

4 REVIEW OF EXISTING PLANS FOR DANANG CITY

4.1 At present, Danang City has a number of approved plans which provide an umbrella framework for, and affect the development and management of, the city as a whole and its key sectors. Related plans reviewed in DaCRISS are the following:

- (a) **Socio-Economic Development Plan 2006–2010:** The draft Socio-Economic Development Plan 2006–2010 or SEDP 2006–2010¹ for Danang City was prepared by the Danang People's Committee (DPC) and the Department of Planning and Investment (DPI) with inputs from other departments. It includes an overview of Danang's economic situation, including opportunities and challenges, as well as objectives and targets for the plan period of 2006–2010. The city's "special attributes" identified in the SEDP and which are expected to contribute to improved levels of economic growth include the city's premier administrative status, the region's major tourism attractions and facilities, and the emphasis being given to opening up the economy and markets. However, the Plan recognizes that there are serious challenges that must be met. These include: (i) the present relatively low levels of economic development; (ii) an investment situation where demand is high but available funds are low; (iii) need to strengthen the city's urban management capacity; (iv) rapid urbanization wherein infrastructure provision cannot match demand; and (v) mounting environmental problems associated with rapid city expansion.
- (b) **Socio-Economic Development Master Plan up to 2020:** The DPI of Danang City drafted the "Report on Danang City Socio-Economic Development Master Plan up to 2020" (hereinafter referred to as SEDP 2020) in 2008. The City Assembly approved the Plan on 3 July 2008 and is now awaiting the final approval by the Prime Minister. After the appropriate procedure, it will be finally authorized for implementation. Table 4.1 shows the summary of the SEDP 2020.
- (c) **Danang City Master Plan (Construction Plan):** In line with the prevailing national planning system in Vietnam and as provided by the Construction Law and supporting legislation, urban construction plans or master plans comprise a general plan for an urban area and detailed district as well as local plans. The "General Plan for Danang City 2000–2020" was prepared mainly by the National Institute for Urban and Rural Planning (NIURP²) in Hanoi in 1999, and revised in 2003. A further readjustment of the Master Plan was done in 2007. In preparing the Master Plan, NIURP reportedly collaborated with concerned local agencies such as the DPI, Project Management Office (DOC PMO), Urban Planning Institute (UPI), DONRE, and Department of Labor, Invalids and Social Affairs (DOLISA).
- (d) **Danang City Land Use Plan 2006–2010:** The draft of the "Da Nang Land Use Plan 2006–2010" prepared by DONRE revises the preceding Danang land-use plans for the 1997–2010 and 2004–2010 periods. It focuses on the supply of urban land to meet the city's development needs, specifically by converting some agricultural and unused land.

¹ The WB assessment is based on the draft SEDP published in May 2005. The SEDP was eventually approved on 28 December 2005.

² Reorganized into the Vietnam Institute of Architecture, Urban and Rural Planning still under the Ministry of Construction.

- (e) **Danang Environment City Development Plan:** The “Environmental City–Danang” concept was formulated to transform the city into an environmental city, while also pursuing sustainable development and improving people’s living conditions. While the environmental quality in Danang City in the last 10 years has seen positive changes and improvements, rapid urbanization and expansion of industrial estates are seen as the causes of environmental degradation and their adverse impacts are predicted to worsen if efforts to manage such phenomena are not carried out successfully.

4.2 It is assumed that the reviewed key plans are to be integrated under an umbrella policy of transforming Danang City into a competitive and livable environmental city. It is in pursuit of this objective that there have been, or are, important undertakings carried out by donors. These include the “Danang Priority Infrastructure Investment Project” (PIIP) of the World Bank, a public transport improvement project of KfW³, and “Developing Danang–The Environmental City” of GTZ, among others.

Table 4.1 Summary of the Danang Socio-economic Development Plans

Target	SEDP 2006–2010	SEDP 2010–2020
General Development Objective	<ul style="list-style-type: none"> • Become a satellite urban center playing an important role in CFEZ development in particular and national development in general. 	<ul style="list-style-type: none"> • Become one of the largest urban centers in Vietnam and the economic and social center of the central coastal regions.
Economic Development	<ul style="list-style-type: none"> • Achieve a GDP of 14–15% per year, wherein agriculture grows 5-6%, industry 22–23%, and services 14–15% with a corresponding production share of 3.2%, 48.8%, and 48%, respectively. • Increase export turnover at 23–24% per year. • Achieve a GDP per capita of USD 2,000 by 2010. 	<ul style="list-style-type: none"> • Achieve a GDP of 12–13% per year, wherein agriculture has a production share of 1.6%, industry 55.6%, and service 42.8%. • Increase export turnover at 19–20% per year; and • Achieve a GDP per capita of USD 4,050–5,000 by 2020.
Social Development	<ul style="list-style-type: none"> • Improve overall education and training capacity. • Establish vocational schools, software center, humanity and social science center. • Establish biology research center, and upgrade existing hospitals and construct new general hospitals. • Reduce poverty rate to 0.58% by 2010. • Create 10,500 new dwellings. 	<ul style="list-style-type: none"> • Further improve overall education and training capacity. • For 100% of communes and districts to meet the national standard for public healthcare. • Reduce malnutrition rate to 10–12% and reduce annual birth rate to 0.3%. • Reduce poverty rate to 0.5% and reach 60% of better-off households (no clear criteria).
Environment	<ul style="list-style-type: none"> • Improve water environment. • Treat wastewater from industrial parks to meet environment standards, etc. 	<ul style="list-style-type: none"> • Develop Danang City into an “Environment City” by 2020. • Provide 100% of urban population and 90% of rural population with access to clean water by 2015. • Collect and treat 100% of solid waste by 2015 and recycle over 95% of solid waste by 2020. • Collect and treat 100% of industrial and domestic wastewater by 2020.
Infrastructure Development	<ul style="list-style-type: none"> • Provide roads, airports, water supply and drainage systems, urban greenery. 	<ul style="list-style-type: none"> • Further provide roads, airports, water supply and drainage systems, urban greenery. • Connect 100% of suburban households to the power grid, etc.
Population	<ul style="list-style-type: none"> • Achieve an average population growth rate of 1.9%. • Achieve a total population of 859 million by 2010. • Generate employment: 32,800 pa (2006-2010) 	<ul style="list-style-type: none"> • Maintain a natural population growth rate of 1%. • Achieve a social growth rate (net migration) of 5%. • Achieve a total population of 1,078 million by 2015 and 1,369 million by 2020. • Keep the urban population rate at 92% by 2020. • Generate employment: 32,000-35,000 pa (2006–2010) 35,000-45,000 pa (2011–2020).

Source: Danang SEDPs

³ “Feasibility Study for Improvement of Public Transport in Da Nang City 2008–2015” carried out in 2008 .

5 VISION AND GOALS

Vision and Goals

5.1 Danang City has adopted the “Environmental City” concept as its vision for the city and objective of development. Based on this concept, the vision statement for Danang is proposed thus:

**“Danang to be an Internationally Competitive Environmental City
 Beyond being Pollution-free”**

5.2 The above vision for Danang City, which is fully supported by the stakeholders of the city, connotes the following ideas and intentions; (i) for Danang City not only to become free from pollution, but also to ensure broader environmental sustainability by preserving ecosystems and cultural assets, (ii) for Danang City to develop a distinct identity and an appealing image as a significant urban core in the Asia-Pacific region with a key role of connecting CFEZ with the world, and (iii) for Danang City to become a national center for developing new industries. In order to realize this vision for the city, a set of goals is elaborated, as follows; (i) manage growth effectively, (ii) develop a competitive economy, (iii) ensure an inclusive social development, (iv) manage environment effectively, and (v) strengthen governance.

Socio-economic Development Framework

5.3 Vision and development goals are further interpreted in terms of selected key socio-economic indicators to concretize strategies and achieve the vision and goals. The existing socio-economic indicators of the city for 2020 have been duly considered in the study when formulating those for 2025 (see Table 5.1).

Table 5.1 Main Socio-economic Indicators

		2007	2009	2025	Growth (07-25)	
					Ratio	% / yr
Population: 000	Total	807	890	2,100	2.6	5.5
	Productive ¹⁾	528	699 ³⁾	1,160	2.2	4.5
Households	Total No.: 000	204	278 ³⁾	563	2.8	5.8
	Ave. Size (no./household)	4	3.93 ²⁾	3.71	0.9	-0.4
Employment: 000 (%)	Primary	40 (11)	39 (10)	18 (2)	0.5	-4.1
	Secondary	123 (34)	135 (33)	198 (24)	1.8	3.4
	Tertiary	203 (56)	234 (57)	611 (74)	2.4	5.1
	Total	366 (100)	408 (100)	826 (100)	2	3.9
Student: 000 (%)	Primary	59 (27)	63 (29)	144 (32)	2.4	5.1
	Secondary	93 (43)	86 (40)	224 (50)	2.4	5
	Tertiary	65 (30)	68 (31)	78 (18)	1.2	1.1
	Total	218 (100)	217 (100)	486 (100)	2.1	4.1
GRDP: VND Billion (%) ²⁾	Primary	396 (4)	459 (4)	922 (1)	3.5	7.3
	Secondary	4,450 (44)	5,226 (44)	28,876 (17)	8.4	12.6
	Tertiary	5,169 (52)	6,054 (52)	138,201 (82)	9.4	13.3
	Total	10,015 (100)	11,738 (100)	168,000 (100)	8.7	12.8
GRDP / capita: VND million (USD) ²⁾		12.4 (730)	13.2 (775)	41.7(2,452)	3.4	5.5
Vehicle Ownership (% of household)	Car	1.5	1.6 ³⁾	69.9	46.6	23.8
	Motorcycle	90.1	84.6 ³⁾	23.2	0.3	-7.3

Source: 2007 figures from GSO, 2007 and DaCRISS HIS, 2008

1) assumed age group for productive population is 15 – 59 years old for male and 15 – 54 years old for female

2) in 2000 constant prices

3) estimated based on 2007 – 2025 growth

Alternative Growth Scenarios

5.4 **Alternative Scenarios:** Three alternative scenarios have been assessed:

- (a) **Scenario 1 (Base Case):** This scenario shows a future urban development situation where the current trend continues without significant intervention to the growth of urban areas. The future population is estimated to be about 1.2 million by 2025.
- (b) **Scenario 2 (Current Construction Plan):** This scenario envisages a future urban development situation that follows the existing urban plan prepared by the Department of Construction. The future population is set at 1.5 million by 2025.
- (c) **Scenario 3 (Accelerated Growth Strategy):** This scenario refers to a future urban development situation that responds to the need for accelerated growth in the Central Focal Economic Zone as well as the need for sustainable development in Danang City. The future population will be large enough for the city to provide internationally competitive and high-quality services to investors. The expected population by 2025 is about 2.1 million, and about 2.5 to 3 million by 2030.

5.5 **Proposed Growth Strategy:** The alternative scenarios have been rapidly assessed from the viewpoint of Danang City's sustainable development, wherein; (i) urban growth avoids sprawl and promotes effective land use, (ii) economic sustainability refers to competitiveness, including industry mix, investment attractiveness, impact on the region, and others, (iii) social sustainability refers to livability, including employment, access to services, equity, and others; and (iv) environmental sustainability considers pollution levels, preservation of the ecosystem, disaster preparedness, and others.

5.6 The results of the rapid assessment of the above alternative scenarios are summarized in Table 5.2. As is shown in the table, the potential urban area in the city is large enough to accommodate a population of 2.1 million.

Table 5.2 Rapid Assessment of Alternative Spatial Growth Scenarios

Item		Scenario 1: Base Case	Scenario 2: Current Construction Plan	Scenario 3: Accelerated Growth Strategy
Profile	Population (000)	1,213 (2025)	1,500 (2025)	2,117 (2025)
	Net Area ¹ (ha)	20,572	24,028	25,043
	Net Density (persons/ha)	59	62	85
Sustainability	Economic: • Industry mix • Investment attractiveness • Impact on the region	Low: • Ineffective land use • Decreased investment attractiveness • Little positive impact on the region	Moderate: • Urban sprawl • Lack of competitive urban center • Integrated with urban areas of adjoining provinces	High: • Modern compact CBD and sub centers • Strategic locations for new industries • Stronger integration with adjoining provinces
	Social: • Equity • Employment • Access to services	Low: • Limited employment opportunities • Continued outmigration	Moderate: • Difficult to provide public transport services	Moderate to High: • Stronger human resources • Improved accessibility to services • Stronger communities
	Environmental: • Pollution levels • Preserved ecosystems • Disaster preparedness	Low: • Spread of pollution • Adverse impact on ecosystem • Higher vulnerability to disasters	Moderate to High: • Environment is preserved/considered	Moderate to High: • Pollution-free • Preserved ecosystem • Improved amenity

Source: DaCRISS Study Team.

¹ 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.

6 DANANG CITY DEVELOPMENT STRATEGY

6.1 Danang City to Become an Internationally Competitive Growth Center for CFEZ, Vietnam, and GMS: The growth of Danang City as an environmental city must be sustainable, because the growth of CFEZ is highly dependent on the growth of Danang City and vice versa. However, ensuring a sustainable growth and development of the city and CFEZ is a tremendous responsibility. Assuming that the current trend continues, that is, SFEZ grows the fastest, followed by NFEZ, the gap between CFEZ and the latter two focal economic zones may further widen. Therefore, the most fundamental policy for Danang City to pursue is to establish a firm and long-term accelerated growth strategy to enable the city to function as the third-important growth center in the country whose role is to facilitate the physical and socioeconomic integration of the two stronger focal economic zones, and in the process serving as the link to a more realizable national integration. Without a strong growth area in the center of Vietnam, the country would find it hard, even impossible, to integrate the northern and southern growth centers and distribute the benefits of development to other areas in Vietnam, including the hinterland mountain regions as well as the Greater Mekong Subregion along the east–west corridor.

6.2 In order to respond to the above regional requirements, Danang City has to grow faster than it is currently experiencing. Future city population is targeted to reach 2.1 million by 2025 and even higher beyond that year. Danang's large population in the future is the basis for providing the city and CFEZ with high-quality urban services and amenities not only for the people but also for investors and visitors alike.

