

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

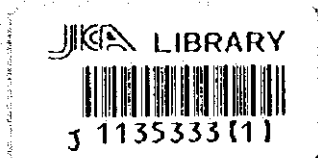
DEVELOPMENT STRATEGY INSTITUTE (DSI)  
MINISTRY OF PLANNING AND INVESTMENT (MPI)  
THE SOCIALIST REPUBLIC OF VIET NAM

**THE STUDY  
ON  
THE INTEGRATED REGIONAL SOCIO-ECONOMIC  
DEVELOPMENT MASTER PLAN  
FOR  
THE KEY AREA OF THE CENTRAL REGION  
OF  
THE SOCIALIST REPUBLIC OF VIET NAM**

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**FINAL REPORT  
PRE F/S REPORT VOL.3  
Tourism Infrastructure Improvement and  
Tourism Promotion Zone Development Project**

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**MARCH 1997**

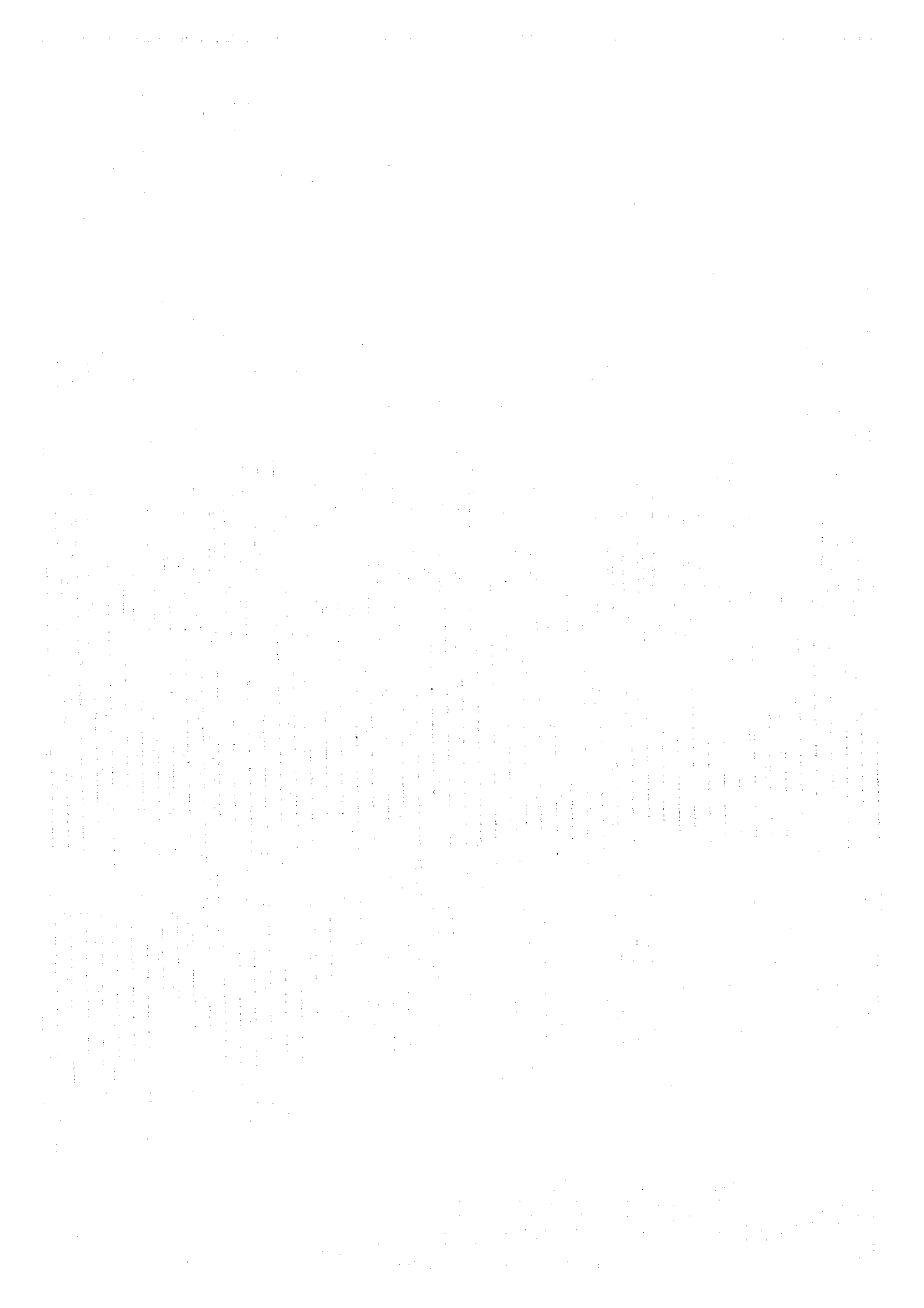
PACIFIC CONSULTANTS INTERNATIONAL  
SANYU CONSULTANTS INC.  
INTERNATIONAL DEVELOPMENT CENTER OF JAPAN

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**MARCH 1997**

**PACIFIC CONSULTANTS INTERNATIONAL  
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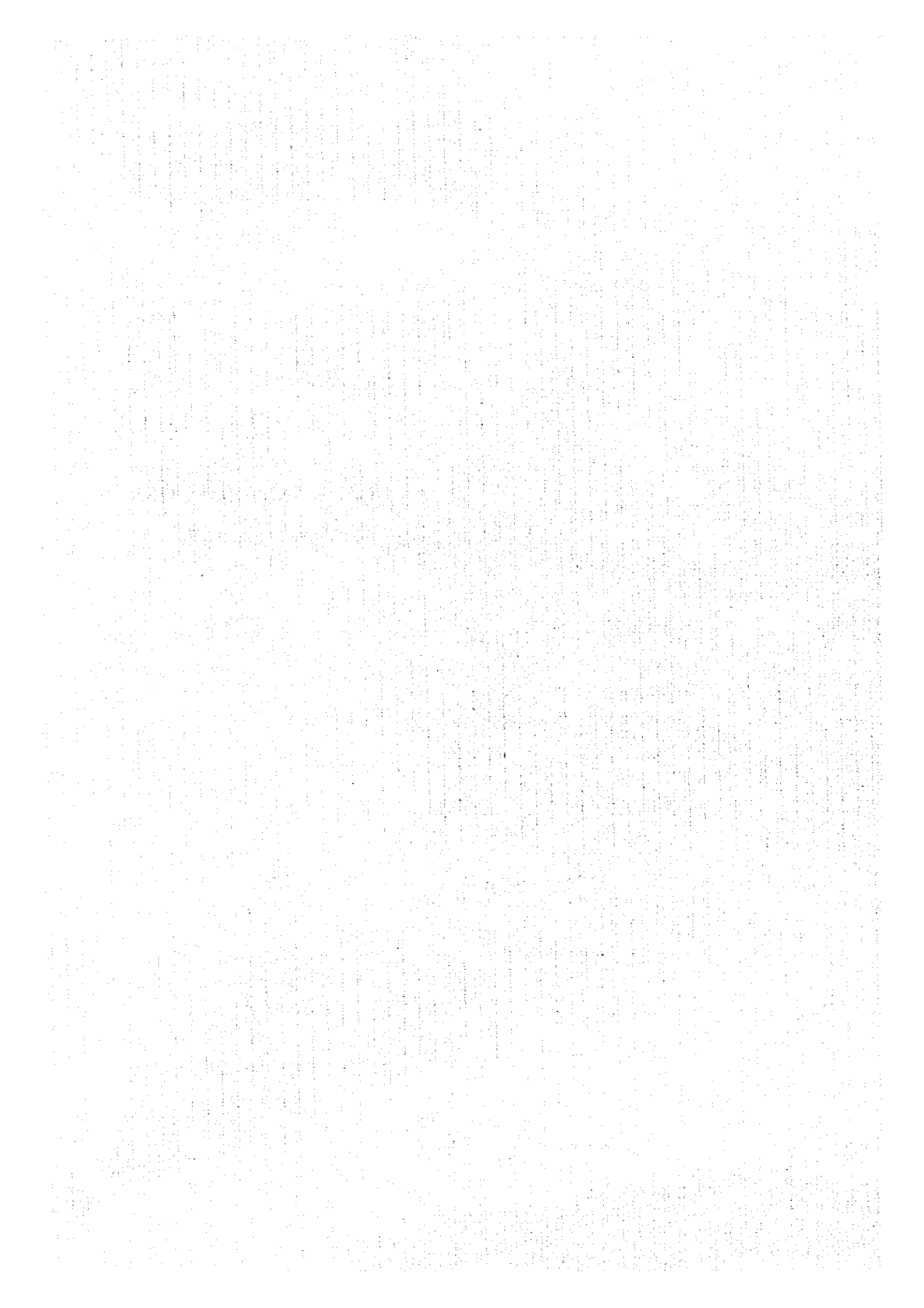
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## ABBREVIATIONS

BOD	Biochemical Oxygen Demand
BTDC	Bali Tourism Development Corporation
CRDC	Central Region Development Committee
CRTDC	Central Region Tourism Development Corporation
DD	Detail Design
EIA	Environmental Impact Assessment
F/S	Feasibility Study
I.D.C.	Interest During Construction
IEE	Initial Environmental Examination
JICA	Japan International Cooperation Agency
OECF	Overseas Economic Cooperation Fund
PMU	Project/Program Management Unit
PSC	Project Steering Committee
Q.N. Da Nang	Quang Nam Da Nang
Q.N.D.N.	Quang Nam Da Nang
Q.Ngai	Quang Ngai
Q.Tri	Quang Tri
R.O.W.	Right of Way
TI	Tourism Infrastructure Improvement Project
TPZ	Tourism Promotion Zone (Development Project)
TSIC	Tourist Service Improvement Committee
T.T. Hue	Thua Thein Hue
UNESCO	United Nations Educational, Scientific and Cultural Organization
V.A.T	Value Added Tax
VNAT	Vietnam National Administration of Tourism
VND	Vietnamese Dong
WTO	World Tourism Organization

# **CHAPTER 1**

## **GOALS AND OBJECTIVES**





# CHAPTER 1 GOALS AND OBJECTIVES

## 1.1 GOALS

This pre-feasibility study focuses on the tourism development projects in 4 provinces, especially Quang Nam Danang and Thua Thien Hue Provinces, which have to play important roles in regional tourism development and which have to function as one of the regional centers in the national tourism structure of Viet Nam. Main goals of the projects proposed by this study are described as follows

- Optimization of the contribution of the tourism sector to economic growth at national and regional levels through promoting consolidation of the tourism centers
- Enhancement of and contribution to social cohesion and cultural conservation and encouragement
- Sustainable development of tourism in consideration of tourism resources and the environment, and
- Exploitation of various tourism products (destinations, attractions, and so on) taking into account minimal exposure to internal and external threats of tourism activities.

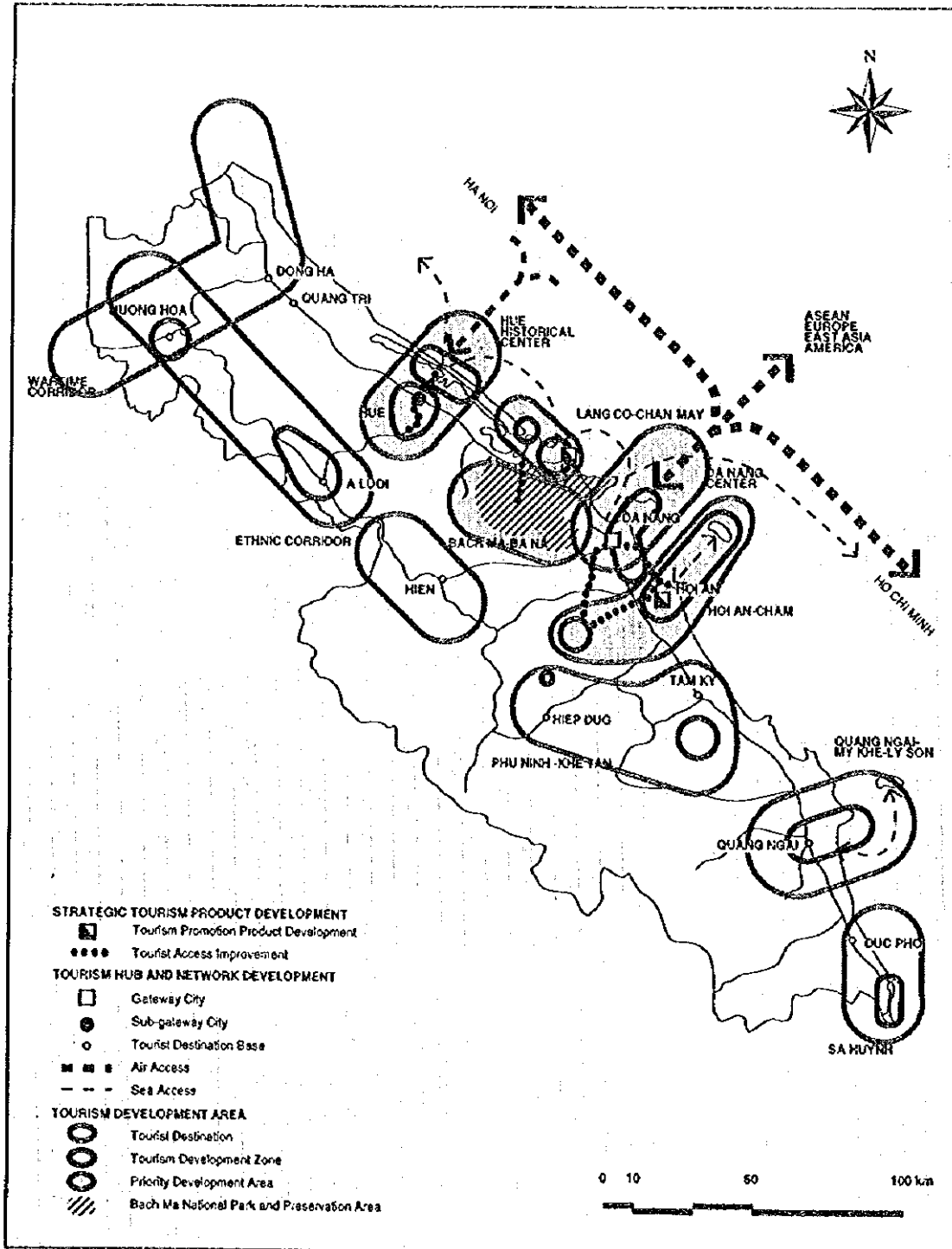
## 1.2 OBJECTIVES

The principal objectives are to achieve a well balanced tourism development over the country, attaining full distribution of development benefits and enhancing overall attractiveness of Viet Nam's tourism, through provision of adequate tourism attractions and infrastructure in consideration of harmonious exploitation between development and conservation in these province's resources. The objectives are summarized as follows

- Expansion of the tourism carrying capacity in national and regional tourism development
- Encouragement of sustainable tourism development taking into account the economic decentralisation policy
- Correspondence with urgent local needs to provide basic infrastructure in tourism development areas as Tourism Centres of the Central Region of Viet Nam, and
- Establishment of effective implementation systems for various tourism related projects in co-ordination with all agencies concerned.

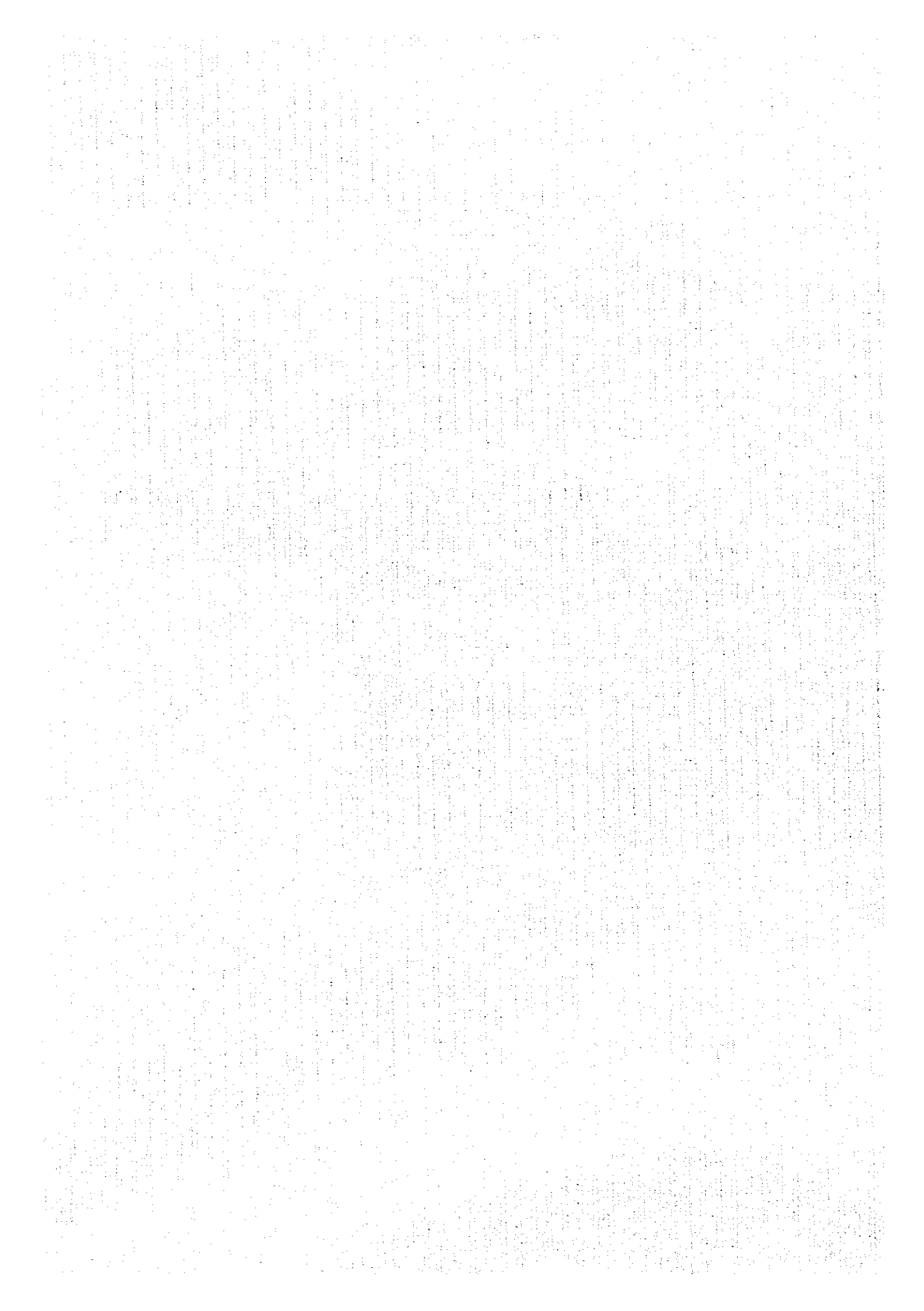
The pre-feasibility study has been carried out for selected priority development projects. They are selected in the priority development area identified in the structure plan shown below.

