,545	7,226
Construction	44	4,201	2,221	20,881	27,347
Wholesales & Retail Trade	26	1,970	4,970	90,092	97,058
Hotels & Restaurants	0	808	1,107	5,067	6,982
Transportation, Storage, Communications	40	3,921	3,360	14,290	21,611
Financial Intermediation	209	4,785	1,983	784	7,761
Science and Technology	97	2,295	835	816	4,043
Real Estate, Renting & Business	124	2,047	1,283	3,637	7,091
Public Administration & Defense	194	6,705	5,152	4,530	16,581
Education and Training	972	10,455	5,279	1,906	18,612
Health & Social Work	274	3,219	3,052	1,140	7,685
Recreational, Cultural, Sport	29	596	634	1,383	2,642
Activities of Party	52	1,829	891	1,218	3,990
Community Activities	50	625	460	2,232	3,367
Other Industries	0	2,404	1,889	12,593	16,886
Services	0	496	570	12,422	13,488
Not Applicable	0	1,420	2,098	15,092	18,610
Total	2,455	54,706	43,409	272,886	373,456

Source: DaCRISS HIS, 2008.

Table 5.3.4 Distribution of Workers in Danang by Employment Sector and Educational Achievement

(%)

Employment Sector	Master / Doctoral	University	Junior College	High School or Below	Total
Agriculture and Forestry	0.3	0.7	0.6	98.4	100.0
Fishery	0.3	5.6	3.9	90.2	100.0
Mining & Quarrying	0.0	9.4	9.7	80.9	100.0
Manufacturing	0.4	8.4	9.6	81.7	100.0
Electricity, Gas & Water Supply	0.6	23.1	27.3	49.1	100.0
Construction	0.2	15.4	8.1	76.4	100.0
Wholesales & Retail Trade	0.0	2.0	5.1	92.8	100.0
Hotels & Restaurants	0.0	11.6	15.9	72.6	100.0
Transport, Storage, Communications	0.2	18.1	15.5	66.1	100.0
Financial Intermediation	2.7	61.7	25.6	10.1	100.0
Science and Technology	2.4	56.8	20.7	20.2	100.0
Real Estate, Renting & Business	1.7	28.9	18.1	51.3	100.0
Public Adm. & Defense	1.2	40.4	31.1	27.3	100.0
Education and Training	5.2	56.2	28.4	10.2	100.0
Health & Social Work	3.6	41.9	39.7	14.8	100.0
Recreational, Cultural, Sports	1.1	22.6	24.0	52.3	100.0
Activities of Party	1.3	45.8	22.3	30.5	100.0
Community Activities	1.5	18.6	13.7	66.3	100.0
Other Industries	0.0	14.2	11.2	74.6	100.0
Services	0.0	3.7	4.2	92.1	100.0
Not applicable	0.0	7.6	11.3	81.1	100.0
Total	0.7	14.6	11.6	73.1	100.0

Source: DaCRISS HIS, 2008.

5.20 Creating higher-value-added employment is another challenge faced by the city. Currently, most employment is in the low-value-added sectors. Even employment in higher-value-added modern industries, such as manufacturing, is concentrated in light manufacturing (textiles, food and beverage production, etc). Creating these kinds of jobs in high-value-added industries is especially difficult for Danang, as it has to compete with the industrial areas of the north and southeast for a relatively small pool of trained workers.

5.21 Evidence from interviews with businesses and officials in Danang City suggests it is difficult for enterprises in the city to retain skilled labor in Danang. As a consequence, there is evidence of a ‘brain drain’ of talent from the city to the southeast in particular.

5.4 Foreign Direct Investment

1) Constraints in FDI Promotion

5.22 Vietnam is a low-income country. The people are mostly poor, and the domestic market for industrial products is still small. Therefore, many foreign enterprises in the industrial sector are export-oriented. They export most products to foreign markets in Asia, Europe, and America. These export-oriented foreign enterprises naturally prefer to be located in cities with good conditions for exporting. Currently, many foreign industrial enterprises invest in either Hanoi or HCMC and their neighboring provinces. A few foreign enterprises have come to Danang.

5.23 As far as industrial production is concerned, the foreign-invested sector has played a very limited role in Danang. Per-capita output of the foreign-invested sector in the city is very small and does not even reach the national average. It is the industrial sector that generates a great amount of employment in the local economy and is no doubt the major driving force of the recent economic development in other major cities. It is of utmost importance to promote foreign investment in the industrial sector of Danang.

5.24 Danang is strategically located along National Highway No. 1 (NH1), has an international airport, and a deep seaport. It has five industrial zones (IZs) with good access to the seaport. The city has several higher educational institutions, including the Danang University of Technology, from where about 2,000 students graduate annually. The city seems to have favorable conditions for export-oriented industrial FDI. Despite these advantages, the following factors have been pointed out as constraints in attracting foreign investment:

(a) **High Shipping Costs and Infrequent Ship Calls:** The shipping costs via the Danang Port are high, and vessels do not frequently come to visit. Based on 2006 data, the amount of port throughput of Danang Port was 2 million tons, while that of Saigon and Haiphong ports were 31 million tons and 11 million tons, respectively.[5] The limited amount of port throughput results in high shipping costs and infrequent shipping schedule. Garment manufacturing is the biggest export industry in Danang, and it is very important for the enterprises to deliver products to foreign customers on time. The poor shipping schedule from Danang Port has made it difficult for them to schedule their production accordingly. With few ships calling at Danang Port, local garment exporters often choose to ship from other busier ports. Saigon, with frequent vessels going to and coming from many destinations in the world, has become their preferred port.[6] Moreover, the shipping costs from Danang Port to major foreign ports are three times higher than those from Saigon Port. It is sometimes cheaper for garment enterprises in Danang to transfer products to HCMC and export them from Saigon Port.

(b) **Inadequate and Rising Costs of Manpower:** The supply of labor force in Danang is limited and its cost is rising. In comparison with HCMC and Hanoi, the size of Danang's local labor market is small even though the labor markets of neighboring provinces are included. Garment enterprises believe that the labor force has become smaller. In the past, a garment enterprise had the choice to select applicants with skills and experience from among a large number of applicants for job positions in the

[5] P12, 'Freight Transportation Sub-sector Analysis Da Nang, Vietnam', March 2008, Vietnam Private Sector Support Programme, EU.
[6] P20, 'Economic Potential Study Da Nang Final Report', July 2006, Vietnam Private Sector Support Programme, EU.

factory. Nowadays, fewer applicants are received and the factories accept almost any work applicants.[7] Some new investments in labor-intensive manufacturing could result in more severe shortage of local labor. Furthermore, the recent increase in the levels of minimum wage in Danang makes the city less attractive for foreign investors. Danang used to be in the third category regarding the level of minimum wage, but the city is now in the second category just like Haiphong. As a result, the minimum wage in Danang increased by 35% from USD80 to USD108. This serves as a negative message for foreign investors, which look for a large pool of cheap labor.

(c) **Poor Infrastructure:** The industrial infrastructure of Danang is poorly developed particularly with regard to electricity supply and drainage. According to foreign enterprises located in the Hoa Khanh IZ, the supply of electricity is often unstable and they suffer from frequent outages. For IT enterprises that develop software, for instance, even a short period of electricity cutoff is detrimental to their production. To avoid this, they have to invest in backup facilities to prepare for electricity outages, which have resulted in rising production costs. Poorly maintained drainage facilities are a severe constraint for seafood processing enterprises. Even in the Tho Quang IZ, which had been developed particularly for seafood processing manufacturers, the capacity of its drainage facilities is small and the system often breaks down. Consequently, untreated wastewater comes out from the factories, causing environmental problem for the surrounding communities.

5.25 Despite these constraints, however, there are foreign enterprises that still prefer Danang and manufacture products for export. Each enterprise has its own reasons to come to Danang. For instance, a manufacturer in the electronics sector produces high value-added electronic components in small quantities, so it exports products by air. High shipping costs or poor shipping schedules do not affect its export business. A manufacturer of precious equipment, which ships products mainly to Hong Kong, uses Danang Port for export. According to this enterprise, the shipping schedule from Danang Port to Hong Kong Port is relatively stable and shipping costs are not very high.

5.26 Thus, it seems possible for Danang to attract more foreign investors who might only be insufficiently informed about the business potentials of the city. Through more active promotional activities, perhaps this can be done. The current institutional structure of FDI promotion in Danang, which is widely perceived as responsible for the low level of FDI flow to the city, must also be reviewed.

2) New Institutional Setting to Manage and Promote Industrial Zones

5.27 It is often pointed out that the management of industrial zones is similar to that of hotels. If one has internationally recognized good management practices, such as Hyatt, Hilton, etc., one can have a good hotel of international standard, with a good network with overseas markets. On the contrary, if one has weak management, limited knowledge of international standards, and a poor overseas network, one can never attract enough foreign tourists to keep the business growing.

5.28 Similarly, a highly experienced and internationally recognized developer of industrial zones should be able to provide high-quality services to foreign manufacturers located in the industrial zone, as well as to promote it to potential overseas investors in an

[7] P19-20, 'Economic Potential Study Da Nang Final Report', July 2006, Vietnam Private Sector Support Programme, EU.

effective way. Local management companies, however, find it difficult to meet the requirements of foreign investors and to promote Danang's industrial zones worldwide. In fact, many of the successful industrial zones in Vietnam are managed by foreign developers, including Thang Long in Hanoi, Nomura in Haiphong, Tan Tuan EPZ in HCMC, and many others (see Table 5.4.1).

5.29 Danang City has five industrial zones (see Table 5.4.2). Four of them have been developed and managed by a local state company called DAIZICO (Danang Industrial Zones Infrastructure Development and Exploitation Company). DAIZICO was established by the state authority, DIEPZA, which is responsible for issuing business licenses to foreign investors. Many foreign investors located in one of the four industrial zones complain about the management and facilities maintained by DAIZICO there. Moreover, DAIZICO does not seem to promote the industrial zones to overseas investors. It seems the information about these industrial zones reach overseas investors only through the general promotional activities of IPC (Investment Promotion Center) Danang.

5.30 Another industrial zone, the Danang IZ, is managed by a foreign developer called MASSDA, part of a Malaysia-based company called MASSCORP, which has a rich experience of managing industrial zones overseas. The Danang IZ is full and the investors enjoy excellent services provided by this management company.

Table 5.4.1 Vietnam's Largest Industrial Zones by Registered FDI, 2003

IZ Name	Province	Nationality	Total FDI
Bien Hoa II	Dong Nai	Vietnam	1,106,917,060
Nhon Trach I	Dong Nai	Vietnam	628,039,804
Tan Thuan	HCMC	Taiwan, Japan	611,839,946
VSIP	Binh Duong	Singapore, Vietnam	596,051,971
Nhon Trach II	Dong Nai	Vietnam	448,276,865
Thang Long	Hanoi	Japan, Vietnam	439,623,667
Amata	Dong Nai	Thailand, Vietnam	356,000,000
Sai Dong B	Hanoi	Korea, Vietnam	321,744,320
Kim Hoa	Vinh Phuc	Vietnam	270,000,000
Nomura	Haiphong	Japan, Vietnam	221,467,508
Loteco	Dong Nai	Japan, Vietnam	175,116,256
Phu My I	BR-VT	Vietnam	150,839,000
Lien Trung I	HCMC	China, Vietnam	118,771,433

Source: UNDP Policy Dialogue Paper 2008/2, Hanoi, July 2008.

Table 5.4.2 Danang Industrial Zones and Their Management Companies

IZ Name	Developer/Managing Company	Nationality
Danang	MASSDA	Malaysia, Vietnam
Hoa Khanh	DAIZICO	Vietnam (State)
Hoa Khanh (extension)	SDN	Vietnam (Private)
Lien Chieu	DAIZICO	Vietnam (State)
Lien Chieu (extension)	SDN	Vietnam (Private)
Tho Quang	DAIZICO	Vietnam (State)
Hoa Cam	DAIZICO	Vietnam (State)

Source: DPI, Foreign Affairs Division (13. Nov. 2008).

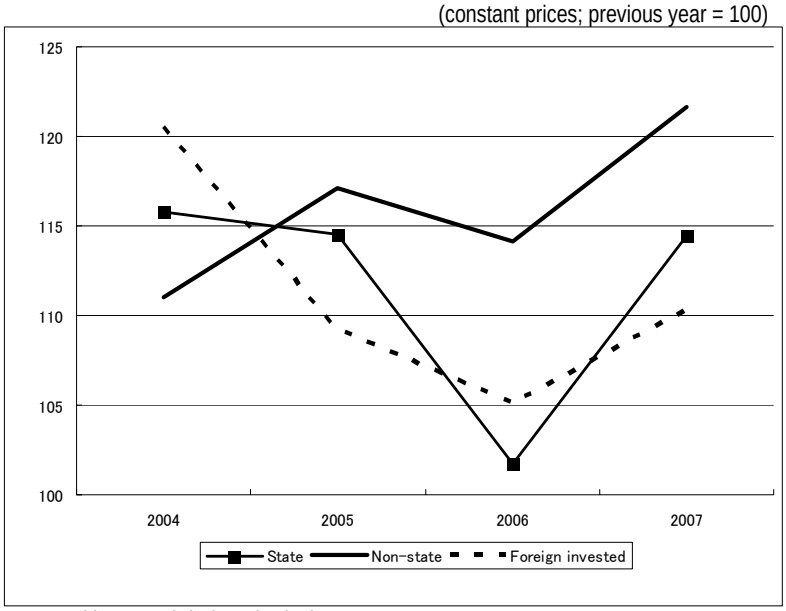
5.31 Based on the preceding discussion, there is a need for more aggressive and effective promotional activities to attract foreign investors to the city. The local authority should reconsider the current institutional setting of IZ management as well. Moreover, there is a common perception that the authority should put the four industrial zones under the management of foreign developers with good international business networks and experienced in managing industrial zones. This could be the most effective way to promote industrial FDI to Danang.

5.5 Private Sector Development: Exploitation of Untapped Business Opportunities

5.32 State sector dominates the economic structure in Danang, while private (non-state) sector remains small. In 2007, the share of state industrial output reached 57%, while that of private output was only 24%. State sector employed over 40% of the industrial labor force, while the private sector employed one fourth of the total in the 2000s.

5.33 The state sector in Danang is large, but it might not be a strong driving force to achieve high economic growth. Meanwhile, the private sector in Danang showed better performance in the last few years; the growth rate of its industrial output was higher than those of state and foreign-invested sectors after 2005 (see Figure 5.5.1).

Figure 5.5.1 Index of Industrial Gross Output in Danang by Ownership



Source: Table 38, Statistical Yearbook of Danang 2007

5.34 In order for Danang to achieve high economic growth there is a need to expand the private sector. However, young local entrepreneurs are not attracted to the city and tend to leave for other industrial cities, HCMC in particular. Every year about 2,500 graduate from the Danang University of Technology, but nearly 30% of them reportedly go to HCMC to find better jobs in private or foreign-invested companies.

5.35 It is not clear what the critical constraints exist that deter the private sector from flourishing in Danang. These might include limited access to credit or land, small local market, low level of regional income, unfavorable administrative procedures, and others. However, the private sector should have a huge business potentiality in Danang. The city is strategically located in the central region, and it receives a growing number of domestic and foreign tourists. There is a variety of educational and training institutions in the city, supplying highly qualified workers to the local labor market. Moreover, a large amount of foreign capital is pouring into the city for real estate development.

5.36 There is a need to introduce measures to support private entrepreneurs to set up their businesses in Danang. One of the measures is the establishment of business incubation centers. Such centers usually provide young entrepreneurs with office spaces, telephone and Internet connection, laboratory facilities, as well as machinery and equipment.

Young entrepreneurs can start their business at little cost by utilizing these facilities. Vietnam already has incubation centers in Hanoi and HCMC, which were recently established with financial and technical assistance from the European Union's (EU) Vietnam Private Sector Support Programme (VPSSP). Both are equipped with pilot plants, laboratories, product development units, etc. Pre-incubation training is also given to the entrepreneurs.

5.37 Second, there is a need to offer entrepreneurship training to small business owners and young entrepreneurs. Business planning, marketing, accounting, human resource management, and others are major subjects in the training program. One of the examples of such training program is IYB (Improve Your Business) and SYB (Start Your Business) training, which were provided by the Danang branch of the Vietnam Chamber of Commerce and Industry (VCCI) in association with the International Labour Organization (ILO) and the Swedish International Development Cooperation Agency (SIDA) from 1997 to 2004.

5.6 Analysis of the Industrial Sector in Danang City

1) Textile and Garment[8]

5.38 Textile and garment made the highest contribution to Danang export earnings in 2005, and continue to be the major sector generating export earnings. The production of this industry is dominated by the state sector. The four largest state-owned enterprises in Danang contribute the most to provincial annual export sales, while 55 local private enterprises of different sizes combined account for a small share. In 2007, the industry employed 19,357 people[9], which was 5% of the total labor force then in the city.

Table 5.6.1 Main Indicators of Danang's Textile and Garment Industry

Item	State		Non-state		Foreign		All	
	2005	2007	2005	2007	2005	2007	2005	2007
Number of Enterprises	5	4	32	55	6	5	43	64
Share of Value-added Production (%)	78	84	3	7	19	9	100	100
Value-added Production per Enterprise (VND mil.)	204,575	459,314	1,096	2,983	42,559	37,929	30,542	34,234
Share of Total Asset Value (%)	77	64	3	12	19	24	100	100
Total Asset Value per Enterprise (VND mil.)	174,978	273,327	1,161	3,652	36,186	83,739	26,259	26,763
Share of Employment (%)	65	67	11	13	24	20	100	100
No. of Workers per Enterprise	2,016	3,263	56	46	619	756	362	302
Ave. Monthly Salary (VND 000)	1,156	1,636	600	1,270	799	1,271	1,007	1,517

Source: Danang Statistical Office, November 2008.

5.39 In 2007, the share of state sector in the total value-added production was 84%, increasing from 78% in 2005. The private sector composed of 55 enterprises contributed only a small percent in these years. The average amount of value-added production for state enterprises was significantly higher than that of non-state and foreign enterprises. In 2007, one state enterprise generated an amount of value-added production which was 150 and 12 times bigger than those by non-state and foreign enterprises, respectively. The dominance of the state sector is also prominent in terms of total asset value and employment. The average size of employment in state enterprises was 3,263 in 2007, while those in non-state and foreign enterprises were only 46 and 765, respectively. Average monthly salary in the state sector is higher than those of the other sectors. One worker at a state enterprise received VND1.6 million in 2007, while those working at non-state and foreign enterprises obtained only VND1.3 million.

