

A wide-angle photograph of a sunset over a body of water. The sun is a bright, glowing orb on the left side of the horizon, casting a long, shimmering reflection across the water's surface. The sky is filled with scattered clouds, some of which are illuminated from below by the sun, giving them a golden-orange glow. In the distance, dark silhouettes of mountains or hills are visible against the horizon. On the right side of the frame, a dark, rocky coastline or island rises from the water. Several small, dark shapes, likely boats or structures, are scattered across the water's surface. The overall mood is serene and contemplative.

sustainable visions for  
the future of vietnam

GHENH RANG  
VIETNAM



# ORGANIC DESIGN CHALLENGE 2013

sustainable visions for the future of vietnam

## SUSTAINABLE PLANNING IN GHENH RANG

Winter 2013

Final Report

submitted to

Eric Lloyd Wright & Associates Architecture  
3RockD Development Company

by

**CRP 471 Selected Advanced Laboratory**

City and Regional Planning Department  
College of Architecture and Environmental Design  
California Polytechnic State University San Luis Obispo





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## STUDENT TEAMS



### TEAM 1

Liz Brighton  
Kerby Olsen  
Tom Van Pelt  
Abraham Sheppard  
Edith Lopez-Victoria  
Tan Tranngo

### REPORT (LAY-OUT AND EDITING)

Liz Brighton

### STUDIO INSTRUCTORS

Dr. Hemalata Dandekar  
Dr. Vicente del Rio

### A SPECIAL THANK YOU TO

Eric Lloyd Wright, AIA  
Hannah Wear  
Kevin Parkhurst, LEED AP  
Dr. Christine Theodoropoulos, Dean CAED



### TEAM 2

Jenny Ha  
Sophia Lai  
Matt Orbach  
Thomas Park  
Stephan Schmidt  
Hillary Tung



### TEAM 3

Danielle Althaus  
Kyle Bell  
Ryan Banuelos  
Penelope Legget  
Shaun Prestridge

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# preamble & sustainable planning principles

This report culminates a 10-week elective studio effort during which a group of seventeen graduate and undergraduate students from Cal Poly's College of Architecture and Environmental Design (CAED) engaged in the 2012 Organic Design Challenge in Vietnam. This was an opportunity to engage in an international and interdisciplinary design project to create a viable schematic plan for the sustainable development of Ghenh Rang, a small ward of Quy Nhon.

Vietnam is undergoing a fast-paced transformation as it integrates into the global economy. It faces many opportunities and challenges as it strives to pursue economic growth that promotes development, respects local cultures and traditions, utilizes available resources and addresses resource constraints.

Drawing upon instruction from Eric Lloyd Wright Architecture & Planning, the development firm 3RockD, the reports from the 2010 Challenge and limited available data, three alternative strategies were developed. All were designed to provide the foundations for environmentally sustainable development and to foster a robust and dynamic economy, while providing a vibrant social space for residents and tourists alike.

The notion of sustainable development seems to have appeared in the 1970s and rapidly gained recognition in circles preoccupied with the quality of life (Symes, Deakin & Curwell, 2005). Particularly since the Earth Summit in Rio and the Agenda 21 in the early 1990s, the sustainability paradigm has shaped public policies and projects at different levels, permeated public perception, and started to influence the private sector. Facing unprecedented environmental changes at a planetary scale which have grave local consequences, efforts at the

international, regional, and local have aimed to move societies towards a more rational use of natural and existing resources, to maximize returns on investments, increase use of clean energy, diminish greenhouse effects and, in general, curtail the environmental impacts of human activities.

However, sustainability is a complex concept now widely utilized but in many cases, without a clear definition. On the one hand, it has been tied to specific environmental performance, as when desired levels of specific environmental quality indicators are established to assess air and water quality or climate change. On the other hand, the notion of sustainability suffers from having become fashionable and, in many instances, vague and imprecise: used in many contexts it means different things to different people, particularly in political rhetoric.

When sustainability is approached holistically and particularly when the attempt is to utilize it as a foundation for urban development, planning, and design there is a pressing need clearly define it from the get-go. In this sense, sustainable development can be best represented, as suggested by Godschalk (2004), by a pyramid with ecology, economy, and equity at the base and livability as the top vertex. Having livability as the commanding component of this paradigm also supports the notion that many of the intentions of sustainable urban development are to be attained through design and urbanism (Curwell, Deakin & Symes, 2005; Farr, 2008).

A holistic notion of sustainability and its integration to urbanism and architecture inevitably leads us to a design fundamental that must be at the base of any development and should not be forgotten. This fundamental may be called design with nature (McHarg, 1971),

a design that flows with the patterns of places (Alexander, 1979) or as “sustainable organic design” which can be seen in the work of architects following the tradition of Frank Lloyd Wright, who introduced the notion of organic architecture in his work in 1908. Well ahead of his time in this sense, Wright would summon the nine principles of his organic philosophy in his book “The New Architecture: Principles” of 1957. Organic architecture is about reaching a harmony between human habitation and the natural world through a unified and interrelated composition of parts. The implementation of this ideal can be seen in the work of architects such as Alvar Aalto, Hans Scharoun, Bart Prince, Faye Jones, and Eric Lloyd Wright. It has also inspired ecologists and the Gaia international movement and its charter which understands the earth as a superorganism.

Architect Eric Lloyd Wright & Associates interpretation of sustainable organic design, presented in the brief for the 2013 Organic Design Challenge - Sustainable Visions for the Future of Vietnam, and delivered in a richly illustrated presentation by Eric Wright at the start of this exercise, served as inspiration for this work and these development alternatives presented for Ghenh Rang. The client’s holistic Sustainable Organic Design Principles are as follows:

- Simplicity
- Bringing the outside in/inside out
- Buildings grow from the site with harmony
- In the nature of materials
- Character of place
- Resonance of scale through use of unit system
- Spirit of building
- Resonance with nature
- Timeless beauty

In this context, sustainable development is understood as “[meeting] the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environmental Development, 1987, p 43). Inspired by the client’s holistic design principles and a thorough review of compelling approaches in the existing literature, the class considered a working definition of sustainable planning and design that comprises five key principles.

The class discussed the notions of sustainability and of holistic design, and considered several contemporary authors who have contributed with planning and urban design approaches that coincide with this philosophy and are appropriate to the task of planning a development future for Ghenh Rang particularly Alexander et al (1977), Lynch (1981), Bentley et al (1985) and Farr (2008). These discussions concluded in a working definition of sustainable planning and design that comprises five key principles which guided the class in defining a holistic vision for the work, helped set goals and design concepts, and defined the overall development framework.

The Sustainable Planning Principles adopted in this project are:

- Respect existing eco-systems;
- Develop socially, culturally, and environmentally friendly land-use patterns;
- Offer eco-efficient infrastructure and design solutions
- Provide full accessibility;
- Maximize existing resources.

Throughout the planning and design process the class encountered a complex set of cross-cultural challenges. Set in a context that is foreign and distant with limited, detailed information particularly on our site conditions, our work has attempted to celebrate and intertwine the local culture into the design. Through drawing on the best planning practices, global solutions have been integrated with local culture and traditions. The focus has been on finding creative solutions rather than constraints.

Our vision proposes Ghenh Rang to be developed through investments centered on the implementation of a state-of-the-art medical center and university facilities, transforming it into a global destination for medical and cultural tourism. To implement this vision three alternative plans are proposed representing different approaches in combining development components such as the preservation and enhancement of agricultural land, open spaces, and historic structures; the strengthening of local industries –particularly boat production and furniture making; a diversity of housing and hotel types; an active commercial core; a renewed street network; and amenities such as schools, clinics, and public facilities.



# chapter 1 site assessment

## 1.1 REGIONAL CONTEXT

Ghenh Rang is a one of 16 wards of Quy Nhon. Quy Nhon is the city capital of the Binh Dinh province. In the greater context of Vietnam, Ghenh Rang is a satellite ward of a city striving towards integration into the global economy, Quy Nhon. In 2009, Quy Nhon's population surpassed a quarter million. In recent years, and as population grows, Quy Nhon has undergone through an economic transition going from the primary industries of fish and agriculture, to service and production industries of tourism and manufacturing. In fact, Quy Nhon is the major industrial center of the Binh Dinh province, this transition in combination with its spectacular natural beauty has made it gravitational force for tourism (Binh Dinh Province).

Ghenh Rang is geographically situated approximately 3 kilometers south of Quy Nhon city and is between 150-200 hectares in size. Sitting in a valley, the site is bounded on the north, south and west by the Truong Son Mountains and the east by the South China Sea. To the northwest is a passage leading to Quy Nhon city. Elevations in the mountain range reach as high as 1000 meters. A network of regional and local roads exists linking the site to other locations north and south. There are no such connections leading east-west (Qui Nhon).

## 1.2 SITE ANALYSIS

The project site in Ghenh Rang is located approximately 3 kilometers south of Quy Nhon city and is between 150-200 hectares in size. Sitting in a valley, the site is bounded on the north, south and west by the Truong Son Mountains and the east by the South China Sea. To the northwest is a passage leading to Quy Nhon city. Elevations in the mountain range reach as high as 1000 meters.

A network of regional and local roads exists linking the site to other locations north and south. There are no such connections leading east-west. Additionally, a trail runs from the north through the mountains and into the site. Along the waterfront, a barrier of trees separates the site from the beach. This barrier serves as a line of protection from storm surges. A dermatological hospital exists in the northern portion of the site and is complemented by Quy Hoa Leper Colony, an active community where leprosy patients live and work in a waterfront setting.

A substantial amount of cultural infrastructure is already established. Near the colony is Humane Park, a small cultural area with a row of busts featuring prominent scientists from Vietnam and abroad. Near the mountains is a notable memorial to adored Vietnamese poet Han Mac Tu, which includes a souvenir shop and landscaped grounds.



Source: vietnamtourasia.com

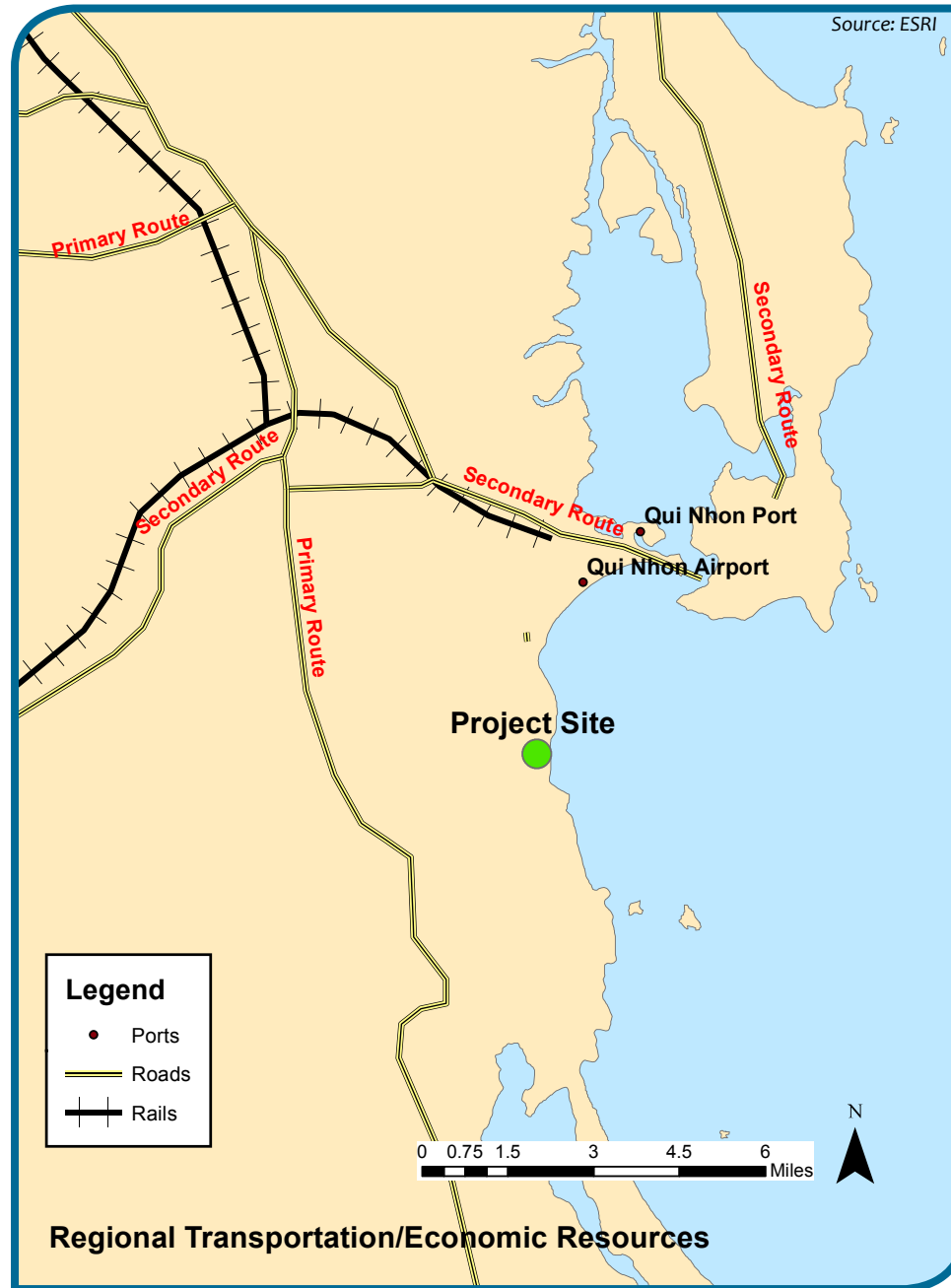


Figure 1.1 Regional Transportation Network

## 1.3 STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS

### PHYSICAL

Some physical strengths of Ghenh Rang are its close proximity to country-wide transportation corridors and a lack of old/dysfunctional infrastructure that would ordinarily need to be torn down. The city does lack accommodations (Spencer 2011, p. 26) and restaurants for its citizens and potential tourists.

There is also a lack of sanitation facilities (Spencer 2011, p. 31) and efforts to combat such public works issues. Human waste is often used to fertilize the land, so major changes in sanitation are unlikely (Spencer 2011, p. 33). Some opportunities for Ghenh Rang are the future development of a unique architectural style and the building of new roads and operational rail lines.

Future development of public utilities can also include the dispersion of clean/disinfected water and electricity to rural areas. One notable threat is the use of its waterfront (inner-bay) where there is conflict between the fishing industry and tourism industry (Spencer 2011, p. 27).

### ENVIRONMENTAL

Located 3 km south east of Quy Nhon City, the area of Ghenh Rang is one of the most attractive destinations in Vietnam's South Central Coast. This site is located in a naturally scenic area with natural urban growth boundaries (water/mountains/protected habitat). These aesthetic borders create plentiful opportunities for tourism, waste product re-use/recycling from natural resource industries (Spencer 2011, p. 20), and water/wind energy potential (UNC 2010, p. 61).

However, being surrounded by so many natural elements and low elevations make Ghenh Rang prone to flooding, vulnerable to sea level rise and typhoons (which are most severe in October & November (Spencer 2011, p. 6)).

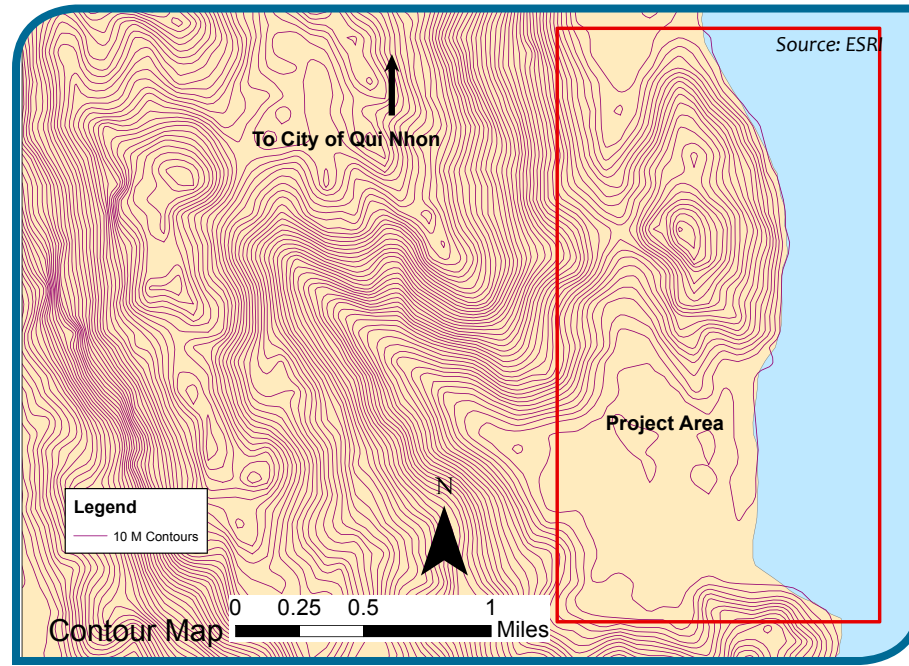


Figure 1.2 Topography Map

Some threats to Ghenh Rang include climate change (losing wetlands, which help buffer climate impacts) (Spencer 2011, p. 9) and associated sea level rise, urban expansion (Spencer 2011, p. 8), pollution (Spencer 2011, p. 6), flooding, reckless development of sensitive areas, over-fishing (UNC 2010, p. 13), and health diseases. These shortcomings make Ghenh Rang a limited developable area.

#### CULTURAL

Ghenh Rang's main open space area is the waterfront where resident uses include festivals and fishing (UNC 2010, p. 107). Ghenh Rang has developed a strong cafe culture (Spencer 2011, p. 11) due to the colonization of the French.

Ghenh Rang is known for its traditional woodworking, shown through boats, furniture, religious buildings and local/traditional architecture. Vietnam traditionally has an open culture with a relaxed attitude to foreigners entering the country. One of the Ghenh Rang area's weaknesses is the resident's lack of education.

The modernization of Vietnam has led to a lack of knowledge of geographic and cultural history in the youth. One of the opportunities that Ghenh Rang has is the market industry. Ghenh Rang has the ability to create a market that will thrive off tourism by showing its traditional industries and beautiful beaches.

#### ECONOMIC

Ghenh Rang has economic strengths such as high fish exportation (Spencer 2011, p. 23), local food products and operational rail lines. The connections between these sectors will allow the city to thrive (Spencer 2011, p. 20). The area has a centralized government that facilitates planning in Ghenh Rang.

With this Ghenh Rang has the opportunity to bring in higher level service jobs like fishing and boat building (Spencer 2011, 20). Ghenh Rang has a beautiful beach area that is attractive to foreigners and retirees because of the country's affordability (Spencer 2011, p. 30). The area also has a great source of water and wind energy where sustainable energy is a possibility (UNC 2010, p. 61).

However there are some threats and weaknesses that Ghenh Rang faces. Natural disaster is a huge threat (Spencer 2011, p. 10). With the city being at sea level, there is a potential of flooding in the area. Ghenh Rang also has a lack of funding for development, tourism and education. Without these services the city faces an increasing percentage of poverty (Spencer 2011, p. 31).