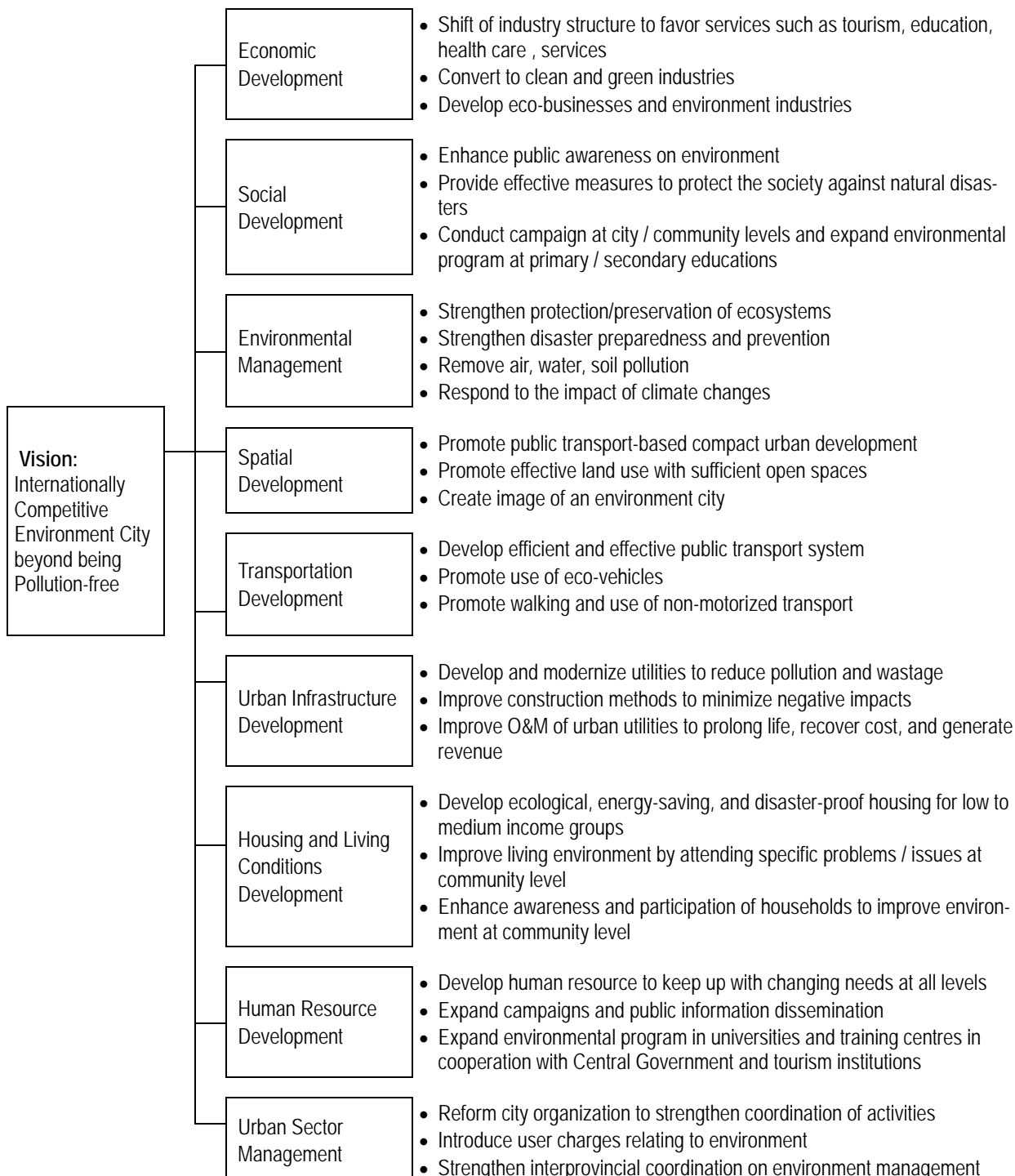
6.3 Challenges: With a target population associated with a high level of economic development, as well as social and environmental sustainability, the management of such growth process will prove to be a significant challenge not only for the city but also for the central government which encourages balanced national development. Without coordinated and integrated development strategies at central, provincial, and city government levels, the proposed scenario for the city and the expected synergy from all sectors will be difficult to realize. The main challenges therefore are as follows: (i) competitive economic environment, (ii) connectivity with the world, NFEZ, and SFEZ, and (iii) sustainable urban development.

6.4 Need for Integrated and Coordinated Strategies: A weakness in urban development planning in many Vietnamese cities is the uncoordinated implementation of policies and projects among them. Lack of coordination brings about not only wastage of limited resources but also ineffective outputs. For example, in introducing public transportation services, if the land use along the routes is not developed in a compact manner, access to such services becomes difficult and the people are discouraged from availing themselves of these services. If a development in an environmentally sensitive area becomes commercially successful, it will eventually affect the society adversely. In urban areas where different activities concentrate, there are always conflicting interests among stakeholders which require not merely coordination among relevant departments and policies but also call for broad-mindedness toward differing opinions. In order for Danang City to promote its envisioned development in the most effective manner, therefore, urban development strategies should be integrated across subsectors and implementing bodies should closely coordinate with each other..

6.5 At the same time, under the vision of an environmental city, the environment

should not merely be an appendage to development; rather, it should be the driving force to promote the city's sustainable development. To realize this, each urban subsector should have environment strategies in synergy with those in other subsectors (see Figure 6.1).

Figure 6.1 Integrated Subsector Strategies towards Environment City



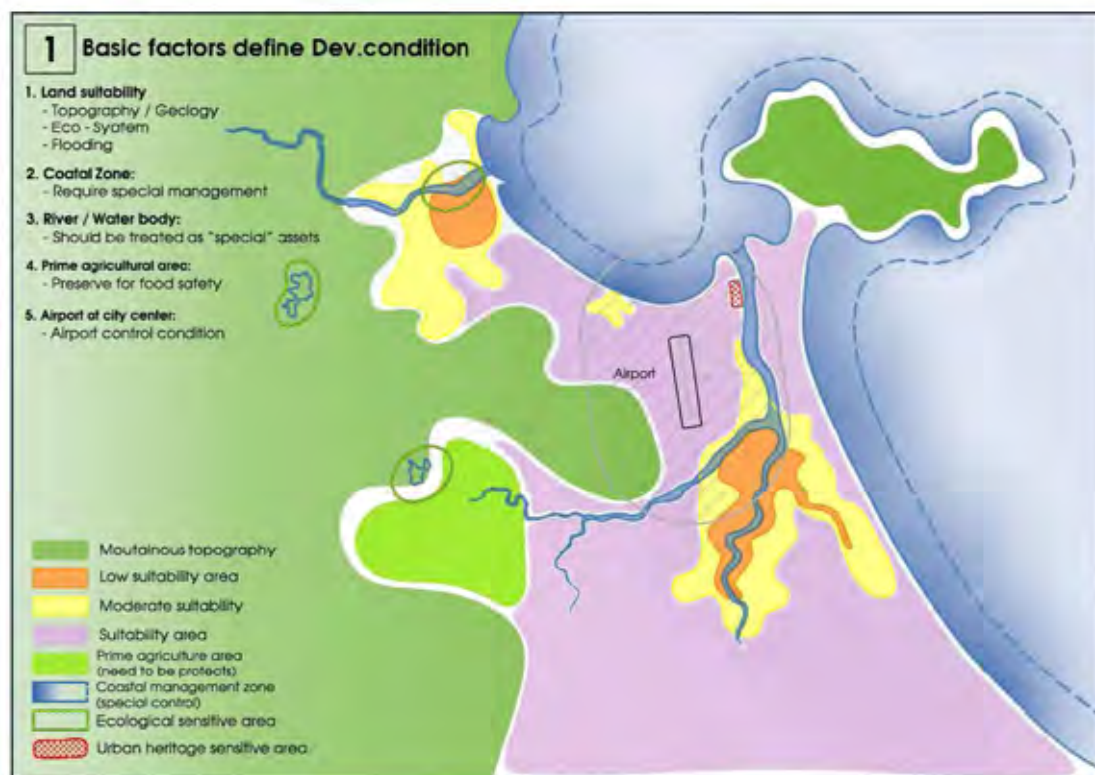
7 URBAN GENERAL PLAN FORMULATION

7.1 Planning Concept: The primary objective of spatial planning is to define the spatial development strategies in order to realize an environmental city, and to enhance the social, economic, and environmental sustainability. It is further defined as follows:

- (i) To establish function and image of an international environmental city;
- (ii) To enhance regional economy and increase employment by attracting investments (both domestic and international, in tourism, environment, education, healthcare, service, etc.);
- (iii) To provide a safe, comfortable, convenient, and clean living environment; and
- (iv) To create an environment in which ecological preservation, disaster management, pollution prevention, and adaptation to climate change are ensured.

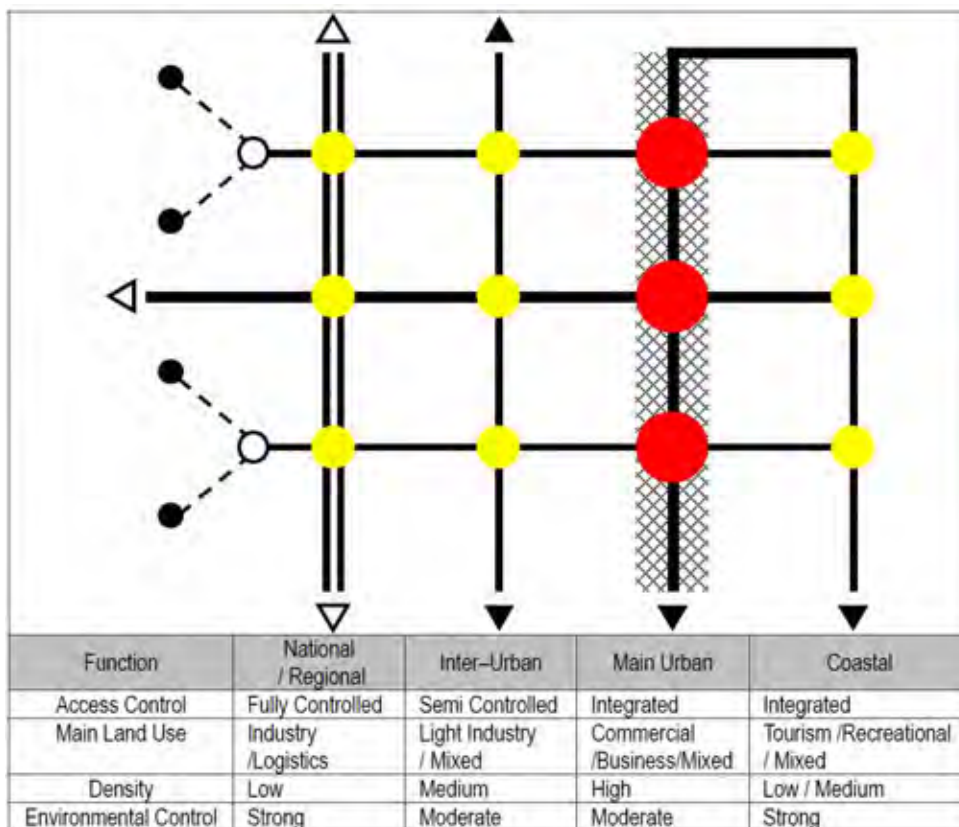
7.2 Spatial Structure Concept: The main points of the proposed spatial structure are as follows: (i) broad environmental zoning (primary environmental consideration before developments take place, broadly classifying areas into Ecological Preservation Zone, Marine / River Zone, and Urban Development Zone, see Figure 7.1), (ii) green and open space network (utilizing rich natural environmental resource comprising forests, mountains and hills, greenery, water bodies to create the identical image of the city as well as for tourism / recreation), (iii) transport network comprised of inter-city passenger / freight transport network (ports, high-speed railway, expressway, airport, provincial bus terminal), primary / secondary road network, and mass transit corridors, (iv) three main urban centers (Hai Chau, Lien Chieu, Ngu Hanh Son CBDs) and a number of suburban centers, and (v) urban expansion towards Quang Nam Province. (See Figures 7.2 and 7.3 for detailed spatial structure concept.)