5.40 The United States is the main market for Danang's garment enterprises, followed by the European Union and Japan. In some cases, locally produced materials are sourced with prior approval of buyers. Most materials are imported from neighboring countries, which serve as manufacturing bases of raw materials. If not sourced from other countries, local enterprises purchase materials from HCMC, where they can easily access higher-quality sources. Designs and technical specifications of products are also supplied by the buyers. In the case of one state enterprise located in Danang City, 80% of materials are imported from Chinese manufacturers who are specified by the buyers.[10]

5.41 Majority of garment products are exported, and large enterprises tend to export products every workday. Therefore, the industry is very sensitive to shipping costs. As is

[8] Major pieces of information in this section were obtained from the paper entitled 'Economic Potential Study Da Nang Final Report', July 2006, VPSSP Danang.
[9] Data obtained from the Danang Statistical Office in November 2008.
[10] Based on an interview with a director of a state textile and garment enterprise on 12 November 2008.

pointed out earlier, the high shipping costs from Danang Port compared to those of Saigon have discouraged local enterprises to use the local port. Moreover, with few ships calling at Danang Port, garment exporters often have no choice but to ship from Saigon Port. Saigon, with frequent vessels to many destinations in the world, is the preferred port of Danang garment exporters. The poor shipping schedule from Danang Port also makes it difficult for the enterprises to schedule their production accordingly. According to the director of one large state enterprise, half of its products is exported from Danang Port, while the remaining half is shipped from Saigon Port. The director, however, pointed out that the enterprise might increase the share of exports shipped from Danang Port in the future, due to the rise in road transportation costs to Saigon Port.

2) Software Development

5.42 Two medium-sized enterprises (i.e., FPT and Softech) have a large share in the software development industry in Danang. Both are equitized SOEs with FPT employing 300 IT engineers, while Softech 150 IT engineers. The city also has around 20 small enterprises engaged in software development, which employ 30 IT engineers on average.[11] Thus, it can be assumed that around 1,000 IT engineers are employed in the software development industry in the city.

5.43 According to the manager of Softech, the amount of turnover of this enterprise was VND22 billion in 2007. This means that every IT engineer of the company generated VND147 million. Assuming that IT engineers of other enterprises generated the same amount in a year, it is roughly estimated that the total amount of turnover of Danang's software industry could be around VND150 billion, which was 1% of the city's GDP and 2% of its industrial output in 2007.

5.44 The Danang University of Technology (DUT) is a major educational institution that supplies IT engineers to the local labor market. Around 250 IT engineers graduate from this university every year.[12] Softech also has a two-year training program in IT engineering. Annually 300 participants, some of whom are DUT students, complete this training program.

5.45 While the Danang post office and local software enterprises are connected to each other through fiber optic cables, few of these local enterprises use this facility, because the monthly service fee is very high. Most enterprises and shops, including Internet shops, use cable instead to connect to the post office. According to one manager of a foreign-invested software development enterprise, Internet access is often interrupted in the late afternoon when many people start accessing Internet services at local Internet shops.[13] Periodic cutoffs of electricity also disturb the operation of software development enterprises.

5.46 The low labor cost of IT engineers should be the biggest advantage of the software development industry in Danang. The monthly salary of IT engineers in the city is around USD200–300, while that in HCMC could reach USD800. Due to this low salary, local enterprises face difficulties in retaining highly skilled IT engineers in Danang, because these engineers can easily find good jobs outside Danang, HCMC in particular. Moreover, IT engineers working for local software development enterprises tend to leave after a few

[11] Based on an interview with a director of Softech on 6 November 2008.
[12] Based on an interview with the Rector of the university on 11 November 2008.
[13] Based on interviews with directors of foreign-invested software development enterprises in September 2008.

years to look for better-paying jobs outside the city.

5.47 The industry has various customers in the domestic and foreign markets. For state-owned enterprises, the local government seems to be the biggest client. E-government is actively introduced by many departments of the local government. Foreign-invested enterprises usually have their own clients outside Vietnam, and they receive orders from these overseas clients.

5.48 In 2008, an incubation facility called 'Danang Software Park' was established by the People's Committee of Danang City. It is expected that local young IT engineers would start their own software development businesses in this facility. It seems, however, that this facility is not yet sufficiently utilized by them.

3) Seafood Processing[14]

5.49 The highest proportion of seafood processing production belongs to two state-controlled enterprises and one foreign enterprise. These enterprises have their strengths in securing machinery, human resources, and customers. Thirty-three (33) local private (non-state) enterprises are also engaged in seafood processing, although their sizes are much smaller than the others. The Tho Quang IZ is especially designed to accommodate foreign-invested and private seafood processing enterprises.

5.50 In 2007, the share of state sector in the total value-added production was 48%, slightly decreasing from 51% in 2005. In 2008, the private sector generated 38% of valued-added production. The average amount of value-added production by state enterprises is much higher than that of non-state and foreign enterprises. In 2007, the value-added production of one state enterprise was 20 and 2 times larger than that of non-state and foreign enterprises, respectively. The dominance of the state sector is also prominent in terms of total asset value and employment. The average labor size of state enterprises was 1,077 in 2007, while those of non-state and foreign enterprises were only 82 and 592, respectively. Regarding average monthly salary, workers in foreign enterprises received the highest pay in 2007, reaching VND2.1 million. Those of state and non-state enterprises were VND1.4 million and VND0.9 million, respectively.

5.51 International buyers are increasingly concerned with quality more than safety. Among local processing enterprises, however, only a few follow the Hazard Analysis and Critical Control Points (HACCAP) system and have retained the E.U. code.

5.52 The limited capacity of drainage facilities is one of the major constraints for the local processing enterprises, even at the Tho Quang IZ. Its drainage facility is poorly maintained; so the wastewater often comes out of factories without proper treatment, causing environmental problems in the neighboring areas. Periodic cutoffs of electricity also diminish the capacity of water treatment facilities of the enterprises.[15] Facing the environmentally negative effects of the industry, the local authority intends to relocate these seafood processing enterprises to industrial zones in neighboring provinces, such as Dien Nam Dien Ngoc IZ in Quang Nam province.

[14] Major pieces of information in this section were obtained from the paper entitled « Economic Potential Study Da Nang Final Report, » July 2006, VPSSP Danang.
[15] Based on an interview with a director of a foreign-invested seafood processing enterprise in September 2008.

Table 5.6.2 Main Indicators of Danang's Seafood Processing Industry

Item	State		Non-state		Foreign		All	
	2005	2007	2005	2007	2005	2007	2005	2007
Number of Enterprises	2	2	13	33	1	1	16	36
Share of Value-added Production (%)	51	48	35	38	14	14	100	100
Value-added Production/Enterprise (VND mil.)	223,397	246,927	24,059	11,995	124,928	142,825	55,281	28,681
Share of Total Asset (%)	48	44	34	44	17	12	100	100
Total Asset per Enterprise (VND mil.)	107,809	134,332	11,731	8,199	76,696	74,183	27,801	17,039
Share of Employment (%)	29	39	51	50	19	11	100	100
No. of Workers per Enterprise	594	1,077	161	82	789	592	254	152
Ave. Monthly Salary (VND 000)	990	1,410	762	917	828	2,108	841	1,241

Source: Danang Statistical Office, November 2008

5.7 Assessment of Business Environment in Danang by Selected Enterprises

5.53 Respondents to the survey totaled 343 enterprises from various sectors, each proportional to the ratio of enterprises in Danang City (see Table 5.7.1).

5.54 Interviewers made appointments for interviews with the general managers of the target business establishments. They went in pairs, with one asking questions and the other recording the answers. The questionnaire had two forms: Form 1 was used to interview the general manager and Form 2 was for the interviewee to answer and for the surveyors to collect after several days.

Table 5.7.1 Sampling Profile for the Enterprise Survey

Enterprise Sector	No. of Enterprises[1]	No. of Samples	% of Samples
Agriculture	2	2	100.0
Fishery	2	2	100.0
Mineral	25	3	12.0
Primary	29	7	24.1
Manufacturing	523	61	11.7
Electricity, Power and Gas	12	6	50.0
Construction	420	35	8.3
Secondary	955	102	10.7
Hotels and Restaurants	152	62	40.8
Transportation and Storage	274	29	10.6
Science and Technology	146	17	11.6
Education and Training	17	10	58.8
Personal, Community	-	21	-
Medical and Welfare Work	7	5	71.4
Entertainment and Sport	-	10	-
Real Estate	33	20	60.6
Business	-	54	-
Finance and Credit Service[1]	4	6	150.0
Tertiary	633	234	37.0
Total	1,617	343	21.2

Source: GSO (number of enterprises).

[1] The number of enterprises stated in GSO statistical yearbooks was smaller than the actual number.

5.55 Survey results indicate the following as the main obstacles to the smooth operation of business in Danang (see Table 5.7.2):

(i) For the entire sector, inadequate electricity supply, rising transportation costs, low skills/education and security, and limited financing;

(ii) For the secondary and tertiary sectors, limited access to land;

(iii) For the primary sector in order of severity, limited financing, rising transportation costs, and low skills/education; and

(iv) For the secondary sector, inadequate electricity, poor transportation, limited access to land, high taxes, limited financing, and low security.

Table 5.7.2 Percentage of the Two Major Business Obstacles

Enterprise Sector	Biggest and Second-biggest Obstacle (%)																		
	Telecommunications	Electricity	Transportation	Access to Land	Regulatory Policy Uncertainly	Tax Rates	Tax Administration	Customs and Trade Regulations	Labor Regulations	Skills/education	Business Licensing and Operating Permits	Access to Financing	Cost of Financing	Macroeconomic Policy	Corruption	Crime, Theft and Disorder	Uncompetitive or Informal Practices	Conflict Resolution	Environmental Regu-lations
Agriculture	0	0	25	0	25	0	25	0	0	0	0	0	25	0	0	0	0	0	0
Fishery	0	25	0	0	0	0	0	25	0	25	0	25	0	0	0	0	0	0	0
Mineral	0	0	17	0	0	0	0	0	0	17	0	33	17	0	0	17	0	0	0
Primary	0	7	14	0	7	0	7	7	0	14	0	21	14	0	0	7	0	0	0
Manufacturing	1	15	10	13	4	3	2	4	0	13	1	6	6	3	0	12	5	2	1
Electricity, Power and Gas	0	8	8	8	0	0	0	8	0	8	8	8	0	0	0	17	8	17	0
Construction	3	16	11	5	6	6	2	0	0	16	0	6	11	5	2	6	5	0	0
Secondary	2	15	10	10	5	4	2	3	0	14	1	6	7	3	1	10	5	2	1
Hotels and Restaurants	4	41	12	4	2	8	4	0	1	2	0	4	9	2	0	2	2	3	0
Transportation and Storage	0	7	13	7	7	4	2	5	0	11	2	9	11	5	4	9	2	2	2
Science and Technology	6	22	3	9	6	6	3	0	0	3	0	3	9	3	3	13	6	3	0
Education and Training	6	31	6	19	6	6	0	6	6	6	0	0	6	0	0	0	0	0	0
Personal, Community	3	17	6	9	3	6	3	0	0	9	0	11	3	0	0	9	17	3	0
Medical and Welfare Work	11	22	22	0	0	0	0	0	0	22	0	0	11	0	0	11	0	0	0
Entertainment and Sport	0	20	5	15	0	10	0	0	0	5	5	10	15	5	0	5	5	0	0
Real Estate	5	11	8	8	3	11	0	0	0	5	0	14	11	5	0	3	14	3	0
Business	5	18	15	9	3	11	4	2	0	3	2	7	6	2	1	10	3	0	0
Finance and Credit Service	20	0	0	0	0	0	0	0	0	20	0	0	0	20	0	40	0	0	0
Tertiary	4	22	11	8	3	8	3	1	0	5	1	7	8	3	1	7	5	2	0
Total	3	20	11	8	4	6	2	2	0	8	1	7	8	3	1	8	5	2	0

Source: DaCRISS Enterprise Survey, 2008.

5.56 With regard to transportation, problems observed vary by sector (see Table 5.7.3). The biggest concern in all the sectors is the increase in transportation costs, with the primary sector being the most affected. Secondary sector concerns mainly evolve on road conditions, while the tertiary sector is the least affected by transportation problems.

Table 5.7.3 Assessment of Transportation Obstacles[1]

Obstacle	Primary	Secondary	Tertiary	Total
Road Conditions	16.7	12.8	7.3	6.9
Shortage of Trucks	33.3	6.5	2.3	4.2
Shortage of Drivers	16.7	2.8	1.2	2.6
Increasing Transportation Costs	61.1	35.5	17.4	22.4

Source: DaCRISS Enterprise Survey, 2008.

[1] Percentage of respondents who answered that transportation is the number 1 major business obstacle.

6 SPATIAL DEVELOPMENT AND LAND USE

6.1 Overview

6.1 Current spatial development pattern of Danang City is characterized as follows:

(i) The city is basically composed of a compact urban areas with high population density, relatively small rural areas with scattered settlements and vast hilly and mountain areas. Approximately 60% of the total city area is covered by forest while 28% by green and open space. The area for urban use (residential, commercial/business, industries, institutions, etc.) share only 10% of the total land (see Table 6.3.1).

(ii) However, the urban areas have been quickly expanding to outer areas, especially in south and south west directions. Though much of those areas are still vacant or thinly populated, development of high – end resorts has also started along the coast toward the south.

(iii) It is apprehended that the current progress in spatial development may result in the form of sprawl as is experienced in many cities in Vietnam including HCMC, Hanoi and other medium – sized cities. Most of the developments do not show explicit figures on the settlement functions but most of them are targeted for medium to high – income groups with low density of population without needed socio – economic functions. When this type of development continues, it is hard to create a compact and public transport oriented urban areas.

(iv) Current land use classification adopted in urban planning needs to be amended in considerations of that of MONRE and more effective land use planning purposes. For this an analysis conducted in HAIDEP can provide a basis for discussion.

6.2 Institutional Framework

1) Vietnam National Standards

6.2 The 1980 Constitution stipulated the state ownership of all land in Vietnam. Later, the land reform started gradually since the start of Doi Moi Policy. The most important legislature is the Land Law which was enacted in 1986 and revised in 1993 and 2003. The 1993 Land Law widely adopted the land tenure for stable and long term use by issuing "Land Use Right Certificates (LURC)." As a right of land tenure, LURC has been similar with ownership in terms of exchange, transfer, lease, inheritance, and mortgage. However, the law limits the duration of usage for specific land for 20 years (agricultural land for annual crops) or 50 years (agricultural land for perennial crop, industrial and commercial use). Residential land has no limit of ownership.

6.3 There are 2 main national standards that stipulate land use in Vietnam. MOC follows the Building Code (1997), which divides areas into 2 categories, Civil Area and Non – Civil Area, with 11 categories below this. This regulation mainly defines land use in urban area. MONRE follows the Land Law (2003) mentioned above, which divides areas into 2 categories, Agricultural Land Group and Non-Agricultural Group, and 18 categories below this. This regulation mainly defines land use in non-urban area.

Table 6.2.1 MOC Land Use Regulation by Building Code (1997)

Civil Area	1. Residential
	2. Private business / school
	3. Urban center / public service
	4. Entertainment, green park
Non – Civil Area	5. Industry and storage
	6. Transportation area
	7. Administrative area for infra
	8. Nuisance facilities (cemetery, etc.)
	9. Special areas (military, etc.)
	10. Special green areas (including water)
	11. Reserved area for future expansion

Source: Building Code, 1997.

Table 6.2.2 MONRE Land Use Regulation by Land Law (2003)[1)]

Agricultural Land Group	1. Land for cultivation of annual crops
	2. Land for growing perennial trees
	3. Production forest land
	4. Protective forest land
	5. Special – use forest land
	6. Aquaculture land
	7. Salt – making land
	8. Other agricultural land
Non – Agricultural Group	9. Residential land
	10. Land for construction office
	11. Land for defense and / or security
	12. Land for non – agricultural product
	13. Land used for public utility purpose
	14. Land used by religious establishment
	15. Land with works of communal, etc.
	16. Land for cemetery, grave - yard
	17. Water surface areas
	18. Other non – agricultural land
Unused Land Group (wetland, hill, etc.)	

Source: Land Law, 2003.

[1] The chart shows the general categorization, actual categorization is more complex and is in numerous categories.

6.4 The land use categories in the DOC plan proposed by Danang City basically follow the MOC Land Use Regulations, but some categories are embodied to fit the situation in Danang City. Table 6.2.3 shows the correspondence of these land use categories.

Table 6.2.3 Correspondence of Land Use Categorization for MOC and DOC Plans

Future Land-use Plan to 2020 by MOC	Future Land-use Plan to 2020 by DOC
Public Center Area	Existing Public Center
	New Public Center
Residential Area	Existing Residential Area
	New Residential Area
Tourism Area	Tourism Area
Industrial Zone	Industrial Area
Urbanized Area	Gymnastic Area
	Development Area
	Warehouse
Rural Area	-
Danang Student Village	Danang Student Village
Cemetery Area	-
Military Area	Military Area
Airport Area	Airport Area
Port Area	Port Area
-	Railway Station
Water	Water
Plant Area	Plant Area

Source: Worked out by Study Team based on MOC and DOC Plans.

2) Institutional Framework for Land-use Planning and Management

6.5 The institutional framework for land use in Danang City is similar to that in other cities in Vietnam: land-use rights (LUR) are traded instead of land ownership, and building permits are issued by the Department of Construction (DOC).

6.6 The future framework is prepared by planning documents such as the Construction Plan and Land-use Plan. However, there is a gap between plan and actual construction, especially in the central area. In addition, the zoning of urban areas is not clear. Thus, the framework is not effective in helping to realize the plans (These plans are reviewed in Chapter 4.)

6.7 Based on the plans, city departments are required to follow the prepared land uses. However, these departments have difficulty in following the plan due to a lack of guidelines. With regard to land-use administration, the two key departments, i.e., DOC and DONRE, mainly perform the following tasks:

(1) Department of Construction

(i) Prepare long-term construction plans;

(ii) Prepare district plans (detailed plans);

(iii) Assess and approve technical designs of civil and construction works;

(iv) Issue construction permits;

(v) Compile information on construction prices; and

(vi) Regulate consultancy practices, building contractors, and construction materials trading licenses.

(2) Department of Natural Resources and Environment

(i) Together with districts and communes, prepare long-term, five-year, and annual plans to manage natural resources (mineral resources, water resources, etc.), environment, and residential land;

(ii) Administer land including allocation and leasing;

(iii) Implement laws and regulations relating to land, land use, environment, and natural resources;

(iv) Issue LUR certificates;

(v) Conduct cadastral works; and

(vi) Prepare statistics on land deals including land transfers and auction of land-use rights.

6.8 Large investment projects, such as construction of factories by FDI or resort complexes, require additional approval from the DPI and DONRE.

6.9 Even the Construction Plan is unclear on the types or shapes of buildings that can be constructed on a piece of land. There are no shared guidelines on building specifications, such as height, setback, floor ratio, and building-to-land ratio. City departments issue permits based on a broad classification of land use and from case to case. Such ad hoc decision making promotes a mix of land uses.

6.10 Although the land use planning in urban area occupies a critical element of future development, the existing institutional framework above has not been working properly to fulfill the purpose. It is difficult to control urban sprawl and maintain orderly landscape with the current spatial planning concept. This has also been pointed out in the HAIDEP study (The Comprehensive Urban Development Programme in Hanoi Capital City of the Socialist Republic of Vietnam, March 2007).

6.11 The proposed land use classification in targets the following points: (i) the urban land use classification is defined to indicate a functional image of defined area, (ii) it regulates certain types of urban activity by building types.