TABLE 1.1 STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS

	INTERNAL		EXTERNAL	
	Strengths	Weaknesses	Opportunities	Threats
Natural Resources	Scenic beauty of surrounding mountains and beachfront; The central government has named it a National Landmark site (one of 3000).	Topography- relatively small buildable area; Unsuitable soils for construction; Climate/humidity- large amount of money spent in cooling; Vietnam is second in the world in severity of anticipated impacts from sea level rise.	Geographic qualities create potential for alternative energy sources (wind & hydro).	Over-fishing could deplete supply of several species of aquatic life, thus harming the marine ecosystem as a whole; Typhoons threaten natural ecology; Urban expansion threatens natural resources like wetlands, rice paddies, etc.
Man-made Resources	Existing roadway connects Ghenh Rhang to cities north and south; Trail network exists through natural reserve park into site.	Reversing canals; Bridges can disturb soil; Creation of impervious surfaces and filling of land can cause a change in water flow and create flooding issues; Need for better infrastructure for water and waste.	Proximity to air & rail infrastructure.	Sea-level rise threatens man-made resources such as infrastructure and housing units.
Cultural	Existing attraction in Han Mac Tu's tomb (Vietnamese poet); 3 visitor areas; existing tourist culture.	Stigma of Leper colony; Conflict of uses- more modern uses and traditional	Café culture and market could be further developed; the "soft infrastructure" of Vietnamese culture and customs could be utilized for tourism draw.	Conflicts between fishing and tourism industries exist in the shore and bay areas.
Economic	Existing universities; Existing hospital and life wellness resorts (existing med. tourism); Existing fishing industry.	Cost of increasing connectivity to surrounding cities; Cost of development is high as cost of building materials is high.	Over-fishing could actually stimulate growth in the enforcement industry; Gateway status to Cambodia & Laos could stimulate tourism; Medical and eco tourism expansion; Aquaculture; Furniture/building industry expansion; Great demand for higher education opportunities could spur development.	Over-fishing could weaken the local economy; Typhoon damage threatens infrastructure and industries.
Social-Political	The provincial government is supportive of anything that can take Quy Nhon into the next category- "a national city".	Limited jobs for educated; Government regulations and insufficient public funds.		Can complex plans be implemented?



# Ghềnh Ràng

Social Site Analysis

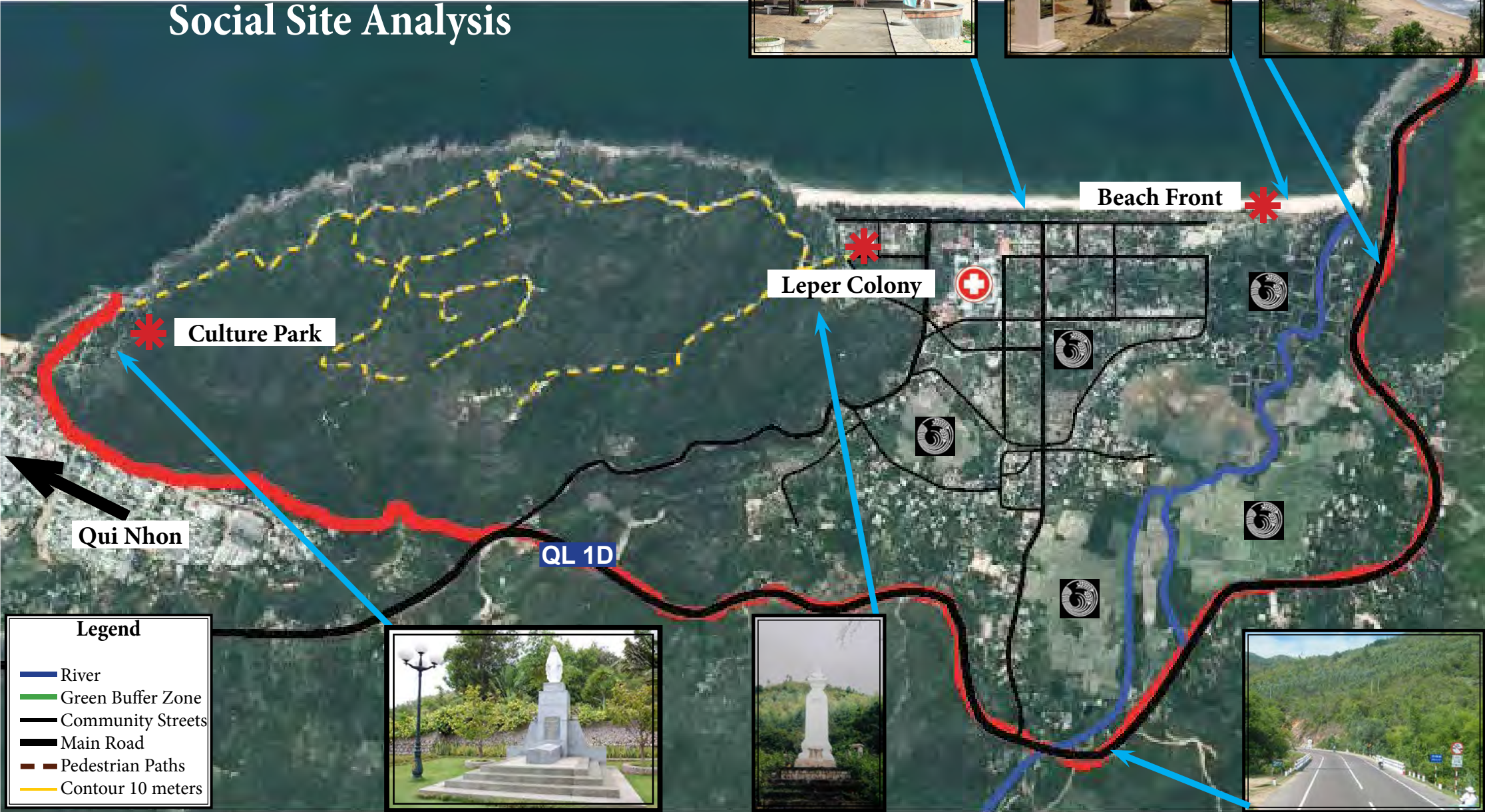


Figure 1.3 Social Site Analysis Map

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## chapter 2 team one: [RESTORE]

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# chapter 2 team one: [RESTORE]

## 2.1 THE [RESTORE] VISION

Ghenh Ráng will become a global destination for medical and cultural tourism that builds upon its spectacular natural environment and rich cultural traditions to become a leading model for sustainable development in Vietnam.

By strategically targeting the medical, tourism and sustainable agriculture industries, Ghenh Ráng will be positioned to take advantage of the 21st-century global economy while supporting and enhancing its own economic traditions. The well-balanced [RESTORE] development plan integrates modern, service-oriented development with Ghenh Ráng's vernacular building typology and distinctive built fabric.

The [RESTORE] development plan is focused on three primary catalysts linked by a restored creek along a north-south axis. At the north end of the project area, a medical and wellness complex will adjoin an associated university campus, providing the development's core economic drivers. At the heart of Ghenh Ráng, a mixed-use core in a new village center will provide amenities and attractions for local residents, students, and tourists. At the south end, restored native wetlands and a sustainable agriculture visitor center will provide a southern "bookend" to the project and a valuable local resource.

These three primary catalysts will provide a framework for infill of varying intensities, ranging from preserved and enhanced residential neighborhoods, to beachfront tourist amenities, to multi-story mixed-use around the urban core.

## 2.2 PRECEDENT & CASE EXAMPLES

The following case studies provided inspiration and helped define the team's approach to the sustainable planning principles listed in the Preamble of this report:

### 2.2.1 ECO-EFFICIENCY

#### A. WETLAND DISCOVERY POINT, UTAH BOTANICAL CENTER

The Utah Botanical Center uses a butterfly roof and cistern to re-use rainwater. The use of rainwater catchment systems is not uncommon in Vietnam. The concrete urns pictured below are the most common catchment systems used. Innovation is needed for more healthy solutions as water stored in this concrete system is unsafe for drinking.



Source: <http://www.ajcarchitects.com>



Source: <http://www.ewb.org.au>

## B. ZERO ENERGY BUILDING IN SINGAPORE

In subtropical South-east Asian climates, air conditioning accounts for about 50% of a building's energy use and up to 30% of operating costs. Research has shown that improvements to the "building envelope" – insulation materials to prevent cold air from escaping, glazed windows to reduce heat entry, efficient chillers and a temperature control system – can reduce the energy required to cool a building by 50-80%.



Source: [www.app.nccs.gov.sg](http://www.app.nccs.gov.sg)

The picture above is a Zero Energy Building (ZEB) in Singapore. It has the following energy efficient features:

- Solar chimneys remove heat from the building by drawing it up and out while bringing in cooler air
- Exterior shading reduces direct sunlight, yet reflects natural light inside
- Living walls of plants shade walls from the sun
- A rooftop garden reduces the temperature of the top floor

## C. GOLDEN HILLS ECO VILLAGE IN DANANG, VIETNAM



Source: [www.inhabitat.com](http://www.inhabitat.com)

Designed by SOM, the Eco Village is a proposed master plan that aims to provide a balanced diversity high-density residential apartments, single-family homes, and commercial development for 30,000 residents. This master plan is designed for flood protection by reinforcing green belts that offer recreational

space while absorbing and filtering storm water before it enters the local Cu De River. The riverfront will be preserved with its existing habitat, which will protect the town from periodic flooding.

This case study demonstrates the effective use of natural buffers to protect developed areas from storm water run-off and flooding. In Ghenh Rang, natural buffers can be used around existing rivers, creeks, and ocean fronts.



## 2.2.2 SUSTAINABLE LAND USE PATTERNS

### A. ROCHESTER INSTITUTE OF TECHNOLOGY (RIT) – GLOBAL VILLAGE, NEW YORK

Global Village is an internationally inspired, LEED-certified sustainable residential community and commercial complex located on RIT's campus. It is open to both the public and to the RIT community, and combines student living with dining, shopping, learning, and event spaces to create a unified and modern upscale community. Global Village also hosts a number of services including a post office, print center, salon, and fine art and craft gallery.



Source: [www.bostonsf.com](http://www.bostonsf.com)

This project demonstrates the effectiveness with which a mixed-use University campus project can be integrated with the surrounding community. This project also demonstrates the effective use of green building technologies and LEED Neighborhood Development design principles. RIT's Global Village effectively integrates the campus into the urban fabric of the city. A similar integration of university and town in Ghenh Rang could be an effective part of the long-term strategy in re-developing Ghenh Rang.

### B. ELM PARK – DUBLIN, IRELAND

The 15-acre site, nestled between a convent and a suburban housing development, has a density about six times that of the surrounding area and includes offices, a healthcare center, market-rate and affordable housing, a daycare center, a conference center, a restaurant, and a fitness center. Density isn't the only aspect of Elm Park that sets it apart; innovative environmental features place it among the more advanced green developments in Europe. The buildings merge form and function, making beautiful use of the site's micro-climate for ventilation.

Elm Park serves as a good case study for the site in Ghenh Rang, Vietnam because it demonstrates design techniques for providing naturally sustainable cooling using site orientation and architectural design. The project is also connected to the city center by public transit, and shows the possibility of a high-density development outside of the city center, a similar situation to that of Ghenh Rang.



<http://greensource.construction.com>

### C. RIESELFELD & VAUBAN DISTRICTS – FRIEBURG, GERMANY

The Rieselfeld and Vauban districts of Germany's greenest city—the historic university town of Freiburg—were consciously designed to push the envelope of sustainable urbanism. Both are peripheral redevelopment sites linked to central Freiburg via the region's tramway network. Both were built in the 1990's on less than 250 acres (100 ha) for 5,000 to 10,000 inhabitants. And both embody Freiburg's aim of becoming a "city of short distances," accomplished through mixed land use patterns and nearly ubiquitous public transit.

The development of Rieselfeld was transit-led. A tramway extension to Rieselfeld opened in 1997, a year after the first families had moved in and when there were just 1,000 inhabitants. The presence of three tramway stations enabled urban growth to wrap itself around the rail nodes. With a maximum wait of seven minutes between trams, residents can reach Freiburg's core within ten minutes. are appropriate case studies for Ghenh Rang, Vietnam, because

they demonstrate the effectiveness of rail in serving high-density communities on the periphery of the city. Ghenh Rang could similarly be served by transit to maximize its future growth potential while remaining a pedestrian oriented community connected to downtown Quy Nhon.



Source: flickr.com

## 2.2.3 HISTORIC PRESERVATION & ADAPTIVE RE-USE

### A. ADAPTIVE RE-USE IN SHANGHAI, CHINA

This aerial view of downtown Shangai shows several blocks of the Shikumen district redevelopment project and its Taipingqiao Lake Park.

The historic buildings in the center (brown roofs) were saved despite development pressure during the redevelopment process. In Ghenh Rang, historic preservation and adaptive re-use of historic buildings should be utilized as often as possible to reinforce local heritage and culture.



Source: skyscraper.org

### B. HOI AN – VIETNAM



Source: www.vietnamonline.com

As a Unesco World Heritage site, Hoi An, Ghenh Rang's neighbor to the north has effectively demonstrated the value of preserving historic local architecture. Many buildings have been renovated on the interior with the historic facades remaining. Historic buildings in Ghenh Rang could be similarly preserved, restored, and re-used.

## 2.2.4 SUSTAINABLE AQUACULTURE

### A. CHANTABURI – THAILAND



Source: canadianmuseumofnature.wordpress.com

In making shrimp farming sustainable, many problems are encountered and solutions are also being developed. One technique being verified is the reduction of water consumption in shrimp farms by recycling the water using various water treatment schemes. Shrimp farm effluent is characterized as having

high volume and is turbid and rich in organic suspension and nutrients. Integrated Physical and Biological Technologies for Water Recycling in Shrimp Farming is being tested in Songkhla, Thailand. The integration of physical and biological treatment system is one of the potential systems which can be used extensively to recycle the effluents from shrimp farms.



The function of mangroves for enhancing a natural food web in water recycling shrimp farms is being verified in Bangkapong District, Chachaengsao, Thailand. Environmental deterioration in coastal waters is a common occurrence after intensive shrimp farming due to the accumulation of organic waste as well as the eutrophication processes. Establishing mangroves in shrimp farming areas may allow utilization of their nutrients and enhance the natural food web in shrimp ponds.

#### B. ILOILO - PHILIPPINES

Approaches for shrimp farming have been developed through studies conducted in sites in the Philippines, specifically studies on growth, survival and production of the tiger shrimp, *Penaeus monodon*. These approaches which include crop rotation; the use of partial and/or zero discharge system; the use of probiotics, bio-augmentation or microbial inoculants; and the use of low salinity levels for shrimp culture, led to the development of techniques that are useful in arresting the occurrence of luminous bacteria.



Source: [aquafishcrsp.oregonstate.edu](http://aquafishcrsp.oregonstate.edu)

## 2.2.5 SUSTAINABLE INTEGRATION WITH NATURAL ENVIRONMENT

### A. MONTEREY BAY SANDS ECO-RESORT, SAND CITY, CA

This project aims to re-create the structure of the sand dunes that



Source: [inhabitat.com](http://inhabitat.com)

were removed long ago by a sand mine. After recreating the dune, extensive restoration work will bring back the dune ecosystem. It is also well integrated into the surrounding morphology and ecology of the dunes. The integration of the Eco-resort project into the restored landscape alone serves as an

inspiration for the desired meshing of the [RESTORE] development into the existing natural fabric of Ghenh Rang.

### B. BAMBOO WING RESTAURANT – VIETNAM

Designed by Vietnamese architect Vo Trong Nghia, this project is well integrated into the surrounding natural area, framing the



Source: [inhabitat.com](http://inhabitat.com)

water and providing views into nature. This project serves as inspiration for the use of sustainable rapidly renewable materials, such as bamboo, that are not common building materials, but are structurally sound as shown in the Bamboo Wing Restaurant (left).

## 2.3 GOALS, OBJECTIVES, AND IMPLEMENTATION MEASURES

With sustainable design principles and the project vision in mind, the design team developed goals, objectives and implementation measures to guide the formation of the [RESTORE] development plan. In this section, five goals are introduced along with associated objectives and implementation measures:

### 2.3.1 [RESTORE] GOAL 1: PROTECT THE EXISTING ECOSYSTEM

#### OBJECTIVE 1.1: MAINTAIN AND PRESERVE NATURAL AREAS.

- Direct new development away from sensitive ecological areas including beaches and existing open spaces.
- Maintain and improve upon vegetated buffers and environmental quality.
- Concentrate development away from steep hillsides and areas vulnerable to flooding.
- Manage stormwater runoff on-site.



Source: news.bbc.co.uk

#### OBJECTIVE 1.2: ENCOURAGE LOW-IMPACT DEVELOPMENT

- Concentrate development away from steep hillsides and areas vulnerable to flooding.
- New development will manage stormwater runoff on site.

#### OBJECTIVE 1.3: ENCOURAGE A SUSTAINABLE RESOURCE-BASED ECONOMY.

- Allocate land for organic farming and research.
- Maintain land for sustainable aquaculture while restoring native wetlands.
- Designate land for sustainable forestry.

### 2.3.2 [RESTORE] GOAL 2: ENCOURAGE A HEALTHY MIX OF INTERDEPENDENT LAND USES

#### OBJECTIVE 2.1: DEVELOP INFILL SITES THAT HARMONIZE WITH THE SURROUNDING CULTURAL, NATURAL, AND AGRICULTURAL RESOURCES.

- The design, materials, and placement of new development will be compatible with existing cultural, natural, and agricultural resources.
- Development will be directed towards previously developed or underutilized land.

#### OBJECTIVE 2.2: THE DEVELOPMENT WILL CREATE A COMMERCIAL CORE THAT IS LINKED TO BOTH THE MEDICAL AND UNIVERSITY CAMPUSES AND THE REST OF TOWN.

- Development will transition in scale from the larger University scale to the vernacular building typology in the core.

#### OBJECTIVE 2.3: ENSURE THAT NEW DEVELOPMENT IS COMPATIBLE WITH THE EXISTING BUILT AND SOCIAL FABRIC.

- Development will be built to accommodate a variety of age ranges.



Source: noipictures.photoshelter.com



### 2.3.3 [RESTORE] GOAL 3: PROMOTE INNOVATIVE DESIGN SOLUTIONS

**OBJECTIVE 3.1: PROMOTE DEVELOPMENT THAT UTILIZES PASSIVE SYSTEMS IN SITE PLANNING AND BUILDING DESIGN.**

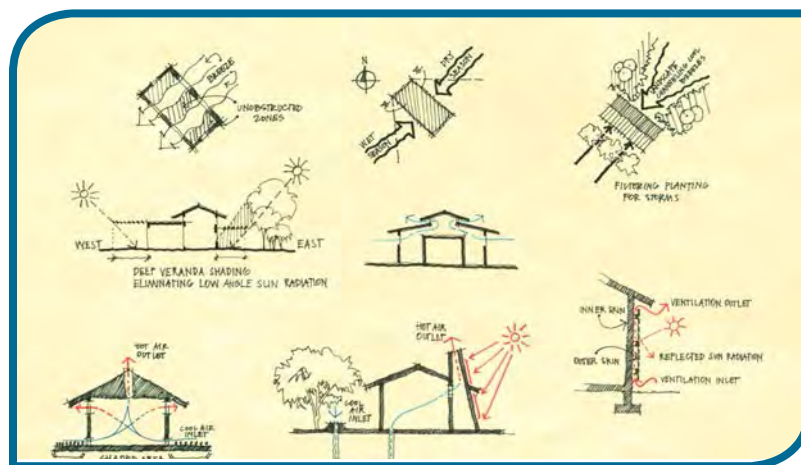
- Development will orient buildings appropriately in terms of solar orientation and prevailing winds.
- New development will incorporate efficient waste management systems.

**OBJECTIVE 3.2: PROMOTE THE USE OF RAPIDLY RENEWABLE AND LOCAL BUILDING MATERIALS.**

- Allocate areas in the City for the growth of renewable and local materials
- Reuse local waste products (such as rice husks) as building materials

**OBJECTIVE 3.3: ENCOURAGE DEVELOPMENT THAT EFFICIENTLY USES WATER AND ENERGY.**

- Development will orient buildings for small-scale solar and wind power production.
- Development will utilize innovative systems that maximize water conservation and re-use.