Figure 7.1 Broad Zoning for Conservation and Development



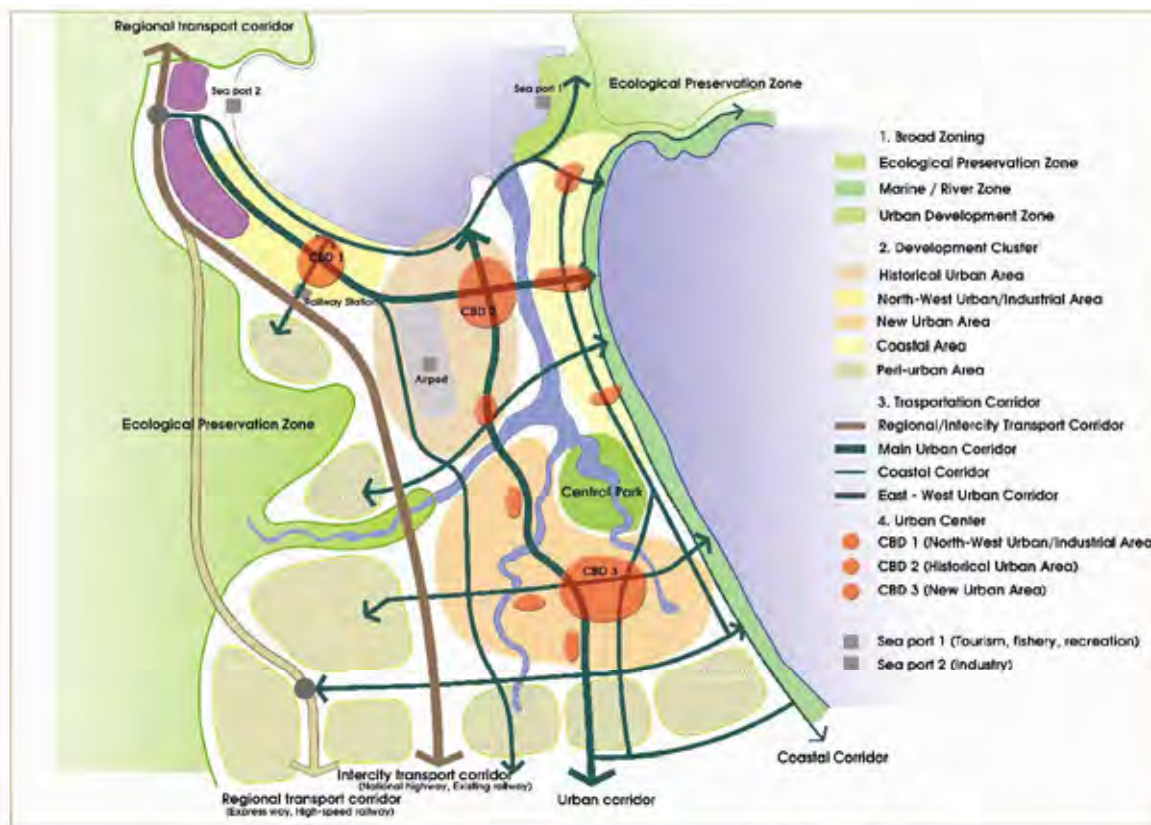
Source: DaCRISS Study Team

Figure 7.2 Structure of Transportation Network, Land Use and Environmental Control



Source: DaCRISS Study Team

Figure 7.3 Concept of Spatial Structure of Danang City



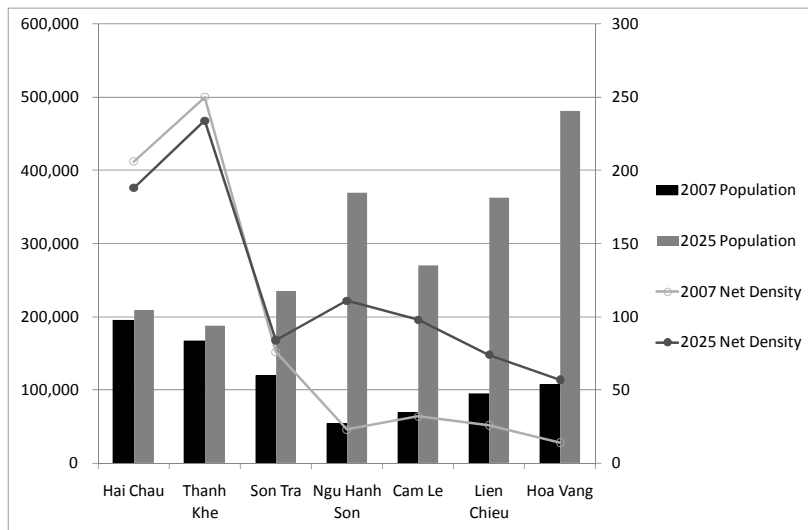
Source: DaCRISS Study Team

7.3 Proposed General Plan: The main points to consider in formulating the General Plan are as follows (see Figure 7.7):

- (a) **Broad Environmental Zoning:** See explanation in 7.2.
- (b) **Development of a Compact City based on Mass Transit:** Promote mixed land use (commercial, business, and residential) with a population density of 100-250 persons / ha along urban mass rail transit (UMRT) lines; adopt the UMRT, composed of the MRT, light rail transit (LRT), and bus rapid transit (BRT), depending upon demand and physical conditions.
- (c) **Enhancement of Existing Urban Areas:** Develop and/or preserve the Hai Chau central business district (CBD2 in Figure 7.3); manage urban transportation and develop the UMRT; control urban design including building heights.
- (d) **Development of New Urban Area:** Develop Lien Chieu CBD (CBD1 in Figure 7.3, administrative center under integrated development with national transportation projects, i.e., expressway and high-speed railway), Ngu Hanh Son CBD (CBD 3 in Figure 7.3, new commercial and business center, area for integrated education and new industrial technologies centering on Danang University). Strongly integrated with the UMRT.
- (e) **Upgrading of Danang Airport:** Keep it in its current location and work on an integrated development with the urban projects while developing the surrounding areas for airport-related businesses (new terminal building under construction is expected to be finished in 2011); expand and upgrade the airport.
- (f) **Strengthening of Connectivity with Regional Transportation Networks:** Strengthen the role of the city as a regional center through regional cooperation via expressways, high-speed railway, East–West Economic Corridor, etc.
- (g) **Development of Transportation Facilities:** Develop Tien Sa Port, Lien Chieu Port, and bus terminals; strengthen their function as transportation nodes.
- (h) **Establishment of Industrial Zones:** Shift to clean and green industries; remove polluting industries from existing urban areas; develop new industrial areas along expressways; and construct a competitive, high-tech park to accommodate new industries.
- (i) **Enhancement of Waterfront:** Improve the environment, preserve landscape, develop tourism and recreation opportunities along the waterfront including My Khe Beach, and Han River.
- (j) **Promotion of Green Areas and Open Spaces:** Manage the environment and protect forests and coastal areas; develop parks in urban areas; preserve open spaces in flood-prone areas (i.e., Hoa Xuan); and develop a green network.
- (k) **Development of Residential Areas:** Develop and expand flood-free urban lands including disaster-proof, energy-saving, low-cost apartment housing.

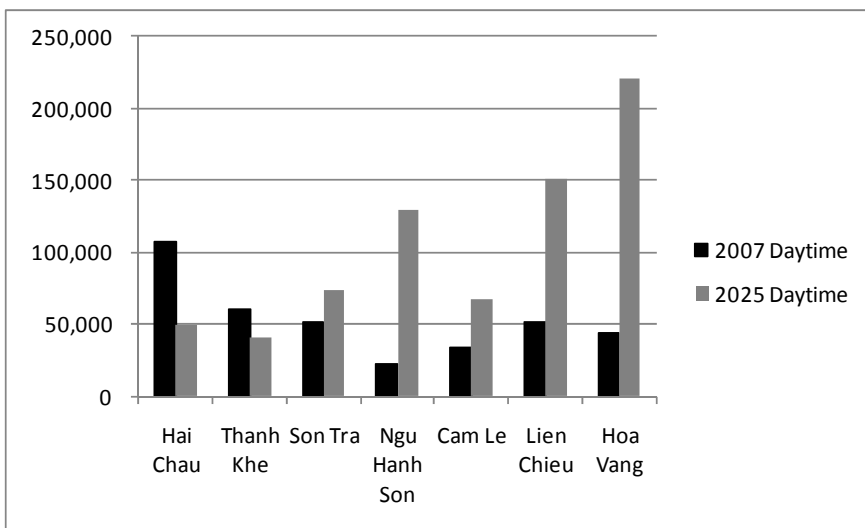
7.4 Socio-economic changes: Figures 7.4 to 7.6 summarizes the changes to population, population density, employment, and tertiary students in the proposed plan. Overall the city's population will grow rapidly as well as attract employment and students. While the current city centers show low population growth (Hai Chau, Thanh Khe Districts), The population in other districts grow rapidly, owing to the new CBD in Lien Chieu and Ngu Hanh Son. This will also effect employment, and students will be concentrated in Ngu Hanh Son CBD due to the plan of a university town.

Figure 7.4 Transition in Distribution of Population (2007 - 2025)



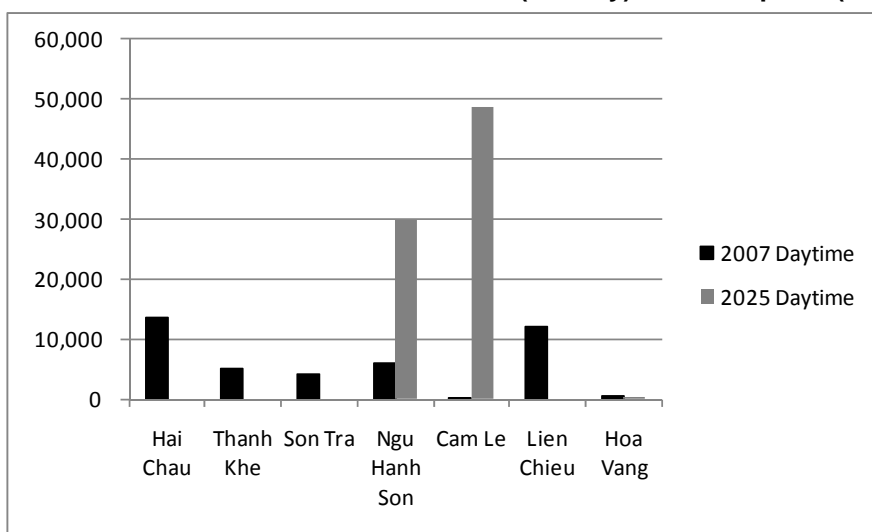
Source: DaCRISS Study Team.

Figure 7.5 Transition in Distribution of Employment at Workplace (2007 - 2025)



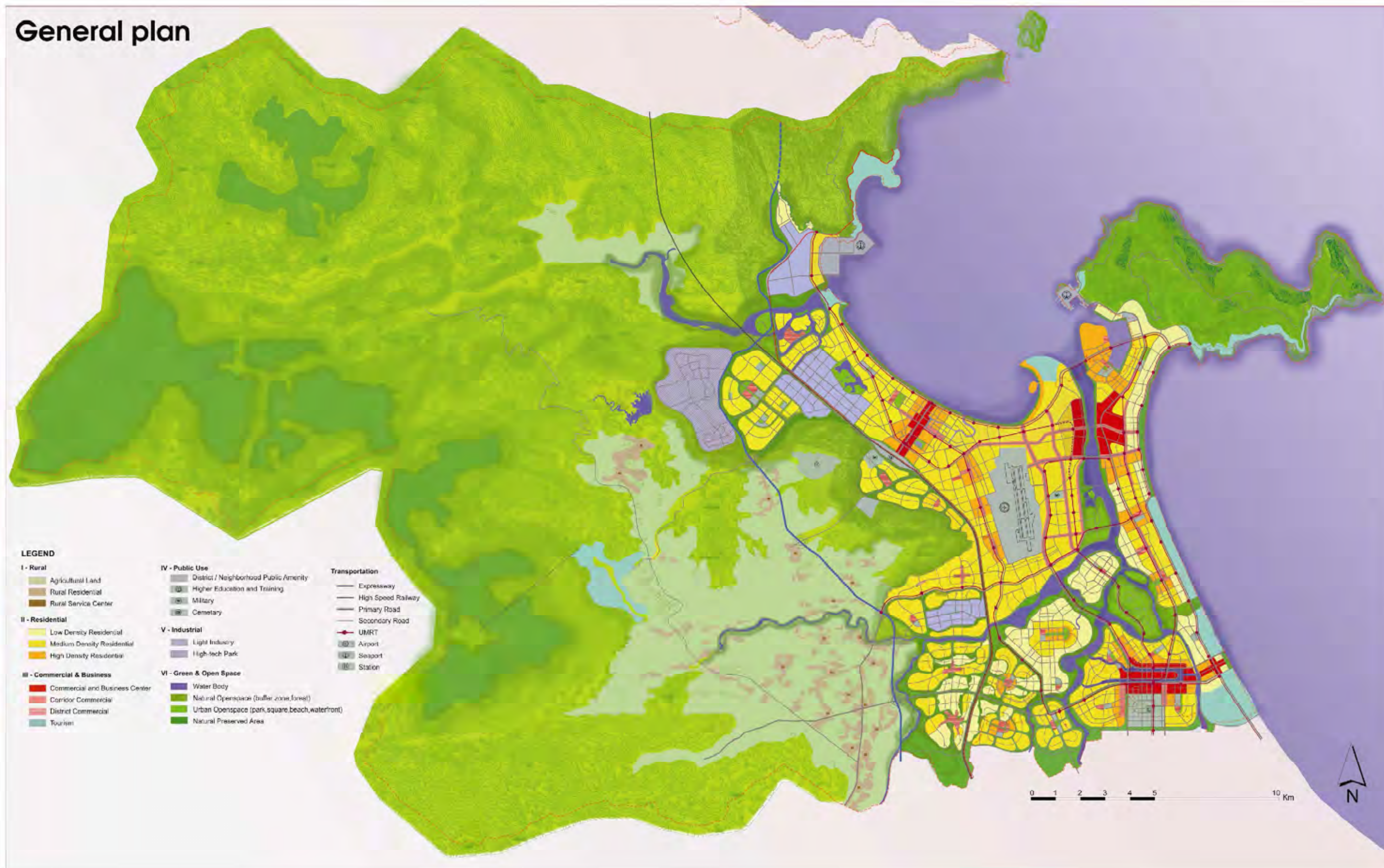
Source: DaCRISS Study Team.

Figure 7.6 Transition in Distribution of Students (Tertiary) at Schoolplace (2007 - 2025)



Source: DaCRISS Study Team.

Figure 7.7 Proposed General Plan



Source: DaCRISS Study Team.

8 TRANSPORTATION DEVELOPMENT PLAN

Planning Considerations

8.1 At present, Danang City has a relatively good transportation infrastructure providing both urban and interprovincial services; consequently basic demands are met. However, the future will be different, especially because Danang City intends to play a much more enhanced role in the growth and development of CFEZ, as explained in the foregoing chapters. To that end, the main considerations taken in the study are as follows:

- (i) Effective interface with the national transportation network;
- (ii) Development of an urban transportation network with clear functions and hierarchy (national/regional transportation corridor, main urban axis, coastal axis, etc.);
- (iii) Development of higher-quality public transportation system in integration with the development of compact urban areas;
- (iv) Introduction of eco-vehicles;
- (v) Expansion of space for non-motorized vehicles; and
- (vi) Development of transportation space for mixed activities and enhancement of urban landscape.

Alternative Scenarios based on Modal Shares

8.2 **Importance of Modal Share Policy:** How urban transportation demand will be met by different transportation modes in the future will critically affect traffic as well as infrastructure investment and service provision policy of the city authority. Table 8.1 and Figure 8.1 show the differences in traffic situations by each modal share scenario. In order to analyze traffic as a result of different modal shares, five cases were assumed, i.e., (i) Base Scenario (target), (ii) Scenario 1 (current), (iii) Scenario 2 (trend), (iv) Scenario 3 (strong bus improvement), (v) Scenario 4 (increased car use). While the current modal shares comprise 94%, 2%, and 4% by motorcycle, car and bus, respectively, this situation is expected to change drastically as is seen in Hanoi and HCMC, as well as in other cities in Asia. The importance of a policy on modal share lies on the impacts transportation modes have on road space use, i.e., the latter varies significantly by mode.