3) Land-use Classification

6.12 There are several land-use classification systems in Vietnam. But because they are based on the specific needs of line ministries or departments and since land uses are not delineated in the urban area, they are not effective for urban planning purposes.

6.13 The most relevant land-use classification for urban planning is that by MOC because the land use for urban areas is more detailed. But, the MONRE system has only one classification for general urban use, i.e. “residential land.”

6.14 Because current land-use classification does not work properly in the urban areas, DaCRISS adopted the land-use classification proposed by the JICA-funded urban planning study entitled “The Comprehensive Urban Development Programme in Hanoi Capital City” (HAIDEP) which finished in 2007 (see Table 6.2.5). The HAIDEP classification went even farther by proposing permitted and prohibited building types.

6.15 For natural land areas, this was identified from MONRE topographic maps and then regrouped to larger categories.

6.16 The DaCRISS Study Team adopted the HAIDEP classification using existing city maps and based on ocular inspections. This classification may later be revised as the study progresses. Table 6.3.1 summarizes the areas by type and district.

Table 6.2.4 Existing Land-use Classification

Land Use		Data Source
Urban Use	Medium Rise Residential	Identified by DaCRISS Study Team
	Mixed Use Residential	Identified by DaCRISS Study Team
	Commercial and Business Center	Identified by DaCRISS Study Team
	Corridor Commercial	Identified by DaCRISS Study Team
	Institution and Special Public Use	Identified by DaCRISS Study Team
	Industrial Park	Identified by DaCRISS Study Team
	Light and Quasi Industrial Area	Identified by DaCRISS Study Team
Green Space	Rural Residential Area	Identified by DaCRISS Study Team
	Shrubs	1:10,000 Topographic Map
	Grass-lands	1:10,000 Topographic Map
	Wet Land	1:10,000 Topographic Map
Cemetery Area		Future Landuse Map by MOC
Military Area		Future Landuse Map by DOC
Transportation	Airport	1:10,000 Topographic Map
	Port	1:10,000 Topographic Map
	Other Transportation	1:10,000 Topographic Map
River/Lake		1:10,000 Topographic Map
Forest		1:10,000 Topographic Map Protective Forest Area Map by DARD
Agriculture	Rice Field	1:10,000 Topographic Map
	Agriculture	1:10,000 Topographic Map
	Cultivated Tree	1:10,000 Topographic Map

Source: Summarized by the DaCRISS Study Team.

Table 6.2.5 Land-use Classification Proposed in HAIDEP

Classification	Subzone
Class I: Rural	1-1 Agricultural Land
	1-2 Rural Residential
	1-3 Rural Service Center
Class II: Residential	2-1 Low Rise Residential
	2-2 Medium Rise Residential
	2-3 High Rise Residential
	2-4 Urban Village
	2-5 Mixed Use Residential
Class III: Commercial & Business	3-1 Commercial and Business Center
	3-2 Corridor Commercial
	3-3 District Commercial
Class IV: Public Use	4-1 Institution and Special Public Use
Class V: Industrial	5-1 Industrial Park
	5-2 Light Industrial Area
	5-3 Quasi-Industrial Area
Class VI: Green and Open Space	6-1 Green Space in Urban Control Area

Source: P.3-8. Technical Report No.6. "The Comprehensive Urban Development Programme in Hanoi Capital City (HAIDEP)" in 2007.

6.3 Existing Land-use Pattern

6.17 The city's land use is characterized as follows:

(i) About 60% of the total city area of about 950km^2 comprises forests (60%) followed by green and open space (28%). The area for urban uses (i.e., residential, commercial/business, institutions, industrial areas, etc.) consists of only 10% of the total land area (see Table 6.3.1 and Figure 6.3.1). Land-use pattern significantly varies by district.

(ii) The land-use pattern is further analyzed by commune (see Table 6.3.2). This table gives basic information on possible land area which can be used for various types of development by clarifying the total administrative area (=gross area) and net area which are estimated as follows: urban area is added to the remaining area suitable for further development, i.e., calculated based on a development suitability analysis wherein areas with development constraints were identified. This includes areas that are flood-prone, vulnerable to erosion and saltwater intrusion, as well as forests, habitats, coral reefs, etc.

6.18 Figure 6.3.2 shows the population growth and density in Danang City by commune. The trend shown within the figure is common in other Asian cities as well including Hanoi and HCMC. It is also observed that high-density communities do not necessarily relate to poor living conditions. The assessment of living conditions based on the DaCRISS HIS results and the comparison with Hanoi's conditions indicate that living conditions in communes with high population densities are relatively good and rather satisfactory based on the people's opinion. It is also true that communes with lower population densities do not necessarily offer better living conditions.

Table 6.3.1 Existing Land Use in Danang City by District, 2006

(ha)

Landuse		Hai Chau	Thanh Khe	Son Tra	Ngu Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Danang City
River / Lake		243	26	142	385	332	353	1,411	2,892
Agriculture		0	0	0	1,078	607	423	6,882	8,990
Forest		0	0	3,885	183	296	3,287	48,985	56,636
Green Space		1	21	664	1,089	976	1,665	13,126	17,543
Urban Use	Medium Rise Residential	292	290	88	32	0	0	0	702
	Mixed Use Residential	318	278	662	0	958	581	0	2,796
	Commercial and Business Center	123	1	6	4	2	0	0	137
	Corridor Commercial	0	22	68	561	0	62	0	713
	Institution and Special Public Use	213	32	119	10	1	90	0	465
	Industrial Park	0	0	70	5	0	907	1	983
	Light Industrial Area	0	27	60	20	0	605	1	713
	Quasi Industrial Area	0	0	16	0	0	0	0	16
Cemetary Area		0	0	0	0	0	0	86	86
Military Area		38	0	0	53	36	51	0	178
Transport	Airport / Ports	721	111	11	94	0	4	0	941
	Railway Station / Bus Terminal / Roads	161	119	226	140	114	282	141	1,182
Total[1]		2,110	927	6,017	3,655	3,322	8,308	70,633	94,972
Net[2]		947	669	1,583	2,341	2,146	3,673	7,916	20,572

(%)

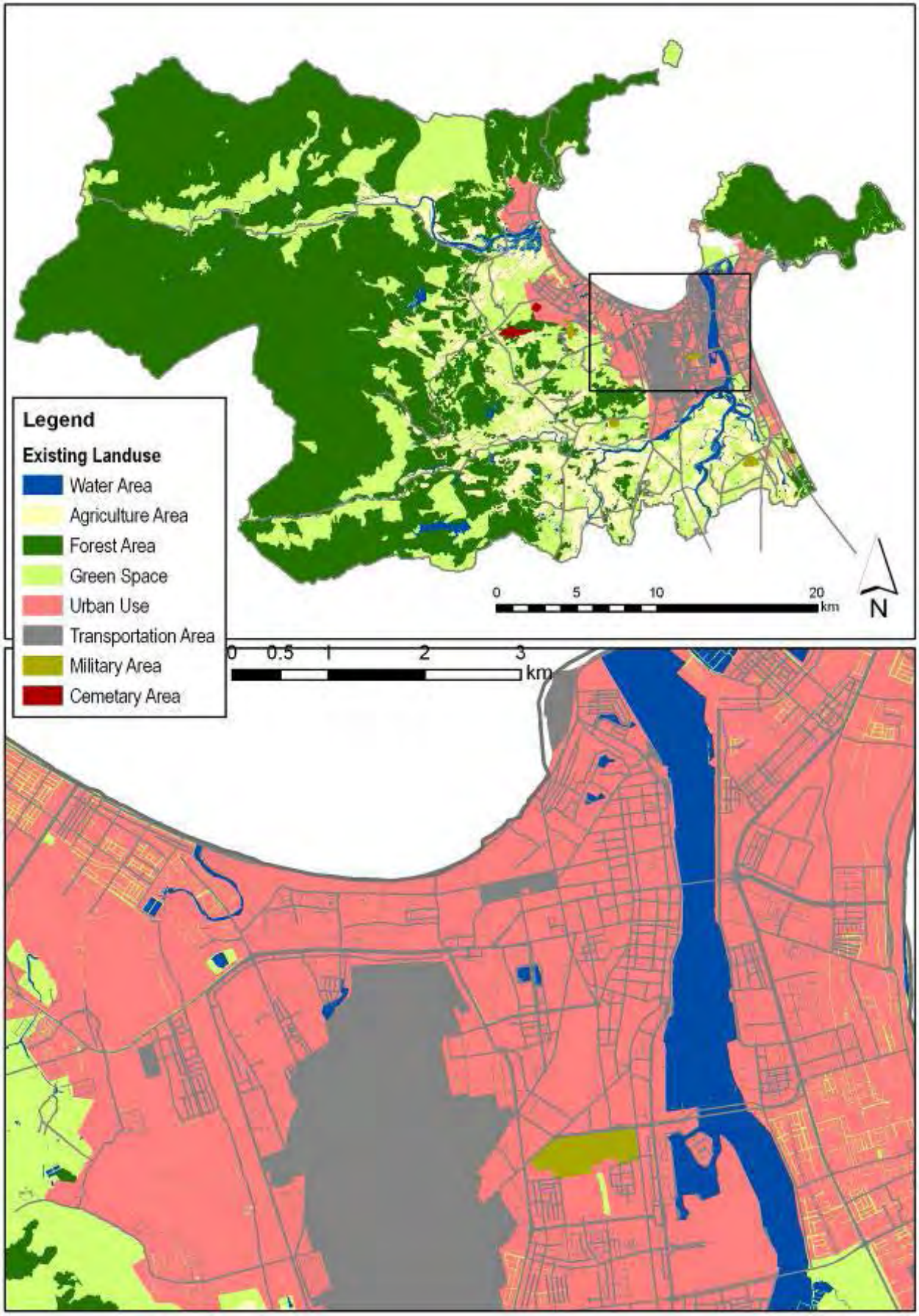
Landuse		Hai Chau	Thanh Khe	Son Tra	Ngu Hanh Son	Cam Le	Lien Chieu	Hoa Vang	Danang City
River / Lake		12	3	2	11	10	4	2	3
Agriculture		0	0	0	29	18	5	10	9
Forest		0	0	65	5	9	40	69	60
Green Space		0	2	11	30	29	20	19	18
Urban Use	Medium Rise Residential	14	31	1	1	0	0	0	1
	Mixed Use Residential	15	30	11	0	29	7	0	3
	Commercial and Business Center	6	0	0	0	0	0	0	0
	Corridor Commercial	0	2	1	15	0	1	0	1
	Institution and Special Public Use	10	3	2	0	0	1	0	0
	Industrial Park	0	0	1	0	0	11	0	1
	Light Industrial Area	0	3	1	1	0	7	0	1
	Quasi Industrial Area	0	0	0	0	0	0	0	0
Cemetary Area		0	0	0	0	0	0	0	0
Military Area		2	0	0	1	1	1	0	0
Transport	Airport / Ports	34	12	0	3	0	0	0	1
	Railway Station / Bus Terminal / Roads	8	13	4	4	3	3	0	1
Total[1]		100	100	100	100	100	100	100	100
Net[2]		45	72	26	64	65	44	11	22

Source:

[1] Excluding the Hoang Sa Islands.

[2] Net area refers to urban areas and other areas suitable for various types of development. It is calculated based on a suitability analysis which excludes areas vulnerable to erosion, rivers and lakes, forest land, transportation land, cemeteries, military land, and areas that need special protection such as natural habitats, coral reefs, etc.

Figure 6.3.1 Land-use Pattern in Danang City, 2006



Note: Compiled by the DaCRISS Study Team from various sources.

Table 6.3.2 Existing Land Use in Danang City by Commune, 2006

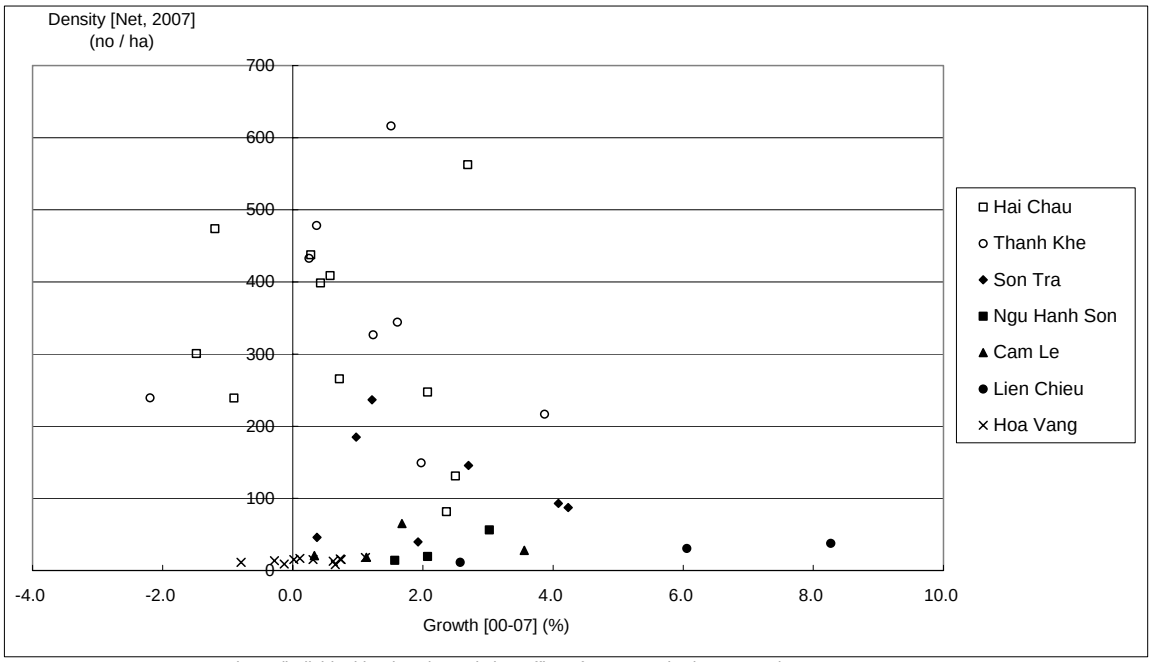
HIS ID	Commune / District	River / Lake	Agriculture	Forest	Green Space	Urban Use							Cemetary Area	Military Area	Transport		Gross	Net [2]
						Residential	Mixed Use Residential	Commercial and Business Center	Corridor Commercial	Institution and Special Public Use	Industrial Park	Light Industrial Area			Airport / Ports	Railway Station / Bus Terminal / Roads		
1	P. Binh Hien	14	0	0	0	29	0	0	0	2	0	0	0	0	0	6	50	31
2	P. Binh Thuan	10	0	0	0	37	0	0	0	0	0	0	0	0	0	5	52	37
4	Hoa Thuan Tay	6	0	0	0	0	63	0	0	38	0	0	0	7	718	12	844	102
13	Hoa Thuan Dong	27	0	0	0	42	14	0	0	1	0	0	0	17	0	8	108	57
5	P. Hai Chau I	15	0	0	0	0	0	44	0	17	0	0	0	0	0	16	92	61
6	P. Hai Chau II	0	0	0	0	15	0	9	0	6	0	0	0	0	0	6	35	30
7	Hoa Cuong Bac	54	0	0	1	0	118	0	0	129	0	0	0	14	0	34	350	247
3	Hoa Cuong Nam	51	0	0	0	133	1	0	0	0	0	0	0	0	0	28	213	134
8	P. Nam Duong	0	0	0	0	20	0	0	0	0	0	0	0	0	0	4	24	20
9	P. Phuoc Ninh	15	0	0	0	10	0	16	0	4	0	0	0	0	0	9	54	31
10	P. Thanh Binh	1	0	0	0	0	61	0	0	4	0	0	0	0	0	10	75	65
11	P. Thuan Phuoc	35	0	0	0	0	61	0	0	3	0	0	0	0	2	10	111	64
12	P. Thach Thang	16	0	0	0	5	0	54	0	9	0	0	0	0	1	16	102	68
	Hai Chau	243	0	0	1	292	318	123	0	213	0	0	0	38	721	161	2,110	947
15	P. Chinh Gian	0	0	0	2	50	9	1	0	0	0	0	0	0	0	12	74	62
16	P. Tam Thuan	0	0	0	2	10	28	0	0	0	0	0	0	0	0	10	50	40
18	P. Thac Gian	12	0	0	0	26	10	0	0	19	0	0	0	0	0	11	78	54
19	P. Tan Chinh	0	0	0	0	26	0	0	0	1	0	0	0	0	0	11	37	26
20	P. Vinh Trung	1	0	0	0	37	6	0	0	0	0	0	0	0	0	8	52	43
21	P. Xuan Ha	0	0	0	14	60	0	0	0	0	0	0	0	0	0	10	83	74
14	P. An Khe	0	0	0	0	0	62	0	22	1	0	0	0	0	111	15	211	85
22	Hoa Khe	3	0	0	0	0	125	0	0	1	0	0	0	0	0	11	141	126
23	Thanh Khe Tay	8	0	0	1	21	37	0	0	6	0	27	0	0	0	18	119	93
17	Thanh Khe Dong	2	0	0	1	61	1	0	0	5	0	0	0	0	0	13	82	68
	Thanh Khe	26	0	0	21	290	278	1	22	32	0	27	0	0	111	119	927	669
24	P. An Hai Bac	48	0	0	0	8	154	0	0	1	70	16	0	0	0	52	349	249
25	P. An Hai Tay	9	0	0	0	57	0	0	6	16	0	0	0	0	0	18	106	79
26	P. An Hai Dong	0	0	0	0	23	36	0	5	6	0	0	0	0	0	12	81	69
27	P. Man Thai	0	0	0	2	0	82	0	8	0	0	0	0	0	0	15	107	91
28	P. Nai Hien dong	64	0	0	229	0	101	0	0	0	0	0	0	0	0	26	420	325
29	P. Phuoc My	0	0	0	17	0	114	6	36	8	0	0	0	0	0	23	204	175
30	P. Tho Quang	21	0	3,885	415	0	176	0	13	88	0	60	0	0	11	80	4,750	566
	Son Tra	142	0	3,885	664	88	662	6	68	119	70	76	0	0	11	226	6,017	1,583
31	My An	42	0	0	35	0	0	0	287	0	0	0	0	0	0	47	411	313
34	Khue My	61	53	8	72	0	0	4	117	7	0	20	0	0	94	33	471	251
32	P. Hoa Hai	99	395	171	407	32	0	0	156	2	5	0	0	45	0	44	1,356	849
33	P. Hoa Quy	184	629	4	576	0	0	0	0	0	0	0	0	8	0	17	1,417	812
	Ngu Hanh Son	385	1,078	183	1,089	32	0	4	561	10	5	20	0	53	94	140	3,655	2,341
36	Hoa Phat	2	39	210	135	0	211	0	0	0	0	0	0	0	0	13	611	368
35	Hoa An	3	0	0	34	0	260	0	0	0	0	0	0	0	0	13	309	283
37	Hoa Tho Tay	37	182	84	445	0	47	0	0	0	0	0	0	36	0	16	847	442
38	Hoa Tho Dong	6	4	1	2	0	224	0	0	0	0	0	0	0	0	17	254	229
39	Hoa Xuan	260	378	1	344	0	0	0	0	0	0	0	0	0	0	9	990	542
40	P. Khue Trung	25	5	0	17	0	215	2	0	1	0	0	0	0	0	47	311	236
	Cam Le	332	607	296	976	0	958	2	0	1	0	0	0	36	0	114	3,322	2,146
44	Hoa Hiep Bac	154	91	3,150	605	0	0	0	0	0	513	0	0	0	4	58	4,576	1,091
41	Hoa Hiep Nam	146	164	0	143	0	80	0	0	79	125	8	0	0	0	50	796	473
45	Hoa Khanh Bac	17	32	17	169	0	5	0	0	0	269	502	0	10	0	71	1,090	947
42	Hoa Khanh Nam	14	136	105	613	0	96	0	0	4	0	12	0	41	0	27	1,049	486
43	P. Hoa Minh	21	0	15	135	0	400	0	62	7	0	82	0	0	0	75	797	657
	Lien Chieu	353	423	3,287	1,665	0	581	0	62	90	907	605	0	51	4	282	8,308	3,673
46	Hoa Bac	256	445	27,559	5,604	0	0	0	0	0	0	0	0	0	0	0	33,864	298
47	Hoa Chau	75	492	35	358	0	0	0	0	0	0	0	0	0	0	23	985	755
48	Hoa Khuong	261	795	2,632	510	0	0	0	0	0	0	0	0	0	0	12	4,211	702
49	Hoa Lien	301	766	1,759	975	0	0	0	0	0	1	0	0	0	0	18	3,820	1,260
50	Hoa Nhon	102	1,061	1,175	570	0	0	0	0	0	0	0	0	0	0	12	2,920	807
51	Hoa Ninh	28	486	8,354	1,229	0	0	0	0	0	0	0	0	0	0	8	10,105	341
52	Hoa Phong	93	852	562	295	0	0	0	0	0	0	0	0	0	0	8	1,810	1,017
53	Hoa Phu	108	459	6,022	1,996	0	0	0	0	0	0	0	0	0	0	0	8,586	539
54	Hoa Phuoc	51	319	8	314	0	0	0	0	0	0	0	0	0	0	21	712	578
55	Hoa Son	63	367	656	1,027	0	0	0	0	0	0	1	86	0	0	27	2,227	612
56	Hoa Tien	73	841	221	247	0	0	0	0	0	0	0	0	0	0	12	1,393	969
	Hoa Vang	1,411	6,882	48,985	13,126	0	0	0	0	0	1	1	86	0	0	141	70,633	7,916
	Danang City [1]	2,892	8,990	56,636	17,543	702	2,796	137	713	465	983	729	86	178	941	1,182	94,972	20,572

Sources: DaCRISS GIS Database (individual land use); Statistics Office of Danang City (gross area).