Source: [www.eslarp.uiuc.edu](http://www.eslarp.uiuc.edu)

### 2.3.4 [RESTORE] GOAL 4: PROVIDE ACCESSIBILITY, MOBILITY, AND CONNECTIVITY

**OBJECTIVES 4.1: PROMOTE A MULTI-MODAL NETWORK**

Construct a roadway network to establish adequate transportation infrastructure

- Research the viability of waterway connections as an alternative to roads



Source: [pwharton.aminus3.com](http://pwharton.aminus3.com)

**OBJECTIVE 4.2: ENCOURAGE NON-MOTORIZED TRANSPORTATION**

- Provide viable options for use of bike and walking

### 2.3.5 [RESTORE] GOAL 5: MAXIMIZE EXISTING PHYSICAL AND CULTURAL RESOURCES

**OBJECTIVE 1 PRESERVE BUILDINGS WITH CULTURAL SIGNIFICANCE**

- Preserve and restore significant historic physical resources such as the leper colony and the church structure.
- Encourage adaptive reuse of existing buildings

**OBJECTIVE 2 PROMOTE LOCAL CULTURAL ACTIVITIES**

- Design public spaces that can be used for local festivals and events, such as the King Hung Ceremony, and Whale and Son Tay Festivals.

**OBJECTIVE 3 PROMOTE ECO- AND ARTISANAL-TOURISM**

- Provide infrastructure for eco-tourism, such as trail systems and visitor centers.
- Provide tourist-accessible facilities for local artisanal industries, such as boat building and furniture making.



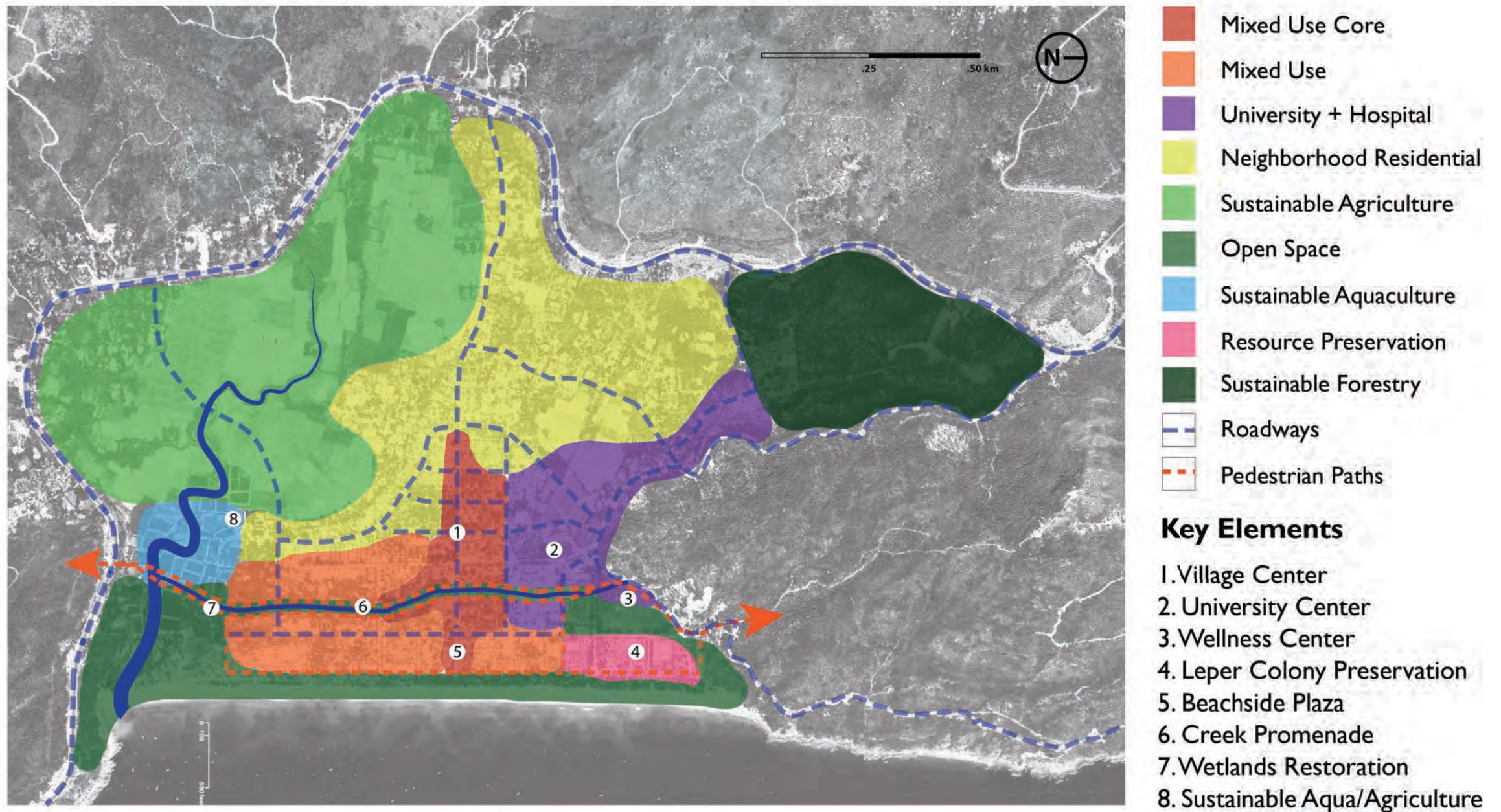


Figure 2.1 Conceptual Diagram



## 2.4 CONCEPTUAL DESIGN

Guided by the project vision, goals and objectives, the project team developed a conceptual diagram for Ghenh Rang (Figure 2.1). The designation of potential land uses paid special attention to the site's topography, geography, existing uses, and development potential.

Listed below are nine land use categories articulated during the conceptual phase. A brief description illuminates the inspiration behind each land use designation, and it explains the rationale behind the land use location within the project area.

### 2.4.1 UNIVERSITY, HOSPITAL, AND WELLNESS CENTER

This health and wellness center, along with an associated university, will provide the primary economic driver for development in Ghenh Rang. The university will primarily focus on the medical, agriculture and hospitality fields, and will be integrated with the hospital. This hospital-university complex will focus on active healing, high-tech medical procedures, and cutting-edge research. This complex will be nestled into the adjacent hills to the north, helping to integrate these larger buildings without overwhelming the scale of the rest of the city.

The complex would be sited on the north end of the project area for several reasons. First, the large building masses that are required would be "nestled" beneath the steep hillside, lessening their visual impact on the traditional built fabric of Ghenh Rang. Second, the complex would adjoin the existing hospital grounds. Third, the Wellness Center would fittingly adjoin the historic Quy Hoa Leper Colony, making a 21st-century connection to the site's heritage as a center for healing and restorative care.

### 2.4.2 MIXED-USE CORE

The higher-density village center would provide the local and tourist populations with urban amenities, urban living, and active public space. It would be located along the main road into town, with views

down toward the beach. It is proximate to the university, hospital and wellness center, connecting these intensive uses with accessible urban amenities. In turn, its central geographic location within the project site also means it is accessible to residents in the surrounding mixed-use and low-density neighborhoods.

### 2.4.3 MIXED-USE

This land area would surround the mixed-use core, providing a transition to the smaller-scale traditional neighborhoods of Ghenh Rang which are focused to the south and west. A variety of uses would provide tourist amenities, local businesses and residential opportunities.

### 2.4.4 NEIGHBORHOOD RESIDENTIAL

This section of Ghenh Rang would be located to the southwest of the mixed-use core and mixed use districts. It would preserve the existing character of the largest residential neighborhood in Ghenh Rang, which is located near the agricultural fields.

### 2.4.5 SUSTAINABLE AGRICULTURE

Sustainable practices would be encouraged in the large area of existing agricultural uses. The current agricultural footprint would be retained, preserving an integral part of the local economy.

### 2.4.6 SUSTAINABLE AQUACULTURE

Sustainable practices would be encouraged in this section located to the east of the agricultural area. The non-sustainable, environmentally-damaging shrimp farming practices that exist here today would be replaced by sustainable methods included seasonal rotation between shrimp farming and rice production.

### 2.4.7 SUSTAINABLE FORESTRY

This hillside region at the northwest corner of the project site would provide residents with timber for local artisanal traditions like boat-building and materials for sustainable construction. This area is

sited on land that is currently utilized for timber production, and its detachment from the main part of Ghenh Rang makes it useful for an undeveloped land use that supports the local culture and economy. Sustainable forestry will support the existing woodworking, furniture, and boat building industries.

#### 2.4.8 RESOURCE PRESERVATION

The Quy Hoa Leper Colony and a historic church would be preserved in a cultural preservation district.

#### 2.4.9 OPEN SPACE

Development would be balanced by maintaining valuable open space along the beach and along the hillsides, while restoring wetlands at the southern end of the project site and developing a creekside open space corridor. At the northern terminus of the creek, public open space will provide a healing garden for the Wellness Center visitors.

In addition, the conceptual plan designated eight key elements that would serve as focal points for future development. (Four key elements were designated “Key Sites” for the development plan; they are discussed in more detail beginning on page 21 of this report.)

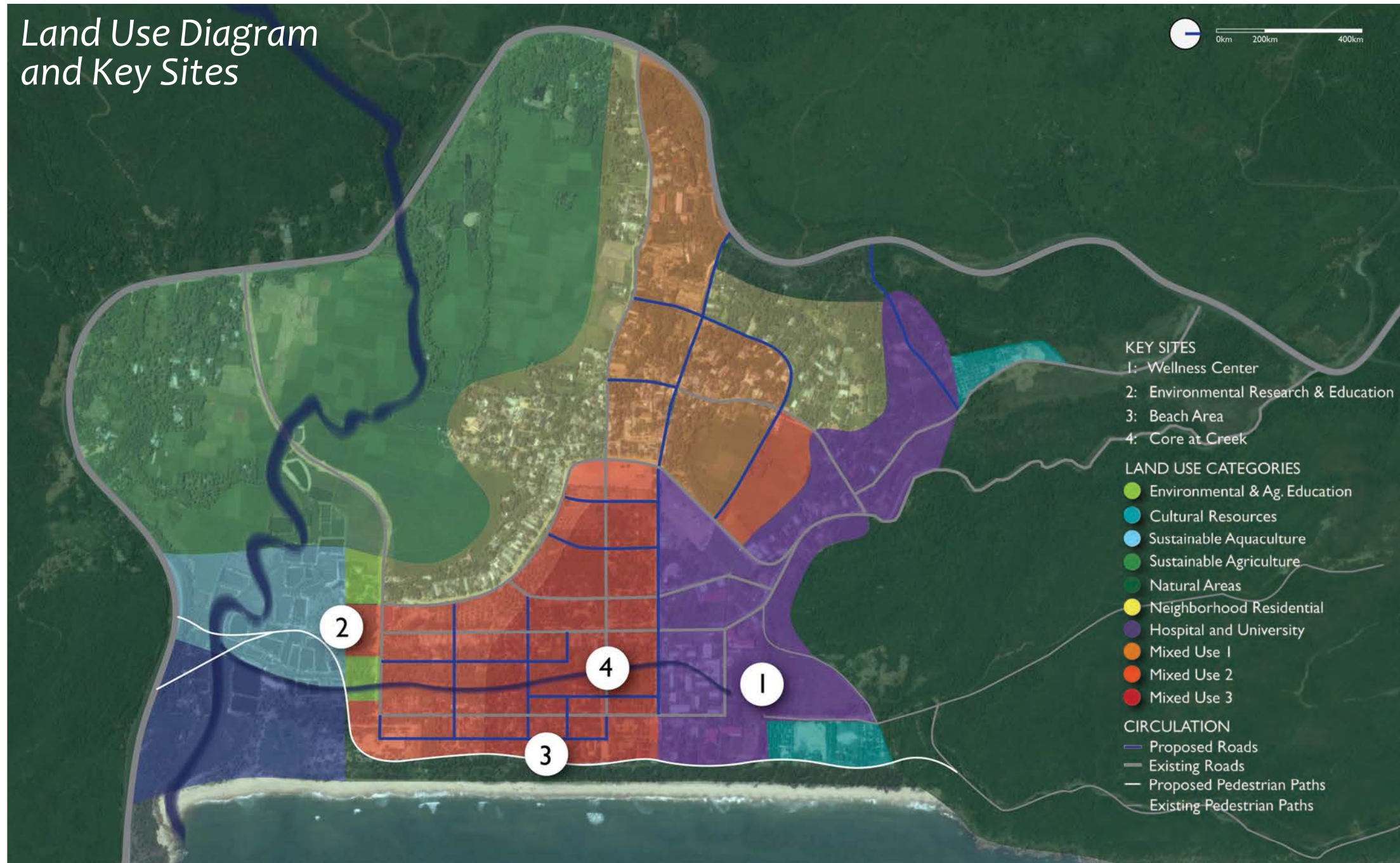
- Village center
- University center
- Wellness center
- Creekside promenade
- Beachside plaza
- Leper colony preservation (cultural resource)
- Wetlands restoration
- Sustainable agriculture visitors center



Source: <http://yume.vn/news>



# Land Use Diagram and Key Sites



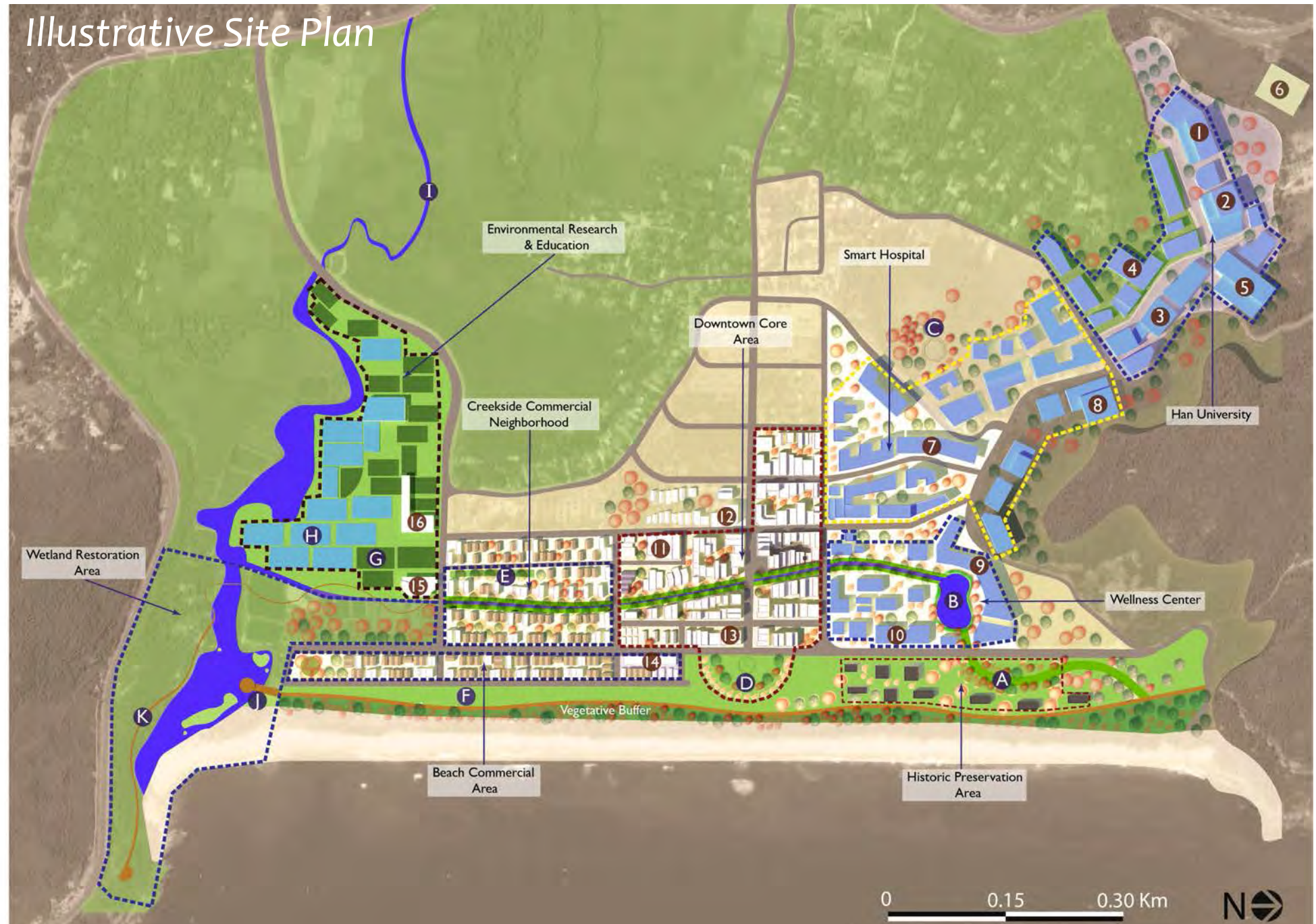


## BUILDING TYPES

- 1 Faculty Housing
- 2 Student Housing
- 3 Gymnasium
- 4 Swimming Facility
- 5 Geothermal Plant
- 6 Woodworking Facility
- 7 Smart Hospital
- 8 Recovery Building
- 9 Health & Wellness Center
- 10 Full Recovery Bungalows
- 11 Green Tech Building
- 12 Boat Woodworking School
- 13 Park Facility
- 14 Beach Hotels
- 15 Environmental Center
- 16 Sustainable Agriculture Research Center

## LANDSCAPING FEATURES

- A Pedestrian Walkway
- B Natural Pond
- C Healing Garden
- D Central Park
- E Neighborhood Pocket Park
- F Public Plaza
- G Agriculture Research Zone
- H Aquaculture Research Zone
- I Natural Creek
- J Viewing Platform
- K Boardwalk



## 2.5 ILLUSTRATIVE SITE PLAN AND KEY SITES

Following the conceptual design phase, the project team refined its land use categories and key sites. The Land Use Diagram (Figure 2.2) shows the final land use plan for the [RESTORE] development program. These land use designations refine those developed in the conceptual diagram, and their distribution in the project area has been refined to reflect iterative improvements to the [RESTORE] development plan.

One significant change from the conceptual diagram is the re-definition of mixed-use districts into three separate designations based on different development densities. Below are ten land use categories articulated on the Land Use Diagram, with a brief description delineating the three mixed use categories.

### MIXED USE 1

"Mixed Use 1" incorporates a low-medium density of mixed uses, allowing for commercial uses interspersed amongst residential uses. This land area borders the main routes into the village center.

### MIXED USE 2

This land use category allows for a medium-density supporting commercial, tourist and residential uses, including two- and three-story buildings. This area provides a transition from the dense "Mixed Use 3" core to the residential neighborhoods and natural resources located to the south and west.

### MIXED USE 3

This land use category designates the urban core and allows for the highest development intensity, including three- and four-story buildings with commercial uses on the first floor and mixed uses on the upper floors.

### HOSPITAL AND UNIVERSITY

Compared to the conceptual plan, the land area for the hospital and university has been increased to accommodate the necessary square footages.

### NEIGHBORHOOD RESIDENTIAL

This land use area has been refined to include residential neighborhoods adjacent to the agricultural area. Some land area previously designated "neighborhood residential" in the conceptual diagram has been re-categorized as "Mixed Use 3".

Based on the land use plan, the Illustrative Site Plan details the project's envisioned building footprints, public spaces and natural amenities (Figure 2.3). The Illustrative Site Plan suggests specified building uses for the land use areas.

#### 2.5.1 KEY SITE ONE: WELLNESS CENTER

With the rise of medical tourism in Southeast Asia, Ghenh Rang's Behn Vien Trai Phong Hospital is in a unique position to place itself as the top destination for foreign and domestic tourists seeking advanced medical treatment and recovery in a pristine environment. The sustainable retrofit for Behn Vien Trai Phong Hospital and Wellness Center will achieve this goal by updating and enhancing the hospital's existing buildings, infrastructure, and natural environment, and creating a new wellness center and retreat.

The current hospital and additional project area lies on the northern edge of Ghenh Rang, bounded by mountains and the historic Quy Hoa leper colony. The retrofit will utilize approximately 60% of the site's existing hospital buildings and develop approximately 20,000 additional square feet, to consist of additional hospital space, a wellness center, and wellness hotel/retreat. The natural features of the site will be enhanced and approximately 55% of the site left as park space. Overall site design is configured around the central reservoir and creek.