**Figure 1.1 Structure Plan for Tourism Product Development in the Central Region**



## **CHAPTER 2**

### **TOURISM PRODUCT DEVELOPMENT PROJECT**



## **CHAPTER 2 TOURISM PRODUCT DEVELOPMENT PROJECT**

### **2.1 PRIORITY PROJECT FOR TOURISM PRODUCTS DEVELOPMENT**

#### **2.1.1 Selection Criteria for Priority Tourism Product Development**

The criteria for selecting priority projects are:

- Projects to be selected in each tourism priority area
- Consideration of development implementation and basic tourism facilities:
  - Infrastructure development necessary to support opportunities for tourism development investment, and
  - Need to have governmental intervention for effective and feasible tourism development investment of small organizations or the private sector with control measures.
- Optimum development scale:
  - Adequate scale of facilities' development in terms of effectiveness of urgent action and immediate project implementation, and
  - Need to develop large-scale tourism development under government control in order to increase supply of accommodation, but subject to a careful feasibility study
- Consideration of development trigger in each tourism priority area:
  - Playing an important role in triggering effects in the tourism sites as adequate samples of development or improvement, and
  - Guide the tourism development into a suitable direction with adequate control measures
- Consideration of urgent supporting action for the tourism sector, resource conservation and management in terms of tourism infrastructure reinforcement:
  - Need to take urgent actions in view of the fragile nature and historical environment threatened by human activities, and
  - Adequate measures of physical development for a valuable environment
- Project coherent with regional development plan:
  - Need to co-ordinate with other sector development plans, such as transportation sector, urban development sector and environmental sector, and
  - Need to supplement such sector development through tourism development projects.

### **2.2 SELECTED SUB PROJECTS**

#### **2.2.1 Project Category of Sub-Projects For Priority Tourism Products Development Projects**

- Urgent improvement projects which provide infrastructure

- Desirable area development projects for reinforcement and integration of tourism products as a whole in strategic special areas, and
- All projects, which need to have planning and design guidelines for sustainable environmental improvement.

### 2.2.2 Tourism Infrastructure Improvement

In order to cope with the disadvantages of the tourism products as identified in the preceding section, it is necessary that the government supports and assumes responsibility for the provision of public facilities and infrastructure. This is apart from the private sector contribution that is investing in tourist accommodations and other related facilities.

On the other hand, some tourism assets and their surroundings, being threatened with environmental destruction, should be protected by several measures. Urgent action needs to be taken for the physical protection and improvement of these assets.

The role of this sub-project is identified below and typical measures to meet requirements are summarized in the Table 2.1

**Table 2.1 Role of and Measures for Tourism Infrastructure Improvement**

Measures	Transportation facilities improvement	Tourism facilities and utilities improvement	Environment control	Suitable development guideline
Development roles				
Securing convenient and safe access and increasing transportation capacity	☆	○	◆	☆
Attractive and comfortable environmental creation	○	☆	☆	☆
Tourism assets revitalization	◆	☆	☆	☆
Local community encouragement	☆	☆	○	○

Note: ☆ = almost compulsory, ○ = necessary, ◆ = desirable

Source: JICA Study Team

The sub-project has the following roles:

- Support the tour route network development in terms of securing convenient and safe access and increasing transportation capacity in the priority development areas
- Improve tourism facilities and their surroundings including landscape improvement in tourism development areas in terms of creating an attractive and comfortable environment for visitors, taking environmental carrying capacity into consideration
- Formulate the system for environmental revitalization of tourism assets (natural, historical, cultural assets) through administrative control measures, such as park systems or development guidelines and standards
- Encourage economic activities of local communities' through provision of suitable facilities and infrastructures in terms of community's participation and enlightenment in the tourism development; and
- Improve local community's environment in terms of the standard of living among tourism development zones.

### 2.2.3 Tourism Promotion Zone Development

For the purpose of more progressive tourism facilities' development, the idea of "Tourism Promotion Zone (TPZ)" is proposed as outlined below.

#### 1) Functions of TPZ

The tourism promotion zone, which is a designated tourism core area accumulating tourism facilities, aims at:

- Accumulating tourism facilities
- Controlling environmentally negative impacts by providing public infrastructure
- Providing effectively necessary public services
- Effectively providing infrastructure, and
- Restraining land speculation.

Accordingly, the following functions should be attached :

- Tourist accommodation
- Provision of food and drink
- Transport services
- Tourism information and supporting services
- Public services, and
- Shopping.

Table 2.2 lists examples of possibly necessary facilities in accordance with the functions.

**Table 2.2 Examples of Necessary Facilities in the Tourism Promotion Zone**

Function	Examples of Facilities
Accommodation	Hotel, Lodge, Tent site, Camping Site
Food and Drink	Restaurant, Fast Food Shop, Bar, Entertainment
Transport Service	Car Parking, Bus Station, Gasoline Stand, Rental Car Shop, Car Repair and Parts Shop
Tourism Information and Supporting Service	Tourist Information Center, Travel Agent Office, Tourist Guide, Equipment, Tool or Machine Rental Shop, Pro shop
Public Service	Post Office, Clinic, Police Box (Station), Bank, Fire Station
Shopping	Souvenir Shop, Glossary Store, Drug Store

Source: JICA Study Team

## 2) Designation of the Tourism Promotion Zone

The tourism promotion zone should be designated for the following area :

- An area, which should support the tourism zone as a core
- An area, in which severe negative environmental impact is highly expected to occur, and
- An area, which had better accumulate tourism facilities and accommodations.

## 3) Structure of the Tourism Promotion Zone

### (1) Land preparation and subdivision

The development body of the tourism promotion zone implements land preparation and subdivides the land. For land preparation, tree felling must be minimized, in order to maintain the natural landscape, especially in forest areas.

### (2) Building control

Building control should be enforced in the zone, in order not only to create an appropriate atmosphere for the tourism place, but also to protect against pollution and provide disaster prevention. Standards of building control should include the following points of view :

- Land use intensity control (floor-area ratio and so on)
- Landscape control (height control, setback, building line and so on), and
- Environment and disaster prevention (necessary equipment with capacity).

### **(3) Environment and sanitary infrastructure**

To restrain pollution in the zone, sanitary infrastructure such as drainage system and waste disposal system should be provided by the public sector. For this end, the public sector should prepare the following facilities and infrastructure under a centralized system :

- Waste water collection main route
- Centralized waste water treatment facilities
- Waste water discharging facilities
- Garbage collection system, and
- Landfill site.

### **(4) Cost allocation of development**

#### **a) Cost Sharing of Land Preparation of Commercial and Public Sites**

To secure private investment for commercial facilities and provide public sites, the land price or lease price should be set up differently by type of activity. The cost of public service and commercial sites will be put partly in the price of the accommodation sites.

#### **b) Cost Allocation of Preparation of Basic Infrastructure**

To implement smoothly infrastructure provisions in the zone, a certain portion of infrastructure projects should be included in the land price.

### **(5) Preferential Institutions in the Tourism Promotion Zone**

Instead of relatively higher land cost and relatively strict environmental control adapted in the zone, taxation incentives should be prepared as outlined below.

#### **a) Preferential taxation for investment**

An investor, which implements a tourism project in the zone should be granted certain preferential taxation. Although the contents and level of the preferential taxation must be determined through careful consideration of the balance with the taxation system for other industries, the following items are listed on a preliminary basis:

- Shortening of the depreciation period
- Preferential custom tax for certain import goods, and
- Extension of the tax free period.

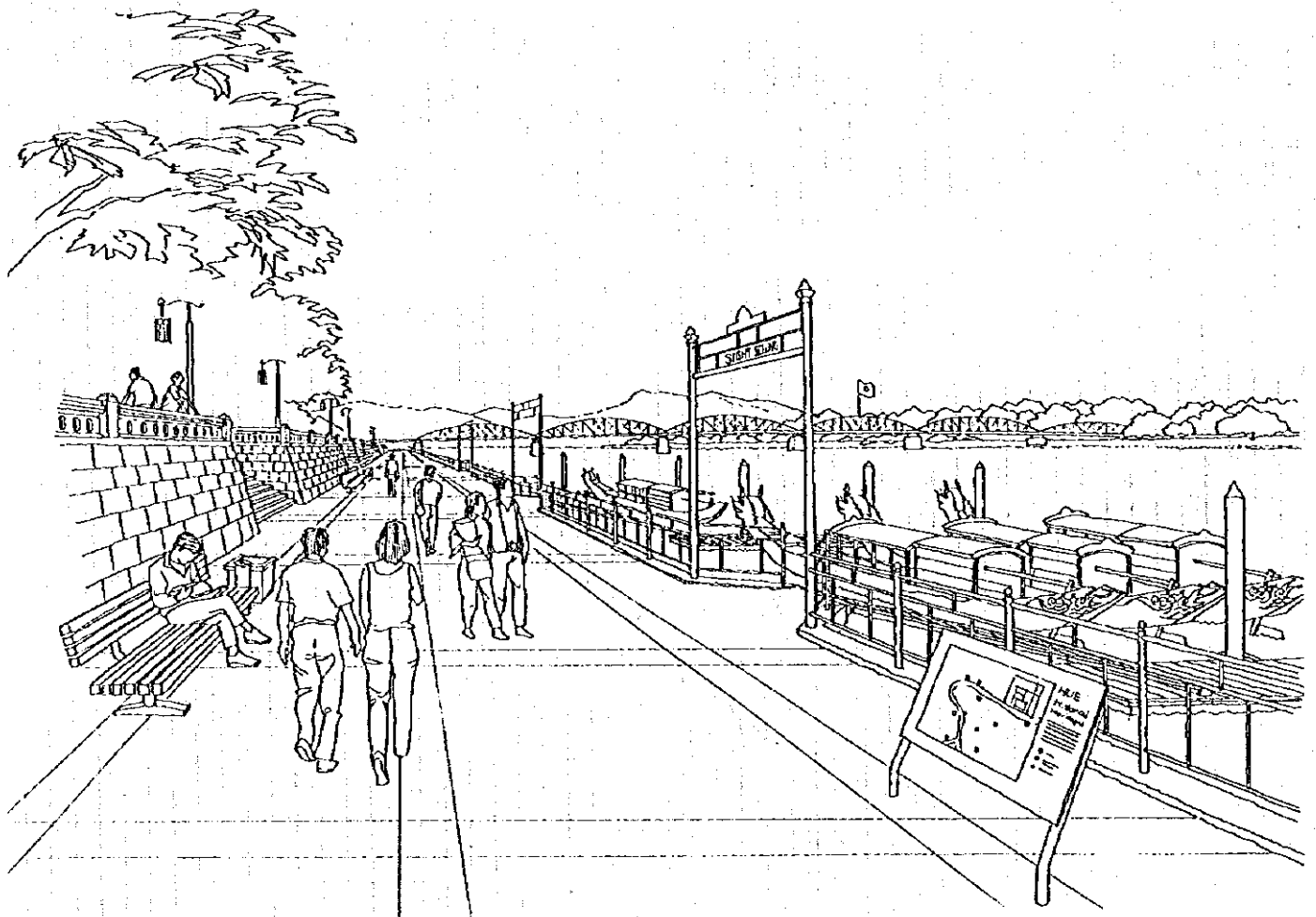
#### **b) Creation of Preferable Conditions for Local Medium and Small Firms**

To encourage local medium and small scale tourism business, a new loan type with preferential conditions should be created by the Central Government. A credit guarantee by the public sector might be another system to be adopted to enhance the creditability of local medium and small firms.



## **CHAPTER 3**

### **TOURISM INFRASTRUCTURE IMPROVEMENT PROJECT**



**Image of Hue Historical Center**

## CHAPTER 3 TOURISM INFRASTRUCTURE IMPROVEMENT PROJECT

### 3.1 PROJECT COMPONENTS

Several projects are identified including supplemental measures, which shall contribute to creating a preferable tourism environment. The projects are based on the following assessment of each priority development area.

#### 3.1.1 Assessment of Tourism Infrastructure in Priority Development Areas

Almost all priority development areas have several access roads to each of the tourism resources. A total road length of 223.1 km is estimated to be necessary as tourism roads. Quite a number of roads need to be improved or newly developed as new access roads. Some roads are too narrow or have bad surface conditions. The conditions of other transportation facilities, which provide access to each tourism resource, and the roads are summarized in Table 3.1 and 3.2.

**Table 3.1 Water Transportation Facility Condition by Priority Development Area**

Priority Development Area	Type of water transportation	Conditions
DA NANG CENTER	Cruising ship	<ul style="list-style-type: none"> <li>- Da Nang Port functions as a base in the Central Region to accommodate cruising ships</li> <li>- The port has several problems, such as seasonal storm, siltation from the Han River, and so on</li> <li>- Land transportation is not enough to accommodate cruise tourists, due to the scale and timing of visitors from ships</li> </ul>
HOI AN - CHAM	River boat	<ul style="list-style-type: none"> <li>- There are not many tourist boats in Hoi An Town, but siltation has caused town water transportation problems during the dry season</li> <li>- No transportation to Culao Cham Island on a tour vessel</li> </ul>
LANG CO - CHAN MAY	(Cruising ship)	<ul style="list-style-type: none"> <li>- The new proposed port is expected to accommodate one more cruising ship base</li> </ul>
HUE HISTORICAL CENTER	River boat	<ul style="list-style-type: none"> <li>- Water transportation facilities play an important role not only in terms of access function to historical areas, but also as an attractive environment means for tourists</li> <li>- Jetties and piers are in no good condition, especially in the historical areas close to the Huong River, due to the bank's deterioration in terms of not only safe and comfortable access to the banks, but also protection of the historical environment</li> </ul>

Source : JICA Study Team

**Table 3.2 Tourism Roads Condition by Priority Development Area**

Priority Development Area	Total length of tourism road *	Conditions of Road
DA NANG CENTER	36.0 km	<ul style="list-style-type: none"> <li>- Comparatively good condition of road surface in this area.</li> <li>- Widths of the right of way range from 6m to 12m.</li> <li>- Road of Hai Van pass is in not too bad condition in terms of tourism utilization, if substitutive highway is prepared.</li> </ul>
HOI AN - CHAM	60.2 km	<ul style="list-style-type: none"> <li>- Almost all roads are in no good condition both in width and road surface, except inside of Hoi An town.</li> <li>- Width of the right of way range from 3m to 10m.</li> <li>- Access road to Hoi An along the coastline is very bad from Marble Mountain except for another route (TL 603).</li> <li>- Access road to My Son is in bad condition in the proximity to the My Son area from a road width and surface point of view, especially shuttle bus route with environmental deterioration in the My Son area.</li> </ul>
LANG CO - CHAN MAY	7.5 km	<ul style="list-style-type: none"> <li>- Main access road of QL 1 is in good condition of road surface.</li> <li>- Widths of the right of way range from 8m to 12m.</li> <li>- New access road is necessary to develop the proposed development area, since there are no access roads.</li> </ul>
BACH MA - BA NA	20.0 km	<ul style="list-style-type: none"> <li>- Almost all roads are in bad condition due to no open area to tourists and mountain side road.</li> <li>- Access road to Ba Na is not included in this project.</li> </ul>
HUE HISTORICAL CENTER	51.7 km	<ul style="list-style-type: none"> <li>- Comparatively good condition of road surfaces in this area, but width of roads are not enough to serve comfort and safety, due to mixed use by several means to historical areas, such as by walking, by bicycling, by vehicles.</li> <li>- Widths of the right of way range from 3m to 6m.</li> <li>- Some roads are too close to historical assets (pagoda, temples, mausoleums).</li> </ul>
HUAN AN RESORT	19.3 km	<ul style="list-style-type: none"> <li>- Comparatively good condition of road surfaces.</li> <li>- Widths of the right of way range from 5m to 7m.</li> </ul>

Note : \* 194.7km of the total length of the roads excludes new tourism road development.

Source : JICA Study Team

### 3.1.2 Tourism Facilities

Tourism facilities, which aim at supporting tourist activities and improving the tourism development zones, are defined as small-scale facilities provided by public authorities, such as sign and information facilities, parking, rest places with toilets and other facilities including landscaping and facilities for environmental improvement. The following are the overall existing conditions of tourism facilities in priority development areas.

**Table 3.3 Tourism Facilities Condition by Priority Development Area**

Priority Development Area	Parking area	Sign & information	Service facilities and environmental conditions		
			For beach recreation	For historical cultural areas	For management and conservation
DA NANG CENTER	○	◆	○	○	◆
HOI AN - CHAM	○	○	○	○	◆
LANGCO - CHAN MAY	◆	◆	◆	◆	◆
BACH MA - BA NA	◆	◆	----	----	○
HUE HISTORICAL CENTER	○	◆	○	○	◆

Note: ○ = good or satisfied, ○ = bad condition or not satisfied, ◆ = no facilities or environmental problems  
 ---- = not applicable ( these evaluations are for the site of each tourism resources).