[1] The total for Danang City excludes Hoang Sa Islands (305ha).

[2] Net area refers to urban areas and other areas suitable for various types of development. It is calculated based on a suitability analysis which excludes areas vulnerable to erosion, rivers and lakes, forest land, transportation land, cemeteries, military land, and areas that need special protection such as natural habitats, coral reefs, etc. This applies to the net area for all charts hereafter.

Figure 6.3.2 Population Density and Growth in Danang City's Communes



Sources: DaCRISS GIS Database (individual land use); Statistics Office of Danang City (gross area).

[1] The total for Danang City excludes Hoang Sa Islands (305ha).

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7 URBAN TRANSPORTATION CONDITIONS

7.1 Overview

7.1 The overall characteristics of Danang City's urban transportation are as follows:

(i) In 2008, total urban transportation demand in the City was about 2.3 million person-trips including walking or 1.9 million excluding walking a day. This means that residents make 2.9 trips/person/day (including walking) or 2.3 trips/person/day (excluding walking);

(ii) Motorcycles and bicycles are the dominant modes of transportation. More than 90% of Danang households owned motorcycles, with 58% owning more than two motorcycles;

(iii) The city's peak hour for travel is from 6 a.m. to 7 p.m. with travel time pegged at 14.9 minutes;

(iv) The total road length in Danang is 480 km, about 65% of which are paved with asphalt or cement concrete, and the remaining roads, mostly in the rural areas, have simple DBST, gravel or earth surface;

(v) There are nearly 2,700 road intersections in Danang, 18 of which have traffic lights, 27 are operated as roundabouts, eight are controlled by traffic policemen, and about 2% have some sort of traffic control; and

(vi) Urban bus services are very limited, with an average bus ridership ranging only from 540 to 1750 passengers a day.

7.2 The main problems of the road transportation in Danang include: insufficient road coverage, irregular primary roads, lack of facilities, and an undeveloped public transportation system. Especially for bus, the major concern is the poor level of services in terms of availability, comfort, punctuality, and frequency.

7.2 Transportation System

1) Overall Network

7.3 Urban transportation in Danang City is primarily composed of roads and road transportation. On the other hand, its inter-city system is composed of all modes of transportation including roads, rail, air, and shipping which serve both passenger and cargo transportation, since the city was given the significant function of administrative and economic center in central Vietnam. The configuration of the city's urban transportation network and major transportation terminals is illustrated in Figure 7.2.1 and its major characteristics are summarized below and Table 7.2.1.

(a) **Roads:** The road network in Danang City is composed of national highways, provincial roads, and urban roads with a total length of 480 km. National Highway (NH) No, 1A and 14B were developed for interprovincial/city linkage. Provincial roads connect mainly urban districts and mountainous areas in Hoa Van District and Quang Nam Province. A dense network of urban roads is developed in the center of the city such as in Hai Chau and Thanh Khe districts.

Urban road transportation services are mostly carried out using private transportation. Current conditions are characterized by the dominant presence of motorcycles, a fast-growing number of cars, and decreasing number of bicycles. Public transportation services are provided by bus, taxi, and xe om (motorcycle taxi). However, their share in urban transportation is low.

(b) **Rail:** The North-South Line of Vietnam railways passes through Danang City with a 42-kilometer length. Within the city, there are five railway stations including Danang Station which is located in the center of the city. This rail line provides inter-city passengers and cargoes transportation services between Hanoi and HCMC. At the Danang Station, there are 18 departures of passenger trains and 12 departures of cargo trains daily.

(c) **Air Transportation:** The Danang International Airport with two runways, which can accommodate A320 aircraft, is located west of the city center. As of January 2008, the airport operated seven regular international flights weekly to Singapore and Bangkok, as well as 120 regular domestic flights to Hanoi, HCMC, Nha Trang, Qui Nhon, Buon Ma Thuot, and Pleiku.

(d) **Ports & Shipping:** Danang Port is the only gateway sea port in the city and is composed of two terminals: Tien Sa and Song Han. Tien Sa Terminal can accommodate a maximum of 45,000 DWT general cargo ships; 2,000 TEU container ships; and 75,000 GRT passenger ships. In 2008, the port handled 2.7 million metric tons of cargoes; 61,881T EU of containers; and 29,642 passengers.

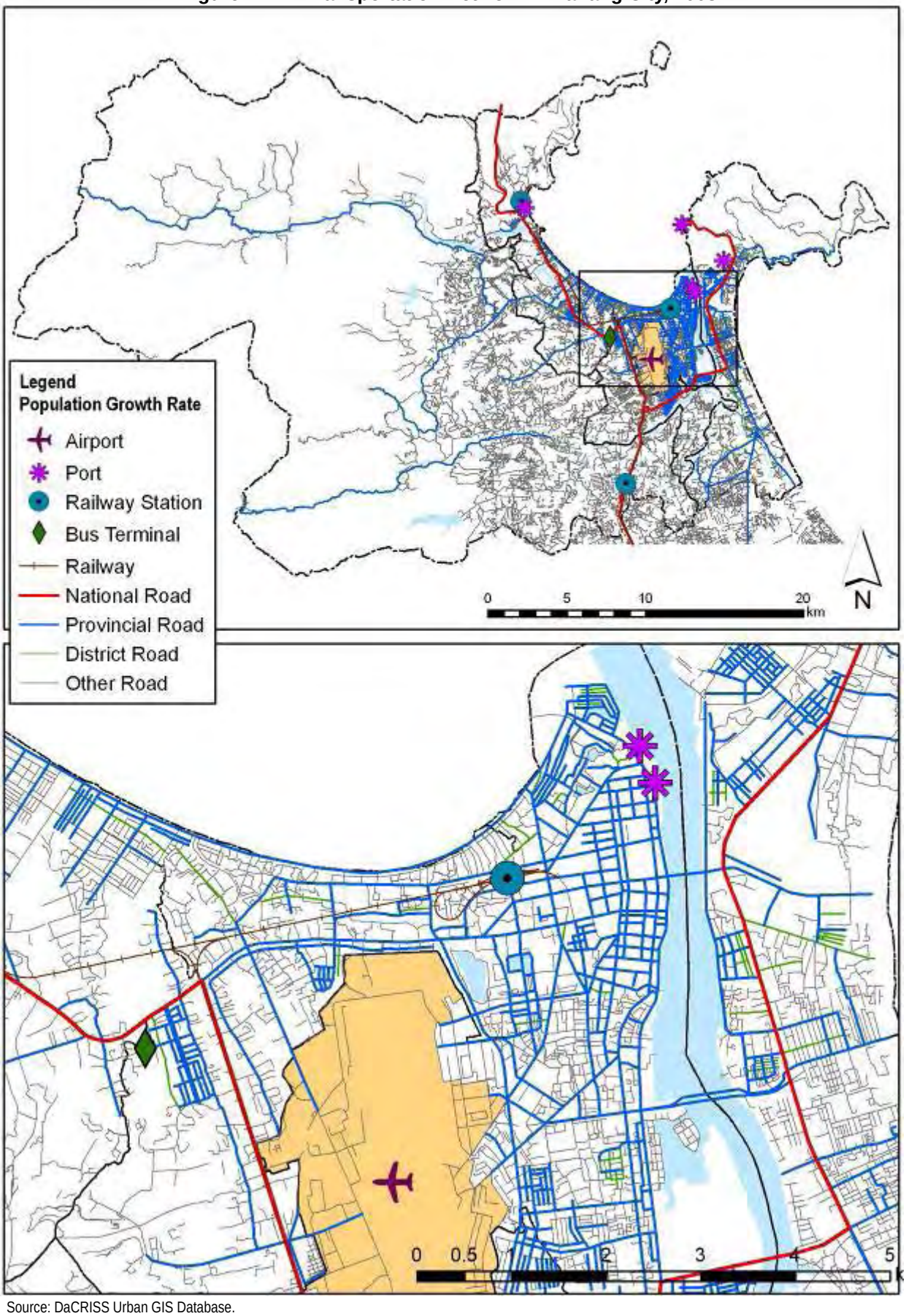
(e) **Inland Waterway:** According to the DOT, there are 13 waterway routes at present in Danang with a total length of 162.7km, 101.9km of which is explored. Only 5.4km of waterway route of Han Riveris under the management of Danang Port, the rest is under local agencies. Although there are 18 passenger stations, there is no regular passenger shipping service available at this moment.

Table 7.2.1 Transportation System in Danang City

Mode		Infrastructure	Services	Traffic Level
Roads	Urban	• Urban roads (311km) • Traffic signal/roundabout • Bridges and flyovers	• Private Transportation: bicycle, motorcycle and car • Public Transportation: urban bus (5 routes), taxi, xe om	Mixed and unsafe situation Congested in peak hours
	Inter-city	• National Highway 1A (37 km) and 14B (32 km), Provincial roads (100 km)	• Private (motorcycle, car) • Provincial bus (various destinations)	Mixed and unsafe situation Congested at built-up area
Rail		• North South Line (42 km length in Danang City) connecting between Hanoi and HCMC • 5 stations including Danang Station	• No. of daily operations (departures): • 18 passenger trains • 12 cargo trains	Traffic volume in 2006: Departure: 364,755 pax Arrival: 377,030 pax
Air		• Danang International Airport (2 runways of 3,048m x 45m, Maximum operating aircraft is A320. Capacity of terminal building is 1 million pax/year)	• No. of weekly operations (departures): • 7 international flights • 120 domestic flights	Traffic volume in 2007: International: 27,000 pax and 100 ton Domestic: 1.41 million pax and 8,800 ton
Ports & Shipping		• Danang Port composed of : • Tien Sa Terminal depth (berth length: 965m, channel depth: 10-17m) • Song Han Terminal (berth length: 528m, channel depth: 6-7 m)	• Tien Sa Terminal: accommodates maximum 45,000 DWT cargo ships, 200 TEU container ships and 75,000 GRT passenger ships. Capacity: 4.5 million MT/year • Song Han Terminal: accommodates maximum 500 DWT cargo ships. Capacity: 1 million MT/year	• Port throughput in 2008: • Total cargo: 2.7 million MT - Import: 526,000 MT - Export: 1,231,000 MT - Domestic: 985,000 MT • Container: 61,881 TEU • Total Passenger: 29,642 pax
Inland Waterway		• 13 waterway routes (162.7 km) and 18 passenger stations	• Mainly used for goods transportation and no regular passenger services	• N.A.

Source: DaCRISS Study Team.

Figure 7.2.1 Transportation Network in Danang City, 2008



Source: DaCRISS Urban GIS Database.

2) Inter-city Transportation Terminals

7.4 **Railway Stations:** Danang Station is the biggest and most important as it is where train coaches are switched. It is located in the center of the city and surrounded by residential and commercial areas. At the Danang Station, there is a space for pick-up and drop-off of passengers but no bus service is available on the road in front of the station. In 2006, the station handled 364,755 departing passengers and 377,030 arriving passengers. Thanh Khe (A and B) stations have limited passengers, i.e., 1,992 departing passengers and 753 arriving passengers.

7.5 **Bus Terminal:** In Danang City, there is one bus terminal called "Central Bus Terminal," located along NH1A on the district boundary of Lein Chieu and Cam Le. This terminal, with a 60,000-square-meter area, is operated by the Danang Transport and Bus Station Management Joint Stock Company. It opened in 2007 but its construction is not completed yet. This terminal provides services for both city and interprovincial buses. As for city operation, there are five bus routes including one informal route operated by a cooperative. On the other hand, there are 20 routes to/from Quang Nam Province, 15 routes to/from northern provinces including Hanoi, and 29 routes to/from the Central Highlands and southern provinces including HCMC.

7.6 **Airport:** Danang City has an international airport accessible within about 10 minutes from the city center. The Danang International Airport has two runways (3,048 m x 45 m each) that allow large aircraft, such as A320s, to land in any weather condition. In 2007, the airport handled 1.43 million passengers (27,000 international and 1.41 million domestic) and 8,900 tons of cargoes (100 international and 8,800 domestic). The existing passenger terminal building with a floor area of 5,700 m^2 was constructed in 1978. Since it has become obsolete and lacks capacity, a new building is under construction which will have a floor area of 36,000 m^2 and a capacity of 4 million passengers a year. Total project cost is USD83 million.

7.7 **Sea Port:** Danang Port is the only sea port in the city and composed of two terminals: Tien Sa and Song Han. Tien Sa Terminal is located in a cove on Son Tra peninsula, while Song Han Terminal is in the city center along the Han River. Tien Sa Terminal is a natural deep-sea port with a depth of 10–17 m. Its total length of berths is 965m with two finger piers and one container wharf. Tien Sa Terminal can accommodate general ships up to 45,000 DWT; 2,000 TEU container ships; and passenger ships up to 75,000 GRT. Port capacity reaches 4.5 million metric tons a year together with its freight yards and warehouse nearby to support port throughput. The Song Han Terminal has a 528-meter length of berth and channel depths of 6–7 m can accommodate a maximum 5,000 DWT of general cargo ships. Its cargo handling capacity reaches 1 million metric tons a year.

Figure 7.2.2 Images of Transportation Facilities in Danang City, 2008



Danang Railway Station



Danang Central Bus Terminal

Danang International Airport – Passenger Terminal Building

Tien Sa Port

Tien Sa Port

Han River Port

3) Provincial Bus Service

7.8 Figure 7.2.3 shows the provincial bus routes operating to/from Danang. Provincial buses go up to Hanoi and Thai Nguyen in the north, and up to HCMC in the south. The routes are basically along the national highways. Its service frequency is high for short- to medium-distance routes (such as Hue). There are normal and high-quality (ordinary and premium) services available, and fares differ considerably (30–80% normally) by the quality of service.

Figure 7.2.3 Interprovincial Bus Routes to/from Danang City

Source: DaCRISS Study Team.

7.3 Urban Transportation Demand

1) Travel Demand and Trip Rates

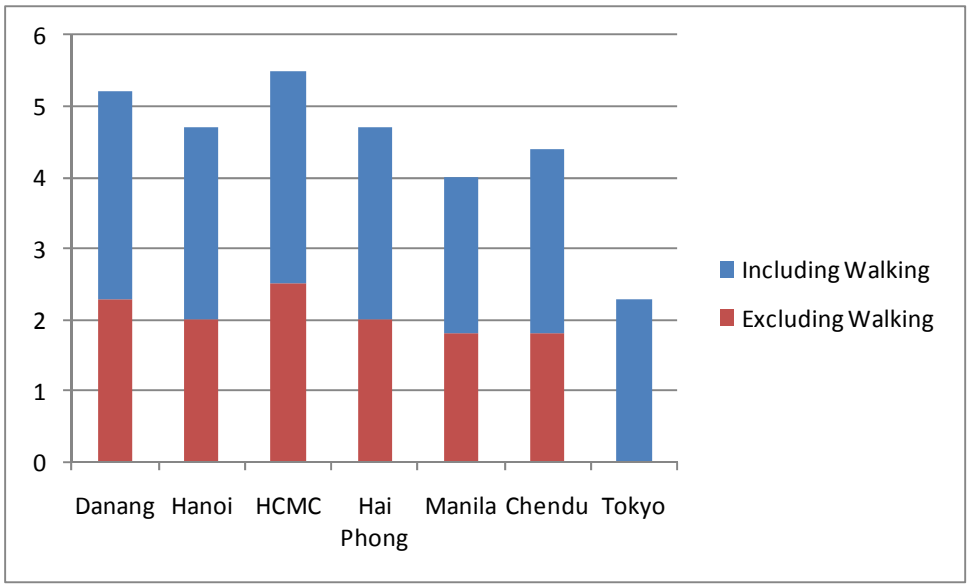
7.9 In 2008, total transportation demand in Danang City is about 2.3 million person-trips including walking or 1.9 million excluding walking a day. This means that residents make 2.9 trips/person/day (including walking) or 2.3 trips/person/day (excluding walking). Compared with other cities in Asia, the trip rate of Danang City residents is quite high and is similar to other Vietnamese cities including Hanoi, HCMC, and Haiphong (see Table 7.3.12). The high level of mobility in Vietnamese cities is explained by the high level of ownership of motorcycles and bicycles, as well as the compactness of urban areas with highly mixed land use.

Table 7.3.1 Trip Rate of Residents of Danang City and Selected Other Cities

City		Year	Population (000)	Trip Rate: No. of Trips / Person / Day	
				Including Walking	Excluding Walking
Vietnam	Danang	2008	867	2.9	2.3
	Hanoi	2005	3,186	2.7	2.0
	HCMC	2002	7,693	3.0	2.5
	Haiphong	2007	715	2.7	2.0
Manila (Philippines)		1996	13,565	2.2	1.8
Chendu (China)		2001	3,090	2.6	1.8
Tokyo (Japan)		1998	34,000	2.3	N. A.