These natural features will contribute to a sense of serenity, with all new patient rooms designed to face the reservoir, creek, or park areas. The retrofitted hospital and wellness center will be integrated with the surrounding areas through the creek, pedestrian footpaths, and





Figure 2.4 Wellness Center Site Plan

vehicular circulation. It will also bolster the local economy through increased tourism and additional job creation.

The architecture of the Wellness Center will focus on passive ventilation and daylighting, rapidly renewable building materials, integrated green spaces, and a respect for the local design vernacular. The design of the buildings will maximize their environmental efficiency through the use of Building Information Modeling (BMI) technologies and Ecotect sustainable building design software.

Key emphasis is placed on building orientation to maximize natural cooling and shading. The main hospital building takes advantage of winds, with strategic openings providing naturally-ventilated interior spaces. Solar glare and heat are controlled through permanent sunshades. "Green roofs" will be installed to aid in cooling and to decrease the project's overall contribution to the heat island effect. Building materials will also contribute to the overall sustainability of the project through the use of rapidly renewable local materials, especially bamboo.

The design for the Sustainable Retrofit of Behn Vien Trai Phong Hospital and Wellness Center was inspired by two primary case studies discussed above: Palomar Medical Center, in San Diego, CA, U.S.A, and Khoo Teck Puat Hospital, in Yishun, Singapore.



Relationship between buildings and mountains



Source: [www.elmich.com](http://www.elmich.com)  
Khoo Teck Puat Hospital, Singapore



### 2.5.2 KEY SITE TWO: ENVIRONMENTAL RESEARCH AND EDUCATION

The creek flows into a newly-restored wetland park, where an Environmental Research and Education Centers will be developed. The wetland park will serve as a model for functional habitat restoration, revitalizing the health of a critical ecosystem. The park will draw tourists with its unique boardwalk and interpretive nature center.



Source: [lindsayrgwatt.com](http://lindsayrgwatt.com)

*The restored wetland park will allow residents and tourists to enjoy this valuable ecosystem, as in the successful Red Ribbon Park in Qinhuangdao City, China.*

The center is comprised of two components: a Sustainable Food Systems Research facility and a Visitor Education facility. The Sustainable Food Systems Research Center will provide support to local agriculturists and aquaculturists to embrace sustainable practices. The center will also provide support research for cutting-edge sustainable practices. Existing residents will benefit from opportunities to join the new economy, to join Vietnam's growing middle class of skilled workers.



Source: [blog.officiance.com](http://blog.officiance.com)

*The Environmental Research Center will promote sustainable practices in agriculture, as in this legume research farm in Hanoi.*

Local demand for sustainable products, combined with research support from the university and increased tourism, will provide farmers, fishermen, loggers and artisans with maximum incentives to be good stewards of the land and ocean. This will ensure that these essential livelihoods are preserved and respected for generations to come.



Figure 2.5 Environmental Research and Education Site Plan

The Visitor/Education Center will provide a resource for local residents and tourists to learn about the local ecosystem and local environmental issues, including overfishing, loss of forests, and endangered species. The building itself will serve as a living model, featuring an innovative use of native bamboo construction and passive design. The central component is the restored native wetlands. According to the United Nations Millennium Ecosystem Assessment, wetlands play a critical role in physically buffering climate change impacts. They also play a major role in naturally treating and removing pollution from the



Figure 2.6 Environmental Education Center



Figure 2.7 Natural Areas Pre-development



Figure 2.8 Natural Areas Post-development



environment, in some cases reducing nitrate concentrations by 80%.

### 2.5.3 KEY SITE THREE: CORE AT CREEK

At the heart of the [RESTORE] plan, an urban core will provide residents, tourists and students with varied local-based amenities. The development plan proposes infill development within the existing core, reconfiguring land uses and revitalizing the creek in an urban setting. This will be done by integrating natural elements into urban lifestyles, converting this space into an asset for the community to enjoy and thrive economically. This development will be molded to embellish the natural beauty of Ghenh Ráng and provide open public space for rituals and ceremonies that will enhance its cultural identity.

Development along the creek and within the core will consist of mixed-use residential and commercial. Buildings will range from three to four stories. The first floor will be primarily used for commercial uses. The second level will typically accommodate residences and office space. The third and fourth level will contain apartments or condominiums. Preserving pedestrian scale is key because walking and biking will be given infrastructural preference within the circulation network.



Figure 2.9 Core at Creek Rendering



Source: [www.flickr.com](http://www.flickr.com)



Source: <http://xes.cx/vietnamese-architecture/>

At the urban core, the creekside walkway becomes an urban asset, providing a hardscaped public space which transitions from the more-natural creekside to the south.

New cutting-edge buildings -- like those envisioned for the urban core (above) -- will retain the vernacular building typologies of Quy Nhon and other Vietnamese cities. Traditional streetscapes (left) will provide inspiration for new construction in Ghenh Rang.

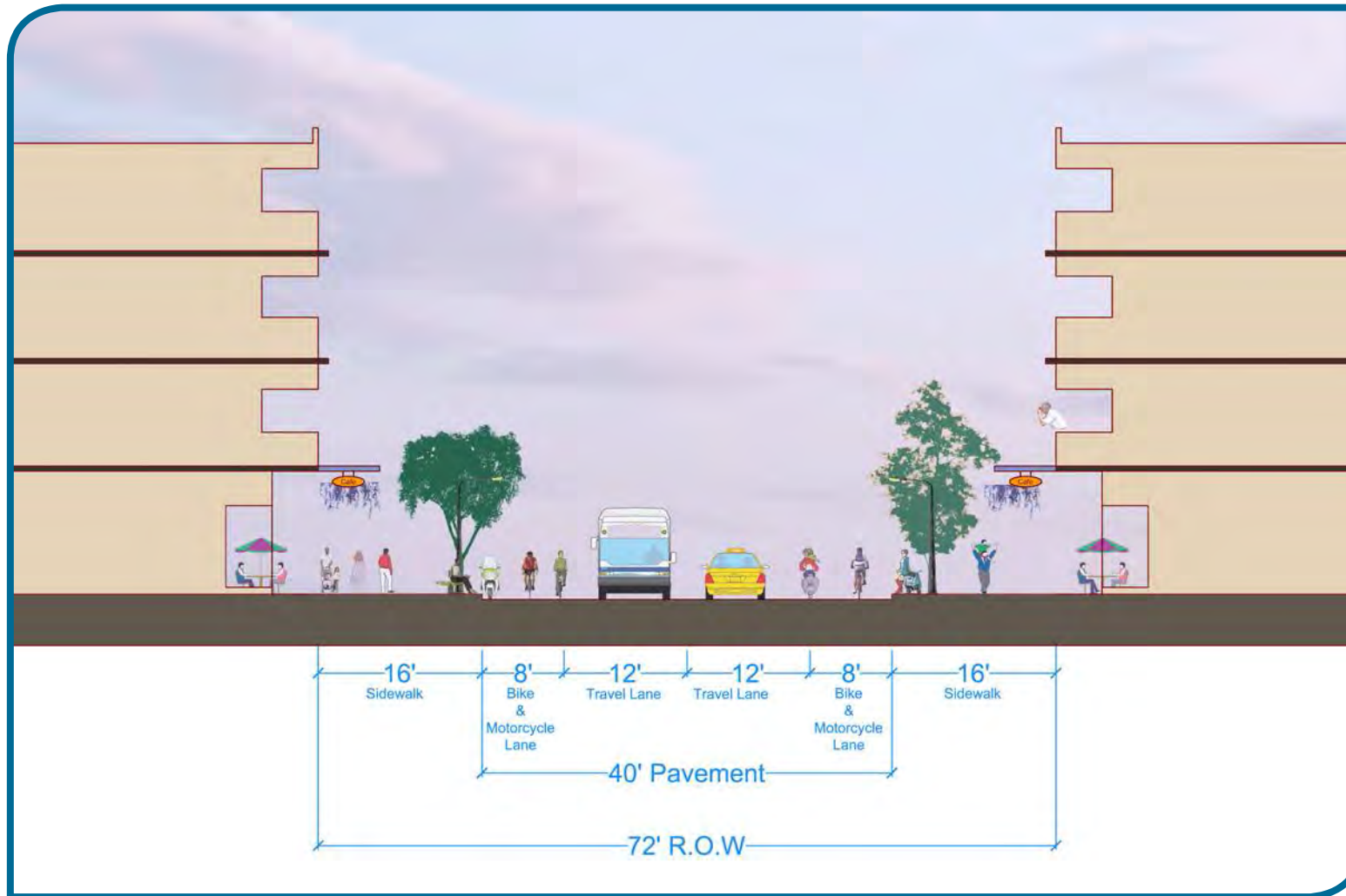


Figure 2.10 [RESTORE] Core Streetscape Section

At the urban core, three- and four-story buildings are envisioned. Protected pedestrian walkways allow space for outdoor seating and street vendors. Non-automotive transportation is supported by street design that encourages bicycling and public transit.



Source: [http://www.e-architect.co.uk/vietnam\\_architecture.htm](http://www.e-architect.co.uk/vietnam_architecture.htm)

Innovative design solutions will result in buildings that work in tandem with the natural environment. In the rendering above, shading devices provide sun protection while allowing openings that take advantage of cooling winds.



Source: [www.flickr.com](http://www.flickr.com)

The sixteen-foot wide sidewalks provide space for Vietnamese street vendors among the pedestrians, street trees, and various street furniture. The [RESTORE] Concept views street vendors as a cultural asset, and as such, the sidewalk width has been widened to allow for street vendors within the Core.



The retail established in this area will offer primary everyday use goods such as groceries, crafts, pharmaceuticals, clothing, hardware and any essentials consumed in the region.

Commercial development along the creek and core will also have small eateries serving traditional Vietnamese food prepared with ingredients grown in the area. Many of the restaurants will have outdoor seating to enhance public space and enhance pedestrian circulation on vehicle roads. Buildings at the core will embrace Vietnamese building typologies and traditions while providing modern amenities and construction. The idea is to attract tourism into this space, while providing a market where residents and tourist alike can purchase their everyday essentials.



Source: [www.flickr.com](http://www.flickr.com)

The Creekside Promenade will provide a pedestrian-oriented, active commercial area. Natural ecosystems will be integrated with urban amenities and public open space.

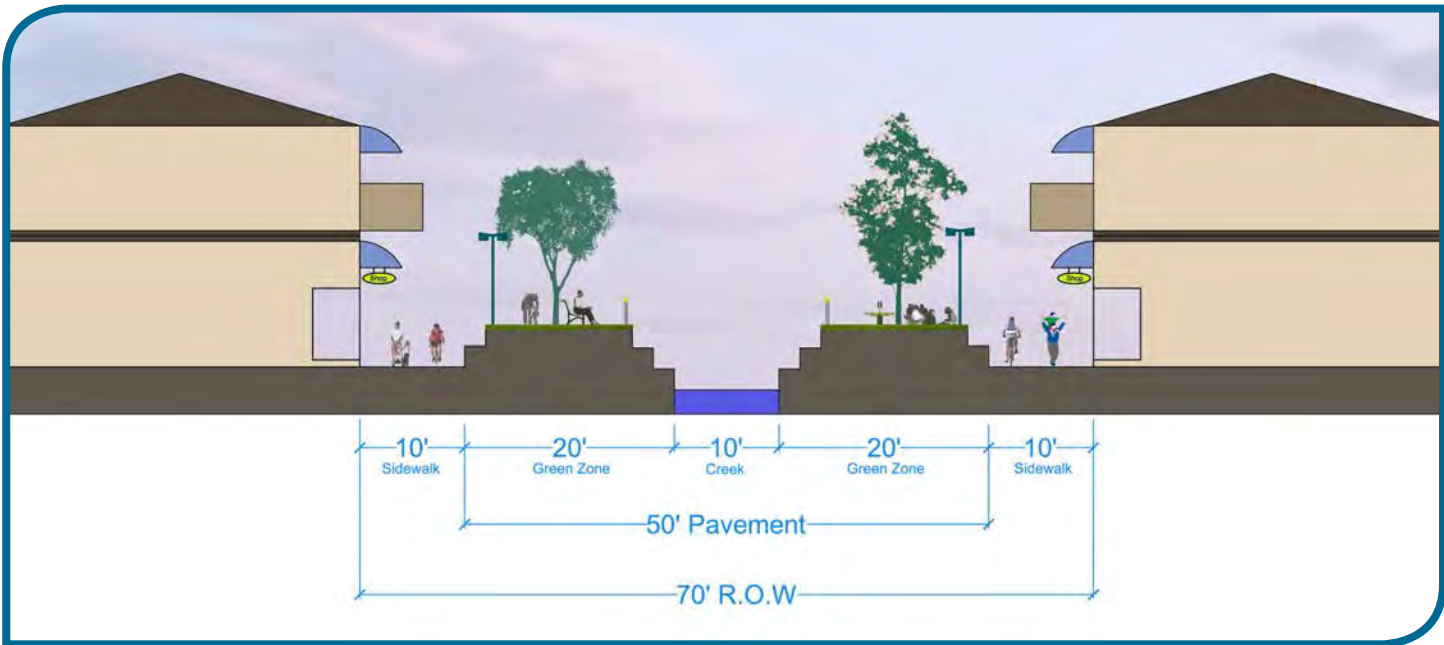


Figure 2.11 [RESTORE] Creekside Promenade Section

The creekside promenade offers a variety of land arrangements along its two-kilometer route. Here, to the south of the urban core, mixed-use development consists of two-story buildings. Ample seating overlooks the creek, providing space for leisure and dining.



Source: [travelmob.com](http://travelmob.com)

Vernacular-inspired dwellings like those shown above are envisioned in the lower-density residential neighborhoods along the creek.



Source: [http://www.e-architect.co.uk/vietnam\\_architecture.htm](http://www.e-architect.co.uk/vietnam_architecture.htm)

To the south of the urban core, the creekside promenade will be more natural in character.

#### 2.5.4 KEY SITE FOUR: BEACHFRONT

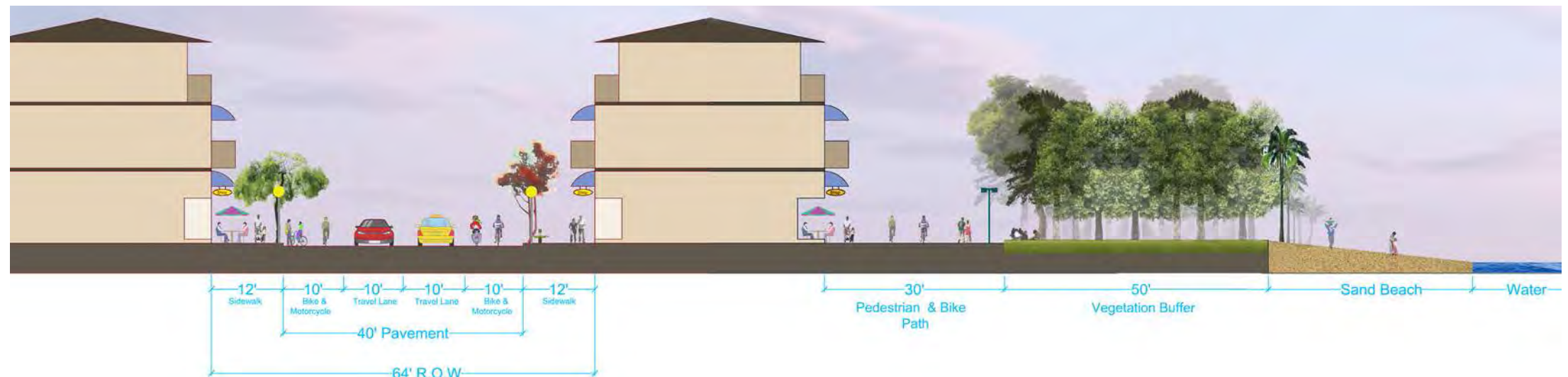
This beach development will be concentrated on the southeast segment of Ghenh Ráng's coastal front. The area is protected from strong winds and ocean storms by an existing vegetative buffer which will be restored and enhanced. This natural buffer is visually-permeable at street-level, affording beach and ocean views from the beachside district. It will allow cooling ocean breezes to filter through the developed area.

The Ghenh Rang beachside district will contain mixed-use commercial consisting of bars, restaurant, hotels and residences. Outdoor seating and active public spaces are envisioned. A walkway parallels the vegetative buffer adjacent to the beachside district, creating a lively beachfront.

One of the ideals behind this commercial development is to maximize the opportunities of tourism and nightlife given the great scenery that the beach has to offer. However, another goal is to not gentrify the area to a degree where local residents would be unable to own or rent beach front property.



Beachside commercial will provide outdoor seating areas and active street fronts (above). Pedestrian-only and human-scaled walkways will inspire walking as a primary means of transportation. Throughout Ghenh Rang, street life will reflect and celebrate local culture and artisinal industries.





## 2.6 DEVELOPMENT GUIDELINES

### 2.6.1 CULTURAL RESOURCES

Existing, significant cultural resources have been identified in this area. These cultural resources are important to the cultural legacy of the area, but may also serve to attract local and international tourism.

Development should:

- Adaptively re-use existing buildings when appropriate
- Preserve and complement the existing architectural character of Ghenh Ráng
- Maintain culturally significant structures, shrines and statues

### 2.6.2 SUSTAINABLE AQUACULTURE

These areas will continue to be used for aquaculture and related uses. Aquaculture provides jobs and access to fresh fish. New innovations in aquaculture can increase production while attracting interest from tourists and researchers.

Aquaculture should:

- Integrate wetland plants for erosion control.
- Minimize artificial inputs.
- Maximize fish diversity.
- One story buildings for research, storage or other support uses will be allowed.

### 2.6.3 SUSTAINABLE AGRICULTURE

This area will be designated to remain agricultural use, with a small number of buildings for agricultural support, such as research or farm stands. Agriculture is important to the local economy, providing jobs and access to fresh produce. Agriculture, especially organic agriculture, can also attract tourists.

Development should:

- Preserve the majority of existing agriculture
- Maintain vegetated buffers to reduce erosion.
- Incentivize organic production methods.
- Allow and promote agricultural tourism.

### 2.6.4 NATURAL AREAS

These areas are existing natural areas that will be kept as parks or open space. These areas serve as natural buffers, and provide habitat for local wildlife. They also serve to attract tourists, and to provide space for active recreation such as trail running and swimming.

Development should:

- Be limited to designated interpretive or support buildings, trails and boardwalks.
- Allow for recreation (trails, etc.)
- Integrate any necessary buildings with natural landforms and minimize site disturbance.
- Designate and restore portions of the landscape to their natural state.
- Boardwalks and any buildings should utilize local, renewable materials.

### 2.6.5 NEIGHBORHOOD RESIDENTIAL

Neighborhood residential areas are important for providing housing for families and workers. These areas will encourage mainly small-scale residential, with some neighborhood-focused retail and commercial.

Development should:

- Focus on small scale single and multi family residential.
- Encourage one to two story buildings
- Include porches and balconies
- Maintain narrow block widths
- Non-residential uses should seek to maintain the residential character.

### 2.6.6 HOSPITAL AND UNIVERSITY

These areas will be oriented to allow large scale hospital and university campuses. These areas will serve as economic drivers, attracting jobs, patients, and tourists. This may include housing and commercial that is focused toward university or hospital markets.

Development should:

- Encourage two to five story buildings
- Buildings should be broken up into smaller masses
- Maximize the use of local renewable resources, such as bamboo.
- Discourage motorized transport on campus
- Utilize a modern interpretation of indigenous architectural styles.
- Orient buildings to maximize natural lighting and ventilation
- Encourage efficient energy and water use
- Manage stormwater on site

### 2.6.7 MIXED USE 1

This designation allows and encourages a mix of uses at a relatively low intensity. Mixed use areas are important because they allow for a diversity of building types to meet market demands.