8.3 **Recommended Policy on Role-sharing among Transportation Modes:** Analyses done in the study clearly indicate that the expansion of bus use and control of car use is the key to an improved urban transportation. Management of motorcycles must also be viewed less as a way to decongest traffic but more of a strategy to improve traffic safety and promote disciplined use of the mode. It was thus assumed that the modal shares of 50%, 15%, and 35% for motorcycle, car, and bus, can be a basis for planning.

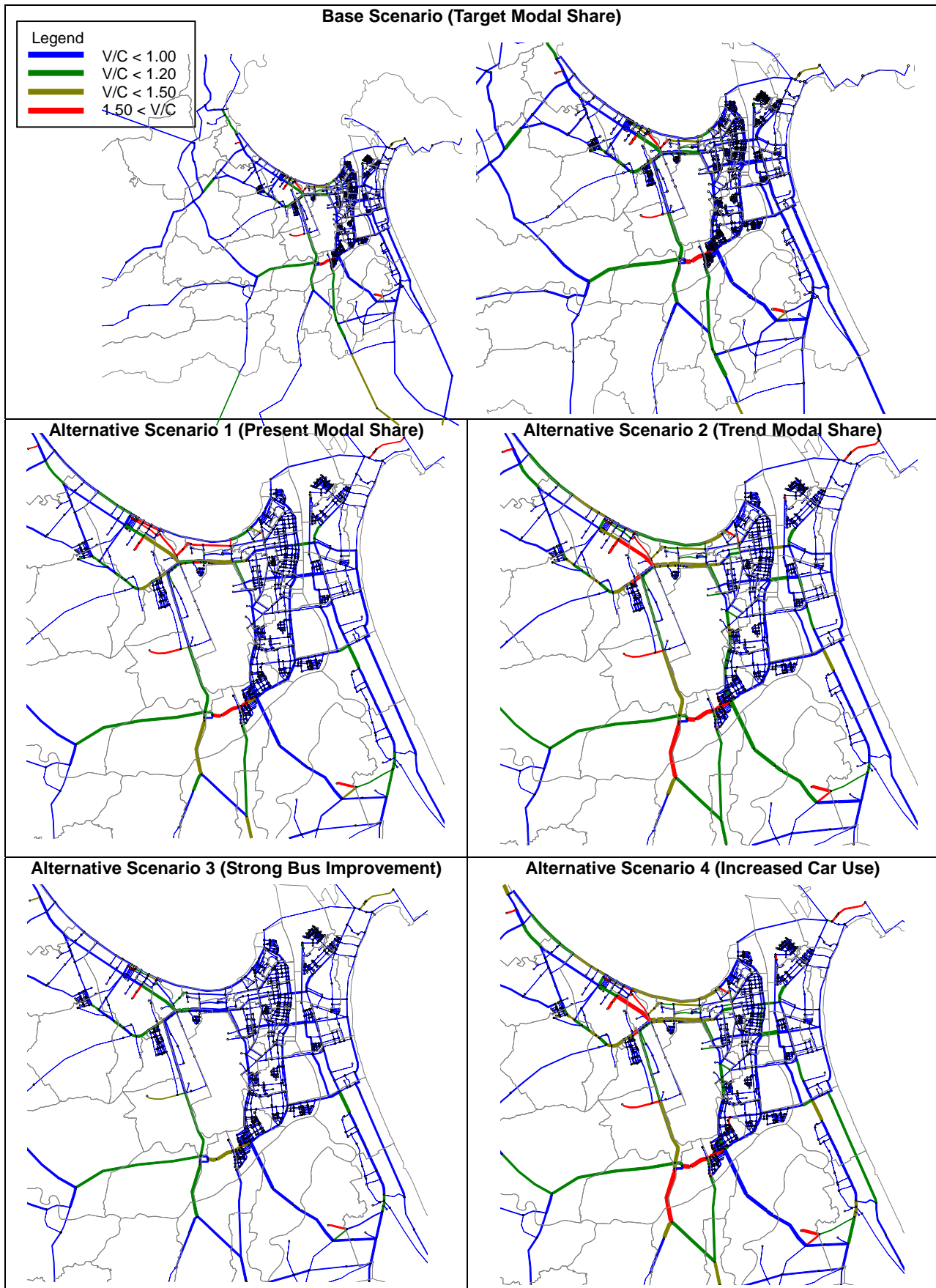
Table 8.1 Traffic Situations by Modal Share Scenario (Do-Committed Case)

Performance Indicator		2008 94/2/4 ¹⁾	Do-committed (2025) ¹⁾				
			Base 50/15/35 ¹⁾	Alt. 1 94/2/4 ¹⁾	Alt. 2 70/20/10 ¹⁾	Alt. 3 35/15/50 ¹⁾	Alt. 4 60/30/10 ¹⁾
Traffic Demand (mil. PCU)		424	1,192	1,303	1,562	995	1,719
Traffic Load	PCU-km (mil.)	2,594	9,600	10,594	12,016	8,825	12,278
	PCU-hrs. (mil.)	59	279	337	416	239	432
Travel Features	Ave. Travel Speed (kph)	44	34	31	29	37	28
	Ave. V/C Ratio	0.18	0.56	0.61	0.68	0.52	0.70
Transportation Cost (mil. US\$)	Vehicle Operation Cost	285	1,426	1,139	1,959	1,302	2,066
	Travel Time Cost	360	3,571	3,610	4,605	3,271	4,787
	Total Cost	644	4,997	4,748	6,564	4,573	6,852

Source: DaCRISS Study Team

¹⁾ Share (%) of Motorcycle/Car/Bus

Figure 8.1 Assignment of Future Demand by Modal Share Scenario (Do-Committed Case)



Source: DaCRISS Study Team
 Note: V/C Ratio denotes daily average.

Proposed Projects

8.4 Road Projects: Road is one of the most basic infrastructure which supports the mobility in the city and affects landuse and environmental management. In the short term, it reduces traffic congestion and enhances traffic safety, and in the longer term, it effects spatial structure, landuse, and environment. In order to realize an ideal road network and for the roads to function effectively in the longer term, in addition to ongoing and committed road projects, an additional five primary road projects and five secondary road project packages are proposed to satisfactorily meet future demands of the city (see Table 8.2 and Figure 8.2). In general, the density of arterial road network (including primary and secondary roads) in urban area is said to be about 3.5 km/sq.km. In grid network, an interval of arterial roads is 500 - 600 m. However, there are few cities where its arterial road network is completely developed. Therefore, for the urban area of Danang City, primary road is established in 1 - 2 km interval and it is supplemented by secondary roads to be formed grid type arterial road network. However, as the road network expands, traffic will increase with a shift to heavier vehicles, and road maintenance will become more important and costly.

8.5 Feasibility Study of UMRT Line 1: UMRT¹ is a strategic infrastructure in which strongly defines the future urban transport and city structure of Danang City. In a city which the population will reach 2 million in 2025 and to increase further on, compact city development based on public transport is indispensable in realizing an environmental city. 4 potential lines were proposed, and a feasibility study for Line 1, the most significant line, is proposed.

8.6 With a total length of 20 km, it will link three central business districts (CBDs) and promote effective public transportation and urban development. The system to be adopted will be a combination of BRT and LRT according to the traffic demand; however, it is preferred that the 5-kilometer section in the city center be located underground (see Figure 8.2). Alternatives for the alignment and areas to be introduced are being discussed, but a feasibility study is needed in the next development stage.

8.7 UMRT takes 7 to 10 years to develop (including study), and large investments are needed. Although UMRT development effects greatly to land acquisition, landuse, and transportation environment, integrated development with urban planning is often not in practice. In the feasibility study, new prospects shall be made as such seen in Japan's railway development and station development, in which integrated development is much in focus. This means that land acquisition, urban development along the line, and UMRT development shall all be done in an integrated manner, and in this course the best solution for land acquisition and resettlements should be clarified. At the same time, traffic management along UMRT corridors as explained below shall be conducted, and while securing land for UMRT introduction, demand for public transport shall be enhanced, and after these steps are taken UMRT should be constructed².

8.8 Comprehensive Transportation Management in City Center and Main Corridors (Transportation Environment Improvement): The situation of urban transport in

¹ UMRT = Urban Mass Rapid Transit. UMRT includes MRT, LRT, and BRT, and the system should be decided based on demand and geographic characteristics. UMRT should serves as a backbone of urban transport in the city, and it is important that it be developed integrated with landuse and urban development along the line.

² As seen in many other Asian cities, lack of comprehensive development strategies lead to longer construction periods and/or inconvenience for users after operation begins.

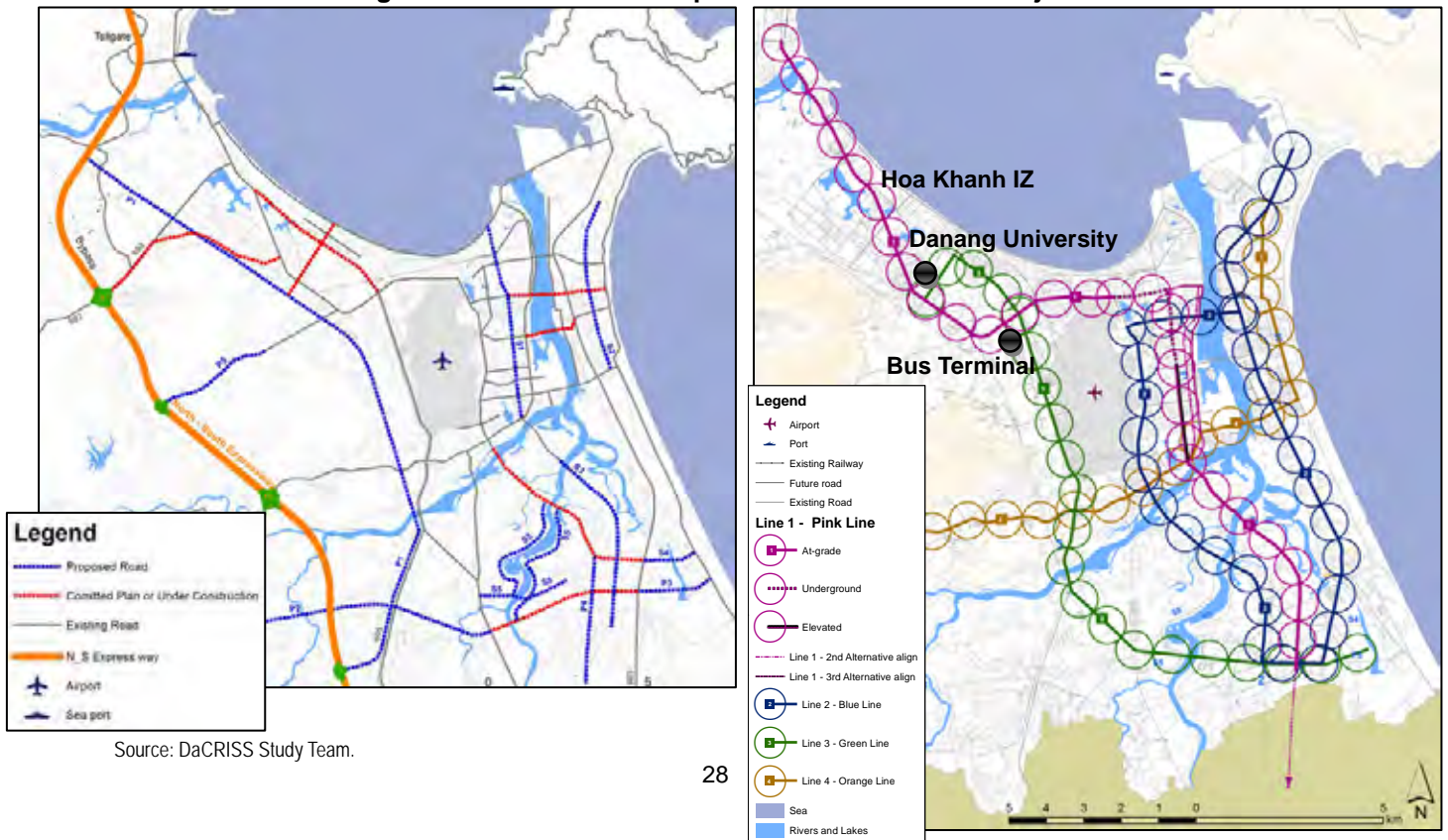
Danang City is better compared to other large cities, as traffic congestion is relatively low and the people’s satisfactions are rather high. However, the situation of urban transport in the city is becoming worse due to the recent increase in motorcycles and cars. Currently, traffic conditions are bad only in certain locations at certain hours of the day, but if this prevails, various problems (congestion, accident, air pollution, increase in greenhouse gases, increase in transportation cost) will arise. The objective of the proposed project is to implement comprehensive transportation management, and while utilizing current infrastructure, better transportation environment shall be realized to prepare for the future introduction of UMRT. Detailed measures are as follows: an urban traffic signal control system, traffic calming zones, i.e. Level 1: Danang urban traffic calming area (inner core of Danang City) and Level 2: Danang urban traffic smoothing area (outer core of Danang City), corridor traffic management (five main corridors including NH1-Truong Chinh, NH14-Cach Mang Thang Tam, Ngo Quyen – Le Van Hien, Nguyen Tat Thanh, Au Co), urban parking management, and institutional capacity building (strengthening institutional structure, regulations and human resource capacity, etc.).