Source: DaCRISS HIS, 2008.

Figure 7.3.1 Trip Rate of Residents of Danang City and Selected Other Cities (trip/person/day)



Source: DaCRISS HIS, 2008.

2) Vehicle Ownership and Modal Shares

7.10 In 2008, more than 90% of Danang households owned motorcycles, with 58% owning more than two motorcycles (see Table 7.3.2). This extremely high level of motorcycle ownership helps people to move and access necessary services and destinations easily. This makes the share of motorcycle in urban transportation demand as high as 77% and that of public transportation very low (see Table 7.3.3)

Table 7.3.2 Vehicle Ownership among Households in Selected Vietnamese Cities

(%)

Type of Vehicle Owned		Danang[1] (2008)	Hanoi[2] (2005)	HCMC[3] (2002)	Haiphong[4] (2007)
None		3.5	2.3	1.3	2
Bicycle Only		5.0	11.5	4.4	18
Motorcycle	Single	31.6	39.8	33.8	47
	Over Two	58.1	44.7	58.9	33
Car		1.5	1.8	1.7	0.5
Total		100.0	100.0	100.0	100.0

Source: [1] DaCRISS HIS, 2008. [2] HAIDEP HIS. [3] HOUTRANS HIS. [4] ALMEC.

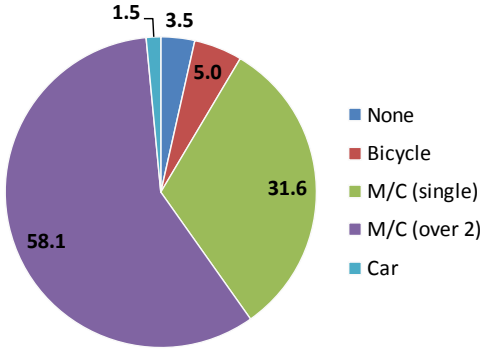
Table 7.3.3 Modal Shares of Person Trips Excluding Walk Trips in Selected Vietnamese Cities

(%)

Mode	Danang	Hanoi		HCMC	
	2008[1]	1995[2]	2005[3)]	1996[4]	2002[5]
Bicycle	21.6	61.1	27.9	32	13.6
Motorcycle	77.0	35.8	59.6	64	79.0
Car	0.5	1.1	2.5	1	1.6
Bus	0.2	0.6	5.6	2	2.1
Others	0.7	1.4	4.5	1	3.8
Total	100.0	100.0	100.0	100	100.0

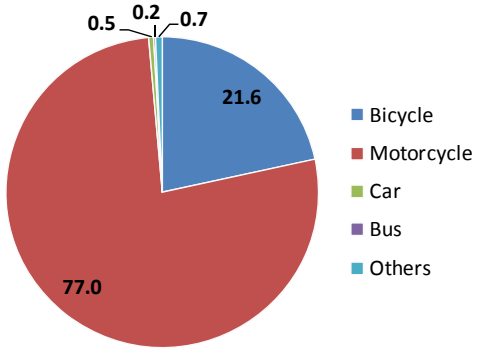
Source: [1] DaCRISS HIS, 2008. [2] SIDA VUTAP (urban districts only). [3] HAIDEP HIS, 2005. [4] HCM Transportation Study (1996, DFID) [5] HOUTRANS, 2002.

Figure 7.3.2 Vehicle Ownership among Households in Danang



Source: DaCRISS HIS, 2008.

Figure 7.3.3 Modal Shares of Person Trips Excluding Walk Trips in Danang



Source: DaCRISS HIS, 2008.

3) Volume and Distribution of Transport Demand

(1) Trip Generation and Attraction

7.11 Travel demand (generated and attracted number of trips in a day) by district is shown in Table 7.3.4. In 2008, there was a large volume of generated and attracted trips in Hai Chau and Thanh Khe districts, especially “to work” and “to school” trips. Hai Chau attracted the most number of “to work” trips (141,000 trips in a day or 1.2 times more than the generated trips).

Table 7.3.4 Trip Generation and Attraction Excluding Walk Trips in Danang, 2008

District	Generation (No. of Trips, 000/day)						Attraction (No. of Trips, 000)					
	To Work	To School	Private	Business	To Home	Total	To Work	To School	Private	Business	To Home	Total
Hai Chau	116	53	112	3	300	585	141	66	150	10	227	593
Thanh Khe	94	49	87	4	155	390	66	38	81	3	202	389
Son Tra	55	31	58	2	103	250	50	24	48	2	128	251
Ngu Hanh Son	29	17	30	1	62	139	23	21	26	2	65	138
Cam Le	32	20	42	1	71	165	33	14	34	1	77	159
Lien Chieu	39	25	43	1	113	222	54	35	41	5	88	223
Hoa Vang	36	29	29	1	70	165	25	26	24	1	89	165
Hoang Sa	0	0	0	0	0	0	0	0	0	0	0	0
Total	402	225	402	14	875	1,917	390	225	404	24	876	1,919

Source: DaCRISS HIS, 2008.

Figure 7.3.4 Distribution of Trip Generation / Attractions

Source: DaCRISS HIS, 2008.

(2) Trip Distribution of Demand

(a) Trip Distribution in Danang City

7.12 Tables 7.3.5 and 7.3.6 show the distribution of urban transportation demand between districts in Danang City. In 2008, about 1.2 million trips were generated and attracted a day in urban centers (Hai Chau and Thanh Khe districts) and that is nearly a half of the total demand in Danang City. Figure 7.3.1 illustrates the distribution of inter district transportation demand and Figure 7.3.2 illustrates the distribution pattern of the dominant motorcycle trips between communes.

7.13 Major characteristics of trip distribution by mode in 2008 are as follows:

(i) Walk trips sharing about 16% of the total were limited mostly within each district, showing short travel distances;

(ii) Bicycle trips sharing about 15% of the total show a similar distribution to walk trips. Its travel distance is slightly longer than that of walk trips;

(iii) Motorcycle was the most popular mode of transportation in Danang. Its modal share accounted for about 64% (including walk trips);

(iv) Car use was still limited in the entire Danang, although it is relatively well used in the urban districts of Danang and Quang Nam Province;

(v) Bus use was also not popular in Danang. Its modal share was less than 2% (including walk trips). However, bus use was relatively good between the urban districts of Danang and adjacent provinces particularly Quang Nam and Thua Thien Hue. Bus use was popular for long-distance provincial trips;

(vi) Tourist bus was used mainly between Hai Chau District in Danang and Quang Nam Province. Many hotels are located in the former, while the latter has tourist spots including Hoi An; and

(vii) Truck traffic concentrated around the urban districts of Danang and Quang Nam Province.

Table 7.3.5 Distribution of Urban Transportation Demand in Danang City Excluding Walking, 2008

District		1.Hai Chau	2.Thanh Khe	3.Son Tra	4.Ngu Hanh Son	5.Cam Le	6.Lien Chieu	7.Hoa Vang	Total
1	Hai Chau	346,522	92,507	56,028	22,785	16,925	32,315	10,026	577,108
2	Thanh Khe	93,524	218,985	20,854	8,896	13,861	32,267	4,009	392,396
3	Son Tra	57,650	20,880	148,054	10,932	3,907	6,213	1,829	249,465
4	Ngu Hanh Son	23,240	8,937	10,774	87,159	3,021	3,109	1,399	137,639
5	Cam Le	18,967	14,197	7,431	2,914	106,129	4,747	12,676	167,061
6	Lien Chieu	31,493	31,862	6,127	3,316	4,522	134,826	7,695	219,841
7	Hoa Vang	10,350	3,998	2,069	1,482	12,528	7,647	127,803	165,877
Total		581,746	391,366	251,337	137,484	160,893	221,124	165,437	1,909,387

Source: DaCRISS HIS, 2008.

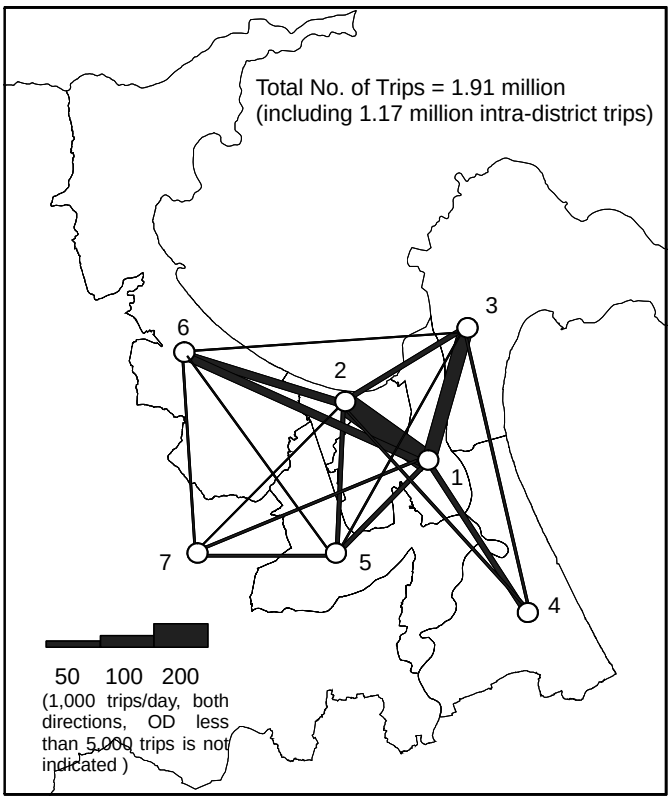
Table 7.3.6 Distribution of Walk Trips in Danang City, 2008

District		1.Hai Chau	2.Thanh Khe	3.Son Tra	4.Ngu Hanh Son	5.Cam Le	6.Lien Chieu	7.Hoa Vang	Total
1	Hai Chau	88,495	4,613	360	30	217	35	120	93,870
2	Thanh Khe	4,491	81,409	0	0	131	697	0	86,728
3	Son Tra	407	33	54,177	597	0	0	0	55,214
4	Ngu Hanh Son	30	0	674	23,231	0	0	0	23,935

5	Cam Le	217	180	0	0	29,344	79	73	29,893
6	Lien Chieu	35	697	0	0	79	56,228	212	57,251
7	Hoa Vang	203	0	0	0	115	243	55,897	56,458
Total		93,878	86,932	55,211	23,858	29,886	57,282	56,302	403,349

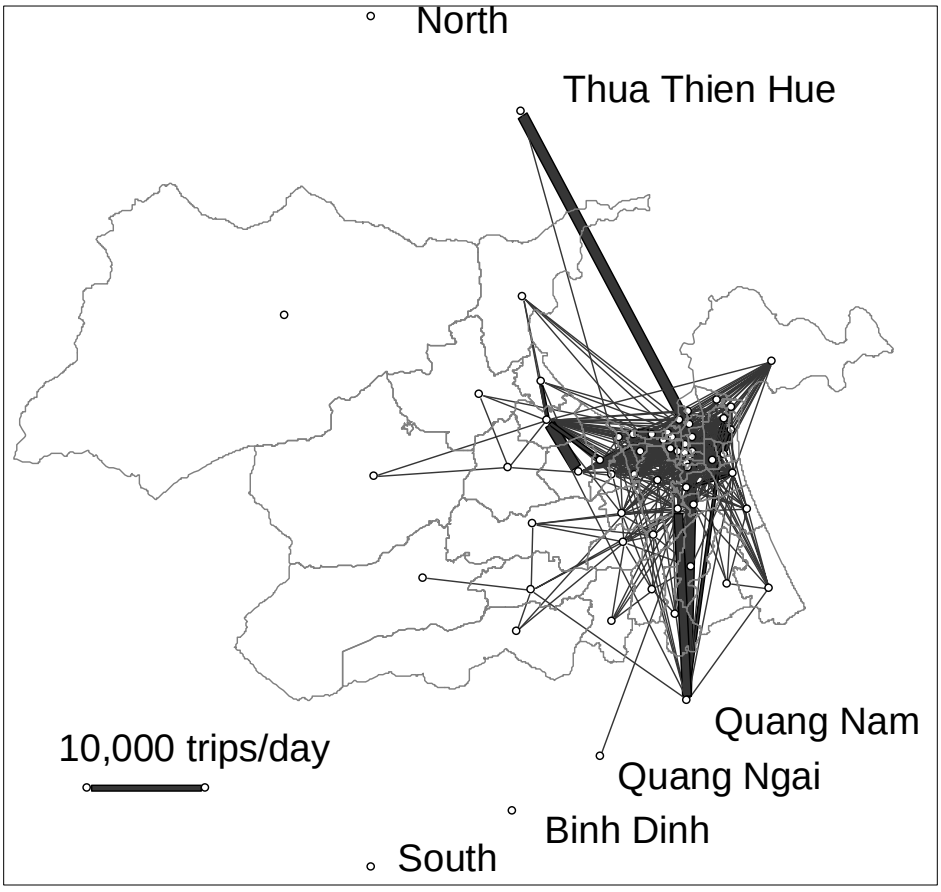
Source: DaCRISS HIS, 2008.

Figure 7.3.5 Distribution of Transportation Demand between Districts Excluding Walking, 2008



Source: DaCRISS HIS, 2008.

Figure 7.3.6 Distribution of Motorcycle Transportation Demand, 2008



Source: DaCRISS HIS, 2008.

(b) Intra provincial Trip Distribution

7.14 Table 7.3.7 shows the distribution of interprovincial transportation demand in the study area (i.e., CFEZ). About 1.7 million people are traveling daily to and from Danang City. Among neighboring provinces, Danang City has close relation with Quang Nam Province in terms of people's movement. For interprovincial travel, motorcycle is mainly used for moving between adjacent provinces, and car and bus are used for long-distance trips.

Table 7.3.7 Distribution of Interprovincial Transportation Demand in Danang City, 2008

(No. of Persons)

		Danang	CFEZ				Others		Total
			TT Hue	Q. Nam	Q. Ngai	B. Dinh	North VN	South VN	
Danang		1,536,939	8,323	55,190	3,447	173	2,160	1,339	1,607,571
CFEZ	TT Hue	7,728	0	5,113	61	46	131	3,149	16,228
CFEZ	Quang Nam	67,621	1,160	77	280	0	259	0	69,397
CFEZ	Quang Ngai	2,536	25	0	0	0	2,511	0	5,072
CFEZ	Binh Dinh	461	45	0	0	0	43	0	549
	North VN	1,049	11	182	162	109	12	8,788	10,313
	South VN	1,687	509	465	441	0	18,117	0	21,219
Total		1,618,021	10,073	61,027	4,391	328	23,233	13,276	1,730,349

(No. of Vehicles)

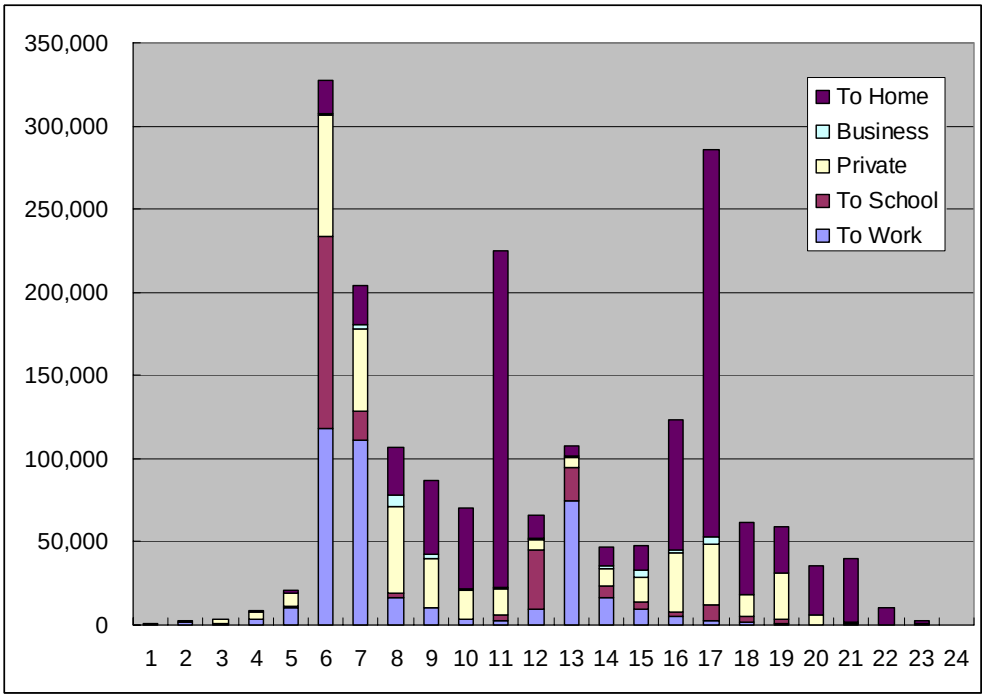
			Danang	CFEZ				Others		Total
				TT Hue	Q. Nam	Q. Ngai	B. Dinh	North VN	South VN	
All modes	Danang		1,169,207	4,346	32,761	2,311	57	995	601	1,210,278
All modes	CFEZ	TT Hue	4,593	0	2,728	36	24	19	247	7,645
All modes	CFEZ	Quang Nam	39,339	348	48	18	0	197	0	39,950
All modes	CFEZ	Quang Ngai	549	25	0	0	0	173	0	746
All modes	CFEZ	Binh Dinh	169	22	0	0	0	43	0	234
All modes		North VN	473	11	146	86	109	12	1,417	2,253
All modes		South VN	742	203	56	29	0	1,833	0	2,862
All modes	Total		1,215,072	4,955	35,738	2,479	190	3,271	2,264	1,263,968
Motorcycle	Danang		1,156,918	2,775	26,799	2,085	0	0	0	1,188,577
Motorcycle	CFEZ	TT Hue	3,005	0	2,176	0	0	0	0	5,182
Motorcycle	CFEZ	Quang Nam	31,004	0	47	0	0	0	0	31,051
Motorcycle	CFEZ	Quang Ngai	0	0	0	0	0	0	0	0
Motorcycle	CFEZ	Binh Dinh	0	0	0	0	0	0	0	0
Motorcycle		North VN	0	0	0	0	0	0	0	0
Motorcycle		South VN	0	0	0	0	0	0	0	0
Motorcycle	Total		1,190,928	2,775	29,022	2,085	0	0	0	1,224,809
Car	Danang		6,512	950	2,070	65	0	398	194	10,189
Car	CFEZ	TT Hue	1,052	0	400	25	0	0	12	1,488
Car	CFEZ	Quang Nam	3,216	138	0	0	0	60	0	3,414
Car	CFEZ	Quang Ngai	231	0	0	0	0	0	0	231
Car	CFEZ	Binh Dinh	161	22	0	0	0	0	0	183
Car		North VN	0	0	35	74	0	0	200	308
Car		South VN	88	16	29	0	0	30	0	163
Car	Total		11,260	1,126	2,534	163	0	487	405	15,976
Bus	Danang		959	149	846	31	8	52	37	2,082
Bus	CFEZ	TT Hue	79	0	91	0	2	8	200	379
Bus	CFEZ	Quang Nam	1,081	46	1	18	0	0	0	1,146
Bus	CFEZ	Quang Ngai	121	0	0	0	0	162	0	282
Bus	CFEZ	Binh Dinh	9	0	0	0	0	0	0	9
Bus		North VN	40	0	0	0	0	0	495	535
Bus		South VN	59	20	26	29	0	1,123	0	1,257
Bus	Total		2,347	215	964	77	10	1,345	732	5,689
Truck	Danang		4,817	472	3,046	131	49	545	370	9,430
Truck	CFEZ	TT Hue	456	0	61	11	22	11	35	596
Truck	CFEZ	Quang Nam	4,039	164	0	0	0	137	0	4,340
Truck	CFEZ	Quang Ngai	197	25	0	0	0	11	0	233
Truck	CFEZ	Binh Dinh	0	0	0	0	0	43	0	43
Truck		North	433	11	111	12	109	12	722	1,410
Truck		South	595	167	0	0	0	680	0	1,442
Truck	Total		10,537	839	3,218	154	180	1,439	1,127	17,494

Source: DaCRISS HIS, 2008.