Development should:

- Encourage ground level shops with housing or commercial above.
- Maintain small lot sizes
- Encourage one to two story buildings
- Encourage a mix of housing types (one bedroom, two bedroom, multi-family, etc.)

### 2.6.8 MIXED USE 2

This area allows medium density, development that encourages a mix of uses and accommodates various mid-range building heights.

Development should:

- Encourage ground level commercial with upper level offices or residential or both.
- Allow some large-scale commercial
- Encourage two-to-three story buildings
- Incorporate outdoor seating and dining

### 2.6.9 MIXED USE 3

This core mixed-use area will allow development at a high density, to allow for taller buildings. This designation is important to allow a core high-density area that will provide a vibrant and pedestrian oriented street life.

Development should:

- Encourage ground level commercial with upper level office, residential, or government.
- Allow some larger lot sizes,
- Build to street property lines, with setbacks only allowed for public open space
- Design for walkable streets, with wide sidewalks and good pedestrian signage
- Encourage three-to-five story buildings
- Share parking and minimize street parking
- Include bicycle parking
- Allow street vendors in designated areas
- Include outdoor seating and dining
- Provide outdoor lighting
- Accentuate the creekside and beachfront areas with seating and outdoor plazas

## 2.7 CIRCULATION

The development plan incorporates improvements to Ghenh Rang's circulation infrastructure (Figure 2.13). Vehicular traffic will circulate in three different road hierarchies: arterial, collector and local. It is important to provide road hierarchy based on volume and capacity because their configuration works in conjunction with land use designations to guide development types. Commercial and mixed-use development will be focused along high-access roads like highways, arterials, and to a lesser extent collector. Agricultural and residential zones will only require local road access to thrive.



The primary arterial road, bisecting the project site east-west, will provide the main access route from the highway to the development area and the city core. Near the city center, primary north-south roads parallel the creek spine, providing connections between the wetland conservation area, the city core, and the university, hospital and wellness center. At the central mixed-use and mixed-use core areas, several new roads will provide a denser street grid that will accommodate new development and increased circulation. There will be additional collector roads linking local roads to the main arterials and the highway. The function of local roads will be to facilitate circulation within short blocks.

Even though new roads will be built to accommodate vehicular traffic, new development in Ghenh Rang will be conducive to walking and bicycling. This will be achieved through land use configuration and by providing pedestrian infrastructure. The entire area of Ghenh Ráng will have more than two miles of walkways connecting most key sites within the city. The projected volumes for both vehicular and pedestrian traffic are illustrated in line thicknesses in the circulation diagram (Figure 2.13).

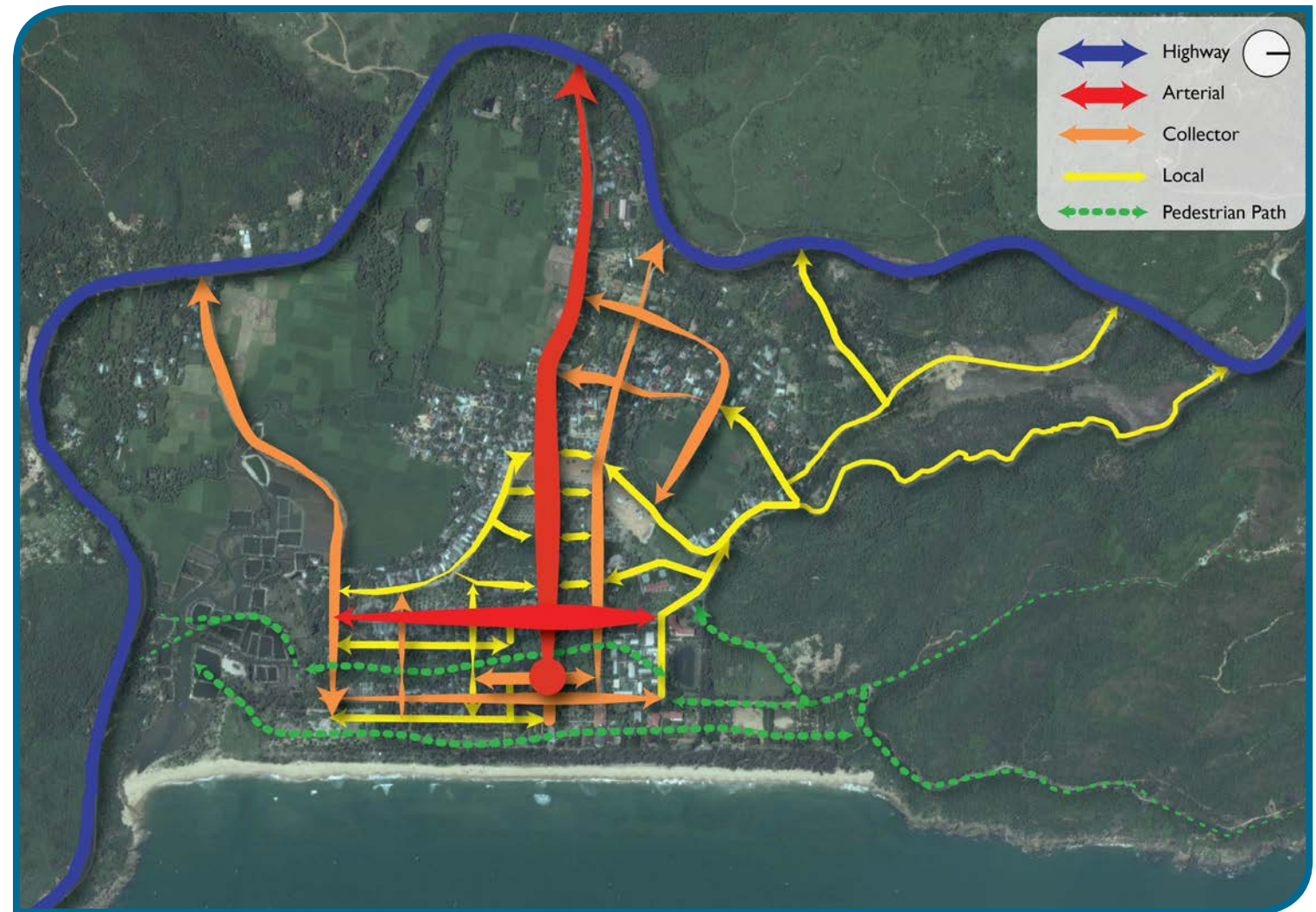


Figure 2.13 Circulation Diagram

## 2.8 PHASING

The development plan is divided into three primary phases.

Phase One (5-10 years) includes development of the project's core economic drivers – the university, hospital and wellness center. This phase would also include restoration of northern portions of the creek (the central spine of the [RESTORE] project), providing a connection between the wellness complex, university and urban core. Partial development of the mixed-use urban core is also central to Phase One.

Phase Two (10-20 years) includes further development of the university and the urban core. With the establishment of these economic centers, phase two includes further development within the mixed-use urban core and in the mixed-use districts surrounding it. In addition, Phase Two includes the first stage of development of the beachside district, completed restoration of the wetlands, and the construction of the Environmental Research and Education Centers.

Phase Three (20+ years) includes build-out of the university, further beachside development, and general infill within residential and commercial districts.

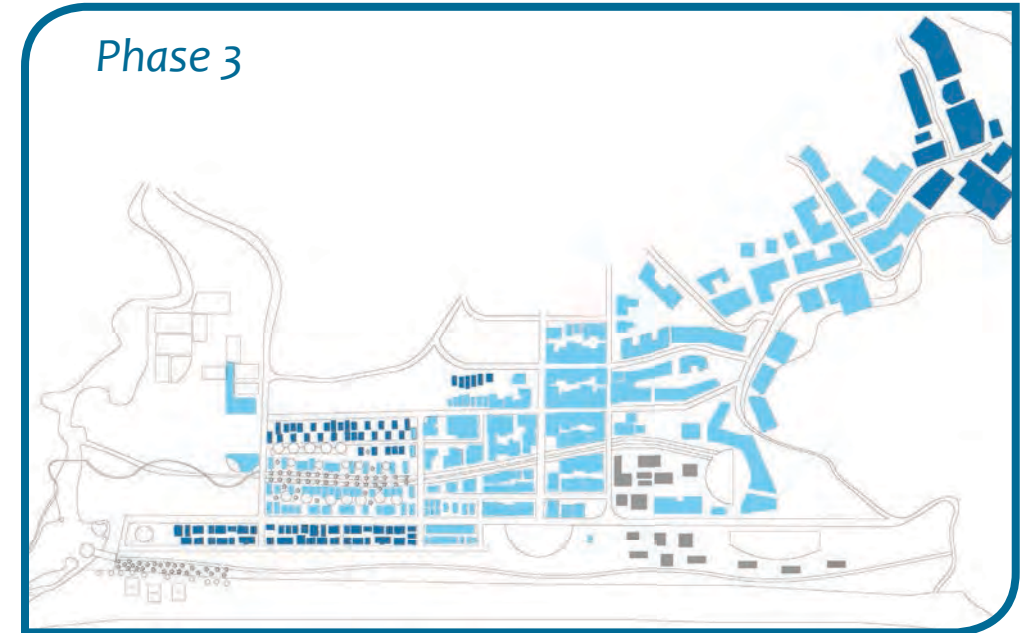
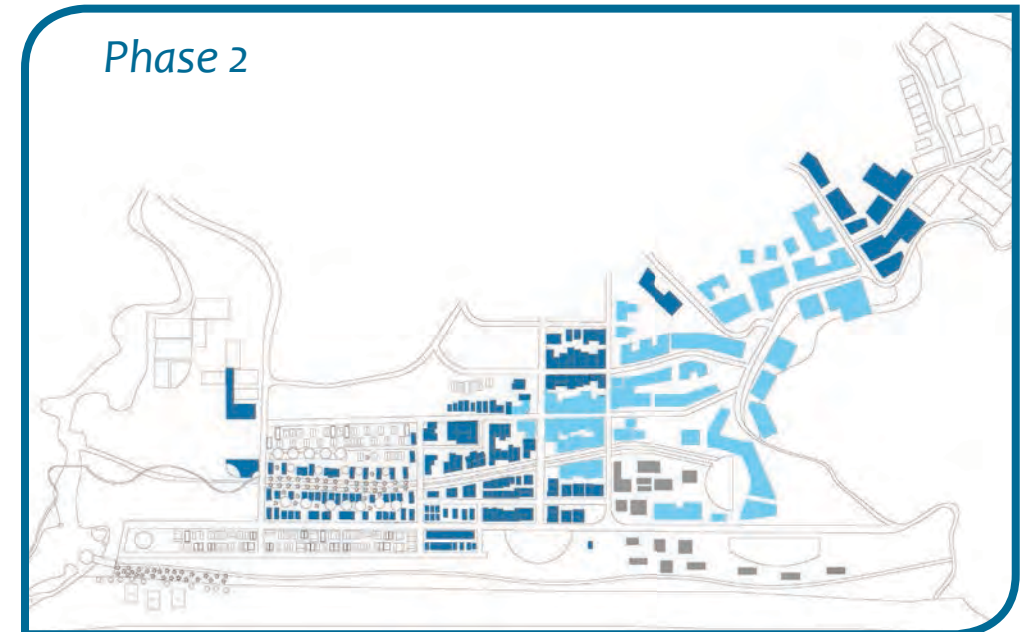
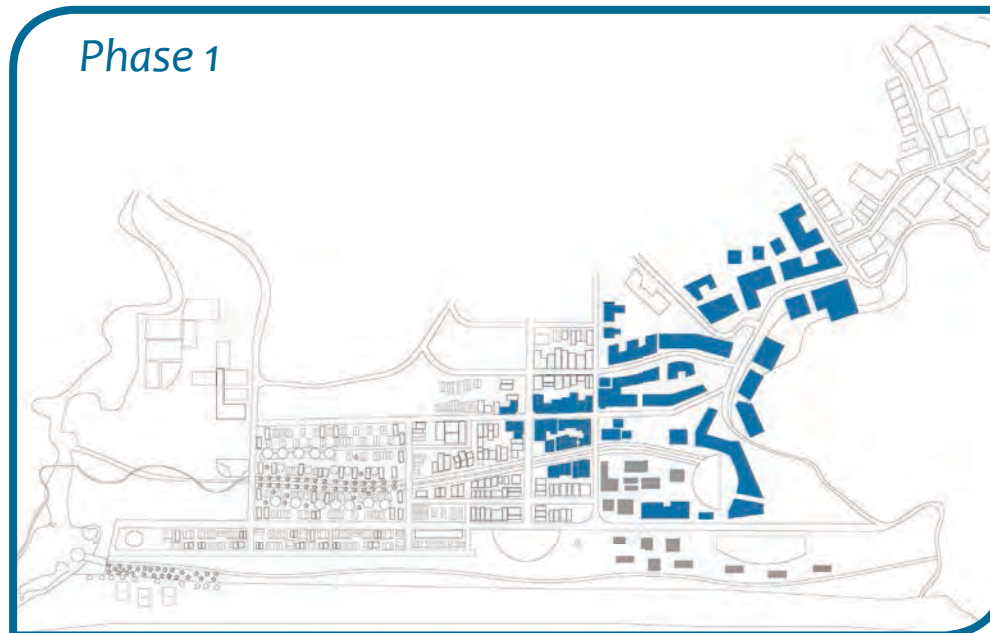




TABLE 2.1 [RESTORE] DEVELOPMENT PROGRAM

SITE ELEMENT	SQ. FOOTAGE
Han University Campus	110,000 SF
Faculty Housing	200,000 SF
Student Housing	850,000 SF
Gymnasium	45,000 SF
Swimming Facility	35,000 SF
Smart Hospital	180,000 SF
Health and Wellness Center	58,000 SF
Sustainable Agriculture Research Center	25,000 SF
Agriculture & Aquaculture Areas	22 Acres
Green Tech Building	26,000 SF
Geothermal Plant	75,000 SF
Woodworking Facility	20,000 SF
Environmental Center	14,000 SF
Hotels	45,000 SF
Retail Area	55,000 SF

Upon completing massing studies of the client’s original list of desired building sizes, the project team adjusted building sizes and land uses to best fit within the existing natural and cultural landscape of Gheng Rang and meet our sustainable planning goals. As the hospital, wellness center, and university are the key economic drivers of the [RESTORE] development, the team slightly increased the square footage of the three uses. As the team viewed the University as a primarily medical campus, the Olympic sized sports facilities listed on the the client’s site elements did not fit the goals of the [RESTORE] development plan. The square footage provided for faculty and student housing was also decreased, in concordance with the [RESTORE] goal for the University to be well integrated into the rest of Ghenh Rang; we envision students and faculty living throughout the city.

2.9 CONCLUSION

Ghenh Rang will be a unique global destination for tourists hoping to [RESTORE] mind and body amidst a spectacular natural setting and a distinctive local cultural environment. The [RESTORE] concept for Ghenh Rang integrates modern medical, educational, agricultural, and tourist industries into an established community with a rich cultural heritage and distinctive physical character. Linked by a restored creek and enlivened by active streetscapes and public space, , the [RESTORE] concept provides a model for eco-friendly development, balancing a rigorous development plan with sustainable land-utilization and building practices. Ghenh Rang will be a global model for a sustainable design and healthy living, attracting locals and tourists who are looking for a special place to [RESTORE].

2.10 REFERENCES

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Spencer, J. (2011). City of Quy Nhon, Binh Dinh Province, Viet Nam: City development summary: Spatial strategy, economic development strategy, and community development strategy. Unpublished manuscript . The University of Hawaii at Manoa.

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## chapter 3 team two: the emerald queen

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# chapter 3 team two: the emerald queen

## 3.1 THE EMERALD QUEEN VISION

The symbol to the left is comprised of the ideological foundations upon which the development concept “Emerald Queen” was created. The fish symbolizes the rich traditions of fishing and farming in the area. The silent “Waiting Statue” on the right represents the physical aspects of the site that have much cultural and historical value, such as the beautiful natural formations and statues. The crown is representative of one worn by Empress Nam Phuong, for whom Emperor Bao Dai named a beach at the site “Queen’s Beach.”



The Emerald Queen vision looks at this as an important connection and inspiration for becoming a ‘model city’ with a position of prominence. Last but not least, a tree stands at the center of the symbol, supporting and incorporating the surrounding parts. The tree represents the ideas of resiliency and sustainability that will be incorporated in each phase and sector of this project.

The Emerald Queen development, located just to the south of Quy Nhon, is the jewel of the central coast. Home to a cutting edge smart hospital and rehabilitation village as well as a technical university focusing on innovative and sustainable agricultural and fisheries methods and technology, the influence of the Emerald Queen development extends well beyond the areas’ physical boundaries. The robust economy is based on integrated and symbiotic relationships between the main sectors of the area: medical, education, and tourism.

Whether tourists come for medical purposes, to see the statue of the famous poet Han Mac Tu, or just to get away from Quy Nhon for the day, the area provides something for everyone. With a vibrant local culture; a main business corridor lined with restaurants, bars, and cafes; a lively central marketplace that showcases local seafood, produce, and hand-made goods; a cultural center offering a glimpse into local maritime and agricultural history as well as classes in traditional crafts such as wood boat building; and a variety of locally owned and operated accommodations, it is a good destination for any length of stay.

The physical structures of all sectors will be built to the highest standards of environmental sustainability, efficiency, and resiliency, which, in combination with best management practices of their local resources, allow them to be a destination for eco-tourism. Transportation to the site takes this environmental sensibility into account as well, bringing tourists in through a transit hub just off of the highway and a scenic greenway along the coast for bike and pedestrian traffic from Quy Nhon. All of these features make the Emerald Queen development a model city for not only other coastal locations in Vietnam, but the rest of the world as well.

The Emerald Queen development will be a fusion of environmental sensitivity and human vibrancy. Built with sustainable development and ecological management in mind, it is home to a rehabilitation village and a university centered around agricultural research and innovation. The city will provide locals with new development that respects cultural heritage and environmentally-sensitive areas while at the same time creating a dynamic, mixed-use and accessible core with cafes, hotels, nightlife attractions and a central market.

## 3.2 PRECEDENT AND CASE EXAMPLES

The following case studies provided inspiration and helped define the team's approach to the sustainable planning principles listed in the Preamble of this report:

### 3.2.1 RESPECT EXISTING ECOSYSTEMS

#### A. GREEN CORRIDOR, SINGAPORE

The Green Corridor in Singapore is an ongoing effort by Singapore's citizens and government to transform an existing railroad line into an uninterrupted green corridor that would connect 6 green spaces and serve approximately 1.2 million people.



<http://jupilier.blogspot.com/2011/07/green-corridor-of-singapore.html>



#### B. MARINE PROTECTED AREAS: FIJI, INDONESIA & SOLOMON ISLANDS, PHILIPPINES



Marine protected areas contribute to poverty reduction by: improving fish catches, creating jobs in tourism, establishing better local governance, providing health benefits, and helping to empower women.

### 3.2.2 DEVELOP SOCIALLY, CULTURALLY AND ENVIRONMENTALLY FRIENDLY LAND-USE PATTERNS

#### A. PENINSULA TOWNSHIP, MICHIGAN

Peninsula Township near Traverse City has successfully implemented a PDR program that has preserved 3,000 to 4,000 acres of land. Michigan's program ensures that the land will be restricted to agricultural uses in perpetuity.



### 3.2.3 OFFER ECO-EFFICIENT INFRASTRUCTURE & DESIGN SOLUTIONS

#### A. DUTCH FLOATING HOMES

With lightweight wood construction, a hollow concrete base, anchored by a piling, and with utilities run through flexible pipes allowing for 13 feet of flotation, these homes allow homes to be resilient in an area with recurrent flood events.