Table 8.2 List of Proposed Road Projects

ID	Projects / Action	Length (km)	Width (m)	Scope	Cost (USD million / km)		
					Construction	Land	Total
P1	Danang Urban Bypass	21.7	48.0	New	3.6	1.9	119.4
P2	University Avenue (1)	7.7	48.0	New	3.8	1.5	40.8
P3	University Avenue (2)	2.3	48.0	New	2.1	1.9	9.2
P4	North-South Highway	3.9	48.0	New	3.7	1.5	20.3
P5	Access road of North-South Expressway	4.3	48.0	Improvement	3.8	1.5	22.8
S1	North-South Highway 1	6.1	48.0	Improvement	4.2	31.0	214.7
S2	North-South Highway 1	5.4	33.0	New	1.7	5.5	38.9
S3	North-South Highway Extension	6.9	48.0	New	3.8	1.5	36.6
S4	Hoa Xuan – Ngu Hanh Son Road (eastside)	1.9	33.0	New	2.1	1.9	7.6
S5	Hoa Chau – Hoa Xuan – Ngu Hanh Son Road (westside)	11.4	33.0	New	2.6	1.9	51.3
DR601	Improvement of District Road No. 601	25.0	12.0	Improvement	1.0	0.0	25.0
DR604	Improvement of District Road No. 604	43.0	12.0	Improvement	1.0	0.0	43.0
Total		139.6	-	-	-	-	629.6

Source: DaCRISS Study Team

Figure 8.2 Location of Proposed Road and UMRT Project



Source: DaCRISS Study Team.

9 URBAN INFRASTRUCTURE AND UTILITIES PLAN

Power Supply Plan

9.1 The development of power generation plants and a high-voltage transmission network (500kV) was proposed in the “6th National Power Development Master Plan” based on demand projections for Danang City. The measures described below follow this master plan.

9.2 **Demand Projection:** Future demand was projected based on the socio economic framework and current growth trend, as well as following factors:

- (i) Energy consumption growth was projected by amount of different sectors and domestic consumption. Those sectors consumption will increase in proportion with economic growth. Meanwhile coefficient for the sector growth varies.
- (ii) Energy consumption increase according to the new transportation system including electric car and high-speed train was excluded.

9.3 Projected consumption volume of third scenario in 2025 is ten times that of 2007. Development of power supply network shall be accelerated since average annual growth rate is more than twelve percent, which is higher than current growth rate (see Table 9.1).

Table 9.1 Power Demand Projection for the Three Scenarios

Item	Unit	2007	Scenario 1		Scenario 2			Scenario 3	
			2015	2025	2015	2020	2025	2015	2025
Industries									
Agriculture, Forestry, Aquaculture	GWh	1	1	2	1	1	2	1	3
Industrial, Construction	GWh	452	894	3,262	976	1,694	3,221	1,064	4,688
Commerce, Hotel, Restaurant	GWh	65	102	528	112	200	391	122	1,059
Consumer (Domestic)	GWh	350	891	1,316	977	1,300	2,166	1,273	3,153
Others	GWh	27	57	153	62	96	173	74	267
Total Consumption	GWh	907	1,945	5,261	2,127	3,291	5,954	2,533	9,170
Multiplicity	Times	1.0	2.1	5.8	2.3	3.6	6.6	2.8	10.1
Peak Load Factor		0.59	0.68	0.74	0.68	0.72	0.74	0.68	0.74
Peak Demand	MW	175.5	327.8	814.5	359.5	518.2	921.8	426.9	1,414.6
Multiplicity	Times	1.0	1.9	4.6	2.0	3.0	5.3	2.4	8.1
Consumption per capita	kwh/person	1,124	1,970	4,330	1,966	2,742	3,969	2,156	4,201

Source: DaCRISS Study Team

9.4 **Expand Network and Develop Renewable Energy Sources:** The power company has increased the capacity of the substations and the distribution network based on the SEDP and the power sector’s five-year plan. Future supply must, however, meet the requirements of the above-mentioned master plan.

9.5 **Improve Operating System for Stable Supply:** Once the nationwide transmission network is established, energy loss rate is expected to decrease to less than ten percent. An unstable power supply discourages investors, displeases citizens, and disturbs the operation of treatment plants and pumping stations resulting in environmental pollution.

9.6 **Promote Awareness Campaign for Environmental Protection and Delay Demand:** Reducing consumption eases the rapid pace of developing facilities. Even a small amount of power saved by each consumer will contribute to delaying the construction of additional power plants.

Water Supply Plan

9.7 **Demand Projection:** Future demand was projected based on the socio economic framework and current growth trend (see Table 9.2).

Table 9.2 Water Demand Projection for the Three Scenarios

Item	Unit	2007	Scenario 1		Scenario 2			Scenario 3	
			2020	2025	2015	2020	2025	2015	2025
Unit Rate	lit/person day	118	180	200	180	200	200	180	200
Coverage(service area)	%	60	80	90	80	90	95	80	99
Domestic Consumption	m3/day	49,549	118,455	202,377	124,560	195,156	235,540	146,243	363,488
Other Consumption	m3/day	14,950	29,164	50,594	31,140	48,789	58,885	36,561	90,872
Loss Rate	%	40	25	20	25	20	20	25	20
Water Consumed	m3/day	107,930	197,425	316,214	207,600	304,932	368,032	243,738	567,951
Multiplicity	Times	1	1.8	2.9	1.9	2.8	3.4	2.3	5.3

Source: DaCRISS Study Team

9.8 **Water Resource Development and Management:** The ADB water supply project at Cu De River may be able to satisfy water demand in 2015. Considering the city's geographic conditions, it is doubtful that there are other large water sources which can be exploited. While upstream of Vu Gia River is one of the prospective water sources in Quang Nam, coordination in the management of water resources among local authorities is lacking. An Integrated Water Resource Management (IWRM) proposed in the Study may help stakeholders to coordinate water resource management and control of pollution, including among others, demand adjustment by season, water source protection and strategic development, as well as environmental protection. If exploiting common water sources proves to be difficult, independent water sources might be considered. A rural clean water program should also be promoted since a centralized water supply system cannot cover both urban and rural areas.

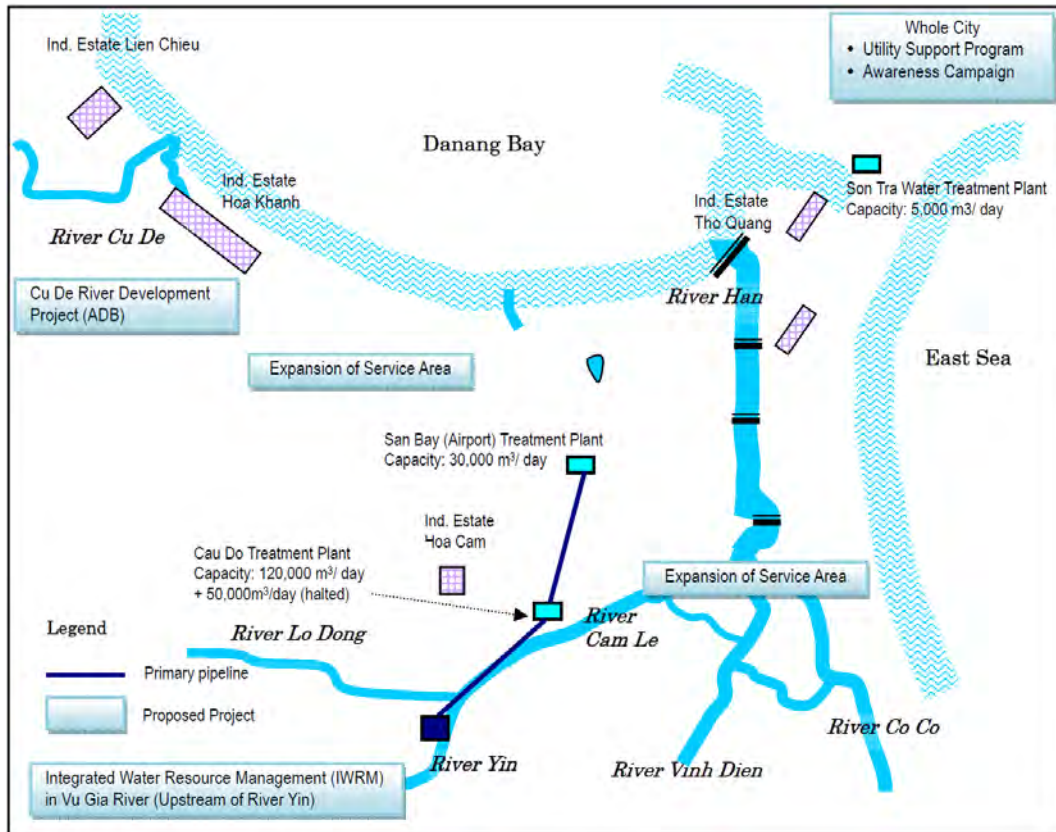
9.9 **Supply and Distribution Network Development:** The supply and distribution network should be expanded to cover new urban areas as well as non-serviced areas.

9.10 **Countermeasures for Nonrevenue Water:** Netherlands and the Danang Water Service Company cooperated to improve current network performance by carrying out the Utility Service Programme (USP) which significantly reduced nonrevenue water and improved customer relations. Loss rate decreased to 36% from 40% within one year. Current efforts will be continued.

9.11 **Promotion of Awareness Campaign:** Managing demand is also effective in delaying investment and can be in the form of measures such as introducing automatic flushing equipment, water-saving taps, and rain water systems. Cooperation among the community, media, and academe through environmental education is also necessary.

9.12 **Proposed Future Water Supply Network:** An ADB water supply project is being implemented at Cu De River. Although upstream of Vu Gia River is another prospective water source, there seems no function of coordinating water resources among local authority or different sectors. Therefore, an Integrated Water Resource Management (IWRM) was proposed by DaCRISS to enable stakeholders to coordinate water resource management and pollution regulation. The Utility Service Programme conducted by Netherlands and DWSC improved current network performance by reducing non-revenue water. Supply and distribution network shall be expanded to cover newly developed areas and non-serviced areas. The overall water supply network is indicated in Figure 9.1.

Figure 9.1 Proposed Future Water Supply Network



Source: DaCRISS Study Team.

Wastewater Treatment and Drainage Plan

9.13 Master Plan by World Bank Project: The wastewater treatment master plan was formulated in the Priority Infrastructure Investment Project by the World Bank. The objectives of this plan are: (i) to assist the local government in choosing comprehensive medium- and long-term strategies, (ii) to recommend options for optimizing the performance of existing wastewater treatment plants, (iii) to identify the specific investment required to implement the recommendation; and (iv) to provide firm recommendations on the optimum wastewater treatment methods for existing and proposed wastewater treatment plants. This plan mainly focuses on domestic wastewater. The preferred scenario divides Danang City into two catchment areas based on hydrologic conditions, i.e., northern Danang and southern Danang. According to the PIIP plan, three wastewater treatment plants are used to treat domestic wastewater in Northern Danang, while only one central WWTP at Hoa Xuan is used in Southern Danang (see Figure 7.4.1 in Part IV Main Report for PIIP future wastewater treatment network plan).

9.14 The following four issues were raised as recommendations in the PIIP master plan: (i) future degree of septic tank connections, (ii) improved O&M of wastewater systems, (iii) public awareness program, and (iv) buffer zone regulations.

9.15 In addition to the master plan, DaCRISS team proposes to enhance remaining important aspects of this sector, namely i) enforcement of industrial waste water treatment, ii) promotion of independent sewerage system in rural area, and iii) awareness campaign and proper tariff setting.

Solid Waste Management Plan

9.16 **Demand Projection:** Future demand was projected based on the socio economic framework and current growth trend (see Table 9.3). The volume of the treatment is projected to increase into four times in 2025. And current Kahn Son landfill site would be expected to be full during 2015 - 2020 in the **third scenario**.

Table 9.3 Project Volume of the Domestic Solid Waste

Item	Unit	2007	Scenario 1		Scenario 2			Scenario 3	
			2015	2025	2015	2020	2025	2015	2025
GRDP per capita	USD	1,200	2,015	4,000	3,000	3,500	5,000	3,000	5,000
Municipal Waste	Kg/person/day	0.8	1.1	1.2	1.1	1.15	1.2	1.1	1.2
Municipal Waste	Ton/day	645	1,086	1,458	1,190	1,380	1,800	1,292	2,619
Collection Rate(Municipal)	%	85	90	95	90	92	95	90	95
Collection(Municipal)	Ton/day	549	977	1,385	1,071	1,270	1,710	1,163	2,489
Multiple Number	Times	1.0	1.8	2.5	2.0	2.3	3.1	2.1	4.5
Cumulative amount from 2007	1000Ton	-	2,228	6,352	2,364	4,313	7,419	2,499	9,977

Source: DaCRISS Study Team.

9.17 **Intermediate and Final Treatment:** New landfill sites are included in the Da-CRISS plan on urban infrastructure and utilities. Site selection for the landfill will be critical because of Danang's limited land. In this light, an intermediate treatment plant can contribute in decreasing the volume for final treatment.

9.18 **Hospital Waste Treatment:** Hazardous wastes are proposed to be included with industrial wastes and treated after proper separation by source. Waste treatment can be outsourced since it is difficult for the city to manage. An incinerator for hospital wastes started operation in 2009, and it reportedly collects and treats almost 70 to 80% percent of hospital wastes collected by the Urban Environmental Company (URENCO).

9.19 **Promotion of Recycling in the Industrial Sector:** Once the volume and type of industrial waste are estimated, various ways of recycling can be proposed. For example, cement, which is the main industrial product in the central region, can easily be mixed with sludge and ash at the early stages of production of cement. Construction waste also has high potential for recycling.

9.20 **Collection and Transportation Plan:** The collection and transportation system for solid waste must be designed according to the type of intermediate treatment and final dump site. Source separation must also be introduced.

9.21 **Funding Source:** According to HIS results, the people's willingness to pay for improved services to collect and treat solid waste was the lowest among the utilities. Furthermore, the collection rate of fees was only about 70%. While the low intention to invest in waste treatment is a common trend in the world, a combination of subsidies and fee collection is necessary to secure funding to maintain such services. Tariffs must be set on a "users pay principle," although frequency and quantity of the services, as well as the collection method should be considered. Customer relations are also important to increase collection rate. The introduction of a computerized system will not only improve record keeping but also provide an information analysis of customer requests which can be utilized to improve services.

9.22 **Awareness Campaign:** An awareness campaign might include several objectives. These are: (i) promotion of source separation and 3Rs (reuse, reduce, recycle), (ii) increase in fee collection rate, and (iii) environmental education.

10 ENVIRONMENTAL MANAGEMENT PLAN

Removing Pollution

10.1 The environmental situation in Danang can be summarized in the problems listed below. These problems should be considered with regard to the objective of Danang authorities to make it an example of an ecological city.