(3) Hourly Distribution of Demand

7.15 Figure 7.3.3 shows the hourly distribution of trips. Results show that the peak hour of travel is from 6a.m. to 7p.m. and the peak hour ratio is 17%. There are three peak periods in a day (6–7a.m., 11a.m.–12nn, and 5–6p.m.) because "to home" trips from schools are concentrated in the afternoon peak.

Figure 7.3.7 Number of Trips Excluding Walk Trips by Hour and Purpose, 2008



Source: DaCRISS HIS, 2008.

4) Demand Characteristics by Transport Mode

7.16 In this section, the characteristics of urban transportation users are identified by mode under various conditions such as trip purpose, socio-economic profile, and travel time and length:

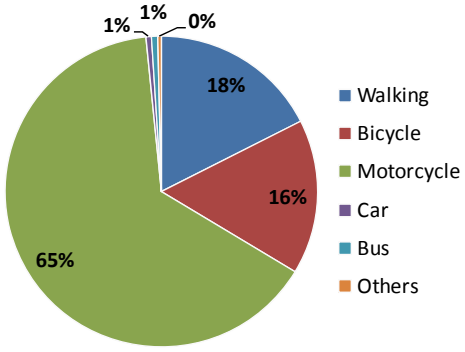
(a) **Trip Purpose by Mode:** Excluding "to home" trips, bicycle and bus were mainly used for "to school" purpose, and motorcycle and car were for "to work" and "private" purposes (see Table 7.3.8).

Table 7.3.8 Travel Demand by Mode and by Purpose, 2008

Trip Purpose (%)	Walking	Bicycle	Motorcycle	Car	Bus	Truck	Others	Total
To Work	10	7	23	28	12	44	22	18
To School	11	31	7	2	24	1	15	12
Business	0	0	1	7	1	18	3	1
Private	30	14	23	31	14	8	16	23
To Home	49	48	46	32	49	29	43	47
Total	100	100	100	100	100	100	100	100

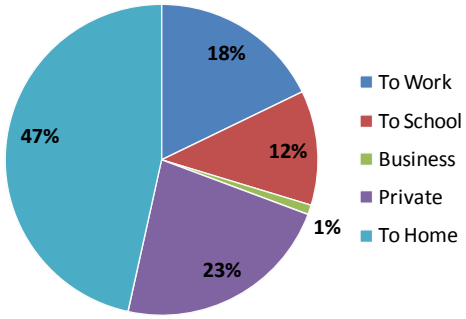
Source: DaCRISS HIS, 2008.

Figure 7.3.8 Travel Demand by Mode



Source: DaCRISS HIS, 2008.

Figure 7.3.9 Travel Demand by Purpose



Source: DaCRISS HIS, 2008.

(b) **Vehicle Ownership by Mode:** Since more than 90% of households own a single or multiple motorcycles, most transportation users own motorcycles on average. However, the share of those not owning any vehicle was relatively higher among users of xe om, bicycle, and public bus, as well as those who walked (see Table 7.3.9).

Table 7.3.9 Travel Demand by Mode and Vehicle Ownership, 2008

	Vehicle Ownership		Walking	Bicycle	Motorcycle			Car/ Taxi	Bus		Others	Total
					Driver	Passenger	Xe Om		Public	Private		
No. of trips	No Vehicle		44,200	31,906	6,522	7,204	8,527	0	133	0	0	98,492
	Motor-cycle	one	151,060	142,628	247,641	58,530	1,704	3,353	732	2,576	2,982	611,206
		2<=	203,250	189,199	986,685	126,998	14,327	3,940	1,246	10,029	4,811	1,540,485
	Car		3,905	3,761	25,060	4,025	0	5,895	166	0	240	43,052
	Total		402,415	367,494	1,265,908	196,757	24,558	13,188	2,277	12,605	8,033	2,293,235
%	No Vehicle		11.0	8.7	0.5	3.7	34.7	0.0	5.8	0.0	0.0	4.3
	Motor-cycle	one	37.5	38.8	19.6	29.7	6.9	25.4	32.1	20.4	37.1	26.7
		2<=	50.5	51.5	77.9	64.5	58.3	29.9	54.7	79.6	59.9	67.2
	Car		1.0	1.0	2.0	2.0	0.0	44.7	7.3	0.0	3.0	1.9
	Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: DaCRISS HIS, 2008.

(c) **Household Income by Mode:** The level of household income was relatively lower among those who travel by bicycle or walking. The income levels of users of motorcycles and cars varied but not as low as the incomes of those using bicycles or walking. Incomes of public bus users range from low to medium (see Table 7.3.10).

Table 7.3.10 Travel Demand by Mode and Household Income Level, 2008

Unit	Household Income Level (VND mil.)	Walking	Bicycle	Motorcycle			Car/ Taxi	Bus		Others	Total
				Driver	Passen-ger	Xe Om		Public	Private		
No. of trips	Less than 1.5	57,389	40,477	56,102	11,983	1,935	348	332	0	220	168,786
	1.5 - 2.0	54,080	47,327	89,150	18,966	3,590	34	397	0	830	214,374
	2.0 - 3.0	98,645	104,300	265,258	48,004	8,815	798	336	304	1,912	528,372
	3.0 - 4.0	68,760	69,300	234,260	35,870	333	1,417	556	711	1,342	412,549
	4.0 - 5.0	56,838	50,294	230,710	34,602	8,881	2,728	458	4,240	1,924	390,675
	5.0 - 6.0	26,182	24,083	129,514	16,571	564	1,488	0	3,822	232	202,456
	6.0 - 8.0	20,505	18,548	131,299	15,579	402	2,507	0	1,974	681	191,495
	More than 8.0	20,866	14,480	130,568	15,382	38	3,868	198	1,554	1,347	188,301
	Total	403,265	368,809	1,266,861	196,957	24,558	13,188	2,277	12,605	8,488	2,297,008
%	Less than 1.5	14.2	11.0	4.4	6.1	7.9	2.6	14.6	0.0	2.6	7.3
	1.5 - 2.0	13.4	12.8	7.0	9.6	14.6	0.3	17.4	0.0	9.8	9.3
	2.0 - 3.0	24.5	28.3	20.9	24.4	35.9	6.1	14.8	2.4	22.5	23.0

	3.0 - 4.0		17.1	18.8	18.5	18.2	1.4	10.7	24.4	5.6	15.8	18.0
	4.0 - 5.0		14.1	13.6	18.2	17.6	36.2	20.7	20.1	33.6	22.7	17.0
	5.0 - 6.0		6.5	6.5	10.2	8.4	2.3	11.3	0.0	30.3	2.7	8.8
	6.0 - 8.0		5.1	5.0	10.4	7.9	1.6	19.0	0.0	15.7	8.0	8.3
	More than 8.0		5.2	3.9	10.3	7.8	0.2	29.3	8.7	12.3	15.9	8.2
	Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: DaCRISS HIS, 2008.

(d) **Age and Gender by Mode:** Users of bicycles and motorcycles (as passengers) are relatively younger than others. There was not much difference in the modal choice by gender of users, but relatively more females used bicycles, motorcycles (as passenger) and walked (see tables 7.3.11 and 7.3.12).

Table 7.3.11 Travel Demand by Mode and Age Group, 2008

Unit	Age Group (years)		Walking	Bicycle	Motorcycle			Car/ Taxi	Bus		Others	Total
					Driver	Passen-ger	Xe Om		Public	Private		
No. of Trips	Less than 10		34,015	12,396	864	53,339	0	183	0	0	0	100,797
	10 - 14		54,622	107,546	1,329	41,196	47	98	240	47	88	205,213
	15 - 49		179,168	215,184	1,132,125	84,972	19,160	10,775	1,742	12,558	6,125	1,661,809
	50 - 69		98,387	29,340	126,952	15,022	4,400	2,132	125	0	2,110	278,468
	More than 70		37,157	4,343	5,801	2,528	951	0	170	0	165	51,115
	Total		403,349	368,809	1,267,071	197,057	24,558	13,188	2,277	12,605	8,488	2,297,402
%	Less than 10		8.4	3.4	0.1	27.1	0.0	1.4	0.0	0.0	0.0	4.4
	10 - 14		13.5	29.2	0.1	20.9	0.2	0.7	10.5	0.4	1.0	8.9
	15 - 49		44.4	58.3	89.3	43.1	78.0	81.7	76.5	99.6	72.2	72.3
	50 - 69		24.4	8.0	10.0	7.6	17.9	16.2	5.5	0.0	24.9	12.1
	More than 70		9.2	1.2	0.5	1.3	3.9	0.0	7.5	0.0	1.9	2.2
	Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: DaCRISS HIS, 2008.

Table 7.3.12 Travel Demand by Mode and Gender, 2008

Unit	Gender		Walking	Bicycle	Motorcycle			Car/ Taxi	Bus		Others	Total
					Driver	Passen-ger	Xe Om		Public	Private		
No. of trips	Male		167,536	147,431	731,684	83,625	11,981	11,310	1,149	6,977	7,300	1,168,993
	Female		235,813	221,378	535,387	113,432	12,577	1,878	1,128	5,628	1,188	1,128,409
	Total		403,349	368,809	1,267,071	197,057	24,558	13,188	2,277	12,605	8,488	2,297,402
%	Male		41.5	40.0	57.7	42.4	48.8	85.8	50.5	55.4	86.0	50.9
	Female		58.5	60.0	42.3	57.6	51.2	14.2	49.5	44.6	14.0	49.1
	Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: DaCRISS HIS, 2008.

5) Travel Time and Trip Length

7.17 The average travel time and trip length in all modes in Danang City were 14.3 minutes and 3.76km, respectively. Indicators for “to work” trips are slightly longer than average, i.e., 15.8 minutes and 4.85km. By mode, users of xe om, cars/taxis, and buses made trips that lasted for more than 20 minutes. Users of these modes also made longer-distance trips, i.e., 8km by xe om, more than 20km by cars/taxis and buses. On the other hand, users of bicycles and those who walked made shorter trips in terms of time and distance (see tables 7.3.13–7.3.15).

Table 7.3.13 Average Travel Time and Trip Length by Mode and Purpose, 2008

Item	Trip Purpose	Walking	Bicycle	M/C			Car/Taxi	Bus		Others	Total
				Driver	Pas-senger	Xe Om		Public	Private		
Average Travel Time (min.)	To Work	13.1	16.3	15.8	15.7	24.1	19.3	19.6	26.4	19.6	15.8
	To School	11.5	15.5	19.4	11.0	15.0	11.9	23.0	26.8	11.1	14.9
	Business	9.4	15.8	16.4	16.8	-	23.2	-	20.0	18.4	17.0
	Private	11.4	12.0	12.3	13.9	27.9	26.1	16.3	25.0	21.3	12.5
	To Home	11.6	14.8	15.2	13.4	18.5	20.4	25.4	25.9	20.7	14.4
	Total	11.7	14.7	14.9	13.1	22.5	21.9	22.6	25.7	19.7	14.3
Average Trip Length (km)	To Work	1.32	2.41	4.46	4.25	7.42	18.43	5.71	21.36	7.11	4.85
	To School	1.10	2.33	6.86	2.14	2.19	1.99	8.24	9.98	6.40	3.15
	Business	2.94	1.74	12.18	2.95	-	15.30	-	38.97	10.59	19.80
	Private	0.95	1.61	3.09	3.31	9.89	29.06	30.24	23.63	10.57	3.30
	To Home	1.05	2.15	4.21	2.99	7.49	11.49	7.15	7.77	7.66	3.29
	Total	1.05	2.15	4.23	2.96	8.20	19.92	21.65	23.39	8.08	3.76

Source: DaCRISS HIS, 2008.

Table 7.3.14 Distribution of Travel Time by Mode, 2008

Unit	Travel Time (min.)	Walking	Bicycle	Motorcycle			Car/ Taxi	Bus		Others	Total
				Driver	Passenger	Xe Om		Public	Private		
No. of trips	01 - 04	11,725	2,807	11,694	1,545	0	191	0	0	66	28,028
	05 - 09	123,579	52,593	202,331	39,838	202	982	82	0	820	420,427
	10 - 14	144,091	114,415	389,543	72,527	7,766	3,314	666	0	1,888	734,210
	15 - 19	67,962	108,418	322,269	43,934	1,745	1,996	423	0	1,799	548,546
	20 - 29	31,128	57,052	205,675	28,547	5,590	2,319	359	6,428	2,318	339,416
	30 <=	24,864	33,495	149,178	12,355	9,255	4,483	708	6,177	1,565	242,080
	Total	403,349	368,780	1,280,690	198,746	24,558	13,285	2,238	12,605	8,456	2,312,707
%	01 - 04	2.9	0.8	0.9	0.8	0.0	1.4	0.0	0.0	0.8	1.2
	05 - 09	30.6	14.3	15.8	20.0	0.8	7.4	3.7	0.0	9.7	18.2
	10 - 14	35.7	31.0	30.4	36.5	31.6	24.9	29.8	0.0	22.3	31.7
	15 - 19	16.8	29.4	25.2	22.1	7.1	15.0	18.9	0.0	21.3	23.7
	20 - 29	7.7	15.5	16.1	14.4	22.8	17.5	16.0	51.0	27.4	14.7
	30 <=	6.2	9.1	11.6	6.2	37.7	33.7	31.6	49.0	18.5	10.5
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: DaCRISS HIS, 2008.

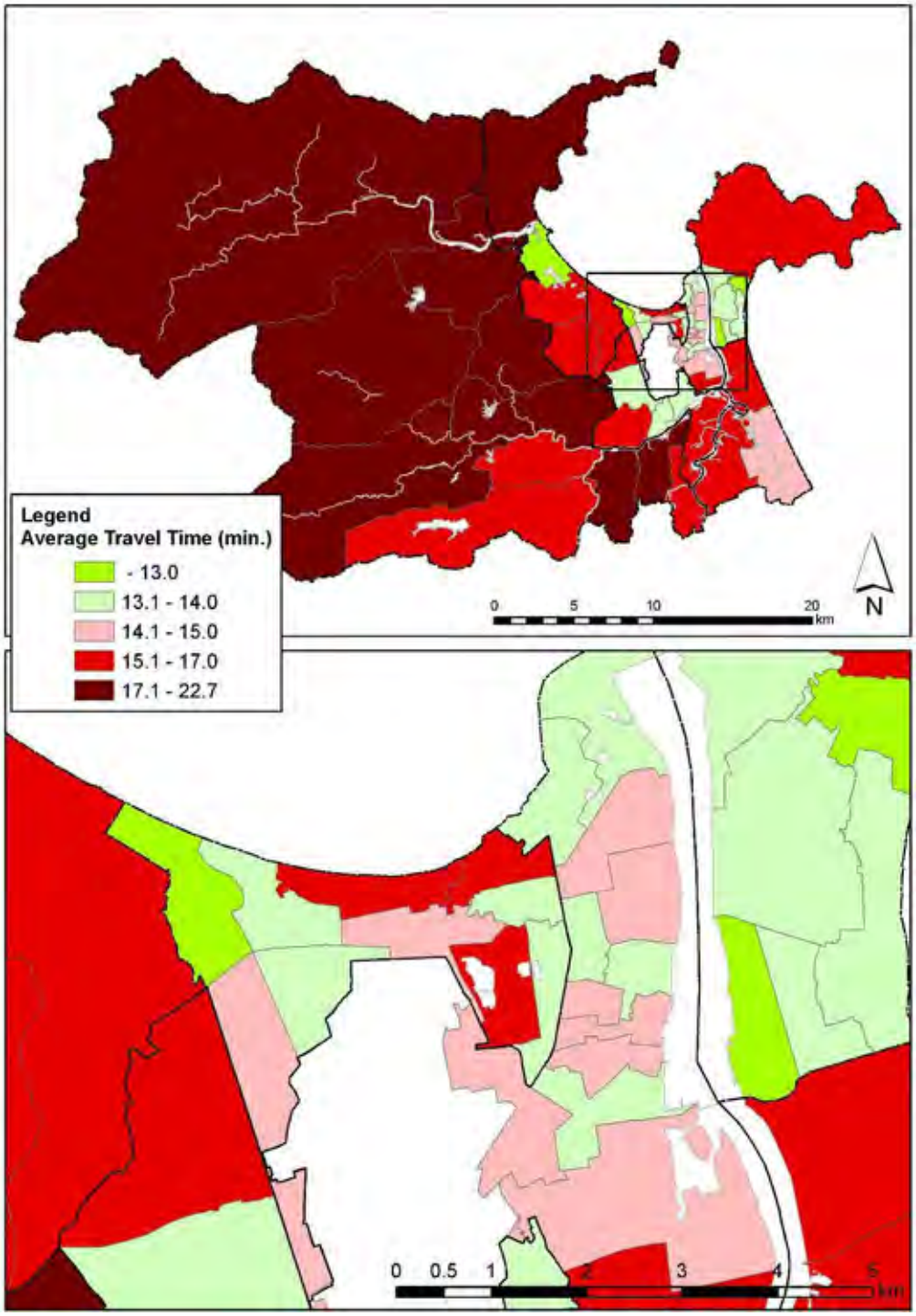
Table 7.3.15 Distribution of Trip Length by Mode, 2008

Unit	Trip Length (km)	Walking	Bicycle	Motorcycle			Car/ Taxi	Bus		Others	Total
				Driver	Passenger	Xe Om		Public	Private		
No. of trips	0.5 >	146,144	54,620	141,791	33,212	274	1,041	82	0	717	377,881
	0.50 - 0.99	106,099	67,457	139,521	26,457	1,094	751	0	0	675	342,054
	1.00 - 1.49	72,928	81,003	153,525	27,703	450	616	234	0	685	337,144
	1.50 - 1.99	26,849	41,057	90,769	15,729	126	568	45	0	337	175,480
	2.00 - 2.99	38,542	50,321	181,711	27,317	1,521	1,775	76	0	540	301,803
	3.00 - 4.99	5,123	34,951	220,533	32,538	3,865	2,783	245	2,100	1,289	303,427
	5.00 - 7.49	5,979	25,794	160,284	21,174	5,277	1,480	653	1,482	2,791	224,914
	7.50 - 9.99	596	6,812	85,909	6,396	2,879	1,089	481	8,405	535	113,102
	10.0 <	1,089	6,794	106,647	8,220	9,072	3,182	422	618	887	136,931
	Total	403,349	368,809	1,280,690	198,746	24,558	13,285	2,238	12,605	8,456	2,312,736
%	0.5 >	36.2	14.8	11.1	16.7	1.1	7.8	3.7	0.0	8.5	16.3
	0.50 - 0.99	26.3	18.3	10.9	13.3	4.5	5.7	0.0	0.0	8.0	14.8
	1.00 - 1.49	18.1	22.0	12.0	13.9	1.8	4.6	10.5	0.0	8.1	14.6
	1.50 - 1.99	6.7	11.1	7.1	7.9	0.5	4.3	2.0	0.0	4.0	7.6
	2.00 - 2.99	9.6	13.6	14.2	13.7	6.2	13.4	3.4	0.0	6.4	13.0
	3.00 - 4.99	1.3	9.5	17.2	16.4	15.7	20.9	10.9	16.7	15.2	13.1
	5.00 - 7.49	1.5	7.0	12.5	10.7	21.5	11.1	29.2	11.8	33.0	9.7
	7.50 - 9.99	0.1	1.8	6.7	3.2	11.7	8.2	21.5	66.7	6.3	4.9
	10.0 <	0.3	1.8	8.3	4.1	36.9	24.0	18.9	4.9	10.5	5.9
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: DaCRISS HIS, 2008.