#### B. AUSTRALIAN STORMWATER RECYCLING/REUSE BY INDUSTRY

Stormwater is captured to reduce the flow of polluted runoff into a nearby estuary, naturally cleansed through a man-made wetland, stored in an aquifer, and then used by industry instead of potable surface water.





### 3.2.4 PROVIDE FULL ACCESSIBILITY

#### A. COASTAL GEORGIA GREENWAY

The Coastal Georgia Greenway Plan, as part of the Coastal Comprehensive Plan, will create a 450-mile trail network for pedestrians, bicycles, and horses that will link coastal Georgia towns to major natural, recreational, educational, and historic sites. It will stretch from South Carolina to Florida.



<http://www.greenway.org/pdf/GA.pdf>

#### B. STREETSCAPES OF DONOSTIA, SAN SEBASTIAN, SPAIN

The streetscapes of Donostia, San Sebastian, Spain, provide an exemplary example of walkability, mobility, and connectivity within an area. The pedestrian and cyclist network is particularly strong because the mobility policy of the city requires that all land uses be reachable on foot through promenades, which are "vertical transport aids and a pedestrian axis." The beautiful promenade follows the arching coast from one end of the city to the other.



[http://wikitravel.org/en/File:San\\_Sebastian.JPG](http://wikitravel.org/en/File:San_Sebastian.JPG)

### 3.2.5 MAXIMIZE EXISTING RESOURCES

#### A. HARVEY W. SMITH WATERCRAFT CENTER, BEAUFORT, NORTH CAROLINA

Crumbling waterfront building purchased by the North Carolina Maritime Museum and turned into a working boatbuilding facility that keeps alive the art of wooden boatbuilding through classes in carpentry, oar making, lofting, tool making, and half-modeling.



#### B. ADAPTIVE RE-USE: GRANVILLE ISLAND, VANCOUVER



This area was formerly used for heavy industry and shipbuilding. Once people began to lose interest, businessmen started redeveloping the area into a large public market filled with galleries, shops, entertainment, industry, and commerce. Instead of abandoning the site, this is a great use of existing space.

### 3.3 EMERALD QUEEN GOALS AND OBJECTIVES

#### GOALS

- A fusion of environmental sensitivity and economic vibrancy
- Built with sustainable development and ecological management in mind
- Home to a medical facility focused on rehabilitation & wellness
- Home to a university centered around agricultural research & innovation
- Stunning beaches, scenic beauty and cultural amenities
- Development that respects cultural heritage and environmentally-sensitive areas
- A dynamic, mixed-use core with cafes, hotels, nightlife attractions and a central market
- Alternative modes of transportation and a scenic pedestrian & bike path through the park

#### 3.3.1 OBJECTIVE 1: DEVELOP A STRONG ECONOMIC BASE

##### A. TOURISM (ECO, MEDICAL, NONTRADITIONAL)

1. Niche market for environmentally-conscious tourists; not luxury or passive
2. Eco tourism centered around active participation in local industries, tours, guides, WOOFing-like opportunities, agriculture
3. Medical tourism centered around wellness and rehabilitation
4. University focused on agricultural research and innovations
5. Attract a diverse range of tourists and tourism industries

##### B. HOSPITAL (REHAB, WELLNESS, RELAX, HIKE, BEACH)

1. Medical tourism will be centered around wellness and rehabilitation and also contribute to economic development
2. The Smart Hospital will serve as the main health consultation center for general health practitioners, dentists, pediatricians, radiology, minor surgery rooms
3. The Rehabilitation Village will be a specialized health care facility/therapy center to treat patients
4. The smart hospital and rehabilitation village can offer training and support for the university students who are interested in volunteering/health professions
5. Recovering patients can enjoy the scenic beaches and natural hiking trails to strengthen their physical and mental state



<http://www.archetype-group.com/EHPAD-Avize>

Character Image: Rehabilitation Village



### C. COMMERCE (MARKET, NIGHTLIFE, HOTELS)

#### 1. Market

- The central market will consist of local fresh produce, seafood, and homemade food.
- This will serve as a community gathering center for people to socialize, do business, and eat.

#### 2. Nightlife

- Ranges from late night cafes and karaoke bars to community programs showcasing movies

#### 3. Hotels

- Located near the beach due to the outstanding view and goal to provide convenient services for tourists
- Not high-end or skyscrapers because it is not appropriate for our site
- Provide high-quality hotels that are well-maintained and appropriately sized



Character Image: Elevations of envisioned housing, mixed-use buildings, and hotels.

### D. UNIVERSITY (AG. INNOVATIONS, MEDICAL)

1. Proposing that the university works Agriculture Innovations.
2. There is a small parcel of land that is next to the proposed university. We are suggesting that the university purchases those agricultural lands to provide for "learn by doing" opportunities.
3. Expand the university and hospital to regional and international destinations.

#### MAIN FRAME FOR TOURISTS

- People visiting their family or friends at the hospital, university, or surrounding areas
- People hoping to gain invaluable experience from the area
- People who want to know more about Ghenh Rang's history and culture

### 3.3.2 OBJECTIVE 2: RESPECT CULTURAL HERITAGE

#### A. EXISTING CULTURAL DISTRICT (COLONY, POET MEMORIAL, RICE PADDIES, FESTIVALS)

1. Existing on this site is a leper colony that should not be ignored.
2. Han Mac Tu's grave in Ghenh Rang Hill where most visitors go to take pictures and admire the talented poet.
3. There is a connection between the poet and the leper colony because Quy Hoa leprosarium was where he stayed during his last days. The Quy Hoa village was also where he created one of his most well-known love poems.





4. The rice paddies comprise a large portion of the site
5. Huge festivals are not taken place in Ghenh Rang, but mostly everyone in the region celebrates Tet (Lunar New Year) with their own families and friends.



Existing church in Ghenh Rang

6. Highlight existing cultural points of interest
7. Leper colony has existing housing and structure.. maintain that and expand
8. Keep existing church structures
9. Accentuate the existing memorial to Han Mac Tu and many others

#### B. NEW CULTURAL CENTER (EXHIBITS, MOVIES, PHOTOS, DESCRIPTIONS, HANDS-ON ACTIVITIES)

1. The Cultural center will consist of exhibits, photos, descriptions, movies, and hands-on activities of the cultural aspects of Ghenh Rang for everyone visiting or living in the site.
2. The purpose is to educate people about Ghenh Rang's history and culture with "Learn by Doing."
3. Educate people on woodworking and boatbuilding
4. Connect the existing aspects of the community with our new vision and expand upon it in order to boost community life
5. Develop a cultural center promoting local assets
6. Utilize Champa architecture traditions
7. The market will feature Champa architecture
8. Maintain existing physical and social structures



Strengthen and expose local boat building tradition



An example of champa architecture in Quy Nhon



Character Image: Tourists will want to experience existing attractions in Ghenh Rang

### 3.3.3 OBJECTIVE 3: PRIORITIZE THE ENVIRONMENT

#### A. ACCESS (GREENWAY, TRANSIT HUB, LOCAL ACCESS)

1. Greenway leading from north in Quoy Nhon through the preserve and into our site, connecting through the downtown core and along the tree-lined beach
2. Transit hub to connect other sites to our site; keep local access roads for vehicles; more of a shuttle than a legit bus line; looks far but really only like .25 miles
3. Provide access from Quy Nhon proper via expanded greenway and central transit hub



Views of the highway that borders the Ghenh Rang site



The highway overlooking the ocean.  
Motorcycles tend to dominate these roads.

#### B. STORM SURGE PROTECTION

1. Add storm surge protection through various methods
2. Possible channelizing of stream near beach
3. Artificial reef and sandbar
4. Sand berm and enhanced vegetative buffer
5. Additional benefits: regeneration of local fisheries (increased biomass & biodiversity), coral reef growth, tourism -Program implemented by State of Hawaii Division of Aquatic Resources with proven success since the 1960's- sink scrap objects opportunities for additional aquatic activities

#### C. PRESERVE AGRICULTURAL USES

1. Agriculture covers nearly all of our entire buildable site. We are planning to preserve all agriculture sites with an exception to one small agricultural site that will be converted into part of the commercial area.
2. There has been an issue with sea level rise in the area. Because our site is approximately 10 - 20 feet above sea level. There is no current way to save the rice paddies from salt water intrusion. Farmers just need to adapt to the change and potentially change the way that they farm or to change the crops that they grow.



## Conceptual Diagram





### 3.4 CONCEPTUAL DESIGN

The Emerald Queen Development is a fusion of environmental sensitivity and human vibrancy. Through the aforementioned five principles of sustainable development, Ghenh Rang will become a destination location for international tourists interested in authentic Vietnamese cultural experiences and for visitors from throughout Vietnam seeking to learn more about the area's rich history or just enjoy the beach.

With a vibrant local culture; a main business corridor lined with restaurants, bars, and cafes; a lively central marketplace that showcases local seafood, produce, and hand-made goods; a cultural center offering a glimpse into local maritime and agricultural history as well as classes in traditional crafts such as wood boat building; and a variety of locally owned and operated accommodations, it is a good destination for any length of stay.



*Character Image: Vietnam's Cafe Culture*

The physical structures of all sectors have been built to the highest standards of environmental sustainability, efficiency, and resiliency, which, in combination with best management practices of their local resources, allow them to be a destination for eco-tourism. Also, transportation to the site takes this environmental sensibility into account, bringing tourists in through a transit hub just off of the highway and a scenic greenway along the coast for bike and pedestrian traffic from Quy Nhon. All of these features make the Emerald Queen a model city for not only other coastal locations in Vietnam, but the rest of the world as well.

Lured initially by a medical facility focused on rehabilitation and a university centered around agricultural and food production innovations, visitors will stay to enjoy the stunning beaches, scenic beauty and cultural amenities. The city will provide locals with new development that respects cultural heritage and environmentally-sensitive areas while at the same time creating a dynamic, mixed-use and accessible core with cafes, hotels, nightlife attractions and a central market.



*Sketch of the Emerald Queen main intersection*

A transit hub will aim to bring visitors in and out of the city while reducing emissions and keeping the center local- access only, and the greenway for pedestrians and bicyclists from the north will provide additional transportation alternatives while providing excellent vistas of Queen Beach.



*Character Image: Rendering of the transit hub*

Our concept plan begins by focusing on redeveloping the existing roads and infrastructure already in Ghenh Rang and reserving certain zones to build on economic development. Planning will include the creation of both a specific plan and a business plan for the beachfront area between Main Street and the South end of Beach Street and the market at the intersection of Main and Market Street. There will also be a focus on mixed-use development and the introduction of a transit hub to bring tourist and outside locals from the nearby Quy Nhon area.

Visitors will stay to enjoy the stunning beaches, scenic beauty, and cultural amenities this area has to offer. The city will provide locals with new development that respects cultural heritage and environmentally-sensitive areas while at the same time creating a dynamic, mixed-use, and accessible core with cafes, hotels, nightlife attractions, and a central market. The transit hub will aim to bring visitors in and out of the city while reducing emissions and keeping the center local-access only, and the Greenway from the north will provide additional transportation alternatives while providing excellent vistas of Queen Beach.

The robust economy is based on integrated and symbiotic relationships between the main sectors of the area: medical, education, and tourism. Thus, our central themes that will guide development are:

1. Economic Development
2. Cultural Heritage
3. Environment

### 3.4.1 ECONOMIC DEVELOPMENT

#### 1. TOURISM (ECO, MEDICAL, NONTRADITIONAL)

Our site will be a niche market for environmentally-conscious tourists. There will be a focus on eco-tourism that will be centered around active participation in local industries, tours, guides, and agriculture. The existing hospital and proposed rehabilitation village will be the

basis for medical tourism, which will be the place of resort for health and wellness. Focusing on agricultural research and innovations, the University will serve the local community through a “learn by doing” approach.

#### 2. COMMERCE (MARKET, NIGHTLIFE, HOTELS)

The basis for commerce in our site will be the market, the nightlife, and the hotels. The central market will sell local fresh produce, seafood, and homemade food. This exposition will serve as a community gathering center for people to socialize, to do business, and to eat. While our day activities revolve around showcasing local products in our site, our vision of the nightlife in Ghenh Rang ranges from late night cafes and karaoke bars to community programs showcasing movies.



We envision the hotels to be located near the beach due to the outstanding view and goal to provide convenient services for tourists. These hotels will fit appropriately with our site. They will not be high-end or skyscrapers. Instead, we seek to provide high-quality hotels that are well-maintained and appropriately sized. Tourist will be able to gather a better sense of homeliness/comfort in these living quarters.

#### MAIN FRAME FOR TOURISTS

- People visiting their family or friends at the hospital, university, or surrounding areas
- People hoping to gain invaluable experience from the area
- People who want to know more about Ghenh Rang's history and culture
- People who are scoping out a location to heal their health
- Potential university students

### 3. UNIVERSITY (AG INNOVATIONS, MEDICAL)

We are proposing that the university works agricultural innovations into their educational program. There is a small parcel of land that is next to the proposed university. We are suggesting that the university purchases that agricultural parcel to use as a "learn by doing" approach.

#### 3.4.2 CULTURAL HERITAGE

We envision the cultural center to consist of exhibits, photos, descriptions, movies, and hands-on activities of the cultural aspects of Ghenh Rang for everyone visiting or living in the site. The purpose of the cultural center is to educate people about Ghenh Rang's history and culture with a "Learn by Doing" approach. We believe by educating people about woodworking and boat-building, people will get a better sense of what Ghenh Rang prides in. The Champa and traditional architecture that will be featured throughout the market in Ghenh Rang will also serve to educate people about Ghenh Rang's culture.

We hope to connect the existing aspects of the community with our new vision and expand upon it in order to boost community life. Existing aspects of the community, such as the Leper Colony; Han Mac Tu's grave in Ghenh Rang Hill, the existing rice paddies, and cultural festivals are all vital aspects of this community that should not be ignored. We believe that it is not only crucial to preserve the existing homes of the Leper Colony, but also to expand their living area if necessary. We hope also to accentuate the existing memorial to Han Mac Tu and others because visitors enjoy and take pictures of this area.

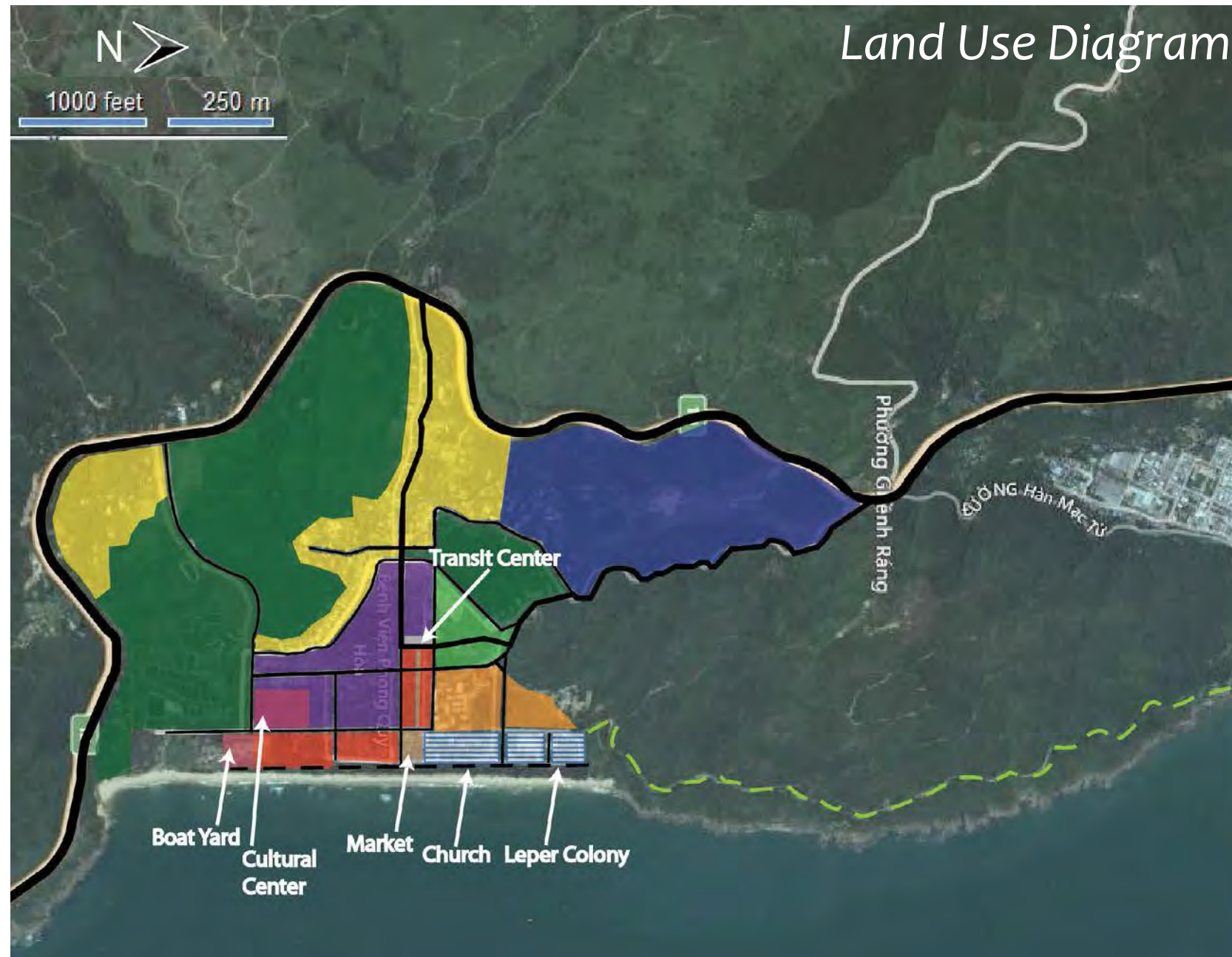
#### 3.4.3 ENVIRONMENT

We envision an accessible greenway leading from north in Quoy Nhon through the preserve and into our site, connecting through the downtown core and along the tree-lined beach. We hope to build a transit hub to connect other sites to our site by shuttle. We want to keep local access roads for vehicles only due to the compactness of the site.

Also, we hope to take emergency preparedness measures by proposing storm surge protection. Some possible storm surge protection techniques we have come up with include: possible channelizing of stream near beach, an artificial reef and sandbar, and sand berm and enhanced vegetative buffer. A few benefits to implementing storm surge protection include the regeneration of local fisheries (increased biomass and biodiversity), coral reef growth, and tourism.

Agriculture covers nearly all of our entire buildable site. We are planning to preserve all agriculture sites with an exception to one small agricultural site that will be converted into part of the commercial area. We want to preserve all agriculture sites to because there has been an issue with sea level rise in our site, which is approximately 10 - 20 feet above sea level. Currently, there has been no proposed plan to save the rice paddies from saltwater intrusion. Farmers will need to adapt to the change and potentially change the way that they farm or to change the crops that they grow.