Source : JICA Study Team

### **3.2 GENERAL PLANNING CONDITIONS AND IMPROVEMENT GUIDELINES**

Tourism infrastructure improvement projects are proposed hereafter based on the preceding assessment. However, measures should also be taken into consideration not to deteriorate the environment of tourism resources. The following are the general planning parameter for tourism infrastructure improvement and improvement guidelines as common measures for the whole priority development areas.

#### **3.2.1 Tourism Road Improvement**

##### **1) Principles for Tourism Road Improvement and Its Equipment**

Standards for road dimensions and construction depend on the existing administrative statutes, since road improvements are to form part of the public highway system. The general policy is described as follows, when road improvement is designed and constructed:

- Planning conditions
  - Refer to the road classification in Viet Nam's highway design standard system
  - Take regional traffic activities (commercial, agricultural, and so forth) into consideration in terms of not only for tourism but regional road functions, and
  - Consider existing and future land-use conditions along the roadside, such as urban and rural area to be improved as a trigger development in the area.
- Principles for tourism road improvement
  - Consider the functions and roles according to tourism traffic character (purpose, scale and volume, means)
    - Purpose : only transfer or sight-seeing
    - Scale and volume : large-scale bus, mini-bus, water transportation
    - Means : vehicle, bicycle/auto-bike / cyclo, walking
  - Control the entry and access of vehicles in accordance with each area's carrying capacity
  - Consider the role of creating a sense of arrival achieved by road landscaping with trees and flowers, sign-information and so on, in terms of formulation of tourism axis for the tourism development zones, and
  - Minimize negative impacts on roadside environmental conditions, such as physical deterioration, noise pollution, traffic congestion, pedestrian safety.

##### **2) Tourism Road Improvement Guideline**

According to the above principles, the guidelines for tourism roads in the priority development areas are:

- Tourism road classification
  - Tourism road dimensions and construction is based on Viet Nam's highway standard. However, some additional improvement to the standards is proposed in order to create an attractive environment as demanded by each area's character
  - The classification for tourism roads is identified in the following Tables and Figures.
- Preferable traffic system and guideline for tourism development zone
  - Introduction of access control system: it should be introduced into the fragile environment (example: historical natural conservation areas) or area, for which it is necessary to create a comfortable environment (example: beach resort area, national parks) by light vehicle transportation or pedestrian network, or substitutive

transportation, such as river boats. The following Figure 3.1 shows a typical conceptual diagram for such a system.

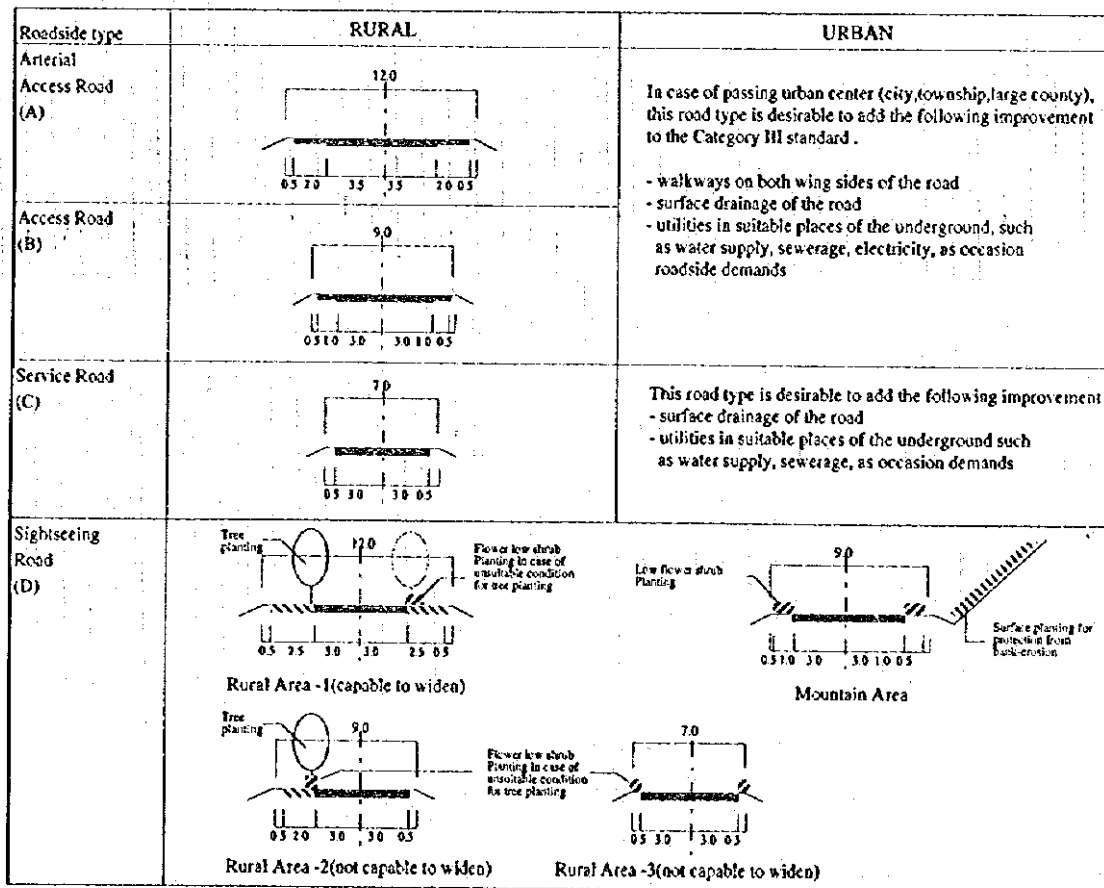
The following Table 3.4 identifies the areas, in which such an access control system should be introduced.

**Table 3.4 Proposed Road Classification for Priority Development Area**

Classification	Function	Carrigeway					Roadside type	Highway standard category
		Width	Lane	Bicycle	Sidewalk	Shoulder		
Arterial Access Road (A)	Access road to tourism areas or Districts from a public trunk road	12.0	3.5 x 2	2.0 x 2	----	0.5 x 2	rural	Category III
		desirable addition	→	+2.0 x 2	ditto	urban	Category III+walk	
Access Road (B)	Access road to sites from a arterial access road or gateway city	9.0	3.0 x 2	1.0 x 2	----	0.5 x 2	rural	Category IV
		desirable addition	→	+1.5 x 2	ditto	urban	Category IV+walk	
Service Road (C)	Service road to facilities in tourism areas or districts	7.0	3.0 x 2	----	----	0.5 x 2	rural	---- *1
		desirable addition	→	+1.5 x 2	ditto	urban	---- *1	
Sightseeing Road (D)	Road to go around tourist destination sites, taking road	12.0	3.0 x 2	(1.0 x 2) plants	2.5 x 2	0.5 x 2	rural	special case*2
		9.0	3.0 x 2	(1.0 x 1) plants	2.0 x 1	0.5 x 2	rural	special case*3
		9.0	3.0 x 2	1.0 x 2 plants	----	0.5 x 2	mountain	III (mountainous)

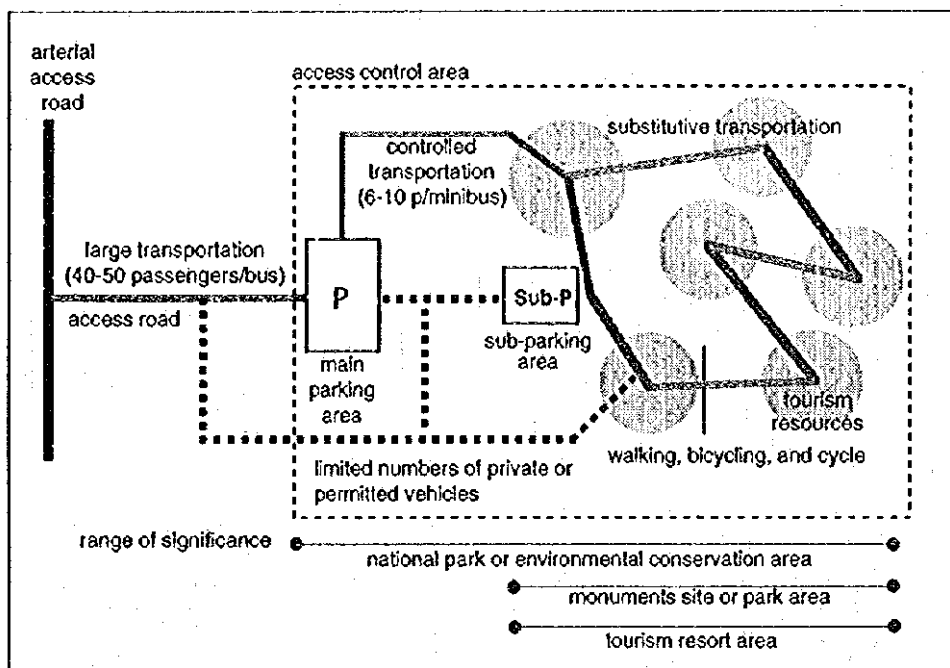
Note : \*1 = This classification shows proposed cross-section for district or commune road type  
 \*2 = Cross-section is proposed to modify taking account of creation of tourism area atmosphere by consultant  
 \*3 = Alternative case for limitation of road expansion, taking account of roadside environment  
 Source : JICA Study Team referred to Viet Nam Highway Design Standards

**Figure 3.1 Dimensions for Tourism Road Classification**



Source : JICA Study Team referred to Viet Nam Highway Design Standards

Figure 3.2 Conceptual Diagram of Access Control System



Source: JICA Study Team

Table 3.5 Desirable Area to be Introduced Access Control System

Priority Development Area	Access control system		For wide range areas with buffers	Substitutive transportation
	For limited site areas	For site and its surroundings		
DANANG CENTER	◆	◆	----	◆ (railway)
HOIAN - CHAM	☆	☆	○	----
LANGCO - CHAN MAY	◆	◆	----	----
BACH MA - BA NA	☆	☆	☆	◆ (cable-car / ropeway)
HUE HISTORICAL CENTER	☆	☆	○	◆ (river boat)

Note: ☆ = almost compulsory, ○ = necessary, ◆ = preferable and possible, ---- = not necessary or impossible.

Source: JICA Study Team

- Environmental protection through tourism road improvement and development
  - By-pass roads are necessary to protect the fragile environment of tourism resources, such as historical monuments and ruins and valuable natural environment.
  - Desirable areas for by-pass roads:
 

The following areas are proposed for implementing by-pass roads in the *Historical Holy Garden Zone* of Hue Historical Center:

(Thien Mu Pagoda by-pass road)  
The local road is in close proximity to the pagoda and the river steps to the pagoda. It is proposed to realign the road as a by-pass in line with the development plan established by the local authority.

(QL49 by-pass)  
The provincial road layout of QL49 is in close proximity to mausoleums and pagodas. It is proposed to develop a by-pass road giving direct access to QL1 without passing the historical area. This project is discussed under the "Secondary Road Improvement Project."

### **3.2.2 Other Transportation Facilities' Improvement**

#### **1) Parking Area Improvement**

In order to guarantee the proposed traffic control system described in the preceding section, some parking areas need to be improved or developed. The general policy guidelines for parking area improvement in tourism development zones with regard to design and construction are:

- **Principles**
  - To take into consideration the scale of parking in terms of environmental carrying capacity of the site and maximum demand, and
  - To consider the location of the parking area, preferably in a remote area, if possible, or with suitable landscaping and without causing any obstacles to the environment.

#### **2) Water Transportation Facilities Improvement**

Water transportation facilities, especially jetties and piers for sight-seeing boats in the Hue Historical Center and destination area, need to be improved, in order to consolidate their function as valuable tourist facilities and as indigenous resources attracting tourists. The general policy guidelines are:

- **Principles**
  - To attach a multi-function to jetty improvement. This implies that the jetty will not only function as landing stage, but also as a scenic access stage to the waterfront area of the river or sea, and
  - To give jetty improvements careful consideration in terms of environmental harmonious landscaping.

### **3.2.3 Sign and Information Improvement**

#### **1) Route Guiding System by Traffic Signs for Tourists**

Although the tourist traffic volume by private vehicles is very small at present, due to organized tour buses, tourist destination areas will have to have convenient and comfortable guide sign systems in priority development areas. This is needed to cope with the increase in tourist movements of foreign and domestic tourists. The general policy to formulate this system is as follows:

- **Principles**
  - To develop visible and attractive sign boards with multi-lingual explanations and maps or diagrams
  - To locate signs at suitable places, taking into account the function of a hierarchical information system, and
  - To utilize signs to enhance the "sense of arrival" of the sites of tourist attractions.

#### **2) Tourism Site Signs and Information**

At present, there are not enough or no signs and information boards at the tourism sites of several tourist destinations. Such facilities are very essential and important to understand tourism assets, even if they add only small explanations about the assets. The general policy for facility improvement, design and construction in tourism development zones is outlined below.



This system is also applicable to Tourism Promotion Zone development as a common measure.

- **Principles**
  - To provide signs and information facilities in line with their function level, such as from general information in the gate area of the site to detailed explanations close to the tourism assets
  - To develop visible and attractive sign boards with multi-lingual explanations and maps or diagrams, and
  - To develop the facilities without effecting negatively the site environment, and with a harmonious design and location

Figure 3.3 and Figure 3.4 show conceptual development guidelines for the route guiding signs and the site signs by category and level of functions.

### **3.2.4 Other Tourism Facilities' Improvement**

#### **1) Principles for Improvement of Other Tourism Facilities**

Other facilities, including rest space with shelter, toilet, ticket booth, and so on, are also necessary to accommodate tourist activities at the site. These facilities are proposed to be introduced at the sites of each tourism development zone as the occasion demands. The principles for other tourism facilities improvement are identified as follows:

- To concentrate such facilities as resting areas, management office, souvenir shops within a limited area as far as possible, for easier management of the facilities
- To develop the facilities without deteriorating the site environment, using harmonious design and landscaping standards, and
- To prepare public recreational facilities to cope with demand for outdoor recreation, especially for domestic tourists, such as parks with camping sites.

#### **2) Considerations for Other Special Facilities Improvement**

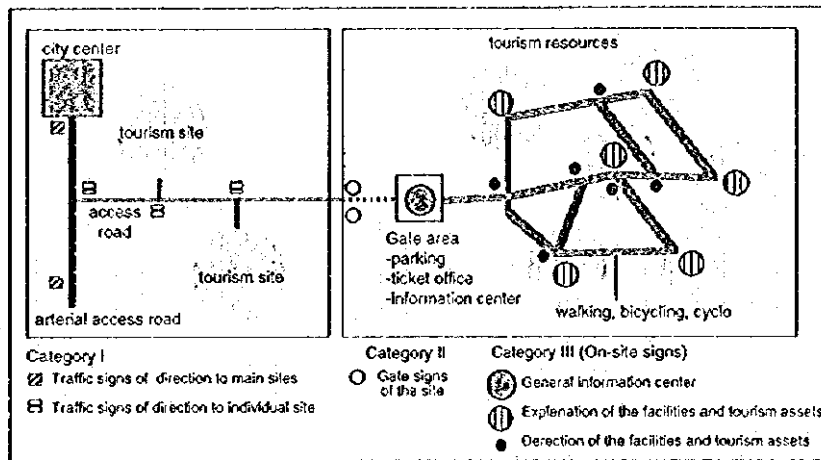
Special facilities, such as "Sonne et Lumière (sounds and lights)" facilities, including lighting up of the monuments, flags and banners are important means to reinforce the attractive atmosphere at each tourism resource. It is proposed to introduce these facilities at the sites in each tourism development zone on a demand basis. Principles for other tourism facilities improvement are as follows:

- To improve the effects on the site or of the objects, such as monuments, without obstacles to the indigenous atmosphere, and
- To create a "sense of arrivals" or "visible landmark", especially at night time with lighting-up facilities for historical monuments and city monuments.

### **3.2.5 Environmental Consideration and its Improvement**

This section elaborates on the necessity of protecting the environment in terms of sustainable tourism development in the priority development areas. The following are typical tools to achieve tourism development with effective environmental control for valuable tourism resources.

**Figure 3.3 Conceptual Diagram of Tourist Signs and Information**



Source: JICA Study Team

**Figure 3.4 Guideline for Tourist Signs and Information Development**

Category	Function	Figure of image	Location	Contents of information
Category I (traffic signs)	To show the information of direction to destinations in tourism development areas for tourists (drivers)		Main intersection or road fork area (within a R.O.W)	- Name of the destination - Distance to the destination - Figure of direction - Bilingual (Viet Nam/English)
Category II (gate signs)	To let tourists (drivers) notice areas as a destination in order to make the sense of arrival (gate information)		Boundary or fringe area of the destination or entrance area of the destination	- Name of the destination - Some compliments words such as "welcome....." - Map information for the facilities necessary to show - Bilingual (Viet Nam/English)
Category III (site signs)	To explain information about facilities or tourist attractions such as its history or location, scientific explanations and cautions for facilities maintenance and operation to tourists		Beside facilities or attractions, taking account of its design without obstruction of its environment	- Name of facilities / attractions - Explanation of them - Map of the location - Trilingual (Viet Nam/English / French)
LEVEL I General information of the site			- Entrance or gate of facilities/attractions	- Map guide of facilities or attractions as a whole - General information - Trilingual explanation
LEVEL II Explanation of the facilities or attractions			- Beside facilities or attractions - Equip directly to facilities/attractions	- Explanation of facilities or attraction in detail - Trilingual explanation
LEVEL III Information for direction of the facilities or attractions			- Equip signs to walkway toward facilities/attractions	- Guide of location and direction for facilities or attraction by diagrammatic figures - Trilingual explanation

Source: JICA Study Team

**1) Principles of Improvement and Conservation in Priority Development Areas**

- Utilize tourism resources effectively, taking into consideration the environmental carrying capacity in terms of stimulating local economic benefits through improvements of infrastructures
- To promote greater appreciation by not only visitors, but also local people of the value of tourism resources, especially natural, cultural and historical resources, and
- To formulate appropriate design standards to achieve harmonious improvement and development with a valuable environment.