- (i) Great concern with urban effluents, often mixed together with industrial effluents;
- (ii) Observed poor quality of groundwater and lack of systematic data on the situation of aquifers;
- (iii) Large number of construction projects, resulting in land reclamation which in turn has affected coastal forests and riverbank stability;
- (iv) Solid wastes dumped in water bodies, such as urban rivers, lakes, and sea, and problems raised by the partial treatment of medical and industrial wastes; and
- (v) Illegal forest cutting, hunting, and fishing, which are not quantified but which remain a matter of concern.

10.2 Today, the city still benefits from certain natural advantages and has taken appropriate decisions to preserve the environment, such as:

- (i) Relocating polluting industries to industrial zones and planning to relocate petrol ports facilities;
- (ii) Deciding not to develop the industrial sector excessively;
- (iii) Conducting ODA projects, in particular those by the World Bank, the Dutch and Australian governments, in sectors such as solid waste, water supply, or wastewater;
- (iv) Creating protected areas, such as the Ba Na forest zone, although the question on how these areas can be effectively protected remains; and
- (v) Keeping traffic at better levels than that in Hanoi or HCMC.

10.3 The main concern for the future is environmental management. With a population estimated to reach 2.1 million by 2025, the promotion of sectors, such as tourism and business, and the effects of further land reclamation, infrastructure construction, air pollution from handicraft villages, among others, have to be balanced. Potentially major environmental issues will concern the following:

- (i) Availability of water sources vis-à-vis increasing demand and climate change;
- (ii) Impact of future hydropower projects;
- (iii) Solid waste management due to the fragile institutional arrangement;
- (iv) Effects of land reclamation on the natural environment;
- (v) Management of risks, in particular floods; and
- (vi) Air pollution from traffic due to the expected growth of motorization and tourism.

10.4 It is the fact that Danang City will be growing in the future, making use of its locational advantages and its economic potentials with plenty of resources for tourism. Based on a study of alternative scenarios by the DaCRISS Study Team, Scenario 3, the most ambitious but target case, indicates that Danang will continuously attract migrants at a considerably high growth rate. Its population will reach 2.1 million by 2025, compared to 806 thousand as of 2007, at an average increase rate of 5.5% per annum. Needless to

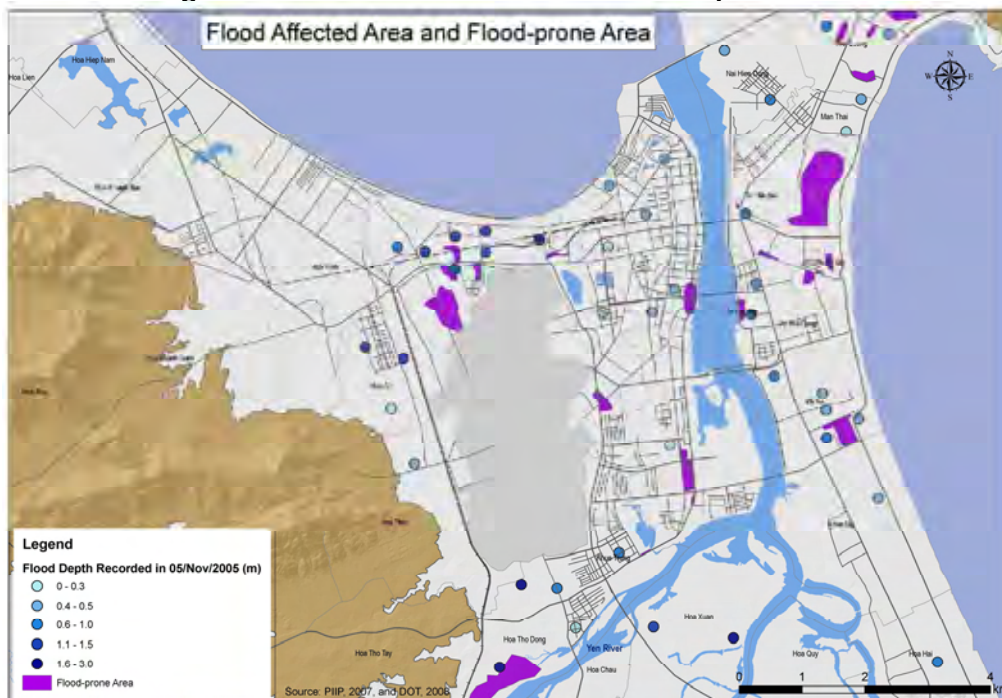
say, such a rapid population increase will impose a heavy pressure on the environment.

10.5 Taking into account the increasing environmental load on the city and its resources, some vital institutional issues need to be addressed soon. These are: (i) more enforceable regulations, (ii) further people's participation, (iii) encouragement of business entities' contributions, (iv) aggressive introduction of and R&D on environment friendly technologies, (v) more cross-governmental and interprovincial coordination, and (vi) more monetary inputs and human resource development.

Disaster Management

10.6 Flood occurs mainly in the rainy season from September to November. In September 28th, 29th, 30th of 2009, typhoon Ketsana hit Danang and Central Vietnam, bringing about great damage to the region. In the study area, although flooding is the most frequently occurred natural disaster and causing sizable damage to the community people almost every year (see Figure 10.1), sufficient flood mitigation measures have yet been taken. Necessary flood mitigation measures should also be taken into consideration upon formulating urban development plans.

Figure 10.1 Flood Affected Area and Flood-prone Area



Source: DaCRISS Study Team based on PIIP 2007 and DOT 2008.

10.7 Mitigation measures for flood disaster protection should be implemented, such as 1) river dyke construction for main river channel, 2) promotion of integrated watershed management to control runoff including tree plantation and erosion control in upper reach of the river basin, 3) implementation of early warning system for flood disaster management, and 4) promotion of community based flood disaster management.

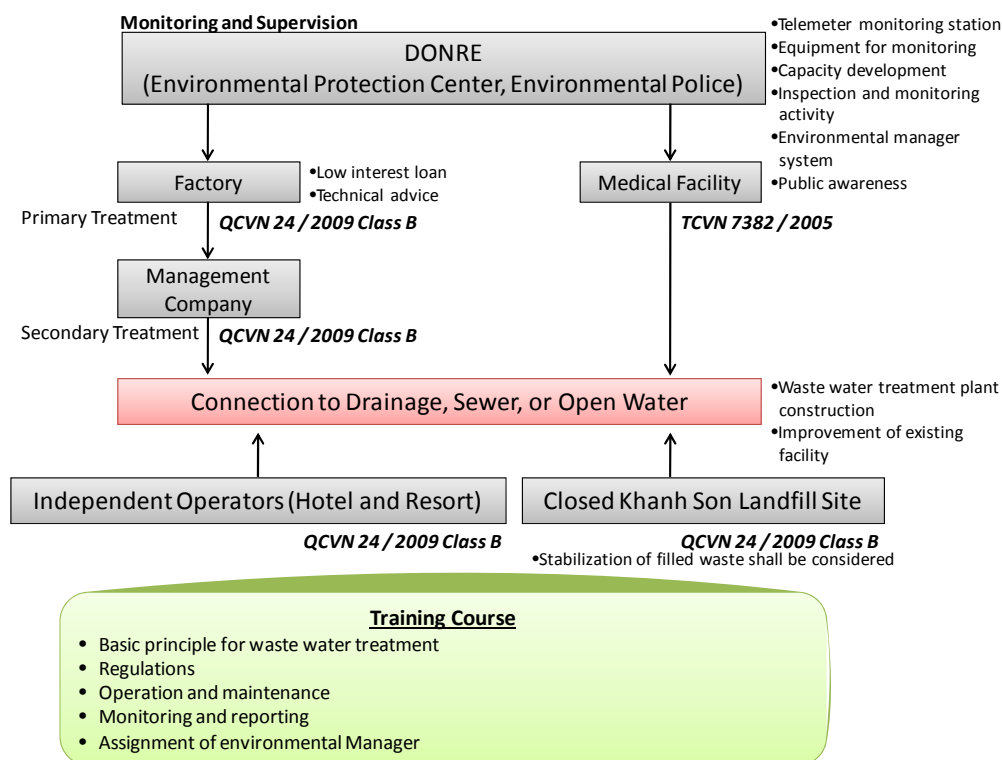
10.8 Flood mitigation in urban areas is also important in Danang City. Flooding in urban areas is mainly due to inundation of inner water due to an ineffective drainage system. According to DOT, one of the reasons causing inner water inundation in urban areas is related to the lack of drainage connection to the existing network at large construction sites. Large bare land or under construction sites generate a significant volume of draining water

without proper networking to the existing drainage system. Water at construction sites which flow to surrounding areas causes inner water inundation on the occasion of strong rainfalls. A drainage system master plan for Danang city is now progressed by PIIP, to be completed by the year 2011.

Priority Projects

10.9 Industrial and Medical Wastewater Treatment: While the PIIP project supported by the World Bank has already proposed the improvement of domestic wastewater, only a small-scale treatment of industrial and medical wastewater was implemented by the Danang City government. A treatment system was therefore proposed with the following objectives: (i) to improve wastewater treatment in medical facilities and industrial parks to meet standards and regulations, (ii) to enforce regulations on operators through a partial introduction of the CPCM (Certified Pollution Control Manager) system, (iii) to improve operating performance through capacity building for operators, and (iv) to establish a more reliable wastewater monitoring system by enhancing the monitoring and inspection capacities of DONRE. The project's subcomponents are: (i) facility support, (ii) capacity development for operators, and (iii) management enhancement for DONRE.

Figure 10.2 Conceptual Image of Future Industrial/Medical Wastewater Treatment System

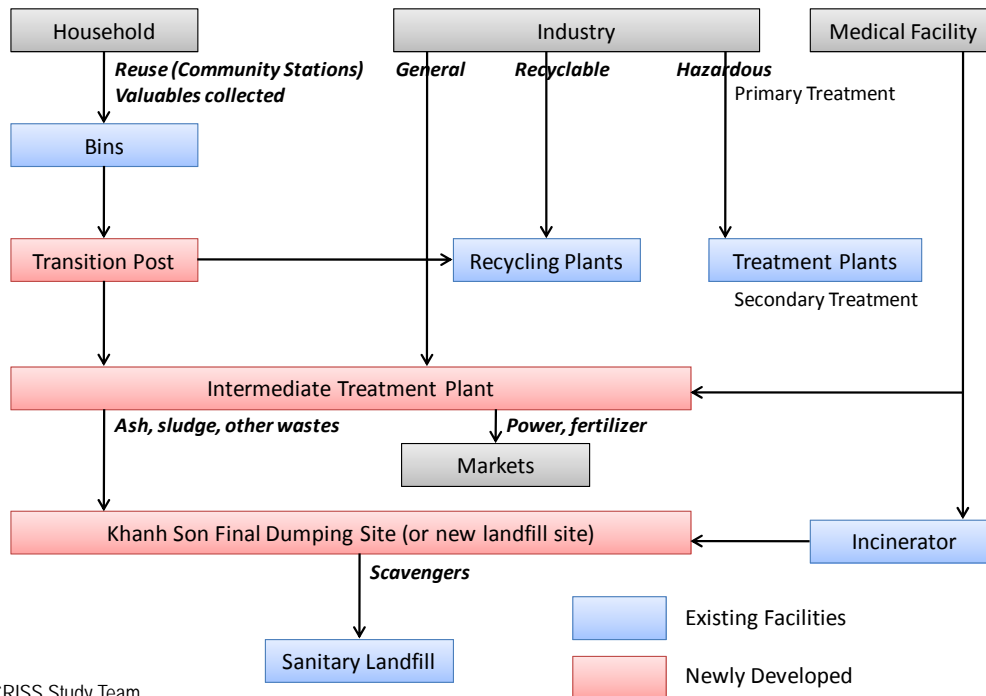


Source: DaCRISS Study Team.

10.10 Intermediate Solid Waste Treatment: A domestic solid waste management system was established in Danang with the support of the World Bank. However, further improvements to extend the life of dumping sites are required due to the increasing volume of generated waste. In addition, there are currently no systematic measures on recycling. Therefore, a treatment system was proposed with the following objectives: (i) to promote the efficient operation of intermediate plants to include source separation, (ii) to reduce waste generated from domestic activities by promoting the 3R concept, and (iii) to support the Clean Development Mechanism (CDM) concept through improved waste collection.

The project's subcomponents are: (i) facility support, (ii) introduction of CDM, and (iii) 3R activities.

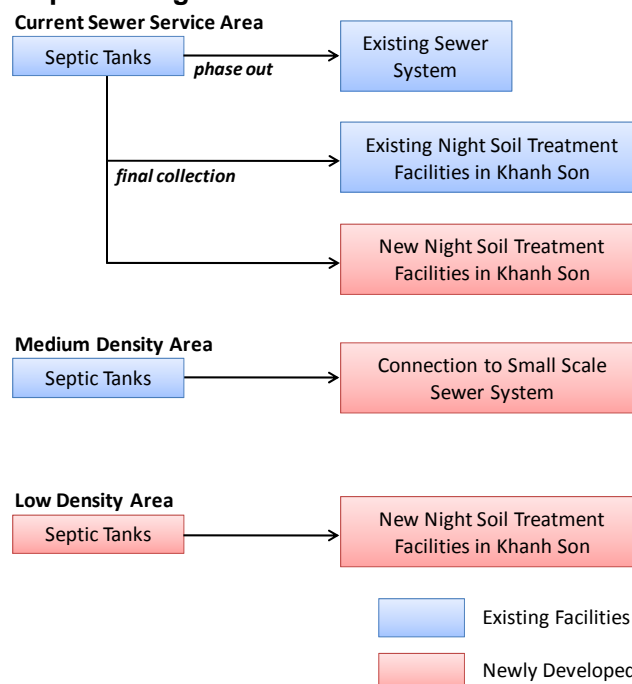
Figure 10.3 Conceptual Image of Future Waste Collection System



Source: DaCRISS Study Team.