## Land Use Elements

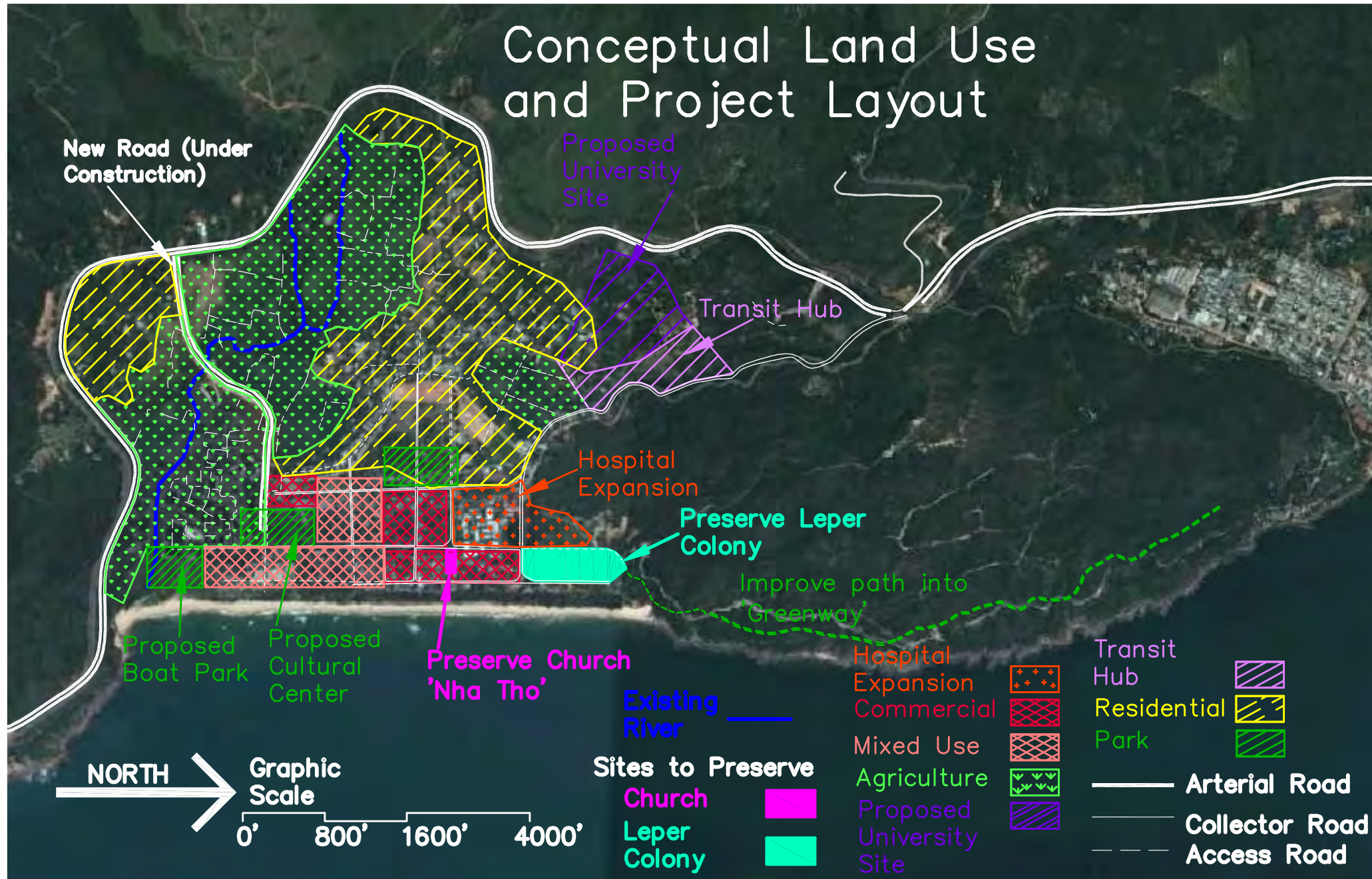
- Public Space
- Park/Attraction
- Commercial/Hotel
- Mixed Use
- Transit Hub
- Hospital
- Residential
- Open Space
- Agriculture
- Special Preservation District
- University

## Circulation Elements

- Pedestrian Path
- Greenway (Ped/Bicycle)
- Arterial
- Collector
- Access



# Conceptual Land Use and Project Layout



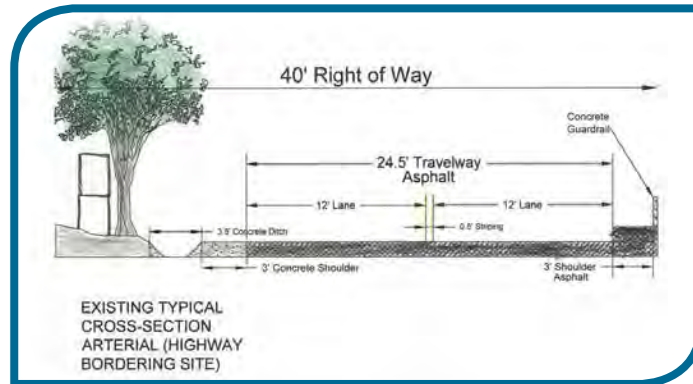


Figure 3.5 Existing Highway Cross-section

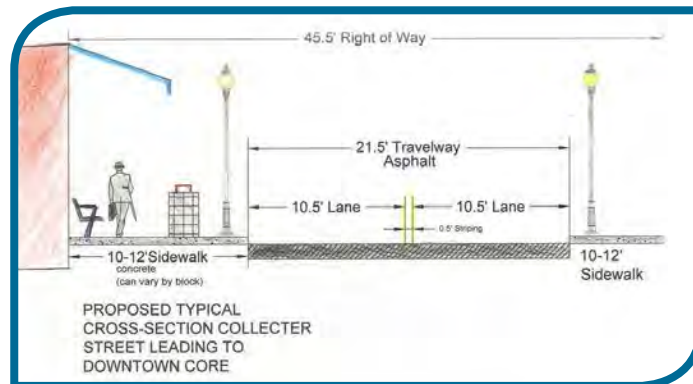


Figure 3.6 Proposed Collector Street Cross-section

## Circulation Diagram





## 3.5 KEY SITES

### 3.5.1 DOWNTOWN CORE

The intersection of the primary arterial roads in central Ghenh Rang will be redeveloped to accommodate an expanded commercial sector including accommodations, restaurants, shops, and nightlife venues. Wide pathways allowing for sidewalk cafes will inspire social interaction between locals and tourists and contribute to street vibrancy. Accommodations will transcend the isolation of luxury resorts and allow visitors to engage in the community and take advantage of the diverse offerings, including bed & breakfasts. Shops will feature local specialties including furniture and seafood. Nightlife venues will serve to attract tourists and locals to create 24/7 activity within the downtown area.

The design of the core is inspired by similar ocean-side villages in Southeast Asia, including but not limited to Koh Samui, Thailand and Phu Quoc, Vietnam. We envision a high density of shoppers, promenaders, vendors and xxx creating a bustling and human-scaled street-life.



Figure 3.3 Illustrative Site Plan

3.5.2 TRANSIT HUB/MARKET

Access from sites North and South will be key to Ghenh Rang's success in the future. The new central transit hub will act as a locus for taxi traffic, shuttle routes to and from Quy Nhon and new a new local bus route. It will serve a dual role by keeping the main streets local-access only and keeping emissions low when development begins in earnest. Motorcycle and bike parking will be in abundance.

Designed with the Champa architectural traditions in mind, Ghenh Rang Central Market will act as a bridge between the waterfront commercial zone and the inland residentially-focused area, allowing for mingling of visitors and residents in the open air. Local artisans and farmers will be encouraged to sell their wares. An archway will welcome visitors to the site while clearly demarcating it as a defined space. An additional flexible open space near the church will host informal and sanctioned events such as weekend fish markets and festivals. An important aspect will be the showcasing of local specialties like woodworking and boat-building.



Figure 3.7 Proposed Market Cross-section



<http://dannycorinne.blogspot.com/2012/03/day-32-33-fishermans-village-sky.html>

Downtown Core inspired by ocean-side villages



A market filled with visitors and locals





Figure 3.8 Rendering of the plaza leading to the market



Figure 3.9 Rendering of the Central Market

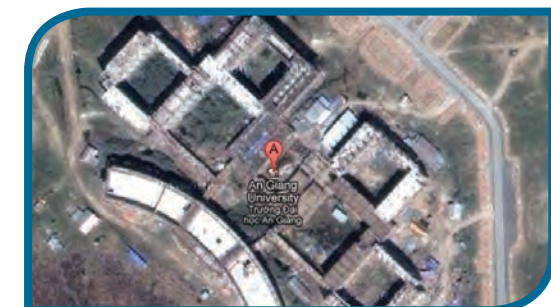
### 3.5.3 HOSPITAL & REHABILITATION VILLAGE

The upgraded hospital will attract patients from Vietnam and across the world for orthopedic surgery and rehabilitation services. At the same time, the existing specializations of dermatology and Hansen's Disease treatment will be fortified and marketed as a means toward increased medical tourism. Recovering patients can enjoy the scenery, serenity, and privacy of the new Rehabilitation Village and its community-like setting near the beach. The emphasis on holistic healthcare can be achieved by this strategic location. Doctors will be attracted to the beautiful surroundings and housed in the mixed-use area near the downtown core or in existing residential areas. A link with the university will provide a base for volunteers to help and learn about the processes related to various treatments.

### 3.5.4 UNIVERSITY

Taking advantage of the agricultural land nearby, Ghenh Rang University will specialize in research and innovations within the agricultural field. Visiting professors will be attracted from the region to teach and research at the campus and be housed in the mixed-use area near the downtown core or in existing residential areas.

We used An Giang University in southwestern Vietnam as a model for our university site given its close proximity to agricultural land.





### 3.6 EMERALD QUEEN DESIGN GUIDELINES

The aesthetic part of our vision for Ghenh Rang will be reached by applying a certain set of guidelines to inform design decisions for future development.

There are five goals that the guidelines seek to achieve:

1. Promote pedestrian-friendly spaces
  - Sidewalks in downtown core shall be at minimum 10 feet wide to promote pedestrian use and comfort.
  - Travel-ways should be kept at minimum widths that are deemed safe in order to discourage higher vehicle speeds and maximize public walkable space.
  - Parking should be minimized to the extent possible and provided as far from the downtown core as possible.
2. Preserve human-scale development
  - Building heights in downtown core shall not exceed three stories.
  - Seating opportunities in the form of benches, planters, and grass spaces should be provided.
3. Encourage both traditional and Champa-inspired architectural details
  - Market area facilities shall adhere to Champa tradition of brickwork.
  - Encourage and allow temporary structures typically used by street vendors by providing centrally located public spaces.
  - Integrate local cultural and historical themes into building and site design, where appropriate. For example, thematic wall murals depicting local fishing or historical figures such as Han Mac Tu should be encouraged.
  - Encourage mixed-use structures, especially in the form of buildings that have commercial uses on the first floors and residential uses on the second floor.
4. Maintain and enhance view-sheds of surrounding environment
  - Building heights are subject to review of potential line-of-sight conflicts.
5. Protect natural resources
  - In construction of hotels consider windows with views of the mountains and the beach.
  - New development shall not impose upon existing and active agricultural land, except in the case of uses that enhance use (i.e. University research facilities).
  - Building materials should minimize negative environmental effects through common best management practices which include but not limited to:
    - Porous pavement surfaces to facilitate increased water infiltration
    - Focus on use of locally available material such as bamboo for structures.
    - Integrate water catchment systems into new and existing structures.
    - Enhance water quality of wetlands through adequate drainage to minimize runoff (e.g. retention basins).
    - Emphasize and enhance the existing vegetative buffer between the beach and developed area through adding native plants and educational signage along bordering pedestrian walkway. This creates a type of botanical garden that can be viewed as an attractive amenity as well as provide an opportunity for locals and tourists to learn about native flora.



Figure 3.10 Illustrative Site Plan with Labels

TABLE 3.1 DEVELOPMENT PROGRAM

Building #	Height (Ft.)	Total Building Footprint (Sq. Ft.)
1 to 8	12	10,320 (1290/each)
9	17	5,600
10	14	2,800
11	11	2,800
12	17	2,800
13	12	13,702
14	30	23,000
15	30	15,000
16	30	15,000
17	30	20,000
18	30	15,000
19	30	6,000
20	30	2,400
21	30	10,000
22	30	8,000
23	30	10,000
24	30	8,000
25	30	25,000
26	30	25,000
27	30	25,000
28	30	25,000
29 to 35	15	109,200 (15,600/each)
36	45	90,000
37	45 (Max)	600,000



### 3.7 PHASING

Implementation will happen in three main phases. The first phase will focus on building and maintaining a strong foundation of existing roads and infrastructure. The second phase will focus on establishing ways for getting visitors to the site. The last phase will focus on improving and doing a follow up of the existing structures: the hospital, the university, the boating/cultural center, the Leper Colony, and residential areas.

The first phase of the plan involves redeveloping existing roads and infrastructures, reserving flexible public space/plaza right next to the church and right by the beachfront, and reserving zones for the boating/cultural center and residential areas. By reserving flexible public space right next to the church and right by the beachfront, this area can be used to serve as a flexible site for local entertainment, vendor's markets, and public space for tourists and locals.

Redevelopment and preservation of existing land were chosen as our first phase because of the importance to have a strong foundation and infrastructure before any new additional developments can be built in our site. By achieving a solid foundation, this will allow for future developments and tourist traffic to flow more smoothly and efficiently.

The second phase will focus on developing the economy by creating a transit hub to bring tourist into the area and creating a mixed-use zone for commercial/hotel use and the market. The mixed use zone will be the primary area for local nightlife, cafe shops and vendors to sell their produce, seafood, and homemade foods. The transit hub will be located right before Main St. hits the central core of the market. With a bulb out for vehicles to pull into and a median to separate traffic from the bus, this transit hub will serve as a station to link people from outside Ghenh Rang to this city.

Right outside the skirts of the transit hub will be two facilities that will as a rest stop for travelers and a visitor's center for tourist to gather more information on Ghenh Rang. Developing this transit hub in our second phase will establish the flow of visitors between places of interest in our site and nearby areas such as Quy Nhon and the Rehabilitation Village.

The third phase will focus on expanding the existing hospital in Ghenh Rang with a Rehabilitation Village, preserving the existing Leper Colony, improving the boating and cultural centers, and improving and expanding existing residential areas. The Rehabilitation Village will be right along the beachfront, taking advantage of the scenic views Ghenh Rang has to offer. Patients of the Rehabilitation Village will be able to enjoy a private setting to revitalize their health and recover from sports injuries.

Like most present day universities, this technical university on our site is constantly undergoing expansion. This facility serves as a good foundation for agricultural research and innovations. Because our site is made up of primarily agricultural land, maintaining and improving the university is part of our third phase so that we link all that we have established in Phase 1 and 2 back to this important institution in our final phase.

As preservation is one of our main priorities in developing this site, preserving the existing Leper Colony, improving the boating and cultural centers is part of our last phase to ensure that part of our vision has been maintained throughout the entire phasing process.

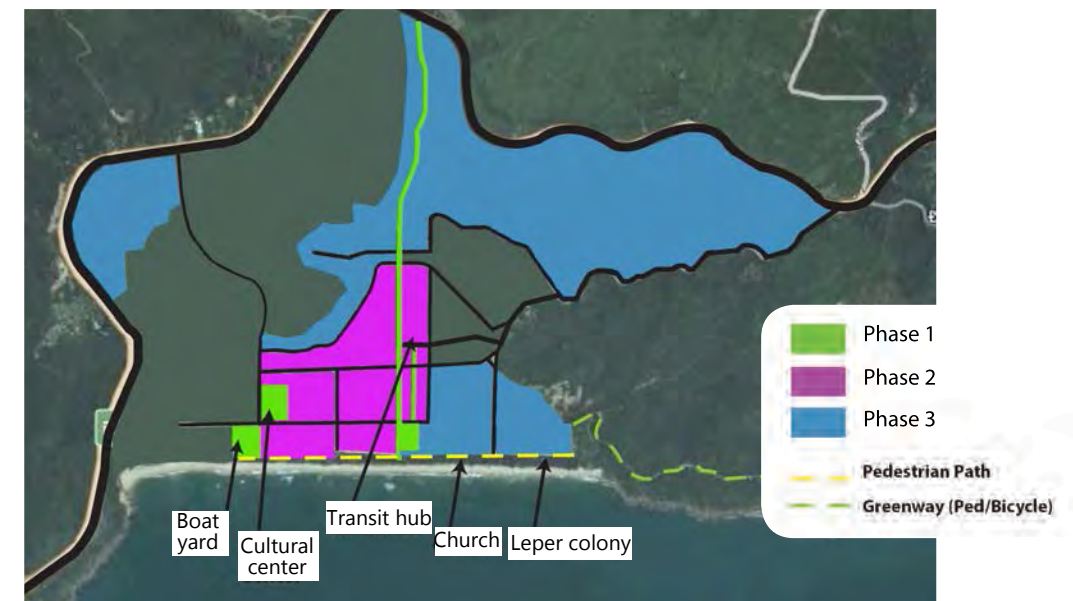


Figure 3.11 Phasing Diagram

### 3.8 CONCLUSION

Drawing inspiration from organic design principles, our team proposed several design elements to achieve our overall vision. Our key sites, including an expanded hospital and rehabilitation village, an agricultural university, a transit hub and market district, and a downtown core, all include sustainable development aspects that respect existing infrastructure and environmental areas. The strong character of place in Ghenh Rang was seen as a critical strength of the site and we sought to maintain it as such. We also aimed to keep in balance with the human-scale of development and to maximize existing resources to both keep costs down and to preserve the overall aesthetic qualities.

Our process was one of evolution. We began as seeing the site as one primed for redevelopment, but as we conducted further research we discovered a wealth of cultural capital in the area. We wanted to add a transit to allow ease of access to the site which would allow more people to take advantage of sites such as the Quy Hoa Leper Colony and the memorial to Han Mac Tu. Our downtown core idea is seen as a means to keep people in the area and be a boon to the local economy. The university and hospital are seen as regional and global tourist attractions.

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# chapter 4 team three: Ghenh Rang 2050

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# chapter 4 team three: Ghenh Rang 2050

## 4.1 THE VISION

Ghenh Rang, a scenic beach ward located south of Quy Nhon, is an active agricultural community with potential for economic and social growth. The spectacular beaches and rich culture make Ghenh Rang a unique area that has the capacity to attract both local and international tourism. The following plan provides a suggestion for integrating a hospital, university, and sports complex with existing infrastructure in a way that steers Ghenh Rang towards a sustainable, vibrant future and, in addition, acts as a model for future development in Vietnam.

This vision for Ghenh Rang constitutes a community that integrates sustainability through organic design in order to advance the local and regional economy, create opportunities in education, promote a healthy environment, and foster new and existing social connections. Enhanced circulation networks will enable Ghenh Rang to become a distinct place, while strengthening the link to the greater Province of Quy Nhon. Three significant anchors, the Quy Hoa Hospital, the Han University, and the Green Tech District, will shape the central node, providing a core of public infrastructure to new and existing development.

In order to actualize the vision for Ghenh Rang, we will focus on five main goals: sustainable use of land, following organic design principles, building community, establishing linkages, and maximizing resources.

## 4.2 PRECEDENT AND CASE EXAMPLES

The following case studies provided inspiration and helped define the team's approach to the sustainable sustainable planning principles listed in the Preamble of this report:

### 4.2.1 SHENYANG ARCHITECTURAL UNIVERSITY, SHENYANG, CHINA

Located in the Liaoning Province of China, the newly built Shenyang Architectural University looked to create a campus that followed sustainable land-use patterns. With a growing population and an abatement of arable land, the design of the university was centered on the idea of celebrating agriculture and maintaining not only a beautiful landscape around the school, but one that was productive and didactic. The campus is surrounded by a monoculture of rice fields; a valuable food source and also a way of teaching students about agriculture, the Shenyang University landscape is a responsible choice for land-use that should be emulated. Our plan for Ghenh Rang looks to connect the university and agriculture in a way that incorporates the students with the agrarian community.



#### 4.2.2 LORETO BAY, BAJA CALIFORNIA SUR, MEXICO

The new urbanist community in Loreto Bay is focused on mixed-use development and walkable communities. A majority of the bay is also designated for wildlife preservation and open space. The site features sustainable energy components including: passive/active solar harvesting, wind farms, and a water harvesting plant. While the site highlights eco-tourism and emphasizes an organic urban form, there is a lack of community development and the majority of income for the area is based on tourism alone. This case study is a model for urban design and sustainable energy, but also demonstrates the necessity of having a strong community-based economy.



#### 4.2.3 JURONG LAKE RESERVOIR, SINGAPORE

The Jurong Lake District is a development plan for Jurong that will act as a destination for open space; it is located in the western side of Singapore. Jurong features scenic woodlands and lake front, and this development plan utilizes these natural features to develop the city. Jurong will accommodate more housing outside of Singapore for the growing population, but will also retain its natural features to provide valuable leisure space that will make Jurong an escape from the city. The design also focuses on mass transit as a main form of transportation.