**2) Planning Guidelines for Priority Development Area Improvement and Conservation**

- Categories for environmental control  
Some of the following categories are applicable and should be introduced in the priority development areas. They are arranged in ascending order of degree of use.
  - Nature preservation and conservation  
Scientific preserve and strict nature reserve (SSPR)  
National park system for land and marine (NPS)  
National and regional nature monument and natural landmark (NML)  
Managed nature reserve and wildlife sanctuary for flora and fauna (WS)  
Protected natural landscapes (LP), and  
Forest reserve (FR).
  - Historical and cultural conservation  
National historical-cultural monument and historical-cultural landmark (HCML)  
Safeguard historical-cultural landscapes (SHC), and  
National intangible asset conservation such as performance, craftsman (NAC).
  - City and Town control measures  
Landuse control (LC)  
Town-scape control (TC)  
Development control for each land-use (DC), and  
Development guidelines and design standards (DGS).

**Table 3.6 Desirable Area to be Consolidated with an Environment Control System**

Priority Development Area	Nature preservation and Conservation						Historical and Cultural Conservation			City and Town Control measures			
	SSPR	NPS	NML	WS	LP	FR	HCML	SHC	NAC	LC	TC	DC	DGS
DANANG CENTER	----	----	----	○	○	○	○	◆	◆	☆	☆	☆	☆
HOIAN-CHAM	○	☆	◆	◆	☆	☆	☆	☆	☆	☆	☆	☆	☆
LANGCO-CHAN MAY	○	☆	◆	◆	☆	☆	----	----	----	☆	☆	☆	☆
BACH MA-BA NA	☆	☆	☆	☆	☆	☆	----	○	----	----	----	----	----
HUE HISTORICAL CENTER	----	----	----	○	○	○	☆	☆	☆	☆	☆	☆	☆

Note: ☆ = almost compulsory, ○ = necessary, ◆ = preferable and possible, ---- = not necessary or impossible  
Source: JICA Study Team

### 3) Specific Environmental Considerations for Infrastructure Improvement

Based on the preceding environmental control measures, specific considerations are identified below in terms of careful project execution for tourism infrastructure improvement in valuable areas.

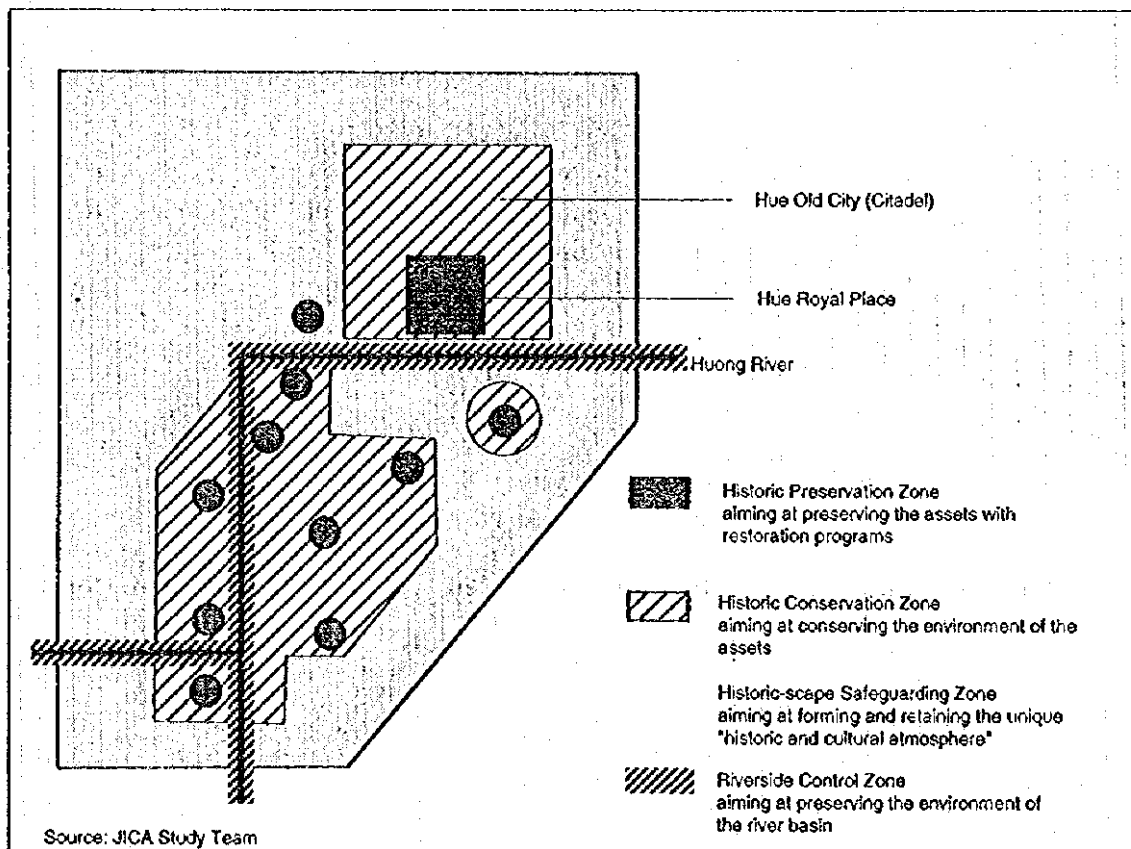
- **Safeguarding of Hue Historical Center**

Many efforts, taken by central and local authorities and other related organizations (especially UNESCO) in order to protect the "World Heritage of Hue City" have identified the following subjects in terms of tourism infrastructure improvement:

- To formulate an overall development master plan incorporating both preservation and development concerns
- To conserve the unique "culture landscape" consisting of traditional vernacular villages, rural temples and the natural environment, and
- To formulate strict zoning and land use regulations with buffer zones in order to preserve the traditional environmental context of the historical monuments.

The concept of the proposed zoning system for the Hue Historical Center is identified in Figure 3.5. It is based on the items discussed above and takes account of the principles stipulated in Viet Nam's law on "Cultural and historical remains and natural monuments conservation."

**Figure 3.5 Conceptual Diagram of Proposed Zoning System for Hue Historical Center**



**Table 3.7 Proposed Zoning System for Hue Historical Center and Example of Regulations**

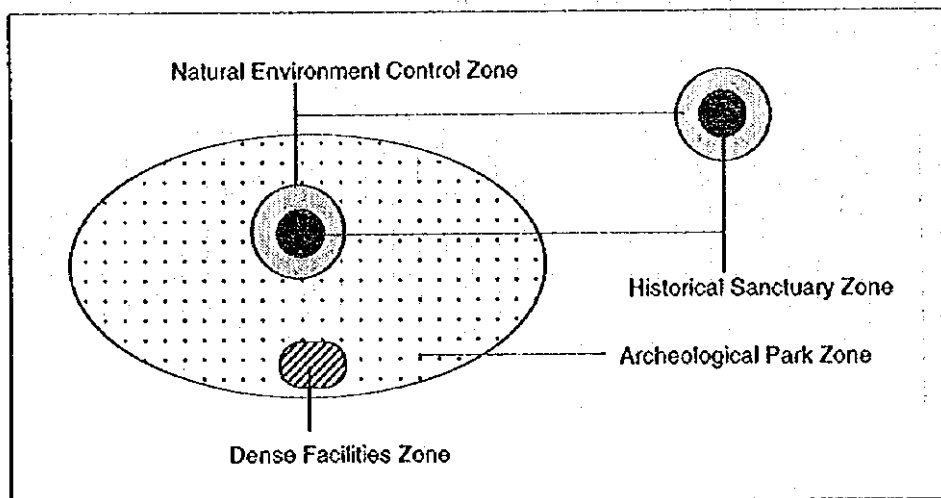
Proposed Zoning system	Activities controlled by specific zoning					General	
	Changing			Develop-ment facilities	Advertise-ment facilities	Development Sanitary control	Control Land-use / agri//forest
	Building height	Building use	Land reclaim				
<b>PRIMARY Control</b>							
Historic Preservation Zone	----	----	----	----	----	#	#
Historic Conservation Zone	○	----	○	○	----	#	◆
Historicscape Safeguarding Zone	☆	○	○	☆	○	◆	◆
<b>SUPPLEMENTAL Control</b>							
Riverside Control Zone	○	----	○	○	----	◆	◆
Roadside Control Zone	○	----	○	○	○	#	◆

Note: ☆ = allowed, ○ = conditionally allowed, ---- = not allowed, # = not applicable, ◆ = necessary  
 Source: JICA Study Team

- Proposed National Archaeological Park development for the My Son area  
 Protection of important Cham ruin sites should be guaranteed by a national park system. This is needed not only to keep valuable nature areas, but also significant historical asset sites. A national park system is proposed to be introduced into My Son site for the following purposes:
  - To protect Cham ruins and their environment, providing legal protection against all exploitation, such as stock grazing, agriculture, lumbering and mining, and human settlement
  - To promote scientific research activities without any negative impact on the ruins and their environment
  - To enlighten visitors in terms of educational, cultural activities, preparing the facilities to support such activities, and
  - To provide a self-financing mechanism for the park as a tool for conservation of historical ruins.

The proposed park system applicable to the My Son site is described conceptually in Figure 3.6.

**Figure 3.6 Conceptual Diagram of Proposed Park System for My Son**



### 3.3 PROJECT PLAN

#### 3.3.1 Project Plan for Da Nang Center and Hoi An - Cham Priority Development Area

##### 1) Tourism Road Improvement and Development Projects

There is a total of 96.2 km of tourism road improvement projects and about 5.5 km of tourism roads to be developed newly as summarized in Table 3.8. These projects are needed to provide proper access to the tourism resources. The projects include bridge improvements and the outlay is based on the proceeding classification of tourism roads.

**Table 3.8 Proposed Tourism Road Improvement Projects**

Destination Area	Tourism Development Zone	Project code No.	Project description (Location)	Width (m)	Classification	Length (km)	
						Up-grade	New
DANANG	Da Nang Gate	DTR-01	New Bridge	21.5	---	---	2.1
CENTER	Da Nang Coast	DTR-02	Han River - Marble Mt.	12.0	A	6.0	---
		DTR-03	Marble Mt. - Hoi An TPZ boundary	9.0	D	9.0	---
	Hai Van	DTR-04	Kiem Lien village - Southside of Lang Co	9.0	D	21.0	---
Sub-total						36.0	2.1
HOIAN-	My Son	DTR-05	QL1 - Village traffic node	9.0	B	27.0	0.4
CHAM	Archeological Park	DTR-06	Village traffic node - Park Gate	7.0	D	2.3	---
		DTR-07	Park Gate - Sub-gate	4.0	D	1.8	---
		DTR-08	Pho Lao village - Route 14B	9.0	B	4.3	0.5
	Hoi An	DTR-09	TPZ boundary - Hoi An Town	9.0	D	10.0	0.2
	TPZ (tourism road only)	DTR-10	Hoi An Town - QL 1	12.0	D	10.5	---
		DTR-11	Extension to Western Beach	9.0	D	---	2.3
		DTR-12	TL607 - Hoi An coast	9.0	D	4.3	---
Sub-total						60.2	3.4
Total						96.2	5.5

Source: JICA Study Team

##### 2) Tourism Facilities' Development Projects

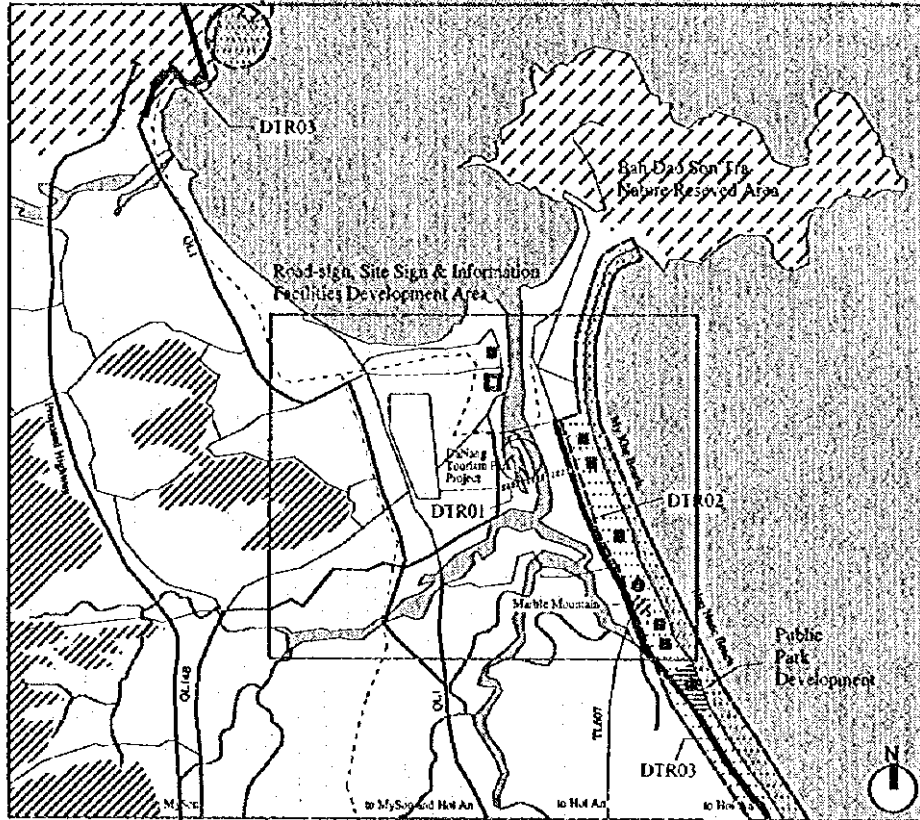
These projects, consisting of sign and information facilities' development projects and the My Son Archeological Park development project improvements, are proposed as outlined in the following Table and Figures.

**Table 3.9 Proposed 'Tourist Facilities' Development Projects in Quang Nam - Da Nang Priority Areas**


Destination	Tourism	Project				
		Area	Development Zone	Code no.	Category	Description
DANANG CENTER	Da Nang Gateway City	DTF-01	Road sign	Tourism site traffic sign (I), Direction sign (III)	16	
			Site Sign & Information	LEVEL (I),(II),(III)	12	
			DTF-02	Tourist Information Center	3	
			DTF-03	Hai Van Rest House	2	
	Da Nang Coast Resort	DTF-04	Road sign	Tourism site traffic sign (I), Gate-sign (II), sign (III)	8	
			Site Sign & Information	LEVEL (I),(II),(III)	32	
			DTF-05	Public Park	Restaurants, Rest House, Camping Site, Parking	25 ha
			DTF-06	Marble Mt. /	Parking	1
	HOIAN- CHAM	My Son Archeolo- gical Park	DTF-07	Road sign	Tourism site traffic sign (I), Gate-sign (II), sign (III)	10
				Site Sign & Information	LEVEL (I),(II),(III) Explanation (II)	52
DTF-08				Parking	Main and Sub-parking	1
			Park Facilities Improvement	Museum, Rest House, Office Souvenir shop, Landscaping	62 ha	
HoiAn TPZ		DTF-09	Road sign	Tourism site traffic sign (I), Gate-sign (II), sign (III)	26	
			Site Sign & Information	LEVEL (I),(II),(III)	30	
			DTF-10	Tourist Information Center	1	
	Parking		Main and Sub-parking	1		
		Other tourism facilities are described at Hoi An TPZ section			----	

Source : JICA Study Team

**Figure 3.7 Tourism Infrastructure Improvement Project of Da Nang Center Priority Development Area**



**GENERAL PLANNING GUIDELINE proposals**

 Da Nang Coast Resort Zone aimed at controlling disorganized coastal development

 Future Development Area for Coast Resort

 Nature Preservation Area


**Existing Conditions**

 Hotel / Resort Development Projects


**TOURISM INFRASTRUCTURE IMPROVEMENT PROJECTS**


**Proposed Road Improvement (classification of road)**

 Access Road Improvement

 New Bridge Construction proposed by Local Authority

**Proposed Tourism Facilities Improvement / Development**

 Road-sign, Site Sign & Information Development

 Tourist Information Center


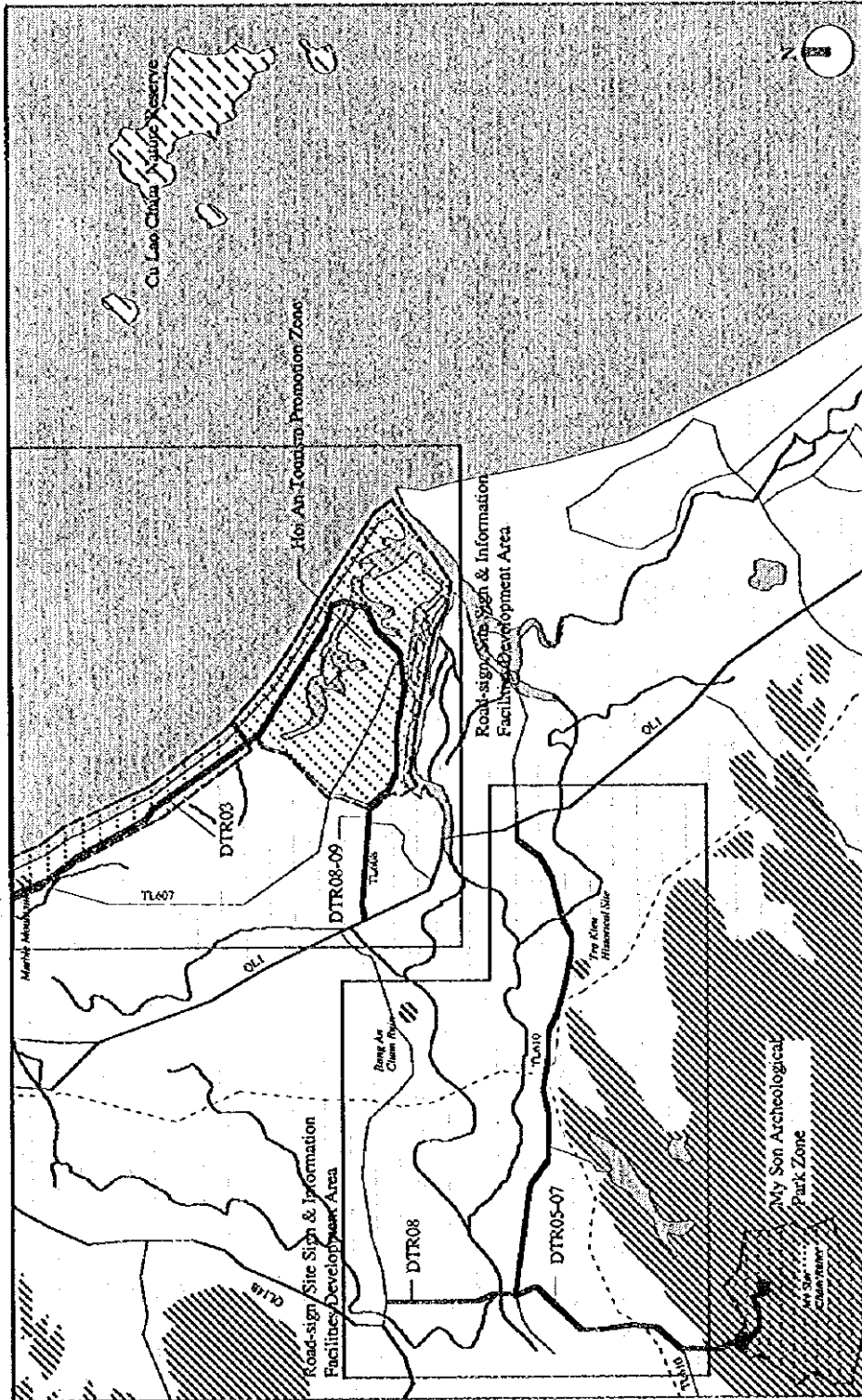
 Service Facilities (toilets, ticket booth, parking, and so on.)