7.18 Travel time in Danang is illustrated in Figure 7.3.4. The average travel time in 2008 was 14.9 minutes excluding walk trips, with about 47% of trips lasting for less than 10 minutes. The peak for trip distribution is 10–20 minutes. Compared with Hanoi and HCMC, the travel time was considerably shorter (Hanoi 21.9 minutes in 2005 and HCMC 18.3 minutes in 2002). It is noteworthy that the average travel time of these Vietnamese cities were much lower than that in most other Asian cities.

Figure 7.3.10 Average Travel Time Excluding Walk Trips by Zone, 2008



Source: DaCRISS HIS, 2008, Census 1999.
Note: Figure in Danang City: 14.9 minutes.

6) Reasons for Modal Choice

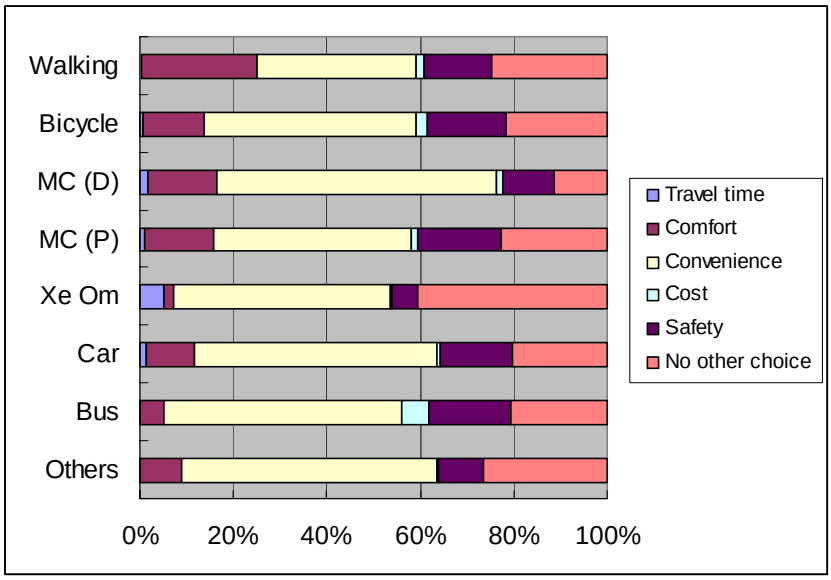
7.19 Table 7.3.16 and Figure 7.3.5 show the reasons for choosing transportation modes. Results show that convenience was the main reason for modal choice. Nearly 60% of motorcycle drivers chose this mode because of its convenience. On the other hand, it is noted that the "no other choice" category was relatively high in all modes, especially xe om.

Table 7.3.16 Reasons for Modal Choice, 2008

Mode		Travel time	Comfort	Convenience	Cost	Safety	No other choice	Total
Walking		0.4	24.6	34.0	1.8	14.4	24.9	100.0
Bicycle		0.5	13.1	45.7	2.1	16.8	21.7	100.0
MC (Driver)		1.5	14.8	60.2	1.1	11.4	10.9	100.0
MC (Passenger)		1.0	14.9	42.4	1.5	18.0	22.1	100.0
Xe Om		4.0	11.9	28.0	1.0	11.9	43.2	100.0
Car		1.3	11.4	53.1	0.7	12.0	21.5	100.0
Public Bus	Minibus	0.0	4.7	59.3	2.1	16.6	17.3	100.0
	Standard Bus	0.0	2.4	47.1	6.5	16.0	28.0	100.0
Others		0.0	15.2	31.2	1.1	6.7	45.7	100.0
Total		1.1	16.3	50.9	1.5	13.5	16.7	100.0

Source: DaCRISS HIS, 2008.

Figure 7.3.11 Reasons for Modal Choice, 2008



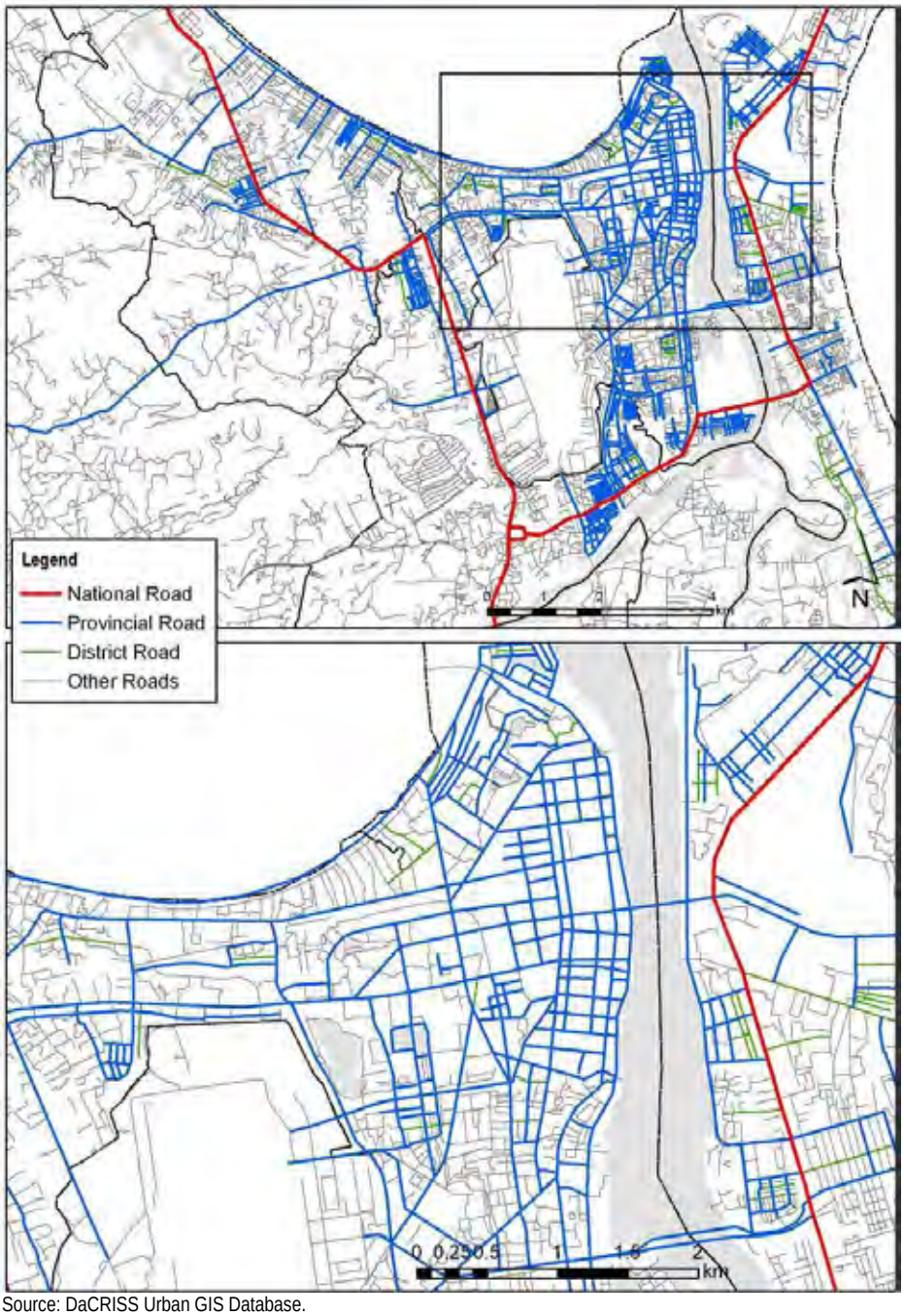
Source: DaCRISS HIS, 2008.

7.4 Roads and Road Traffic

1) Road Network and Management

7.20 Road network in Danang City which, as of 2008, is composed of national highways (690km), provincial roads (100km), and urban roads (311km, including district and other roads) with a total length of about 480 km. NH1A and NH14B are the interprovincial/city linkage to and from Danang City. Provincial roads connect mainly between urban districts and mountainous Hoa Van District as well as Quang Nam Province. The urban road network in the city center, particularly Hai Chau and Thanh Khe districts, is dense and shows a grid pattern. The city's overall network, however, is characterized largely by radial national highways (see Figure 7.4.1).

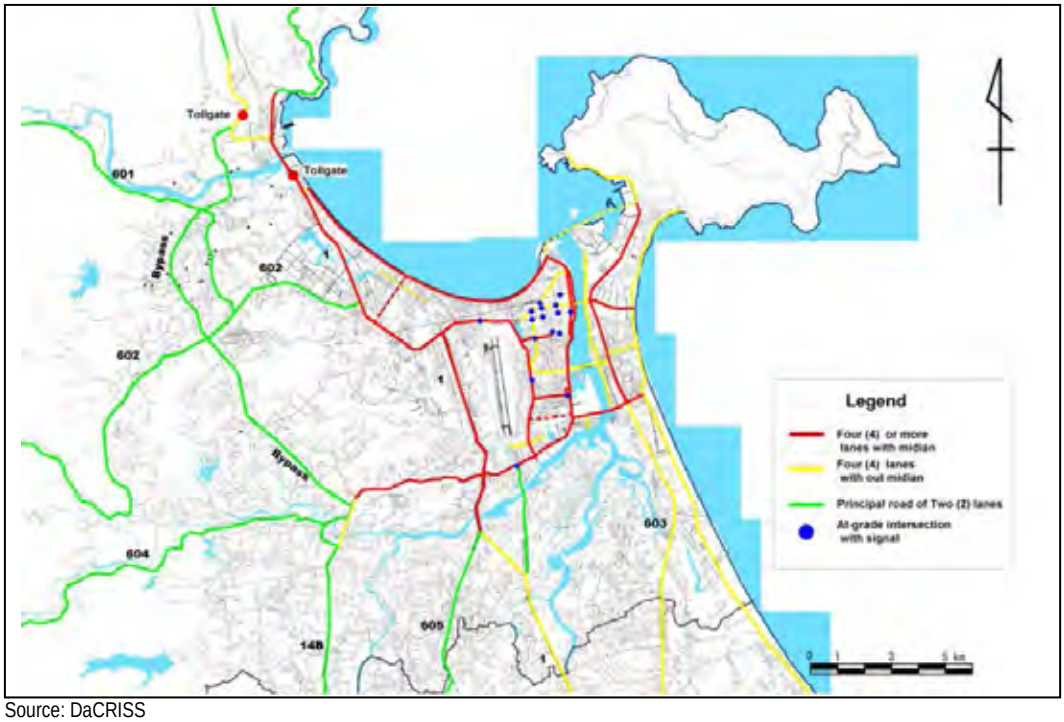
Figure 7.4.1 Road Network in Danang City by Administrative Classification, 2008



Source: DaCRISS Urban GIS Database.

7.21 As shown in Figure 7.4.2, arterial roads including national highways and some major urban roads have four or more lanes, with some having center medians. Most sections of provincial roads only have two lanes with neither center medians nor sidewalks.

Figure 7.4.2 Arterial Road Map of Danang City



Source: DaCRISS

7.22 The density of urban roads in the central districts of Hai Chau and Thanh Khe is 3.9–4.6 km/km$^{2.}$ In other districts except Hoa Vang, it is 0.6–1.1 km/km^2. About 65% of roads are paved by asphalt or cement concrete, and the remaining roads, mostly in the rural areas, have simple DBST, gravel or earth surface (see Table 7.4.1). Danang has 77 bridges, 34 of which are permanent and 43 are temporary.

Table 7.4.1 Road Managed by Danang City

Road Class (District)		No. of Roads	Total Length (km)	Road Density (km/sq.km)	Length by Surface Type (km)				
					Cement Concrete	Asphalt Concrete	DBST[1)]	Gravel	Earth
National Highway 1A		1	37.2	-	-	37.2	-	-	-
National Highway 14B		1	32.1	-	-	32.1	-	-	-
Provincial Road Sub-Total		4	99.9	-	-	0.4	69.8	-	29.7
Urban Road [2)]	Hai Chau	98.3	98.3	4.6	3.0	90.4	4.1	0.5	0.3
	Thanh Khe	36.5	36.5	3.9	1.3	30.7	2.2	1.0	1.3
	Lien Chieu	50.5	50.5	0.6	1.3	33.6	13.8	1.0	0.8
	Cam Le	35.6	35.6	1.1	1.6	29.2	4.5	0.3	-
	Ngu Hanh Son	34.3	34.3	0.9	0.9	14.7	13.7	5.0	-
	Son Tra	55.7	55.7	0.9	1.6	36.0	14.0	1.3	2.9
	Sub-Total	310.9	310.9	1.3	9.7	234.6	52.3	9.1	5.3
Total		429	480.1	0.5	9.7	304.3	122.1	9.1	35.0

Source: DOT, Da Nang City
Note:
[1)] Double Bituminous Surface Treatment
[2)] Roads in Hoa Vang District and Hoang Sa is not included

7.23 National highways are developed and managed by national agencies, particularly the Vietnam Road Administration (VRA) under the Ministry of Transport (MOT). However, the management of some sections near to large cities is with responsibility of local governments. In the case of Danang City, NH14B is managed by Danang City as authorized by the MOT. The Danang Transport Maintenance and Management Company is assigned by the Department of Transport (DOT) of Danang to directly manage and regularly repair roads and waterways.

2) Existing Conditions of Major Roads

(a) **National Highway 1A:** The section of NH1A in Danang from the top of Hai Van pass (Km904+800) to Hoa Phuoc (KM941–boundary between Danang and Quang Nam) has a length of 36.2 km. Its specifications are as follows:

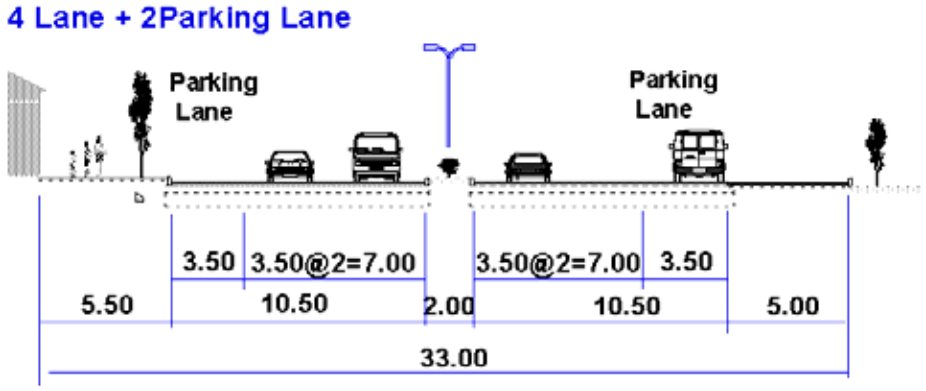
(i) The section from Hai Van pass (Km 904+800) to Kim lien Bridge has length=8 km, right-of-way (ROW)=9 m, carriageway=7 m;

(ii) The section from Kim Lien to Hue, which has four lanes and a length of 13.4 km, was upgraded under the NH1A improvement project to have a ROW=33 m, carriageway=21 m;

(iii) The section from Hue to Hoa Cam, which has four lanes and a length of 5.6 km, was upgraded under the NH1A improvement project to have a ROW=28 m, carriageway=21 m, central reserve=2 m, sidewalk=5 m; and

(iv) The section from Hoa Cam to Hoa Phuoc, which has lanes=4, length=5.6 km, ROW=28 m, and carriageway=21 m, was upgraded under the NH1A improvement project. At present, Danang City is upgrading this section to have a ROW=33 m.

Figure 7.4.3 Typical NH1A Cross-section



Source: DaCRISS Study Team.

(b) **National Highway 14B:** NH14B is located in the East-West Economic Corridor, from Tien Sa Port through the four-lane Hoa Cam section to the boundary between Quang Nam and Danang for a length of 33.5 km. Its specifications are as follows:

(i) Section Km0–Km4+300: B=5+10.5+2+10.5+5=33m;

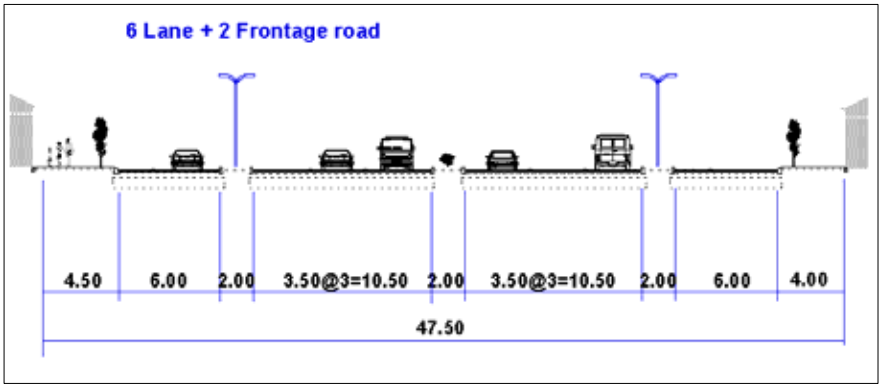
(ii) Section Km4+300–Km12+340: B=4.5+6+2+10.5+2+10.5+6+2+4.5=48m;

(iii) Section Km12+340–Km18+779 (Hoa cam junction): B=5+10.5+2+10.5+5=33m;

(iv) Section Km18+779–Km24+100: B=4.5+6+2+10.5+2+10.5+6+2+4.5=43m; and

(v) Section Km24+100–Km33+500 (Hoa Khuong): B=0.5+11+0.5=12m.

Figure 7.4.4 Typical NH14B Cross-section



Source: DaCRISS Study Team.

(c) **Danang Bypass:** At present, the Ministry of Transport is investing in the construction of the NH1A bypass. The section passing Danang City will have a length of 18 km and will link the south of Hai Van tunnel to Tuy Loan (NH14B). Its specifications are: ROW=12 m, carriageway=11 m (phase one).