10.11 Wastewater Treatment: Based on HIS results, less than 20% of households in urban areas in Danang City are connected to wastewater treatment facilities. And while phasing out of septic tanks is needed, the collection of sludge from existing septic tanks is important as well to prevent groundwater pollution. In rural areas, wastewater treatment is still not introduced in many areas. In this context, a treatment system was proposed with the following objectives: (i) to improve wastewater treatment conditions in urban and rural areas. The project's subcomponents are: (i) facility support, and (ii) legislative enforcement.

Figure 10.4 Conceptual Image of Future Domestic Wastewater Treatment System



Source: DaCRISS Study Team.

11 INVESTMENT PLAN

Evaluation of Candidate Projects

11.1 In order to promote Danang as a truly environmental city, projects and actions proposed in various subsectors were further integrated into strategic programs through which objectives were made clear to enhance synergy. Candidate projects were evaluated comprehensively to facilitate prioritization and ensure compliance with overall city development strategies.

11.2 **Methodology of Prioritization:** The proposed projects were evaluated based on five categories, namely (i) overall policy, (ii) economic aspect, (iii) social aspect, (iv) environmental aspect, and (v) implementation and management. Each project was given a score ranging from 5 to 1 to indicate affirmative impact, 0 for neutral/no effect, and -1 to -5 for negative impact. Priorities were defined by total scores.

11.3 **Budget Envelope:** The DaCRISS estimate of the needed total capital investment (CI)¹ is VND 5,576 billion (USD328 million) for 2010–2012, VND13,579 billion (USD799 million) for 2010–2015, and VND75,200 billion (USD4,424 million) for 2010–2025 (see Table 11.1) for the medium-growth scenario. The CI for 2010–2015 in the medium-growth scenario is equivalent to the total initial cost of the top 66 projects² prioritized according to their secondary screening scores.

11.4 A total of USD 4.8 billion is required to implement all candidate projects, while those with high and medium rank require USD 4.2 billion. On the other hand, the estimated budget envelope for 2010–2025 is USD 3.0 – 5.9 billion. This implies that if there is high economic growth, the city can shoulder the capital costs of future projects.

Table 11.1 Summary of Project Cost to Danang City by Term¹

Sector	Short Term (2010–2012)		Medium Term (2013–2015)		Long Term (2016–2025)		Total	
	USD Mil.	%	USD Mil.	%	USD Mil.	%	USD Mil.	%
1. Economic Development	77	36	1	0	78	2	0	0
2. Social Development	0	0	14	3	781	19	794	17
3. Environmental Management	1	1	194	36	17	0	212	4
4. Spatial Development	0	0	1	0	272	7	273	6
5. Transportation Development	171	80	79	15	1,026	26	1,277	27
6. Urban Infrastructure and Utilities Development	42	20	143	27	1,419	35	1,604	34
7. Housing and Living Conditions Environment	0	0	0	0	26	1	26	1
8. Human Resource Development	0	0	0	0	329	8	329	7
9. Urban Sector Management	0	0	0	0	53	1	53	1
10. Tourism Development	0	0	31	6	80	2	111	2
Total	215	100	539	100	4,004	100	4,758	100
Percentage by Term	5		11		84		100	
Total Budget Envelope	Period	2010–2012	2013–2015	2016–2025	2010–2025			
	VND billion	5,576	8,003	61,621	75,200			
	USD million	328	471	3,625	4,424			

Source: DaCRISS Study Team.

¹ Costs for government, PFI, and private projects were calculated at 100%, 50%, and 0%, respectively, of costs to be shouldered by government

¹ CI refers to the money used by a business to purchase fixed assets, such as land, machinery, or buildings, rather than that used to cover daily operating expenses. Therefore, initial project costs were considered.

² All ongoing/committed transportation projects and projects listed in the Environmental City Plan were included.

11.5 However, there are potential problems as follows: (i) the GRDP may not increase as much as projected, (ii) the proportion of capital investment to the GRDP may not reach the level projected, (iii) political and environmental changes may necessitate an early project implementation even for those not identified as “priority” projects in this analysis. Under such a scenario central government subsidies and ODA funds can be utilized to increase the city’s budget envelope.

Program Formulation

11.6 In order to maximize the synergy of implementing the projects while minimizing conflicts and waste of resources, the following approach was taken: the city’s vision of becoming a “Competitive Environmental City beyond being Pollution-free” was translated into five goals, namely: (i) economic development, (ii) urban development and infrastructure, (iii) environment management, (iv) livability, and (v) management goal. Under each goal, each project was grouped into 20 strategic programs (see Table 11.2).

Table 11.2 Proposed Strategic Programs

Goal / Objectives	Proposed Strategic Program
A. Economic development: Eco - industries / business promoted and developed to accelerate growth of Danang and CFEZ	P1. Program to promote eco – business / environmental industries and those on healthcare and human resource P2. Program to develop and promote eco – tourism P3. Program to develop higher – education on environment, high – tech, medical, and those. related to new industries
B. Urban development and infrastructure provision: Compact and efficient urban areas developed to provide competitive base for investment and socio – economic activities	P4. Program to strengthen enforcement of updated Urban Master Plan, development permit process and environmental zoning P5. Program to develop attractive public transportation P6. Program to develop effective urban roads P7. Program to further develop facilities and utilities including waste water treatment and drainage system and to improve their operation and management P8. Program to upgrade existing IZ and develop new green and clean industrial / business parks
C. Environmental management: Environmental sustainability is ensured in the process of rapid urban growth	P9. Program to remove pollutions in identified hot spots and strengthen monitoring and enforcement P10. Program to strengthen policy dialogue at regional and international levels P11. Program to develop flood free urban lands and settlements P12. Program to establish and operate cross sector participatory mechanism to monitor and manage environment
D. Livability: Living conditions and quality of life of the people enhanced which can also benefit visitors	P13. Program to develop new collective eco – housing (affordable, disaster – proof, energy saving) to meet increasing demand by citizens and immigrants P14. Program to establish landscape and urban design guidelines and enforcement mechanism to enhance city image and identity P15. Program to improve / enhance rural villages and quality of life in rural areas P16. Program to establish participatory mechanism to assess living environment and implement needed measures at community level
E. Management: City is properly managed under concerted vision and leadership	P17. Program to expand application of IT in city management including GIS to promote e-government and e-city P18. Program to establish improved user charge and PPP mechanism with city’s initiative to expand funding sources P19. Program to strengthen investment promotion P20. Program to strengthen inter – provincial coordination on integrated planning and policy implementation

Source: DaCRISS Study Team.

12 STRATEGIC ENVIRONMENTAL ASSESSMENT

Review of SEA for Danang City

12.1 The Department of Planning and Investment (DPI) issued an ordinance regarding the outline of the tasks for the strategic environmental assessment (SEA) for the master plan of Danang's social and economic development to 2020 (SEDP 2020) on 15 October 2008, four months after the first draft of the SEDP was formulated. The ordinance clearly indicates what should be included in a SEA based on Circular No.08/2006/TT-BKHCMNT issued on 8 September 2006. The contents of a SEA report should thus include: (i) legal and technical methods adopted in the assessment, (ii) process of the assessment, (iii) interpretation of the SEDP and its environmental impacts, (iv) general description of current natural, economic, and social conditions in Danang City, and (v) recommendations for mitigating adverse environment impacts, which might be caused by implementing the SEDP.

12.2 Although the requirement for an SEA took effect a little bit behind the formulation of the SEDP, this plan is still undergoing revisions as a result of discussions among concerned government agencies. It can be said that proper steps are being taken to incorporate the SEA into Danang's SEDP.

12.3 The SEA report is quite comprehensive and covers all items indicated in the circular; yet, there is still some room for improvements. The essence of SEA is: (i) to analyze potential adverse natural and social environmental impacts, (ii) to consider the people's opinions in the course of planning, and (iii) to propose possible mitigation or enhancement measures as well as environmental monitoring arrangements. It is widely understood that a SEA scoping is quite a challenging task because target geographic and sectoral areas are broad, making it possible to merely gloss over all possible environmental impacts, and as a result, point no significant differences among the development alternatives presented in the master plan, which contradict with the SEA's objective. If this is a case of a single project or a program whose sites are already identified, scoping and identifying adverse impacts to environmental and social aspects would be much easier.

12.4 The only drawback of SEA is that it did not allow an analyses of the environmental and social impacts of the other two alternative scenarios. The general technical guideline states that environmental trends of the control case (do-nothing scenario) should be carried out in order to highlight the impacts of the SEDP. Since the SEA report is still being prepared in accordance with the progress of the SEDP, it is too early to conclude that another possible drawback is that SEAs do not require feedback from stakeholders, because, so far, no stakeholder meetings have been conducted. The general technical guidance indicates that consultations with relevant authorities, as well as with affected and interested stakeholders is a key SEA element to increase transparency and accountability of the SEA process, possibly reducing too the potential risk of overlooking important information.

12.5 Despite immense efforts at preparing a SEA report, there are still challenges in making one for a long-term, grand design like the SEDP. These are: (i) the gap between the time the SEA was done and the time current projects and measures to prevent adverse environmental impacts are expected to finish, (ii) the SEA report's correlation with the construction plan, and (iii) the incorporation of related plans.

SEA in Preparing the Danang Development Master Plan

12.6 Environmental and social considerations were addressed in accordance with JICA's environmental and social safeguards guidelines. The Study Team conducted an initial environmental examination (IEE), which was the product of a preliminary assessment of possible environmental and social impacts of the master plan. The IEE was carried out to ensure the social and environmental acceptability of proposed projects as early as the master planning stage. Specifically, the IEE aimed to ensure that the negative impacts caused by these projects and activities would be prevented or minimized.

Table 12.1 Evaluation of Environmental Plan

Aspect		Base Case	Current Construction Plan	Accelerated Growth Strategy
Pollution	Air Quality	B	B	E
	Noise and Vibration	D	D	D
	Water Quality (groundwater and surface water)	B	E	E
	Soil	-	-	-
	Wastewater	B	E	E
	Solid Waste	B	E	E
	Coastal Area	C	C	C
Natural Environment	Forest Conservation & Management	C	C	C
	Flora and Fauna (Biodiversity)	C	C	C
	Ecosystem	B	C	C
	Global Warming	B	B	E
Social Environment	Involuntary Resettlement	B	B	A
	Regional Severance & Community Dividend	-	-	-
	Socially Vulnerable Group (poverty, indigenous & ethnic)	B	E	E
	Cultural & Historical Heritage (remains, cultural & historical assets)	-	E	E
	Landscape	A	A	E
	Greenery, Park & Open Space	A	E	E
	Healthcare & Public Health (Hygiene)	C	C	C
	Living Environment	B	C	E
	Safe & Security (crime, disaster management, etc)	C	E	E
	Local Economy (commercial business)	C	+	+
	Existing Social Infrastructure & Social Services	C	+	+
	Uneven Distribution of Benefit & Damage	-	-	-
	Offensive Odor	-	-	-
	Accidents	B	B	+
Other Social Issues (social stability, inequality, etc)	-	-	-	
Overall Evaluation		√	√√	√√

Source: DaCRISS Study Team.

Notes: **Categories for evaluating each environmental item:**

- A: Significant negative environmental impact is expected.
- B: Negative environmental impact is expected to some extent.
- C: Negative environmental impact is not known at this study stage (possible impact is expected).
- D: Negative environmental impact is expected. No significant measure will be taken, nor any clear direction is indicated to alleviate it.
- E: Alleviation of negative environmental impact or such plan is expected from the strategies and/or proposed projects.

- +: Positive environmental impact is expected to some extent.
- : No impact is expected.

Categories for overall evaluation:

- √: Current environmental trend is expanding and scaling up, and/or significant adverse impacts are expected in some of the aspects.
- √√: Negative environmental impact is expected to some extent and/or countermeasures were appropriately taken into consideration with the proposed strategies and projects.
- √√√: Minimal or no adverse impact is expected.

13 TOURISM DEVELOPMENT STRATEGY FOR HDQ REGION

13.1 The existence of three World Heritages, beautiful beaches and coastal areas as well as preserved forests and mountain areas in a relatively compact area is not comparable to other areas not only in Vietnam but also Asia region (see Figure 13.1 and Table 13.1). While the tourism cluster comprising Thua Thien Hue, Danang and Quang Nam involves strength and ample opportunities, they are not fully realized due to lack of, among others, adequate infrastructure, environmental management, operation capacity, promotion and marketing and information strategies. Insufficient inter-provincial coordination may also be attributed to a factor which restraint to accelerate a sustainable development of tourism in the region.

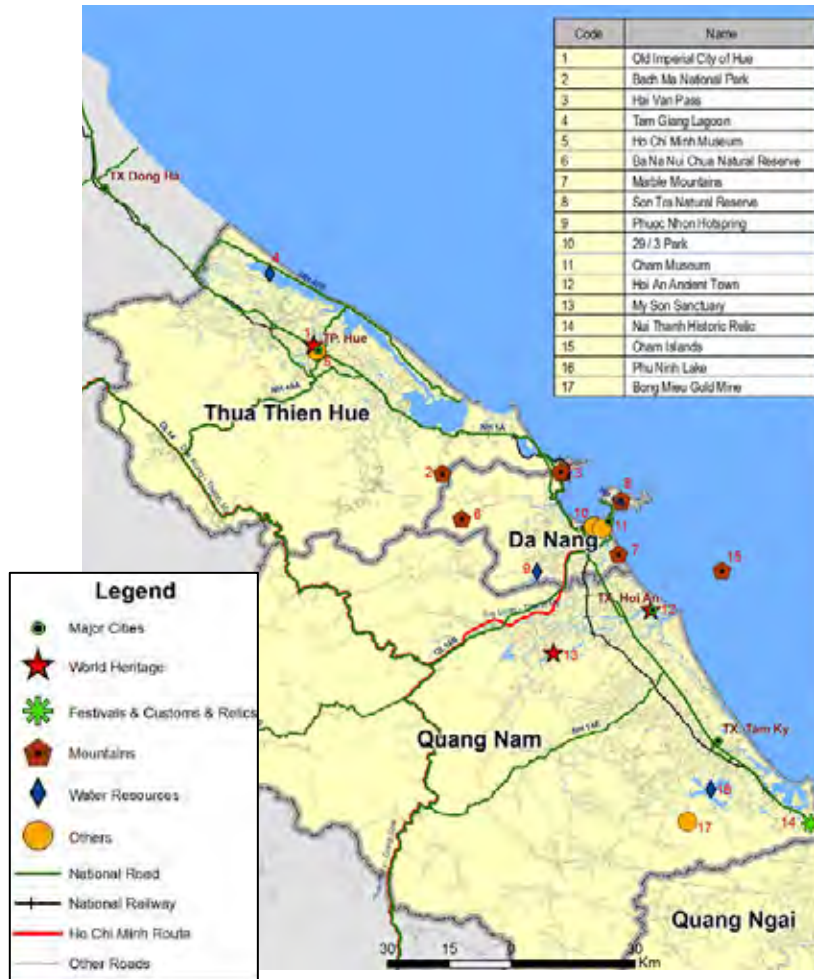
Summary of Issues

13.2 **Enhancing Interprovincial Coordination:** When tourists choose a place to visit in central Vietnam, they do not do so with a specific administrative district in mind; they choose tourist sites regardless of their district. Therefore, when considering a tourism development policy, it is important to identify tourism resources individually, then packaging them, and creating an attractive story to appeal to tourists. For any tourism promotion to succeed, it is important to define the roles of the nation, province, and community and promote a balanced and strategic approach. There are unique tourism resources in the three provinces of Thua Thien Hue, Danang and Quang Nam in central Vietnam; but, currently, these alone are not enough to motivate tourists to stay longer or revisit. These resources can be fully utilized only if all three provinces employ the same strategy. Otherwise, if one province tries to create a tourism package that includes everything from marine and mountain leisure trips, as well as visits to historic sites, these will require the province to allot significant time and investment in providing tourism infrastructure. Secondly, the concentration of tourists in one location might lead to environmental degradation.