Figure 3.8 Tourism Infrastructure Improvement Projects of Hoi An - Cham  
Priority Development Area



- GENERAL PLANNING GUIDELINE proposals**
- Hoi An Tourism Promotion Zone
  - My Son Archeological Park
  - Da Nang Coast Resort Zone
  - Nature Preservation Area
  - Historic Preservation Area
- TOURISM INFRASTRUCTURE IMPROVEMENT PROJECTS**
- Proposed Road Improvement (classification of road)
  - Access Road Improvement
  - Proposed Tourism Facilities Improvement / Development
  - Road-sign, Site, Sign & Information Development
  - Tourist Information Center
  - Service Facilities (toilets, ticket booth, parking, and so on.)

### 3.3.2 Project Plan for Lang Co-Chan May and Bach Ma-Bana Priority Development Area

#### 1) Tourism Road Improvement and Development Projects

It is proposed to improve some 27.5 km of tourism roads and construct about 7.4 km of new tourism roads in order to provide proper access to the tourism resources. The projects include bridges improvement and QLI road improvement as an urgent project in the Lang Co Tourism Promotion Zone (TPZ). With the exception of the service roads in the Lang Co TPZ, the projects are based on the classification of tourism roads as earlier introduced. The proposed projects are summarized in Table 3.10 and Figure 3.9.

**Table 3.10 Proposed Tourism Road Improvement Projects**

Destination Area	Tourism Development Zone	Project code No.	Project Description (Location)	Weight (m)	Classification	Length (km)	
						Up-grade	New
LANG CO-	Lang CoTPZ	HTR-01	Southside LangCo - Cape RangDinh	21.5	D	7.5	0.7
CHANMAY	Chan May Resort	HTR-02	Bridgel ( Bu Lu riv.) - resort villa	9.0	D	---	6.7
			Sub-total			7.5	7.4
BACH MA-	Bach Ma NP	HTR-03	NRI(Cau Hai) - Proposed NP Office	9.0	B	3.0	---
BANA			NP Office - Bach Ma Mt.	9.0	D	17.0	---
			Sub-total			20.0	0.0
			Total			27.5	7.4

Source: JICA Study Team

#### 2) Tourism Facilities Development Projects

Sign and information facilities development projects for the tourism roads to be improved and the Bach Ma National Park improvement project are proposed and summarized in Table 3.11.

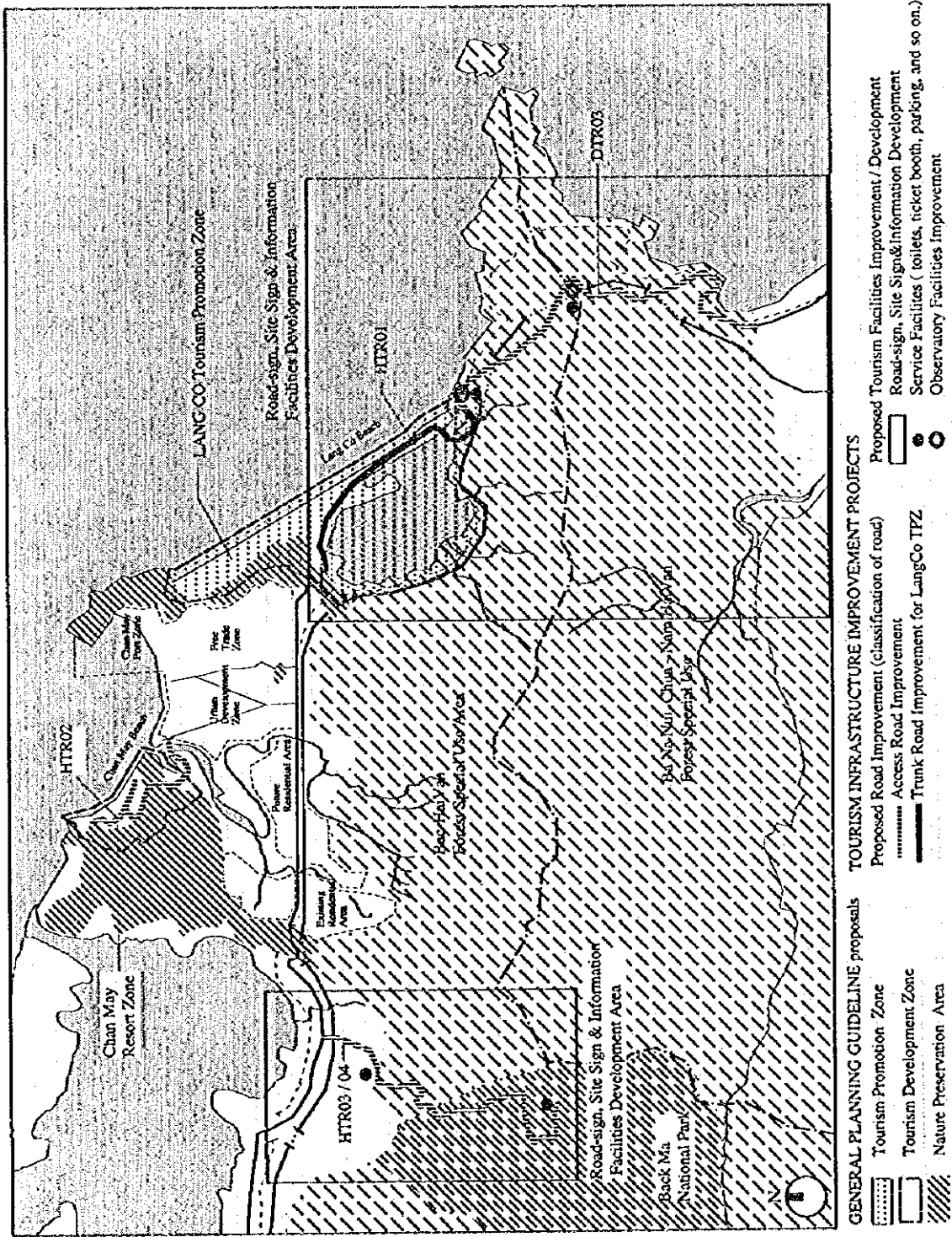
**Table 3.11 Proposed Tourism Facilities Development Projects**

Destination Area	Tourism Development Zone	Project Category	Description	Amount	
LANG CO- CHANMAY	Lang Co TPZ	HTR-01	Road sign	Tourism site traffic sign (I), Gate-sign (II), sign (III)	6
			Site Sign & Information	LEVEL (I),(II),(III) Explanation (II)	22
	Chan May Resort	HTR-02	Road sign	Tourism site traffic sign (I), Gate-sign (II), sign (III)	6
			Site Sign & Information	LEVEL (I),(II),(III) Explanation (II)	12
	Bach Ma National Park Zone	HTR-03	Road sign	Tourism site traffic sign (I), Gate-sign (II), sign (III)	3
			Site Sign & Information	LEVEL (I),(II),(III) Explanation (II)	22
		HTR-04	Parking		1
			Tourist Information Center		1
			Park Facilities Development	Tourist Information Center Rest House, Office	1 ha

Note: Other tourism facilities for the Lang Co Area are described in other sections.

Source: JICA Study Team

Figure 3.9 Tourism Infrastructure Improvement Projects of Lang Co - Chan May and Bach Ma-Bana Priority Development Area



### 3.3.3 Project Plan for the Hue Historical Center Priority Development Area

#### 1) Tourism Road Improvement and Development Projects

About 71.0 km of tourism roads need to be improved and some 15.5 km of new tourism roads need to be developed. They are summarized Table 3.12 and Figure 3.10. The projects include needed bridges and improvement and development.

**Table 3.12 Proposed Tourism Road Improvement Projects**

Destination Area	Tourism Development Zone	Project code No.	Project Description (Location)	Width (m)	Classification	Length (km)		
						Up-grade	New	
HUE HISTORICAL CENTER	Historical Holy Garden	HTR-04	HoQuyen - LeLoi St. - NamGiao	12.0	D	4.6	---	
		HTR-05	Mauseleums and Pagodas access roads	9.0	D	27.8	7.4	
		HTR-06	TuDuc,DucDuc, HonChen, access roads	7.0	D/C	11.6	1.5	
		HRR-01	Proposed 49 bypass (Other Project)	12.0	A	7.7	3.4	
	Sub-total						51.7	12.3
	Thuan An Resort	HTR-7	QL1Bypass - ThuanAn Resort Gate	12.0	D	6.0	3.2	
		HTR-8	Gate - Westside Beach, Eastside Beach 1/2	9.0	D	13.3	---	
	Sub-total						19.3	3.2
Total						71.0	15.5	

Source: JICA Study Team

#### 2) Tourism Facilities' Development Projects

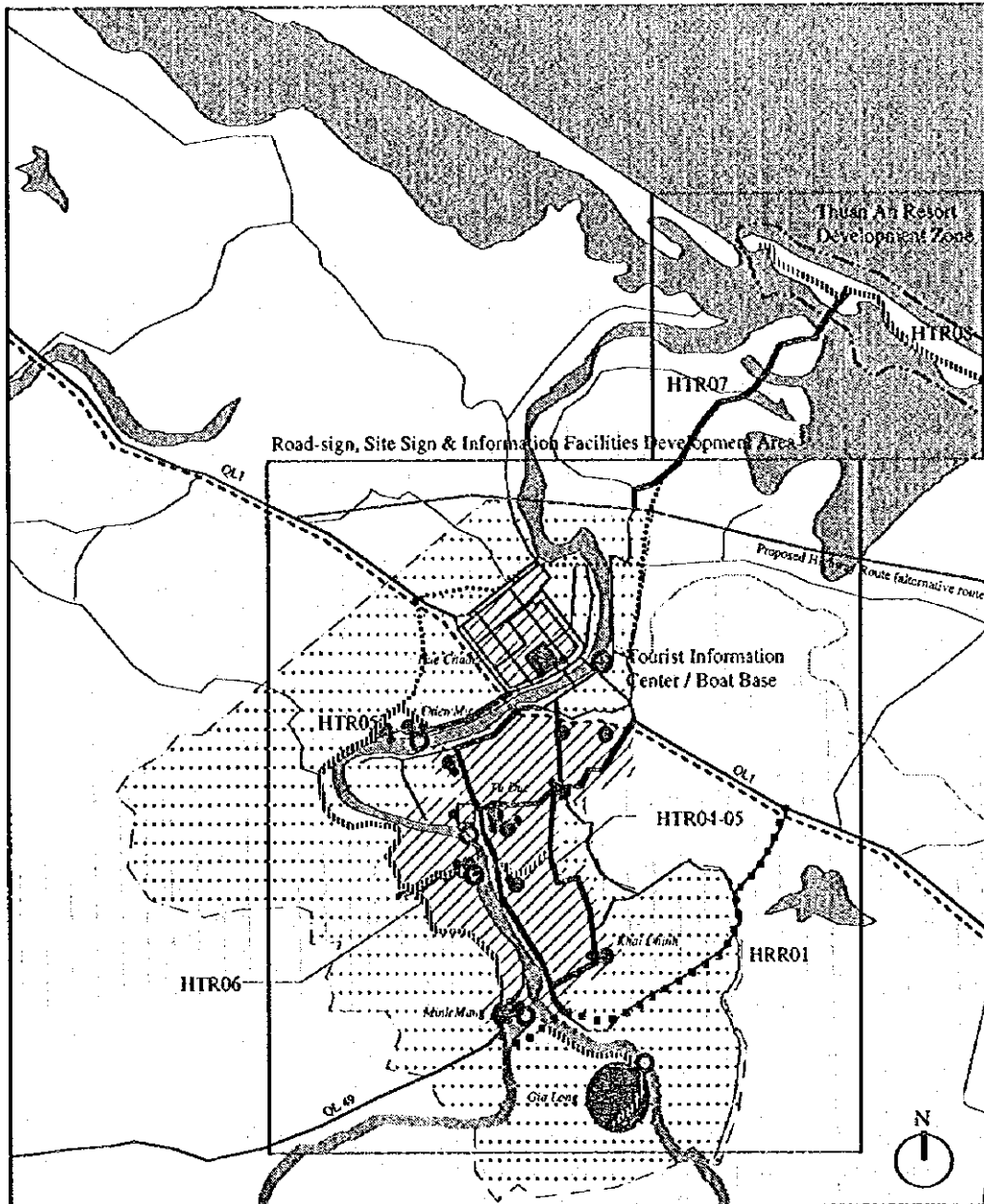
Careful consideration is given to the improvement of tourism facilities' within a valuable historical environment. Several kinds of small-scale facilities' improvement and development, such as the jetty improvements for sight-seeing, sign and information facilities' development projects, service facilities' improvement including ticket booths, parking, toilets and other project, are proposed and summarized in Table 3.13.













**Table 3.13 Proposed Tourism Facilities Development Projects**

Destination	Tourism Development Zone	Code No.	Project		Amount	
			category	Description		
HUE HISTORICAL CENTER	Palace and Historic City Zone	HTF-05	Road sign	Tourism site traffic sign (I), Gate-sign (II), sign (III)	54	
				HTF-06	Jetty and pier improvement	1
				HTF-07	Tourist Information Center	1
				HTF-08	Lighting-up	Royal Palaces and Citadel
	Historical Holy Garden	HTF-09	Road sign	Tourism site traffic sign (I), Gate-sign (II), sign (III)	76	
				HTF-10	Jetty and pier improvement	5
				HTF-11	Parking	12
				Site Sign & Information	LEVEL (I),(II),(III), Explanation (II)	340
		Site Sign & Information	LEVEL (I),(II),(III), Explanation (II)	340		
		Rest House	Shelter with bench, souvenir shop, ticket booth, toilet	7		
		Site Office (restoration, site maintenance)		8		
		Entrance Landscaping (planting, and so on.)		23 ha		
	HTF-12	Holy Garden Museum (restaurant, office, parking)	1			

Source: JICA Study Team.

**Figure 3.10 Tourism Infrastructure Improvement Projects of Hue Historical Center Priority Development Area**



GENERAL PLANNING GUIDELINE		TOURISM INFRASTRUCTURE IMPROVEMENT PROJECTS	
<b>Proposed Zoning System</b>		<b>Proposed Road Improvement (classification of road)</b>	
	Historic Preservation Zone		Main Access Road Improvement
	Historic Conservation Zone		Sub-Access Road Improvement / Development
	Historic-scape Safeguarding Zone		QL49 By-pass Road Development
	Riverside Control Zone	<b>Proposed Tourism Facilities Improvement / Development</b>	
	Roadside Control Zone		Road-sign, Site Sign & Information Development
			Service Facilities (toilets, ticket booth, parking, and so on.)
			Jetty Improvement
			Historical Garden Museum Development

### 3.4 PROJECT COST AND IMPLEMENTATION SCHEDULE

#### 3.4.1 Project Cost

##### 1) Premises

The project cost were estimated under the following premises:

- Cost components consist of direct construction, design and supervision, overheads, profits and contingency, excluding land acquisition costs and taxes
- Estimates are all in 1996 prices, and
- For currency conversion, average exchange rates in September 1996 are applied as follows.
  - US\$ 1.00 = VDN 11,000.00.

##### 2) Cost Estimate

The total project cost as a package of sub-projects amounts to 162.4 million US\$, including the costs for consulting services.

- Category 1 ( Urgent improvement projects )	: 40.1 million us\$ ( 33%)
- Category 2 ( Other improvement projects )	: 122.3 million us\$ ( 67%)
<hr/> Total projects cost	<hr/> : 162.4 million us\$ (100%)

Reference : urgent improvement projects indicate Short-term projects to be implemented within 3 - 4 years; other improvement projects indicate mid-term or long-term projects to be implemented within 5 - 15 years.

The details are summarized in Table 3.14.

#### 3.4.2 Project Implementation

##### 1) Responsible Agencies

Viet Nam National Administration of Tourism (VNAT) will be responsible for the projects as "Executing Agency." The actual implementation of each sub-project will rest with the relevant line-agencies of the Government.

Executing agency : Viet Nam National Administration of Tourism  
Implementation agencies : Line-agencies as follows:

- Ministry of Construction,
- Ministry of Transportation,
- Ministry of Culture and Information,
- Provincial Government /Tourism Department, and
- Peoples Committee of the local government.