(d) **Provincial Road DT601:** From An Ngai Tay to De Bay pass, this road has a length of 42.2 km. The section from An Ngai Tay to Hoa Bac village people's committee office has a length of 11 km, ROW of 6–7 m, carriageway of 4.5 m with asphalt surface. The remaining section runs through hilly or mountainous areas, complex terrain, and sparse population. It has earth pavement with some sections made of granular material but these sections have deteriorated. The bridge and sewerage system have seriously weakened and therefore need to be upgraded or rebuilt; their serviceability is very poor, especially in the wet season.

(e) **Provincial Road DT602:** From Hoa Khanh T-type at grade intersection to the Ba Na mountain tourism zone, the road has a length of 31.5 km. Section Km4+200–Km15+400 (An Loi Bridge): length=11.2 km, ROW=9 m, carriageway=5.5 m with spread asphalt. Section Km15+400–Km31+500: length=16.1 km.

(f) **Provincial Road DT604:** From Tuy Loan to Kien slope, the road has a length of 24.7 km, ROW=7.5 m, carriageway=4.5 m with spread asphalt. The technical conditions of the road are fairly good and road surface is stable. The sewerage system is getting deteriorated and this section becomes flooded in the wet season.

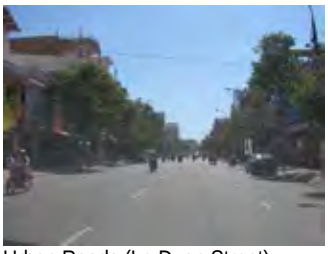
(g) **Provincial Road DT605:** From Km935+165 of the NH1A to Hoa Tien, the section has a length of 5.96 km. Danang City is improving and expanding this road to meet the standards for urban roads, i.e., cross-section ROW=25 m, carriageway=15 m.

(h) **Hai Van Tunnel:** The Hai Van Tunnel, the longest tunnel in Southeast Asia has a length of 6.28 km and lies on NH1 between the cities of Danang and Huế in central Vietnam.

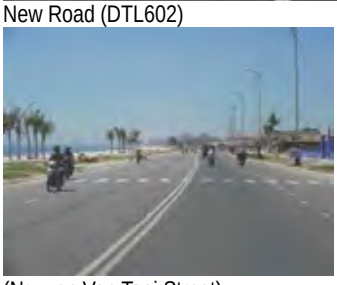

NH1A (in Hoa Vang Dist.)


NH14B (in Hoa Vang Dist.)


New Road (DTL602)


Urban Roads (Le Duan Street)


(Bach Dang Street)


(Nguyen Van Toai Street)

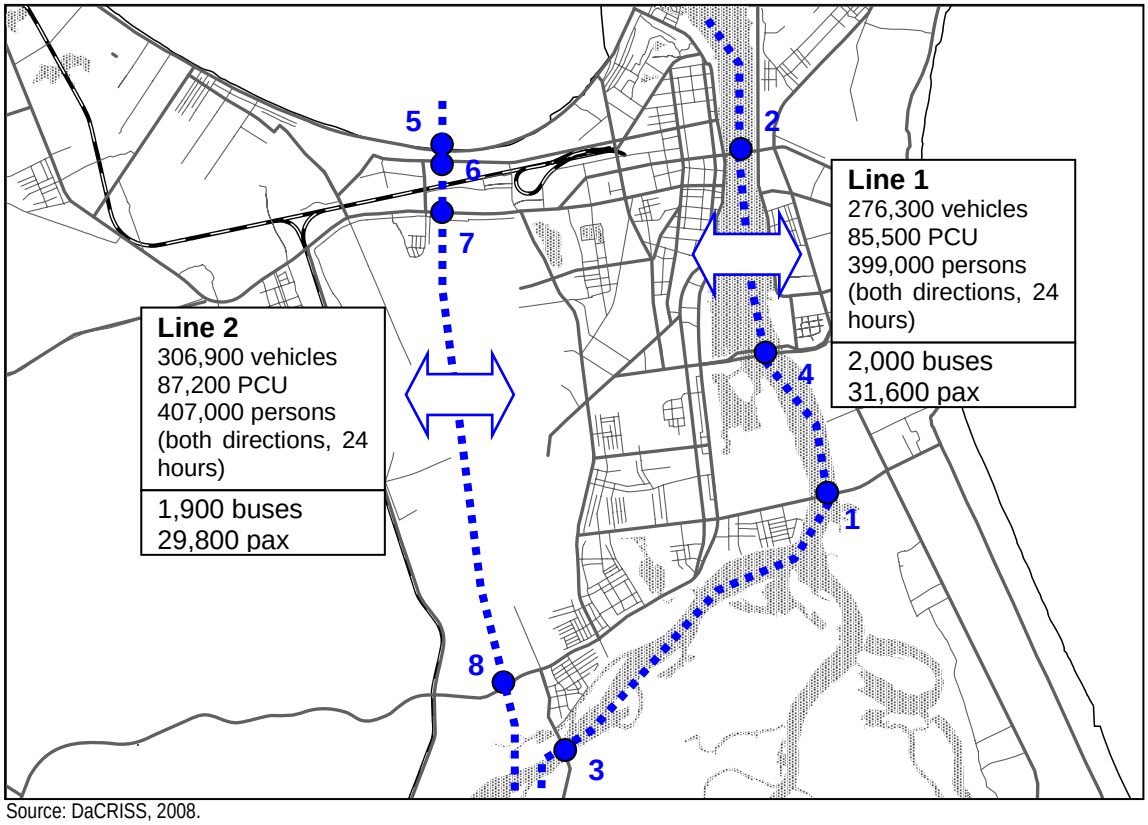
3) Existing Conditions of Main Bridges

7.24 Currently, the city has a total of 45 bridges. Between 1997 and 2007, 35 bridges were rehabilitated or newly built. Han River Bridge, now a central landmark of the city, was constructed jointly by the state and private sectors as the first bridge connecting the east and west sides of Han River. New bridges are being built in line with the expansion of the urban area and construction of new roads, including Thuan Phuoc Bridge connecting Hai Chau District to Son Tra Peninsula, Dragon Bridge to serve for tourists leading them directly from the airport to the coastal areas, and other bridges such as Nguyen Van Troi Bridge and Tran Thi Ly Bridge, Tuyen Son Bridge, Hoa Xuan Bridge, etc.

4) Road Traffic Conditions

7.25 In general, traffic conditions in Danang City are relatively good because there is less traffic here compared with other large cities such as Hanoi and HCMC. In DaCRISS, traffic surveys were conducted on eight road sections crossing two screen lines in order to capture traffic movement between the city center and other areas, as shown in Figure 7.4.5. Four survey stations were set on the bridges crossing the first screen line along the Han River. Another four survey stations were set on major roads crossing the second screen line which separates the city center from western areas.

Figure 7.4.5 Vehicular Traffic Volume on Screen Lines, 2008



Source: DaCRISS, 2008.

(1) Vehicular Traffic Volume

7.26 Vehicular traffic volume in 2008 is summarized in tables 7.4.2 and 7.4.3. Total vehicular traffic volume was 276,302 across screen line 1 and 306,924 across screen line 2. The most dominant mode of transportation was motorcycle, sharing nearly 90% of the total. Bicycles, cars, and trucks shared about 3–5% each. The share of bus was only 0.7% of the total, although it included public and private buses such as tourist and company buses. Of the eight surveys stations, Dien Bien Phu Road and Han River Bridge had traffic volumes of more than 100,000 vehicles, i.e., 199,918 and 136,205, respectively.

(2) Passenger Traffic Volume

7.27 The above-mentioned vehicular traffic volume was converted to the number of passengers using average number of passengers on board by vehicle type. The estimated average number of passengers is 1.20 for bicycle, 1.30 for motorcycle, 1.99 for car, 2.21 for taxi, 1.13 for cyclo, 11.35 for minibus, 21.61 for standard bus, and 14.99 for tourist bus (average of 24 hours both directions). As shown in Figure 7.4.6 and Table 7.4.3, the total passenger traffic volume was 399,000 across screen line 1 and 407,000 across screen line 2.

Table 7.4.2 Vehicular Traffic Volume on Major Road Sections, 2008

	Station	Bicycle	Motor-cycle	Car/ Taxi	Bus	Truck	Others	Total	PCU
Line 1	1.Tuyen Son Bridge	707	30,011	2,053	801	3,441	32	37,045	18,408
	2.Han River Bridge	5,924	124,902	4,526	507	91	255	136,205	31,984
	3.Cam Le Bridge	1,642	38,720	1,400	332	2,222	28	44,344	15,697
	4.NV.Troi/TT.LyBridge	1,230	52,917	1,569	402	2,481	109	58,708	19,427
	Sub-total	9,503	246,550	9,548	2,042	8,235	424	276,302	85,515

	% by Vehicle Type	3.4	89.2	3.5	0.7	3.0	0.2	100.0	-
Line 2	5. Nguyen Tat Thanh	942	20,089	1,334	284	474	31	23,154	7,299
	6. Tran Cao Van	5,817	29,941	624	96	452	177	37,107	9,133
	7. Dien Bien Phu	11,223	178,970	4,340	1,284	3,515	586	199,918	53,851
	8.Cach Mang Thag 8	3,408	38,909	1,563	282	2,521	62	46,745	16,905
	Sub-total	21,390	267,909	7,861	1,946	6,962	856	306,924	87,189
	% by Vehicle Type	7.0	87.3	2.6	0.6	2.3	0.3	100.0	-
2 Lines Total		5.3	88.2	3.0	0.7	2.6	0.2	100.0	-

Source: DaCRISS, 2008.
Note: Traffic count covered 8 stations and vehicles headed in both directions for 24 hours..

Table 7.4.3 Passenger Traffic Volume on Major Road Sections, 2008

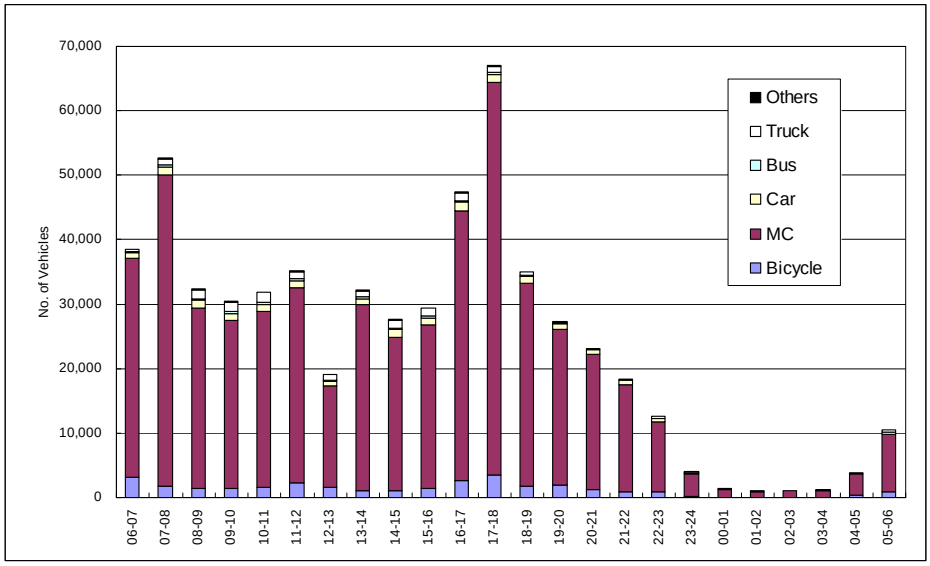
Station		Bicycle	Motorcycle	Car/ Taxi	Bus	Truck	Others	Total
Line 1	1.Tuyen Son Bridge	848	39,014	4,175	12,435	5,162	35	62,430
	2.Han River Bridge	7,109	162,273	9,335	7,551	137	279	188,021
	3.Cam Le Bridge	1,970	50,336	2,805	5,247	3,333	31	64,155
	4.NV.Troi/TT.LyBridge	1,476	68,792	3,200	6,367	3,722	120	84,374
	Sub-total	11,404	320,515	19,514	31,599	12,353	465	398,979
	% by Vehicle Type	2.9	81.0	4.9	8.0	3.1	0.1	100.0
Line 2								
Line 2	5. Nguyen Tat Thanh	1,130	26,116	2,690	4,176	711	34	33,008
	6. Tran Cao Van	6,980	38,923	1,286	1,450	678	190	46,614
	7. Dien Bien Phu	13,468	232,661	8,840	19,578	5,273	648	265,060
	8.Cach Mang Thag 8	4,090	50,582	3,145	4,547	3,782	63	62,547
	Sub-total	25,668	348,282	15,961	29,751	10,443	935	407,229
	% by Vehicle Type	6.0	80.8	3.7	6.9	2.4	0.2	100.0
2 Lines Total		4.5	80.9	4.3	7.4	2.8	0.2	100.0

Source: DaCRISS, 2008.
Note: Traffic count covered 8 stations and vehicles headed in both directions for 24 hours.

(3) Traffic Fluctuation

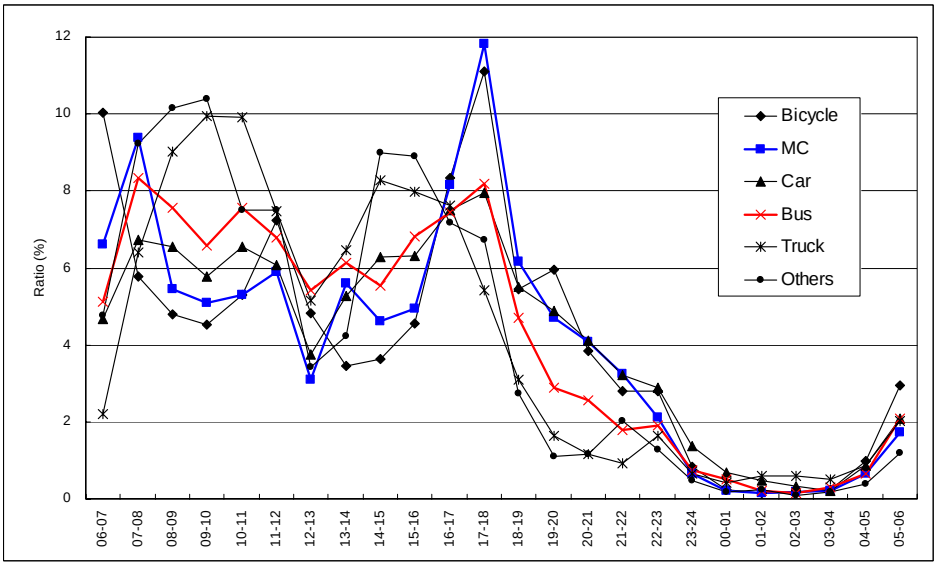
7.28 As shown in Figure 7.4.7, afternoon peak (5–6 p.m.) was higher than that in the morning (7–8 a.m.), 11.5% and 9.0% respectively. Very low traffic was observed at lunch time (3.3%) and midnight from 11 p.m. to 5 a.m. (less than 1% in each hour). By vehicle type, fluctuation of motorcycle traffic was almost the same for all modes, as shown in Figure 7.4.8, because it is the dominant mode of transportation. Peak hour ratio of bus was low at around 8% and its demand was relatively weak during the day. Traffic fluctuation by direction had no significant differences between directions. To illustrate, the traffic fluctuation by direction on Han River Bridge and Dien Bien Phu road is presented in Figure 7.4.8.

Figure 7.4.6 Hourly Vehicular Traffic Fluctuation, 2008



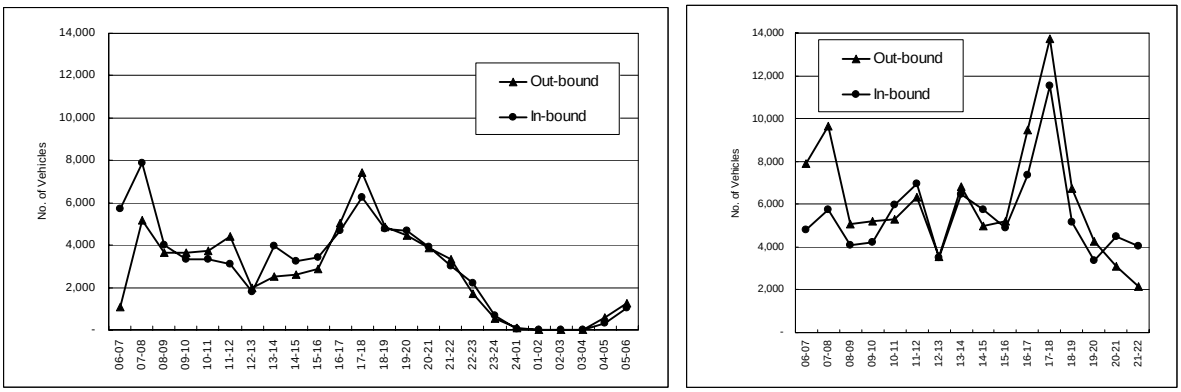
Source: DaCRISS, 2008.
Note: Traffic count covered 8 stations and vehicles headed in both directions.

Figure 7.4.7 Hourly Vehicular Traffic Fluctuation by Vehicle Type, 2008



Source: DaCRISS, 2008.
Note: Traffic count covered 8 stations and vehicles headed in both directions.

Figure 7.4.8 Hourly Vehicular Traffic Fluctuation by Direction



Source: DaCRISS, 2008.

(4) Congested Intersections

7.29 The location of congested intersections was identified by the DOT and shown in Figure 7,4.9. Although the definition of congestion is not clear, it may be observed only in the morning and afternoon peak hours. Traffic congestion on the mid-section of roads is very limited. Based on the experiences in mega cities of Asia, traffic congestion in Da-nang is at a minimum and does not form into long queues; vehicles merely slow down when crossing.

Figure 7.4.9 Congested Intersections in the Center of Danang City

1. Le Duan – Tran Phu
2. Le Duan – Nguyen Chi Thanh
3. Le Duan – Nguyen Thi Minh Khai
4. Le Duan – Ngo Gia Tu
5. Ong Ich Khiem-Tran Cao Van-Quang Trung
6. Ong Ich Khiem – Dong Da
7. Ong Ich Khiem – Hai Phong
8. Ong Ich Khiem – Le Duan
9. Ong Ich Khiem – Hung Vuong
10. Ong Ich Khiem – Nguyen Hoang
11. Hung Vuong – Yen Bai
12. Hung Vuong – Nguyen Chi Thanh
13. Hung Vuong – Teieu Nu Vuong
14. Phan Chu Trinh-Hoag Dieu-Tran Quoc Toan
15. Hoang Dieu – Trung Nu Vuong
16. Trung Nu Vuong – Le Dinh Tham
17. Dien Bien Phu-Ton Duc Thang-TruongChinh
18. Trieu Nu Vuong-Nguyen Trai
19. Quang Trung – Nguyen Chi Thanh
20. Quang Trung – Le Loi
21. Quang Trung – Nguye Thi Minh Khai
22. Quang trung – Dong Da
23. Le Loi – Ly Tu Trong
24. Tran Cao Van – Le Do

Source: DOT, Danang


Intersection of Le Duan–Ngo Gia Tu


Intersection of Le Duan–Ong Ich Kiem