13.3 **Creating Clear Collective Image of the Region:** The existence of three World Heritage sites, beautiful beaches, and quaint coastal areas, as well as preserved forests and mountain areas in a relatively compact area makes the three central provinces a unique tourist hub. Yet the potential of this tourism cluster has not been fully recognized. Clearly, it needs a coordinated and integrated tourism management and promotion.

13.4 **Strengthening Environmental Management:** Tourism development presents threats, such as increased anthropogenic pressure, and opportunities, such as recognition and improved financing for environmental management. The opportunity to stimulate knowledge-based activities, including services and research, as well as soft and green technologies should be considered in more detail. This concept fits Danang's vision to become an environmentally friendly city. In general, environmental impact assessments are necessary in tourist areas, as can be witnessed along the seafront and riverfront in Danang where hotel plans are approved individually without consideration of their cumulative and collective impact. In Hue, an integrated coastal management project has tied up with an integrated lagoon management project which is both in the planning stages. Both have helped coordinate the developments in these areas and reduced conflicts in the demand for natural resources. Tourism presents an opportunity to protect specific natural resources and to increase enforcement of existing regulations. Eco-tourism can likewise increase the sustainable management of sensitive locations.

Figure 13.1 Location of Main Tourism Destinations in the HDQ Region



Source: DaCRISS Study Team.

Table 13.1 Main Tourism Destinations in the HDQ Region

	Thua Thien Hue	Danang	Quang Nam
Major Cities	• Hue City	• Danang City	• Hoi An Town • Tam Ky City
World Heritages	• Old Imperial City of Hue (1) • Hue royal court music		• Hoi An Ancient Town (12) • My Son Sanctuary (13)
Beach Resorts	• Canh Duong, Thuan An, Lang Co	• Thanh Binh, My Khe, Bac My An, Non Nuoc, Nam O	• Ha My, Cua Dai, Tam Thanh, Tan Dinh
Craft Villages	• Many craft villages around Old Imperial City of Hue • Craft villages near Quang Tri border	• Handicraft centered in Marble Mountains	• Accessible craft villages near Hoi An Ancient Town • Craft village cluster near Tam Ky City and Phu Ninh Lake
Festivals, Customs and Relics	• Royal court music • Tombs from Hue Dynasty	• Cham culture preserved in Cham Museum	• Nui Thanh Historic Relic (14) • Various small – scale cham relics
Mountains/ Fauna and Flora	• Bach Ma National Park (2) • Hai Van Pass (3)	• Ba Na Nui Chua Natural Reserve (6) • Hai Van Pass (3) • Marble Mountains (7) • Son Tra Natural Reserve (8)	• Cham Islands (15)
Water Resources	• Tam Giang Lagoon (4)	• Phuoc Nhon Hotspring (9) • 29 / 3 Park (10) • Cham Museum (11)	• Phu Ninh Lake (16)
Others	• Ho Chi Minh Museum (5)		• Bong Mieu Gold Mine (17)

Source: DaCRISS Study Team. Note: The numbers in parenthesis correspond to the numbers in Figure 13.1.

13.5 Central Vietnam's geography can be roughly divided into three: mountain and forest ecosystems, hilly and flat areas, and coastal and marine ecosystems. Some of the most serious development concerns in these three areas include excessive use of water resources, water pollution (from transportation, craft villages, and farming), solid waste disposal, deforestation, and illegal trading (e.g., fur and meat). Donor projects have tried improving management and policy schemes, but coordinated environmental planning and management remain out of grasp. Fragmented approaches to environmental assessment and management prevail and weaken the efficiency of protection measures.

13.6 **Strengthening Transportation Connectivity at All Levels:** Improving accessibility to and within the region is one of the most critical issues not only to promote tourism but also to maintain the region's accelerated growth. Expanding direct connections between the region and major cities in Vietnam and Asia will help increase tourist arrivals due to reduced travel times and increase in comfort. The same will be true with intraregion travel, since most tourists visit more than two provinces. Improved transportation (roads and rivers) within the provinces can also contribute to expanding the opportunities for tourists to visit otherwise isolated and scattered tourist destinations.

13.7 Visitors have a variety of transportation options to travel within the central region. Danang has an international airport and Thua Thien Hue has a deep-water port in Chan May which is accessible to passenger ships. While road networks connecting the city centers are currently sufficient, many provincial roads in the region are too narrow for large vehicles. In Quang Nam, several bridges need to be strengthened. Rail lines also connect major cities and future high-speed railways are planned. Rivers, such as the Huong River in Hue, also offers opportunities for river transportation for tourists.

Proposed Project Packages

13.8 After an initial selection of tourism projects bearing in mind the issues described above, the listed projects were also evaluated based on their responsiveness to the demand of the government for accessibility, hospitality and services, and environment. Based on this, 11 projects were selected. Detailed project profiles were prepared in Part V Chapter 5 Main Text. Finally these priority projects were grouped into 2 comprehensive programs in which their needs were strongly identified by all 3 provinces, and also agreed in general by VNAT as well.

(a) Inter-provincial Tourism Promotion and Human Resource Development

13.9 It is needless to say that strengthening inter-provincial cooperation in the tourism sector is important for the overall economic development of the region. However, promotion and marketing of tourism as a region have not been adequately undertaken in Central Vietnam. This is mainly due to 3 reasons: i) the region lacks a body in which such cooperation be initiated by, ii) tourism promotion is undertaken rather separately among key stakeholders, failing to enhance a collective image as a major tourism destination, and iii) promotion materials for regional tourism are also not prepared in coordinated manner. The need for a coordinating mechanism has been strongly identified by both the public and private sector in the course of this study.

13.10 Another issue in the region is that not only is there a shortage of workers in the tourism industry, but the quality of training schools and systems are still low. This has been proposed by provincial governments as well, but to this day effective measures have yet been taken. Given the popularity of the region for international tourists as well as the

remarkable domestic tourism boom in recent years, human resource development is a prime issue in which all provinces are in agreement on. Individual efforts can be seen in the private sector, but usually lacks in budgets and trainers to meet the needs.

13.11 The objectives of the program are the following:

- (i) To strengthen the Tourism Association especially through involving the Central Government who will take initiative in its activities;
- (ii) To establish a collective image of the region and appeal to tourists as a major tourism destination;
- (iii) To develop high-quality human resources to meet the needs of the growing tourism industry in the region.

13.12 The proposed components of the program are: (i) strengthening and reorganization of the Tourism Association, (ii) promotion and marketing activities, and (iii) establishment of Tourism Training Center.

(b) Community and Eco – Tourism Supporting Program

13.13 To this day, tourism has been mainly developed in coastal areas in Central Vietnam, owing much to the abundant natural resources in the region and the active involvement from the private sector to exploit them. However, all three provinces of Thua Thien Hue, Danang, and Quang Nam share the problem that opportunities for tourism development have been limited primarily to the eastern side, and infrastructure investments have been heavily concentrated on this side of the region as well.

13.14 In the western side of the region, there are many potential kinds of tourism resources / destinations such as culture (handicrafts) and living style of ethnic minorities in beautiful landscape, forests, mountains, etc. Nonetheless, tourism development in this region has not been, and will not develop if it only relies on the market context. This is because the region still lacks basic infrastructure to satisfy tourists, such as access roads, sufficient sanitary, accommodations, well-organized tourism industries, etc., and this has so far been an obstacle for tourism development in the area.

13.15 There is also a high potential for inter-provincial cooperation in this region, as all three provinces share mountainous areas on its west side connected by the Ho Chi Minh trail. The provinces are also in general agreement that tourism development in these areas are strongly in need.

13.16 The objectives of the program are the following:

- (i) To diversify tourism opportunities in the region to attract more tourists and encourage longer stays;
- (ii) To improve the livelihoods of the people through the provision of public services, education, and stable economic basis.
- (iii) To enhance inter-provincial cooperation in the tourism industry for the three provinces.

13.17 The proposed components of the program are: (i) development of access roads to destinations, (ii) improvement of rural water supply and sanitation, (iii) infrastructure upgrading along Ho Chi Minh Trail, and (iv) capacity building for villagers.

14 CONCLUSION AND RECOMMENDATIONS

Central Focal Economic Zone

14.1 CFEZ is much more at a disadvantage compared to NFEZ and SFEZ due to various factors including: (i) small population, (ii) lack of infrastructure, (iii) vulnerability to natural disasters, (iv) weak private sector, and (v) weak connectivity with the global market and growth hubs, a situation which is further aggravated by the (vi) lack of adequate coordination among the region's provinces. However, CFEZ has its strengths and opportunities which so far have not been fully tapped. These include: (i) rich cultural and natural resources; (ii) gateway of east–west corridor; (iii) strategic location in Vietnam; (iv) government commitment to accelerate growth and development of CFEZ; and (v) relatively low cost of labor, suppliers, and services.

14.2 In order to accelerate CFEZ growth in a competitive and balanced manner, the vision, goals, and basic development strategies for the region should be as follows:

- (a) The vision for CFEZ is for the region to become an “Eco-Tech region,” meaning CFEZ will promote economic development, ecological balance, and ethnological harmony based on the maximum use of modern technology;
- (b) In order to enhance the capacity of CFEZ, regional integration should be strengthened at all levels, as explained below:
 - (i) Establish a complementary but competitive role of CFEZ in the national development strategy;
 - (ii) Strengthen connectivity with the international community;
 - (iii) Strengthen interprovincial coordination to attend to common issues among the provinces; and
 - (iv) Respond to existing internal demand and needs of communes and provinces.

14.3 The importance of integration and coordination among the city and provinces in CFEZ as a prerequisite to sustainable development has been commonly recognized and accepted among the provinces where a delineation of roles was presented by the Da-CRISS Study Team. The initial proposal was revised many times based on discussions and comments raised in Steering Committee meetings

Danang City

14.4 It has been observed that Danang City has been relatively well developed and managed, although the situation varies by area. The overall assessment of the people on the living conditions and service provision has also been positive.

14.5 The main issues facing the city pertain more to the future than the present due to the fact that urbanization is expected to accelerate and development investments and pressures will increase. These issues are briefly as follows:

- (a) Growth and expansion of urban areas which are already taking place. Current types of developments may create: (i) poor land use through low-density residential developments in peri-urban areas, (ii) congestion due to high-rise buildings in the city center, and (iii) adverse environmental impacts due to resort projects along the coast.
- (b) The environmental situation may further degrade due to the following:
 - (i) Urban effluents often mixed together with industrial effluents;

- (ii) Observed poor quality of groundwater and lack of systematic data on the situation of aquifers;
 - (iii) Large number of construction projects, resulting in land reclamation which in turn has affected coastal forests and riverbank stability;
 - (iv) Solid wastes dumped in water bodies, such as urban rivers, lakes, and sea, and problems raised by the partial treatment of medical and industrial wastes; and
 - (v) Illegal activities such as forest cutting, hunting, and fishing, which are not quantified but which remain a matter of concern.
- (c) Traffic situation will quickly worsen due to the unavailability of competitive public transportation, shift from motorcycles to cars, further concentration of activities due to the accumulation of high-rise commercial / business facilities in the city center. The lack of traffic management measures will further amplify traffic problems all over the city.
- (d) For sustainable economic growth, the city must be prepared to generate employment opportunities to match the population increase and the change in the industrial structure from agriculture to industries and services.
- (e) As the urban area expands and development activities intensify, vulnerability to natural disasters may increase and ecosystems will be under pressure.
- (f) While it is clear that the people, enterprises across all sectors, and city authorities accept the “Environmental City” concept, there is a need to further elaborate the concept by formulating strategies, plans, and concrete implementing mechanisms. Consolidating survey results, the review of current policies and plans, as well as discussions among experts, it is thus proposed to redefine the vision and goals of Danang City as follows:

**“Danang to be an Internationally Competitive Environmental City
beyond being Pollution-free”**

14.6 In order for Danang City to function as a competitive third national hub to lead the growth of CFEZ and Vietnam, it is assumed that the future population will be 2.1 million in 2025 and larger thereafter. It is also assumed that with the updated development strategies proposed by the study Danang will most likely attract even more migrants from various parts of the country.

14.7 A weakness in urban development planning in many Vietnamese cities is seen in the uncoordinated implementation of policies and projects among them. Lack of coordination brings about not only wastage of limited resources but also ineffective outputs. Therefore, for Danang City to promote its envisioned development in the most effective manner, there is a need to integrate strategies and closely coordinate among implementation bodies. Under the vision of an environmental city, the environment should not merely be an appendage to development; rather, it should be the driving force to promote the city’s sustainable development. To realize this, strategies for each urban subsector should have environment components in synergy with those in other subsectors.