##### 2) Implementation Schedule

The implementation schedule of the sub-projects depends on their nature and scale, readiness to implement them, and so on. Figure 3.11 shows the provisional time schedule assumed for the sub-projects.

Table 3.14 Projects Cost for Tourism Infrastructure Improvement

Destination Area	Tourism Development Zone	Project code no.	Category	Cost '000 US\$	Short-term					Mid-term					Long-term				
					1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010		
DA NANG CENTER	Da Nang Gateway	DTR01	New Bridge at Han River	4,610		4,661	14,583	14,583	14,583										
		DTR01	Road sign, site sign & information	10		1	9												
		DTR02	Tourist Information Center	17		2	15												
		DTR02-03	Coast road improvement	4,790		479	1,437	1,437											
Da Nang Coast Resort		DTR04	Road sign, site sign & information	8		1	7												
		DTR05	Public park development	8,400															
Hai Van		DTR06	Marble Mt. facilities improvement	60		61	27	27											
		DTR04*	Hau Van Pass road improvement (other project)																
HOI AN-CHAM	My Son Archeological Park	DTR03	Tourist facilities (rest house, etc.)	50			5	23	23										
		DTR05-07	Road improvement for My Son access	12,000			1,200	3,600	3,600										
		DTR08	Substantial road improvement to QL14B	4,080						408	1,224	1,224							
		DTR07	Road sign, site sign & information	13		1	12												
Hoi An TPZ		DTR08	Park Facilities improvement	8,310			831	2,493	2,493										
		DTR-11	Extension to Chia Dai Coast	8,010		801	2,403	2,403											
		DTR-12	Road improvement from TL407 to Hoi An coast	2,720		120	360	360											
		DTR09	Road sign, site sign & information	19		2	17												
LANG CO-CHAN		DTR10	Tourist Information Center, parking	150		15	68	68											
		HTR01	Road improvement of QL1	12,320		1,232	3,696	3,696											
MAY	Chan May Resort	HTR01	Road sign, site sign & information	6															
		HTR02	Road development to the resort area	5,680															
BACHMA-BANA	Bach Ma National Park	HTR02	Road sign, site sign & information	5															
		HTR03	Road improvement to the mountain	8,110															
		HTR03	Road sign, site sign & information	5															
		HTR04	Park Facilities development	50															
HUE HISTORICAL CENTER	Palace and Historic City	HTR05	Road sign, site sign & information	30		3	27												
		HTR06	Jetty and pier improvement	600		60	270	270											
		HTR07	Tourist Information Center	20		2	18												
		HTR08	Lighting-up	70		7	63												
Historical Holy Garden		HTR04	Road improvement for the historic city, access	1,750			175	525	525										
		HTR05	Road improvement for tombs, pagodas, access	10,580			1,058	3,174	3,174										
		HTR06	Road improvement for the tombs sub-access	2,880															
		HTR01*	QL 49 By-pass development* (other project)																
Thuan An Resort		HTR09	Road sign, site sign & information	70		7	63												
		HTR10	Jetty and pier improvement	2,550		255	765	765											
		HTR11	Service Facilities development	2,820		282	1,269	1,269											
		HTR12	Holy Garden Museum (restaurant, office, etc.)	210															
Thuan An Resort		HTR07	Road improvement for Thuan An coast, access	13,030		1,303	3,909	3,909											
		HTR08	Road improvement for beach roads	3,720															
		HTR13	Road sign, site sign & information	9		2	7												
		HTR14	Service Facilities improvement	15		3	12												
Total Projects Cost:				162,197	0	9,445	30,442	35,659	38,990	14,159	10,620	4,548	3,225	3,950	4,864	4,867	1,529		

Note: Total projects cost includes contingency, engineering services, excluding land acquisition cost.

\* This project is described in the other sections (Hai Van road to be improved by QL1 Rehabilitation Project)

Source: JICA Study Team

Figure 3.11 Implementation Schedule for Tourism Infrastructure Improvement

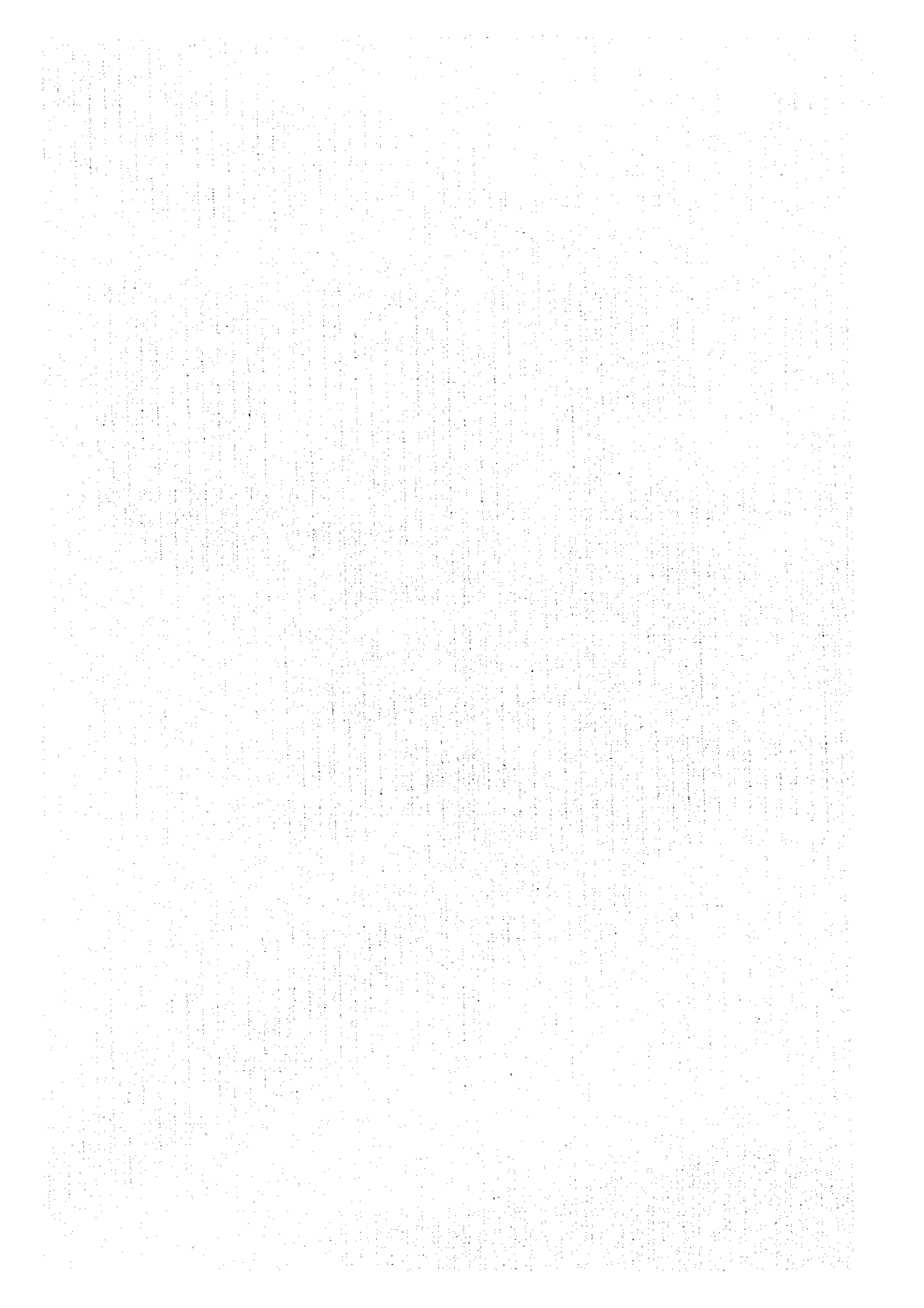
Destination Area	Tourism Development Zone	Project code no.	Category	Short-term					Mid-term					Long-term						
				1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010				
DA NANG CENTER	Da Nang Gateway	DTR01	New Bridge at Han River																	
		DTR01	Road sign, site sign & information																	
		DTR02	Tourist Information Center																	
	Da Nang Coast Resort	DTR02-03	Coast road improvement																	
		DTR04	Road sign, site sign & information																	
		DTR05	Public park development																	
HOI AN-CHAM	Hai Van	DTR06	Marble Mt. facilities improvement																	
		DTR06*	Hai Van Pass road improvement (other project)																	
		DTR03	Tourist facilities (rest house, etc.)																	
	My Son Archeological Park	DTR06-07	Road improvement for My Son access																	
		DTR08	Substitutional road improvement to QL14B																	
		DTR07	Road sign, site sign & information																	
HOI AN TPZ	Hoi An TPZ	DTR08	Park Facilities improvement																	
		DTR09-10	Road improvement from coast to QL1																	
		DTR11	Extension to Cua Dai Coast																	
	Lang Co TPZ	DTR12	Road improvement from TL607 to Hoi An coast																	
		DTR09	Road sign, site sign & information																	
		DTR10	Tourist Information Center; parking																	
LANG CO-CHAN MAY	Lang Co TPZ	HTR01	Road improvement of QL1																	
		HTR01	Road sign, site sign & information																	
		HTR02	Road development to the resort area																	
	Chan May Resort	HTR02	Road sign, site sign & information																	
		HTR03	Road improvement to the mountain																	
		HTR03	Road sign, site sign & information																	
BACH MA-BANA	Bach Ma National Park	HTR04	Park Facilities development																	
		HTR05	Road sign, site sign & information																	
		HTR06	Jetty and pier improvement																	
	Palace and Historic City	HTR07	Tourist Information Center																	
		HTR08	Lights-up																	
		HTR04	Road improvement for the historic city axis																	
HUE HISTORICAL CENTER	Historical Holly Garden	HTR05	Road improvement for tombs, pagodas access																	
		HTR06	Road improvement for the tombs sub-access																	
		HTR01*	QL 49 By-pass development* (other project)																	
	Tuau An Resort	HTR09	Road sign, site sign & information																	
		HTR10	Jetty and pier improvement																	
		HTR11	Service Facilities development																	
Tuau An Resort	HTR12	Holly Garden Museum (restaurant, office, etc)																		
	HTR07	Road improvement for Tuau An coast access																		
	HTR08	Road improvement for beach roads																		
	HTR13	Road sign, site sign & information																		
		HTR14	Service Facilities improvement																	

Note: — Preparation Stage (survey, design, etc.); — Construction Stage  
 \* This project is described in the other sections. (Hai Van road to be improved by QL1 Rehabilitation Project)  
 Source: JICA Study Team



## **CHAPTER 4**

### **HOI AN TOURISM PROMOTION ZONE DEVELOPMENT PROJECT**



## **CHAPTER 4 HOI AN TOURISM PROMOTION ZONE DEVELOPMENT PROJECT**

### **4.1 POTENTIALS AND CONSTRAINTS**

#### **4.1.1 General Background**

Hoi An Town and its district, which is located in the southern part of the coastal region of Quang Nam Da Nang Province and 30 km from Da Nang City Center as the gateway city of the central region, consists of three urban quarters with a population of 28,196 people and seven rural villages with a population of 46,056 people. Hence, the total population was 74,252 people in 1994 in a 60-square-km land area.

Hoi An District has a historical town, known as an ancient international trade port in the 16<sup>th</sup> to 18<sup>th</sup> century, which served the Kingdom of Champa. The town still keeps its historical structure composed of three streets with traditional houses, the market and fishing wharf and the coast line with a high quality beach and the Thu Bon River. Additionally, the Cham Island is known for swift's nests.

Resulting from a symposium held in 1985, many efforts have been made to conserve this historical town with international cooperation extended by Japan and other countries, while Hoi An has been nominated as a World Heritage site.

#### **4.1.2 Tourism Resources in Hoi An District**

Primary tourism resources of Hoi An District comprise Hoi An historical town including dwellings and shops, a historical bridge (Japanese Bridge), temples, a Japanese tomb and so on with local handicrafts and manufacturing. Its landscape ensembles rivers and paddy fields. Secondary resources are identified as a small and beautiful beach stretching from the mouth of the Thu Bon River to the Da Nang coast area.

#### **4.1.3 Visitors and Accommodations**

The numbers of guests, who stayed overnight at accommodations in Hoi An Town, which consists of Hoi An Hotel (65 rooms of international standard) and several small hotels and guest houses have increased sharply in the last few years to 45,000 guests (11.5 times as large as the 1991 members). However, several constraints are identified in several reports in terms of capacity of accommodation during the peak season and limited infrastructure. Several projects by foreign investors are planned in order to meet accommodation demands:

- Three "3 star" hotel projects at the beach site (120 rooms, 200 rooms, 100 rooms), and
- A "3 star" hotel project on Cam Nam Island in front of the Historical Town (80 rooms).

#### **4.1.4 Accessibility and Circulation**

There are three access roads connecting the Da Nang Gateway City with Hoi An Town. The route of provincial road TL603 has good road surface condition. The route serves the big industrial zone of Dien Nam - Dien Ngoc (516ha), which is located close to Hoi An's

administrative boundary. The other two access roads, that is national road QL1 and the local road along the coast, have poor road surface conditions and lack sufficient width. In particular, the coastal road diverging from TL603 at the Marble Mountain is in very bad condition. It is currently an earth/gravel road, in spite of having the potential to serve the coastal resort development.

Roads function as the service road for the town's economic activities and as access roads to historical houses within an urban area. They are in good conditions in terms of road surface and width. However, some consideration will be necessary to demarcate the function between service road for vehicles and tourist pedestrians, and to prepare suitable parking areas, in order to cope with the future increase in traffic.

**Table 4.1 Conditions of Access Roads to Hoi An Town**

Access Route	Length (km)	Width of R.O.W (m)	Road conditions
Da Nang City - QL1 - TL608	33.0	QL1 = 12.0, TL603 = 6.0 - 9.0	- TL608/bad road surface
Da Nang City - TL603-TL607	29.5	TL603 = 9.0 - 12.0 TL607 = 4.5 - 6.0	- Good road surface - Bad road surface with cracks
Da Nang City - TL603 Local coastal road (DL)	31.0	TL603 = 12.0 DL = 3.0 - 6.0	- Good road surface till Marble - Mountain area - Bad condition without earth/gravel road and a narrow bridge

Note : It indicates QL as National Road, TL as Provincial, DL as district level or other.  
Source : JICA Study Team

#### 4.1.5 Infrastructures

A new water supply project is proposed in order to address the existing problems in Hoi An's water supply system, which currently supplies inadequate raw water, has a poor water quality and faces algae problems during the dry season. Likewise, the sewerage system also faces problems. There are no septic tanks and sewerage is discharged into the Hoi An River without proper treatment.

#### 4.1.6 River and Flood

No flood control measures have been taken so far in spite of the fact that Hoi An historical town has been flooded by the Thu Bon River several times (seven times each year according to some sources). Maybe this has to be attributed to the huge ranges of flow variations covering over 350,000 ha during flooding time. Siltation of the river also causes floods. Several reports have proposed the following options to protect the historical town against flooding:

- Flood protection works to isolate the Hoi An historical town during times of peak flows, and
- River dredging to improve Hoi An river flowing capacity.



## 4.2 DEVELOPMENT SCHEME

The principles of development in the Hoi An Tourism Promotion Zone are:

- Formulate the preferable course of development and conservation of Hoi An Town by preparing a zoning scheme within the zone
- Control negative impacts by providing prior to other areas, public infrastructures effectively and urgently
- Protect the historical town and its surroundings from environmental threats, and
- Support the tourist activities in the historical town and other areas by providing suitable facilities improvement.

### 4.2.1 Tourism Products Development Framework

According to the regional framework of accommodation distribution of international standard hotel rooms, the following number of rooms to accommodate the targeted visitors are distributed to this zone in Quang Nam - Da Nang Province. In addition, local distribution within the zone is split into two block taking account of carrying capacity of the historical town of Hoi An.

**Table 4.2 Room Requirement of Hoi An Tourism Promotion Zone**

Location of accommodations	Hotel Class	Number of additional rooms				Total	Total Rooms
		Existing	2000	2005	2010		
Hoi An Urban Area	High	0	0	0	0	0	0
	Mid	0	20	80	250	350	350
	Low	65	0	100	200	300	365
	Sub-total	65	20	180	450	650	715
Hoi An Coast Area	High	0	0	0	70	70	70
	Mid	0	120	300	210	630	630
	Low	0	0	0	0	0	0
	Sub-total	0	120	300	280	700	700
	Total	65	140	480	730	1,350	1,415

Source: JICA Study Team

### 4.2.2 Tourism Products Development Scheme for Hoi An Historical Town

In order to achieve sustainable development of the Hoi An historical town, the following development scheme is proposed.

#### 1) Zoning for Development and Safeguarding of Hoi An Historical Town and Its Environments

The following zoning system for urban development control and tourism development is proposed:

- To demarcate the urban settlement area as a future urban expansion, including the old town. The zoning should be such that the area is protected against floods from the Thu Bon River and it should mitigate against development pressure in the old town
- To designate the control areas of surrounding urban areas for a indigenous landscaping of this zone. This should include the rivers, paddy fields and villages and it should also be done in accordance with agricultural land and urban control measures, and

- To supplement the above control areas by establishing buffer zones in order to protect against the continuous urban expansion pressures of Da Nang City.

The proposed zoning system for Hoi An Tourism Promotion Zone and examples of regulations are summarized in Table 4.3.

**Table 4.3 Proposed Zoning System for Hoi An Tourism Promotion Zone and Example of Regulations**

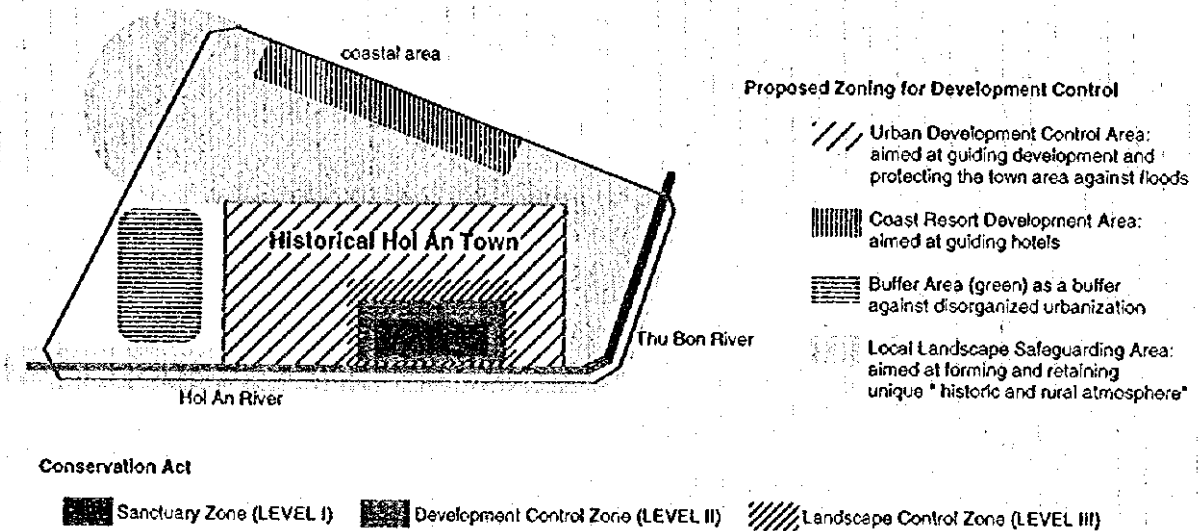
Proposed Zoning System	Activities controlled by specific zoning					General	
	Changing		Land reclaim	Develop -ment facilities	Advertise -ment facilities	Development Control Sanitary control	Landuse / agri. / forest
	Building height	Building use					
<b>EXISTING Control System</b>							
Sanctuary Zone (level I)	----	----	----	----	○*	◆	◆
Development Control Zone(II)	○	----	○	○	○*	◆	◆
Landscape Control Zone (III)	○	○	○	○	○*	◆	◆
<b>SUPPLEMENTAL Control</b>							
Urban Development Area	○	○	○	○	○	◆	◆
Coast Resort Area	○	○	○	☆	○	◆	◆
Local Landscape Safeguarding Buffer Area	○	☆	○	☆	○	#	◆
Riverside Control Area	----	○	----	----	----	◆	◆
Roadside Control Area	○	☆	○	○	○	#	◆

Note: ☆ = allowed, ○ = conditionally allowed, ---- = not allowed, # = not applicable, ◆ = necessary

\* = proposed control measure additionally

Source : JICA Study Team

**Figure 4.2 Conceptual Diagram of Proposed Zoning System for Hoi An Historical Town**



Source: JICA Study Team

## **(2) Planning Guideline for Tourism Facilities Development**

- **Accommodation facilities**
  - Accommodation development in the surroundings of the historical town must conform with regulations and design standards consistent with the Conservation Act
  - It is needed to guide the accommodation development area (on the outskirts or coast area of the historical town) with suitable land use in consideration of the carrying capacity of the historical town, and
  - Building height within 2 -3 storeys
- **Other tourism facilities**
  - The utilization of the historical buildings needs to be diversified. Means would be craft and art factory, not like souvenir shops, museums, cultural convention hall, research and institution facilities, gallery, and so on.
- **Circulation system**
  - Demarcation by the function of vehicle:
    - Tourist traffic → outskirts parking system and pedestrians
    - Resident traffic → allowed to enter the town with permission
    - relocation of major business and commercial functions into the outskirts of the historical town.
- **Town-scaping**
  - It is needed to enhance the town-scaping of public spaces, such as road, park, and so on, in accord the ensembles of historical buildings (color, materials, design)
  - Preparation of street furnitures (lighting, bench, and so on) for tourists
  - Introduction of open spaces as rest space and plants on the streets, and
  - Formulation of a "sense of arrivals" to the historical town through gate facilities and signs.

## **3) Tourism Development Scheme of Hoi An TPZ**

According to the planning guideline in the preceding section, the development is as identified as follows:

- **Coast Resort Development Area**
  - To allocate an accommodation development area in the coastal area in order to meet future demand of hotel development in consideration of mitigation of urban development pressures on the historical town and creation of new resort products of Hoi An TPZ in terms of diversification of tourism products, and
  - To improve the public beach area with tourist service facilities, such as rest house, shelter, shower room, and toilets, and so on.
- **Village Improvement Area**
  - To improve village's living environment (especially for water supply) in the hinterland of the Coast Resort Development Area, and
  - To develop a Culture Village Area as a tourist commercial village area as another spot of amenity of Hoi An TPZ in the future.



**Table 4.4 Hoi An Tourism Promotion Zone Development**

Development Block	Landuse / Facilities Area	Area (ha)
Urban Development Area (Hoi An Town)	Residential/commercial area, public facilities' area, open space, and so on	773
Coastal Resort Development Area	Hotel area	77
	Beach park area	32
	Public coast area	48
	Total	157
Village Improvement Area	Culture village area	10
	Village improvement area	248
	Beach park area	18
	Public coast area	30
	Total	306
Grand total		1,442

Source: JICA Study Team

### 4.3 PROJECT COMPONENTS

#### 4.3.1 Tourism Products Development Projects

The tourism product development project supports the master plan proposed by the central government and the plans and program prepared by the local authority for the revitalization of Hoi An historical town. The following projects are proposed to be implemented as important public sector projects.

##### 1) Road Improvement projects in the historical town

Road projects consist of two projects as follows:

##### (1) Tourism road improvement and development projects

These projects are described under "Tourism Infrastructure Projects".

##### (2) Pedestrian space improvement projects in the historical town

Based on an authorized plan by the central and local governments, this project consists of historical town's road improvement with drainage system improvement, road surface re-pavement for pedestrians, lighting facilities, provision of electricity, and so on.

**Table 4.5 Pedestrian Space Improvement Projects (HTPZF-1)**

Components of projects	Description	Unit	Length
A. Pedestrian space re-pavement (stone brick)	5m width road surface pavement	m	3,680 with adequate material
B. Road surface drainage	5m width road surface drainage	m	3,680 improvement
C. Lighting facilities	Lighting pole ( interval = 20m)	unit	185
D. Electricity	Improvement for town-scape	m	3,680
E. Landscaping	Spot landscaping by tree for shade	sq.	4,000

Source: JICA Study Team



### 4.3.2 Historical Town Safeguarding and Development Projects

Two projects are identified as follows to cope with the flood threat to Hoi An historical town and adequate development for urban expansion in terms of tourism development in consideration of the protection of the historical town as a historical heritage.

#### 1) Flood control project (HTPZR-1)

Although the options for flood protection works and constraints for them are identified as follows, it is proposed to develop the embankment road with lockages as a urban fringe road in order to demarcate the urban area including the historical town to be protected from floods.

##### (1) Options for flood protection

###### a) Whole River Management Control

It is necessary to make huge efforts with enormous costs and it will take a long time to control the Thu Bon River, owing to the wide river catchment area.

###### b) River Dredging To Improve River Channel Capacity

It will take many dredging efforts in the river, although it might not be effective to improve the flowing capacity due to several flood siltations every year.

###### c) Embankment Road Construction

Embankment will be an effective measure to protect Hoi An town from floods during times of peak flows of the river.

##### (2) Embankment road projects

- Principles

- To provide flood protection for conserving " Hoi An Historical Town " as a cultural heritage (nominated as a World Heritage)
- To enclose the urban area including the future town expansion area
- To utilize the embankment as a urban fringe road (9.0m width), and
- To take account of town landscaping without obstacles to the Historical Town's environment.

- Options of lockage system

There are two options for an embankment system. It is proposed to construct the embankment road with lockage as an adequate system. However, it is necessary to elaborate on the elements of this system in a further study.

###### a) Embankment Road with Lockages

It is necessary to construct the lockages with large-scale modern structures in remote areas in consideration of the dead angle from the waterfront area of Hoi An town, that is without obstacles to the historical town area.

###### b) Embankment Road with Rubber Dams

This system might be one of the alternative measures of lockages. However, it is assumed that this system might not be effective to protect against the river flood magnitude, in spite of the necessity to elaborate in a further study.

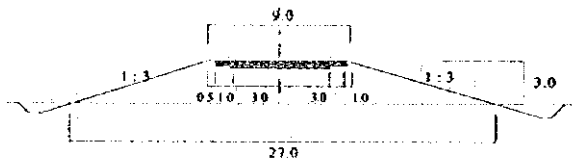
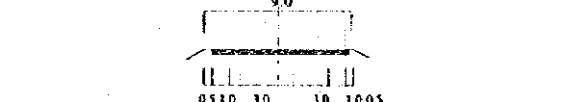
- Embankment road composition

- Taking into account the average flood level (+ 2.46 m) and the area suffered by LEVEL III flood condition (see Figure 4.1), the following road plan is proposed as

embankment road, including other urban fringe roads connected to the embankment road within a non-flood area by LEVEL III.

- Total length consists of 9.0 km (embankment road) and 1.8 km (link road).

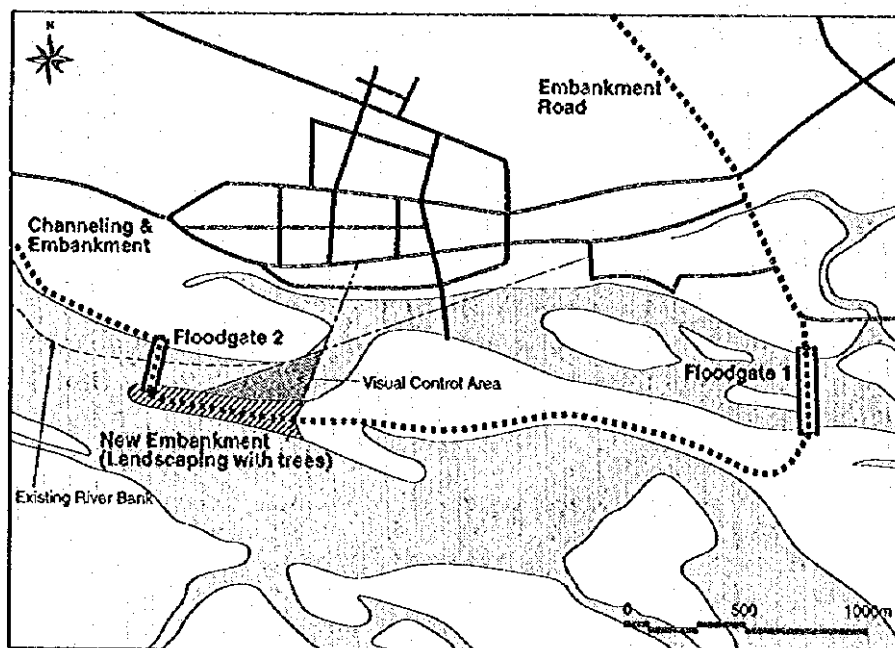
**Figure 4.4 Cross-section of Embankment Road (Urban Fringe Road)**

Road type	Section Plan of Road	Reference
Embankment Type (Urban Fringe Road) Access Road 2		Premise of road design - average flood level = +2.46m*1 - to develop this type of road outside of safe area excluding LEVEL III Flood Area*2 - to reinforce embankment by pitching stone
Standard Type (Urban Fringe road) Access Road 3		- to develop this type of road inside of safe area excluding LEVEL III Flood Area

Source: \*1 = Data source from Pre-Feasibility Study of " Identification/Assessment of Critical Constraints on Tourism Development

\*2 = Data source from location map by local authority, showing levels of the flood area by LEVEL I,II,III (III is maximum)

**Figure 4.5 Layout Plan of Proposed Embankment Road**



## 2) Road Network Development Project for Urban Expansion

The master plan of Hoi An town indicates the urban expansion area into the north west of the town center (see Figure 4.1), thus avoiding the flood area and burden of expansion pressures to the historical town area. In consideration of this condition and possibilities of population increase, such as in migration of labor caused by the expansion of several tourism activities, it is necessary to consolidate the master plan by infrastructure development.

### (1) Development framework of urban expansion

The projections assume that the population of the urban area of Hoi An Town will increase (Table 4.6 refers) taking into account the following:

- To formulate an adequate density of the urban area to be enclosed by the embankment road, including the historical town area (existing density = 321 people/ha) and the island in front of the town.
- To develop the urban expansion area including the master plan area with a buffer area, and
- To sustain as far as possible the existing landscape such as paddy fields as open spaces including other green areas.

**Table 4.6 Urban Population Projection of Hoi An Town**

Urban Population				Net Density in Residential / Commercial Area		
1994	2000	2005	2010	Historical Town	Island	New Town
28,196	34,000	40,000	51,000	5,000 (100pop/ha)	11,750(250/ha)	34,250(100/ha)

Note: Annual natural growth rate = 2.16%; Social increase ratio = 0.05/2000, 0.10/2005, 0.30/2010  
Source: JICA Study Team

**Table 4.7 Landuse Proposal for Hoi An Town Enclosed by Embankment Road**

Development Block	Landuse / Facilities Area	Area (ha)
Urban Development Area (Hoi Town)	Residential/commercial area	441
	Public facilities area	21
Coastal Resort Development Area	Educational facilities area	35
	Open space area ( park, green area )	35
	Public space area (road , and so on)	140
	Other area ( industry, and so on)	36
	Water area ( river)	65
<b>Total</b>		<b>773</b>

Source: JICA Study Team

## (2) Road Development for urban expansion

The road development for urban expansion is proposed in line with the classification specified in Tables 4.8 and 4.9 and in consideration of the following:

- To co-ordinate with the Master Plan for urban expansion
- To formulate a road network, which links up with future road axis development, such as tourism development linkage and Da Nang City urban development linkage, and
- To take into account the hierarchy of road function in the urban areas.

**Table 4.8 Road Classification for Urban Development Area**

Classification	Function	Width	Carriageway				Highway standard category
			Lane	Bicycle	Sidewalk	Shoulder	
Arterial Road	Inter-city Network	16.0	3.5 x 2	2.0 x 2	2.0 x 2	0.5 x 2	ref: Category III + sidewalk
Distributor Road	Inner-city Network for distribution of arterial traffic	12.0	3.0 x 2	1.0 x 2	1.5 x 2	0.5 x 2	ref: Category IV + sidewalk
Access Road1	Inner-city Network for distribution of arterial traffic	9.0	3.0 x 2	----	1.5 x 2	----	----*1
Road2	Town-fringe Network for distribution and embankment	9.0	3.0 x 2	----	----	1.5 x 2	ditto (R.O.W = 27.0m)
Road3	Town-fringe Network	9.0	3.0 x 2	----	----	1.5 x 2	----*1
Service Road	Service Network to facilities of town districts	7.0	3.0 x 2	----	----	0.5 x 2	----*1

Note : \*1= This classification, takes account of the "urban center case" based on the articles mentioned in the highway design standard. It is proposed as a town road system by the JICA Study Team and referred to as Viet Nam Highway Design Standards.

**Table 4.9 Road Classification for Urban Development Area**

Classification	Width (m)	Length ( km )
Arterial Road	16.0	2.8
Distributor Road	12.0	6.0
Access Road 1	9.0	2.8
Access Road 2	9.0 ( urban fringe road by embankment)	9.0
Access Road 3	9.0 ( urban fringe road linking to the above)	1.8
Service Road	4.0	62.0
Total		84.4

Source: JICA Study Team

### **4.3.3 Water Supply and Sanitation Facilities**

#### **1) General**

A series of water supply and sanitation facilities are proposed in order to preserve the natural and human environment and to support the tourism development in this service area. At present, except for the old center of the Historical Town Zone in Hoi An Town Block, this area is not endowed with safe living water, but mainly depends on unprotected shallow well water, and there are no reliable sanitation facilities. In the course of tourism development, the following development schemes for water supply and sanitation facilities are proposed.

##### **(1) Water supply facilities**

The service area will be covered with safe water for potable, living and other purposes by a centralized water supply system, which is equipped with a central water production station purifying surface water from rivers in the form of expansion of the existing facilities. Water for fire fighting will be also supplied through this system.

##### **(2) Sewage disposal facilities**

The service area will be covered by sewage disposal facilities attached with a sewage treatment plant in the form of either centralized or individual treatment. Waste water will be discharged to the East Sea or the Hoi An River after having been purified to specified standards. Together, storm water discharge pumps will be provided to drain out inner rain water into the outside, when water gates are closed.

##### **(3) Storm water drainage**

The service area will be equipped with open channels and/or pipes and retention ponds, if required, to drain out storm water and to prevent submersion of the area.

##### **(4) Solid waste disposal facilities**

The service area will be served by periodical garbage collection provided by the solid waste disposal facilities and collected waste will be disposed of in a sanitary landfill site.

#### **2) Design Policy**

##### **(1) Water supply facilities**

The water demand in 2010 for urban and living water in the service area comprising Hoi An Town Block (divided into Historical Town Zone, Island Zone and New Town Zone), the

Beach Resort Park Block and the Village Settlement Control Block is projected to be some 12,800 m<sup>3</sup> per day<sup>\*1</sup> in total on a daily average base as referred to in Table 4.10.

**Table 4.10 Water Demand Projection in 2010**

Block	Water Demand (c.m./day)	Remarks
1. Hoi An Town	10,980	A total of 51,000 people on the historical island, new town including hotels, commercial and industry use. Restaurant and beach park. A total of 11,380 people. Except for irrigation water.
2. Beach Resort Part	431	
3. Village Settlement	1,366	
<b>Total</b>	<b>12,777</b>	

Source: JICA Study Team

In the old center of Hoi An Town, the rehabilitation and expansion work of the existing water supply system for the water production of 6,000 m<sup>3</sup> per day has been decided to be completed in 1998 under Japanese Government assistance. Therefore, this study is based on the remaining 20,600 m<sup>3</sup> per day of the design capacity on a daily maximum base as referred to in Table 4.11.

**Table 4.11 Design Basis of Water Supply Facilities**

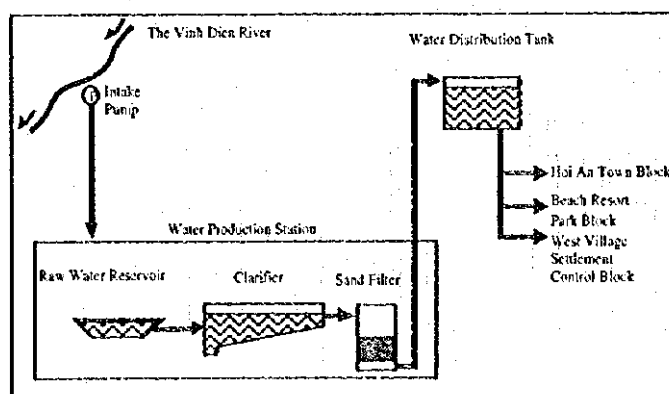
Parameters	Design Basis
Daily Average Consumption	12,777 (cu.m./day)
Daily Maximum Consumption	20,443
Hourly Maximum Consumption	1,193
Daily Maximum Water Production	26,549
Existing Water Production	6,000
Expanded Water Production	20,549
Water Intake	9,153

Note: 1.6, 1.4, 15% and 8% are applied as daily maximum coefficient, hourly maximum coefficient, leakage loss and production loss, respectively.

Source: JICA Study Team

Water purified in the central water production station by sedimentation with coagulation and rapid sand filtration as shown in Figure 4.6 will be transferred to the elevated tanks and then be distributed to the user points in each block of the service area with the residual pressure of some 1.5 kg per cm<sup>2</sup>. The qualities specified in the drinking water standards in Viet Nam will be attained through purification by the water production station. Raw water for water supply is planned to be taken from the Vinh Dien River to be channeled to the water production station by a newly constructed conveyance pipe of some 11 km length.

**Figure 4.6 Conceptual Flow Diagram of the Proposed Water Supply Facilities**



Source: JICA Study Team

\*1: The water demand is calculated based on the unit average water consumption such as 1,500 lit/room.d for hotel guest, 30 lit/cap.d for restaurant, 120 to 150 lit/cap.d for living water in residential area, 150 lit/cap.d for commercial area.

## (2) Sewage disposal facilities

Hoi An Town Block including the Historical Zone, Island Zone and New Town Zone will be covered by the centralized sewage disposal facilities. The Beach Resort Park Block and West Village Settlement Control Block are planned to be equipped with individual sewage treatment systems from the viewpoint of economical implementation, since they are remote from the central sewage treatment plant and the discharge sources of sewage in the blocks are anticipated to be dispersedly located.

In terms of sewage collection and transportation, the proposed sewage disposal system will apply the "Separated Type", paying more priority to the qualities of discharged sewage to the water course<sup>\*1</sup>. Sewage discharge including infiltrated ground water is projected to be some 18,000 m<sup>3</sup> per day on the daily maximum base as shown in Table 4.12 and its influent characteristics will be BOD 250 to 300 mg/l and SS 200 to 300 mg/l.

**Table 4.12 Design Basis of Sewage Disposal Facilities**

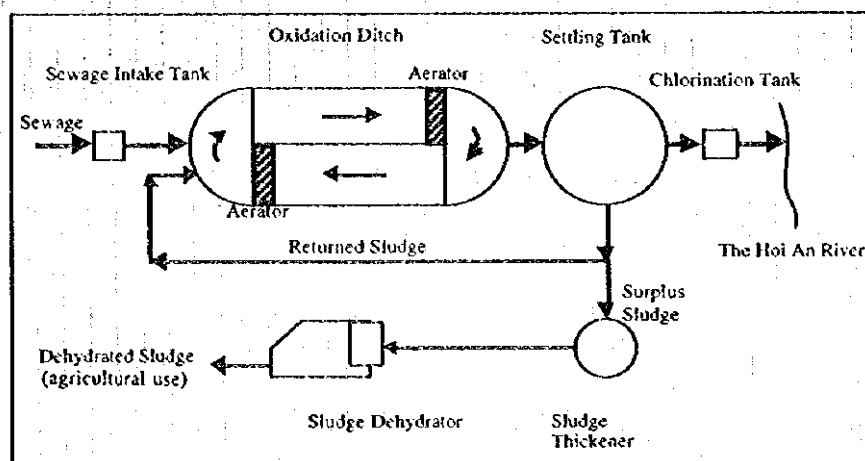
Parameters	Design Basis
Sewage Discharge	10,980 cu.m/day
Daily Average Discharge	12,627
Daily Max Discharge	17,568
Hourly Max Discharge	1,025

Note: Ground water infiltration ratio, daily maximum coefficient, hourly maximum coefficient are assumed to be 15%, 1.6, and 1.4, respectively.

Source: JICA Study Team

Sewage purified by the treatment plant with less than BOD 30 mg/l and SS 30 mg/l, which meet the effluent standard in Viet Nam, will be discharged to the Hoi An River. The "Oxidation Ditch Process" as shown in Figure 4.7 employing the aerobic biological purification principle is recommended for the following reasons: (1) strong durability against low temperature in January to March in this region, (2) lower construction cost including land acquisition, (3) easier operation and maintenance.

**Figure 4.7 Conceptual Flow Diagram of the Proposed Sewage Disposal Facilities**



Source: JICA Study Team

\*1: The "Separated Type" sewage facilities does not collect rain water. Unlike the separated type sewage disposal facilities, in the combined type facilities some portions of pollutant is inevitably discharged to the water courses at the beginning stage of rainfall. Thus, the separated type sewerage is recommended in this section.



### (3) Storm water drainage

One of the proposed mitigation for flood and inundation is to construct water gates and discharge pumping stations, in order to prevent water inflow from the Hoi An River to the inside of the Hoi An Town Block when high-water levels of the Hoi An River occur. The functions of these devices are described as follows:

#### a) Water Gates:

The water gates are shut to prevent water inflow from the Hoi An River, in case the water stage of the Hoi An River reaches the alarm level for inundation.

#### b) Drainage Pumping Stations:

When the sluice gates are shut, all rain water in the block flows into the Hoi An River through the drainage ditches/pipes. In this case, the pumping stations, which have enough capacity to handle the rainwater volume in the block, work to transfer inner storm water to the outside.

The drainage pumps will be designed based on the following parameters:

- The daily 290 mm rainfall for five (5) years probability, and
- Two (2) days of discharge time.

At the same time, open channels and/or pipes will be constructed in the service area to prevent submersion in case of rain. Because hourly rainfall data in this service area are not available at the moment, the following empirical equation in five (5)-years probability derived from the daily rainfall data collected in Da Nang Meteorological Observatory is recommended to be applied to the calculation of design rainfall. In the area sections, where the flow capacity of the water course to receive rain water is limited, some retention ponds should be constructed based on 10-years probability:

Rainfall intensity to be applied:

$$I = R_{24}/24 \times (24/t)^{2/3} = 101 \times 1/t^{2/3}$$

where,  $R_{24}$  : Daily rainfall(mm/d)  
 $I$  : Design rainfall intensity(mm/h)  
 $t$  : Rainfall duration(min).

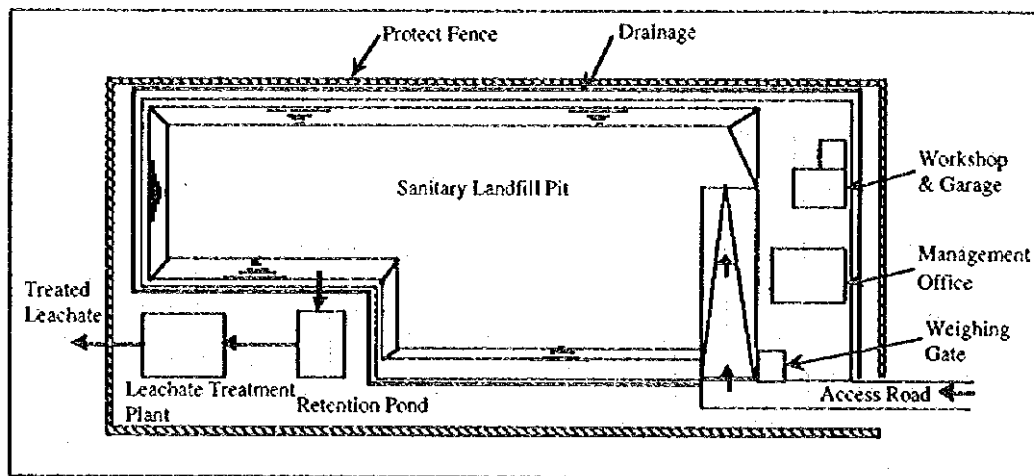
### (4) Solid waste disposal facilities

The solid waste discharge in the area is projected to reach some 20 ton per day in 2010. In order to reinforce the present limited capacity, waste packer vehicles for garbage collection service will be provided, and collected garbage will be transported to and disposed of in the landfill site as shown in Figure 4.8 in the manner of a sanitary landfill. To prevent from reverse influence exerted from the landfill site, the sanitary landfill will be executed by the method of: (1) provision of shield resin sheet to isolate the deposit layer from ground soil, (2) application of soil cover to prevent from ill odor, (3) attachment of leachate treatment plant<sup>\*1</sup> to prevent from outflow of polluted and/or toxic waste water.

The location of the landfill site should be selected in light of such criteria as : (1) the surrounding area is dispersedly populated, (2) the location is easily accessible from the service area, (3) there is no possibility of negative influence on the natural environment and landscapes, and (4) the site is not close to the waterway leading to the intake source for water supply.

\*1 : The word "Leachate" stands for waste water generated from the landfill site resulting from decomposition of solid waste and rainfall.

**Figure 4.8 Conceptual Layout of the Proposed Solid Waste Disposal Facilities**



Source : JICA Study Team

### 3) Outline of the Proposed Facilities

#### (1) Water supply facilities

The proposed water supply facilities will consist of a raw water intake and conveyance system, water production system and water distribution system. Table 4.13 lists the main specifications for the proposed water supply facilities.

**Table 4.13 Outline of the Proposed Water Supply Facilities**

Work items	Quantities	Description
<b>1. Raw water intake and conveyance system (from the Vinh Dien River)</b>		
Max intake capacity		20,600 cu-m/d
Intake pump	2 units	including 1 standby, 0.25cu-m/sec
Conveyance pipe	11 km	carbon steel pipe, 400mmDia (installed along the existing pipe line)
<b>2. Water production system</b>		
2.1 Raw water reservoir	1 lot	reinforced concrete, volume 40,000cu-m
<b>2.2 Water purification facilities</b>		
Purification plant	2 units	type coagulation sedimentation + sand filtration
Component equipment		10,300 cu-m/d x 2 units, total 20,600 cu-coagulation basin, clarifier, sand filter
Site area		disinfection basin, engine generator
Appurtenances		2.6ha including the raw water reservoir operation room, laboratory, electrical room, workshop, storage room
<b>3. Water distribution system</b>		
3.1 Transfer pump	2 units	including 1 standby, 0.25cu-m/sec
3.1 Elevated tank	7 lots	total volume 2,650cu-m
3.2 Distribution pipes		300cu-m x 2units, 450cu-m x 1unit, 400cu-m x
Trunk pipes	8.5 km	cast iron pipe, 300 to 400mmDia
Main pipes	16 km	cast iron pipe, 150 to 250mmDia
Branch pipes	80 km	cast iron pipe, 100mmDia
Fire hydrant	1 lot	cast iron

Notes : The quantities and the capacities in this table are at the final construction stage.

Source : JICA Study

#### (2) Sanitation facilities

The main specifications for the proposed sanitation facilities, which accommodates the sewage disposal facilities, the storm water drainage and the solid waste disposal facilities are shown in Table 4.14.

**Table 4.14 Outline of Proposed Sanitation Facilities**

Work items	Quantities	Description
1. Sewage disposal facilities		
1.1 Sewage collection system		
Trunk pipes	11 km	concrete pipe, 400 to 600mmDia
Main pipes	19 km	concrete pipe, 200 to 300mmDia
Branch pipes	45 km	concrete pipe, 150mmDia
Sewage relay pump	3 sets	centrifugal
1.2 Sewage treatment facilities		
Treatment plant	3 units	biological oxidation ditch type 5,900cu-m/d x 3units, total 17,700cu-m/d grit chamber, oxidation ditch, settling basin chlorination basin, treated sewage discharge mouth sludge thickener, sludge dehydrator
Component equipment		
Site area		2.2 ha
Appurtenances		operation room, laboratory, electrical room, workshop, storage room, sludge dehydration room
2. Storm water drainage		
Storm water discharge pump	4 sets	centrifugal, 2.3 cu-m/sec
Open channel	1 lot	concrete
Embedded pipe	1 lot	concrete
Retention pond	1 lot	brick or stone
3. Solid waste disposal facilities		
3.1 Waste haulage vehicle		
Packer car(2ton)	2 units	
Packer car(4ton)	2 units	
Workshop	1 lot	
3.2 Landfill facilities		
Landfill site	2.5 ha	sanitary landfill type access road, weighing gate, bulldozer workshop, administration office leachate treatment plant
Appurtenances		

Notes : The Quantities and the capacities in this table are at the final construction stage.  
Source : JICA Study Team

### (3) Cost estimation base

The estimated cost for the construction works on the proposed water supply facilities and sanitation facilities are based on the following assumptions.

- Direct construction cost covers preparatory works, purchase of equipment and material, shop manufacturing, ocean and inland transportation, site installation works
- Equipment and material necessary for construction works are purchased on the local market in Viet Nam, if reliable and competitive ones are available. Otherwise, they are imported from foreign countries
- Indirect construction cost covers expense for engineering services and land acquisition, and price and physical contingency. Any taxation such as import tax, V.A.T. (Value Added Tax) and I.D.C. (Interest During Construction) are excluded from construction cost
- All prices of equipment and material are on the basis of "as of 1996"
- Individual sewage treatment systems necessary for the Beach Resort Park Block and the Village Resettlement Control Block are excluded from this estimated cost, and
- Only water supply trunk pipes in the Beach Resort Park Block are included in the estimated cost.

**Figure 4.9 Layout of the Proposed Water Supply Facilities and Sewage Disposal Facilities**

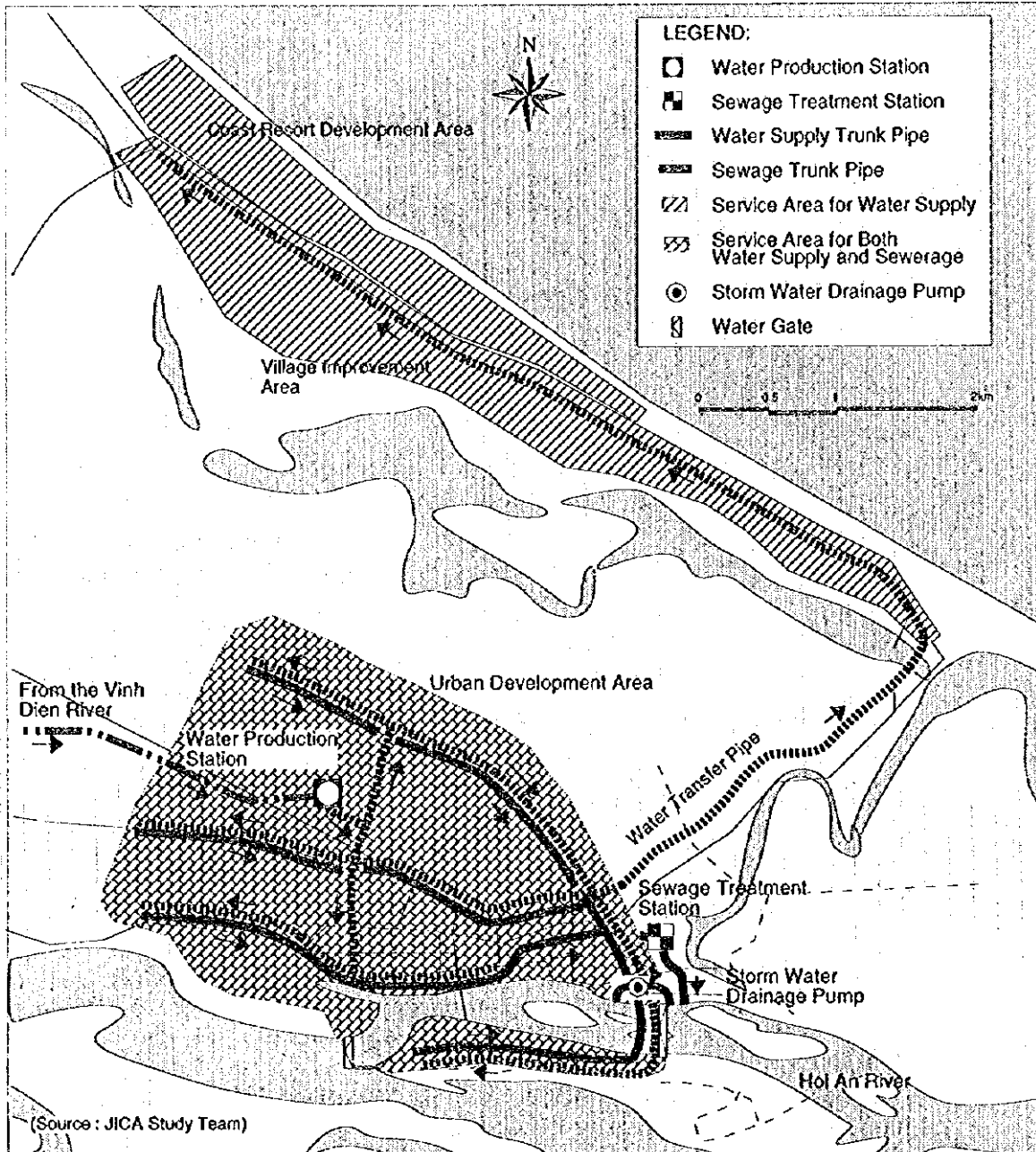


Figure 4.10 Route Plan of Raw Water Conveyance Pipes