### 4.3 GHENH RANG 2050 GOALS & CONCEPTS

#### 4.3.1 SUSTAINABLE LAND USE

Ghenh Rang will follow sustainable land-use patterns in order to mitigate the impact of development. To respect and highlight existing ecosystems, green corridors will be established and floodplains will be reserved for agricultural land. The creek and the river mouth are both surrounded by green space to establish a buffer between the wetlands and the urban environment.



A green belt preserved around the city in the more mountainous regions also denotes an area to preserve natural space. Open space is also created as a way to help control storm water runoff and to contribute to the green corridors surrounding the creek. The majority of agricultural land currently present in Ghenh Rang will also be preserved, as this land serves as an integral part of the community and is also a buffer for flooding. The allee of trees along the beachfront will also be kept as another buffer zone and a wind block.

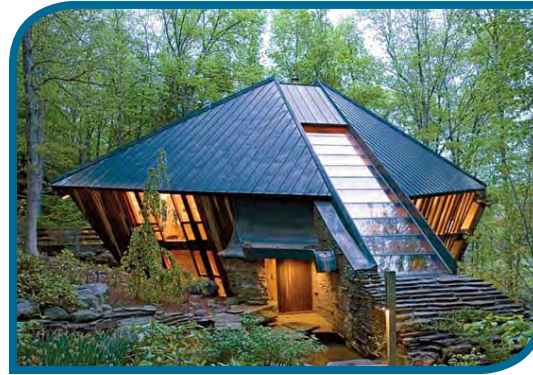
Through culturally and environmentally friendly land-use patterns, the plan for Ghenh Rang reduces the vehicular miles necessary for travel. The downtown core assists in maintaining a strong connection between homes and jobs through public transit and mixed-use development. Infill development is also preferred to





greenfield development; this mitigates sprawl and compacts the development.

Another measure to maintain a sustainable community will be eco-efficient infrastructure. The plan necessitates bioswales and rain gardens to minimize pollution and runoff. The buildings are also compact to allow for the possible trunk infrastructure of geothermal cooling and/or anaerobic digestive systems. The holistic approach to the development of land will ensure that natural resources are preserved for future generations.



#### 4.3.2 ORGANIC URBAN FORM

To ensure the creation of an organic urban form the community's urban framework will grow from a central space that reflects the city's interaction with the central transit node and the surrounding open spaces. The circulation and existing natural systems steer the placements of the built form and also new roads. Through the use of organic design principles Ghenh Rang will establish itself as an imageable and unique place.



#### 4.3.3 COMMUNITY DEVELOPMENT

The plan suggested for Ghenh Rang establishes a resilient and diverse community, utilizing the connection between people and their homes, services, and jobs. To further create an equitable city there

will be a diversity of housing types; there is mixed use development throughout the plan and housing that accommodates students, faculty, and staff. The university housing will also be integrated into the community by having university housing through the area, not just concentrated in one area. Open space will also connect various developments, building an aesthetically beneficial and efficient connection system for pedestrians.

All segments of the population will also be equally protected against environmental disasters including tsunamis, flooding, and typhoons. Mixed-use development will provide all levels of housing types



the same amount of protection from natural disasters; one type of housing will not be protected as a priority over others. The plan provides sufficient infrastructure for evacuations, including multiple modes of transportation and accessibility to emergency services.

#### 4.3.4 LINKAGE

Increasing local connectivity throughout the province, roads will provide clear legibility within the city and will utilize wayfinding techniques such as logical space planning. Green corridors will also benefit pedestrian circulation.

Creating not only new linkages within the community, but in the greater Quy Nhon region, the plan for Ghenh Rang apportions a mass-transit system that is easily accessible and provides a stronger link between Ghenh Rang and Quy Nhon. A supplemental road from Ghenh Rang to the city of Quy Nhon is also added to promote connectivity.



#### 4.3.5 ECONOMIC SECURITY

The plan for Ghenh Rang delineates infrastructure that will build a thriving economy for the community. The focus of the economy will not only be highlight new development, such as the hospital and university, but will promote regional and traditional industry.

To strengthen existing industries, the plan allots space for job training centers to educate locals about various agriculture and aquaculture techniques, and also to advertise these occupations to younger generations. The site also focuses on promote tourism through these local industries; a new pier and beach promenade help to promote the boating industry and a new road features scenic drives through the agricultural land where farmers can host roadside businesses and attractions.

Setting Ghenh Rang to be a leader in the future of green technology development, the University will be a key factor in promoting Ghenh Rang as an innovator. The University will establish a community based on green agriculture, renewable energy, and sustainable fishing. The University will be a central feature of the area and will assist in creating a thriving economy. The University will be in close proximity to a Green Tech Zone allowing students and faculty to receive active participation in new technological developments. Through the establishment of a University based on green infrastructure, Ghenh Rang is set-up as a leader of future industry.

Another Central aspect of the economy will be the Smart Hospital; providing valuable jobs and the opportunity for medical tourism, the Smart Hospital will be an integral part in begetting a bustling economy. The Smart Hospital will be located in an area already associated with wellness– on the site of the former hospital. The hospital will promote a tourist industry based on wellness and holistic health; to further extend this paradigm, outdoor activities, the sports center, and cultural elements will all be factors that bolster the idea of total wellness. In addition to medical tourism surrounded by the idea of total wellness, the hospital will also work to serve the local population. Creating valuable jobs, the hospital will be located in close proximity to housing and also extremely close to the transit hub– making commuters have easy access to hospital jobs if they reside in

Quy Nhon. The Smart Hospital will also cater to the local population, providing ease of access to various medical services. In addition, the University will be closely connected to the Hospital granting further economic support.

The Sports Complex is another part of the plan for Ghenh Rang that will lead to a thriving economy. Connected both to the university and hospital, the Sports Complex will have a large demographic of users. The complex provides an area for students, tourist, and locals. With a large soccer field, the Sports Complex has the opportunity to host international soccer teams; this could lead to more tourism interest from surrounding cities.

The agriculture and aquaculture will also be an integral feature of the economy; with a connection to the total wellness of the hospital, the agriculture industry will, not only, provide income in the form of production, but will serve as an opportunity for tourist attractions. There will be tourism information centers around agriculture to inform tourists and there is also a new road being constructed that is an opportunity for a scenic drive through agricultural lands.

The Downtown will be center for economic activity as well, with the transit hub and close relation to the main road; the Ghenh Rang downtown pavilion will be a center for activity. Mixed-use housing surrounds the area as well as local shops. The downtown is also located conveniently next to the beach so tourists can easily experience both aspects of Ghenh Rang.

## 4.4 KEY SITES

### 4.4.1 DOWNTOWN

The Downtown district is located through the center of the project site linking the western area of the site to the beachfront. It is vital to economic stability job provision and will enhance local and regional connectivity.

This section will contain a few key projects, such as the downtown core, the transit hub and the connection to the beachfront promenade. these key projects will enhance the character of Ghenh Rang and provide an economic center which will support the community.

The downtown core will be built with mixed use development. Commercial and retail uses on the bottom floor and residential on the top floors and will support a diversity of high quality housing types in and around the site. A strong connection between housing, jobs and services will be integrated through the downtown core, and it will bring related business nearby to enhance the economy, encourage tourism, and support local uses.

The design of buildings will follow the latest eco-efficient infrastructure and design solutions of sustainability by integrating passive solar design, geothermal cooling, water recycling techniques such as urban rain gardens, rooftop collection, and greywater recycling through irrigation. All materials used will be of the natural character of Ghenh Rang by use of local and traditional materials.

The Beachfront promenade will be the main connection between all the key areas within Ghenh Rang, starting in the downtown at the transit hub the promenade will flow towards the beach front giving pedestrians easy and immediate access to the beach from the moment they arrive in the community. The path will then split south towards the boat and sailing center and marketplace. The promenade picks up again just past the marketplace and attaches to an existing creek that runs parallel to the beach, this



Figure 4.1 Location of the Downtown District



Figure 4.2 Downtown Illustrative Site Plan



creek promenade comes in a the main downtown plaza and transit up and has a direct path to the gateway of the University which provides a connection to the sports complex and the hospital. The idea of this promenade is to offer strong connections for pedestrians to move through the site, as well as provide an array of plazas and open spaces for the community to use for events, relaxation, and boost tourism to the area.

The transit center will act as the core of the entire community and will provide connections to local and regional areas. It will have a bike trading station that locals and tourists can use to catch an easy ride through the community. A large parking lot will be provided for tourists and others to be able to park their cars and take other modes of transportation to navigate through the community. These other modes would consist of a small taxi service by use of bike carriages that will pick up at the transit center and give rides to the other key areas through the community.

The transit center will also provide bus pick up and drop off, and the buses can be used for taking people in and out of Ghenh Rang to Quy Nhon and other areas north and south of the the site. Looking further down the road, the transit center will also one day be able to accommodate a light rail that can more easily take locals and tourists between Ghenh Rang and Quy Nhon. Space will be provided for cars but other modes of transportation will be provided and encouraged for people to use, in a more sustainable initiative.



Figure 4.3 Beachfront Promenade



Figure 4.4 Transit Center



Figure 4.5 Downtown Core Plaza Rendering





Figure 4.6 Location of the University/Hospital/Sports sector

#### 4.4.2 UNIVERSITY/HOSPITAL/SPORTS COMPLEX

Built on former agricultural land adjacent to a small mountain range, and walking distance from the spectacular beaches of Ghenh Rang is an environmentally intelligent research hospital, sports complex and education center. The new Han University will be the focal point of the area that will connect the Smart Hospital and Sports Complex with the greater region of Quy Nhon. The center will boast three central nodes each connected through the areas expansive rice paddies, celebrating a dialogue between sustainable development, food production, and wellness.

The Han University will create a benchmark in sustainable building design through its use of passive solar and advanced water recycling techniques. Built from locally sourced materials the campus will merge with the existing natural form of the river on the Southern side of the site. University students will be able to partake in kinesiology and nutrition research at the Quy Hoa Hospital or play a game of soccer at the new Sports Complex. The campus will also boast an extended education college of agriculture and food production program as well as a local connection with the woodworking school and sailing center.



Figure 4.7 University Site Plan

The new Smart Hospital will be a community icon for Ghenh Rang. It will service the local population with a health clinic and nutrition education center as well as provide support for medical tourism and sports medicine. The Smart Hospital will foster community involvement through training and research for Han University students and medical personnel. Through its building orientation the smart hospital demonstrates resiliency to natural events that allows for water to flow past with minimal structural damage in the wake of a tsunami or typhoon. The hospital boasts a rainwater collection system that is integrated with the Han University's to provide irrigation for landscaping.

Tying the area together at the western edge lies the new Sports Complex. The complex contains a full gym, training pool, soccer stadium, running track and field. Separate areas in the gym are maintained for those receiving physical therapy from the Smart Hospital. The Sports Complex is equipped to host teams training for the FIFA world cup or local and international soccer matches. Athletes who visit the complex are met with beautiful vistas of the mountains and the beach and the backdrop of the new Han University. The center only a short walking distance to the downtown commercial district and beachfront promenade and pier making it one of the most attractive rapidly growing areas in Quy Nhon.



Figure 4.8 Smart Hospital



Figure 4.9 University





Figure 4.10 Location of the Traditional Practices District

#### 4.4.3 TRADITIONAL PRACTICES DISTRICT:

##### AGRICULTURAL/FISHING

The traditional practices district, located in the south end of the project site, is going to play vital role of maintaining the unique and thriving local economy and character of Ghenh Rang. This section of the site will contain a few significant projects, such as the farmer's and fish market, the sustainable agricultural practices school, the traditional woodworking school for boats and furniture combined with a community sailing center, and a hotel.

The key site objectives correspond and enhance the overall goals for the project (sustainable land use, organic urban form, community development, linkage, and economics). Each one of the objectives for the key site attempt to incorporate the main goals. The first main function of the site is to incorporate fishing and agriculture with the entire community through boat building and educational facilities that promote traditional sustainable practices. There would also be a market established to connect to downtown and the rest of the community for



Figure 4.11 Traditional Practices District Illustrative Site Plan



small scale fishing industry and food production. It would also function as a connection with the district and a strong network of public spaces. Lastly, it would build on the Vietnamese seafaring tradition by establishing a community sailing center that provides access to the sport for locals while hosting international and regional dinghy sailing, kiteboarding, windsurfing and paddling events.

This section connects with the other key sites, while maintaining local character of the fishing and woodbuilding industry. In order to support the connection with the rest of the site, there is a proposed promenade going from the north side of the village along the tree-line, parallel to the beach leading past a hotel to the west and up to an open market place near a coconut grove. This will help to incorporate the other key sites with the fishing and agricultural section. While utilizing organic design, there is a curvilinear shape incorporated throughout the site from the ground to the buildings, and using natural and local materials.

The marketplace continues with a natural progression west up the street, with high density mixed use development as well as the boat building school and the agricultural education center, leading to the rice patties. On the east side of the market extends a pier with public access, specifically designed for the fishing community that has a breakwater for easy launching and docking boats. There is also a strong pedestrian connection throughout, including one that leads along the creek directly towards the downtown core.



Figure 4.12 Marketplace Street

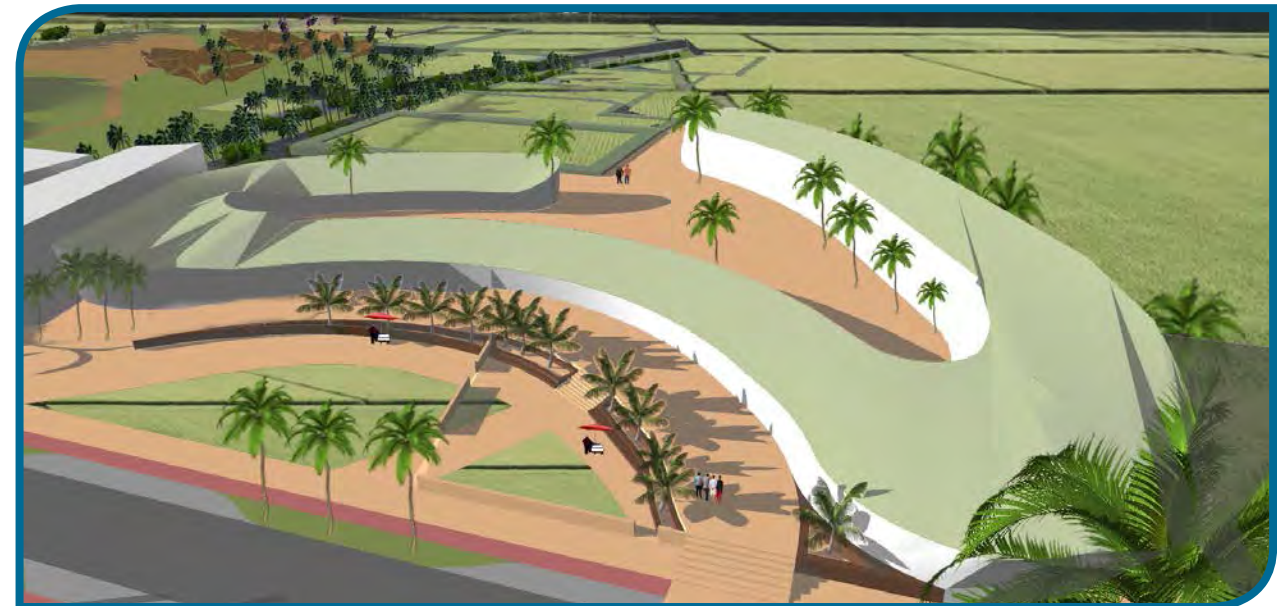


Figure 4.13 Agricultural Education Center



Figure 4.14 Pier harbor and Traditional Boatbuilding Center



Figure 4.15 Sailing Center





*Ghenh Rang 2050 Illustrative Site Plan*



*Ghenh Rang 2050 Southeast View*





*Ghenh Rang 2050 Northeast View*

## 4.5 PHASING

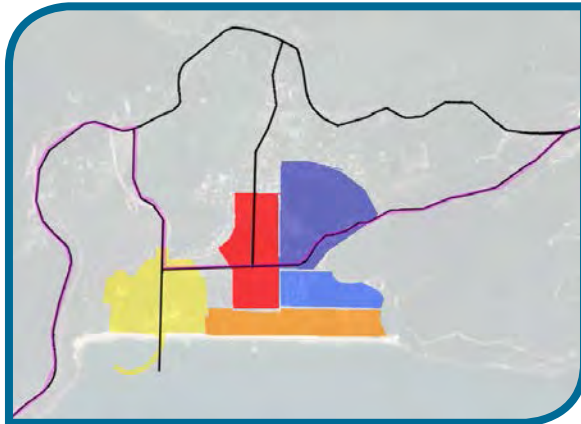
### Phase One

- Improve Local Roads
- Establish strong transit links to Quy Nhon
- Put policy in place to protect wetlands and agricultural land



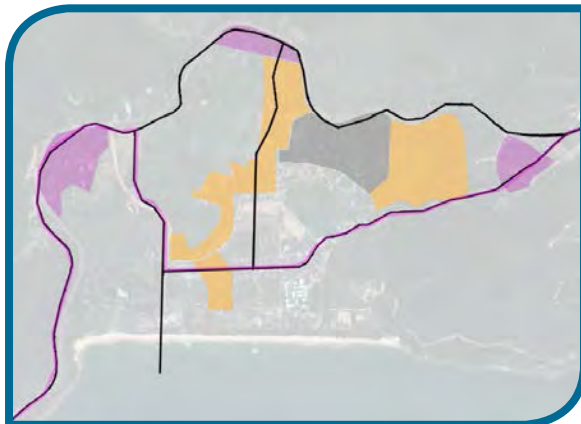
### Phase Two

- Develop Key Opportunity Catalyst Sites



### Phase Three

- Develop Complete Neighborhoods
- Develop Highway Commercial
- Develop Green Industry Zone



## 4.6 CONCLUSION

Through the design process our team came to understand that a vision for Ghenh Rang needs to be more deeply rooted in more primary knowledge that would be gained through site visits and a participatory design process in with stakeholders including the developers, government officials and residents of the region and of Ghenh Rang. With a limited knowledge base of the site we understood the major issues to be concerned with creating a vision for a community as a roadmap assuming building except all but the most important landmarks will eventually need to be rebuilt as they are upgraded to be more resistant to environmental hazards, energy efficient, and efficient in their use of land. To further develop our design schemes without a site visit work needs to be done using techniques from the field of remote observation to further analyze the site and compare it to other similar villages that have the same typologies and more detailed accounts of the site (hopefully Google Earth Street View). With that information we could begin to apply the vision and form generated in our initial vision so that we could apply the design concepts of a sailing center, soft pedestrian trails, etc., to a more detailed reality of Ghenh Rang allowing our form and concepts to evolve.



## 4.7 REFERENCES AND IMAGE SOURCES

Campus with Green Roof

<http://www.vitodibari.com/en/green-roof-building-nanyang-technological-university-singapore-ecological-visual-masterpiece.html>

Agricultural Center

[http://agreenliving.org/wp-content/uploads/2010/11/3feb264e6fsingapore-university-of-technology-and-design\\_1\\_6fRR1\\_69-500x373.jpg](http://agreenliving.org/wp-content/uploads/2010/11/3feb264e6fsingapore-university-of-technology-and-design_1_6fRR1_69-500x373.jpg)

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Transit Hub

<http://www.google.com/>

[http://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&docid=KfeywoxrYhl0RM&tbnid=18Y0O3l9fX7m\\_M:&ved=0CAQQjB0&url=http%3A%2F%2Fwww.archdaily.com%2F48181%2Ftransbay-transit-terminal-pelli-clarke-pelli-architects%2F&ei=aDtKUarqOKXDyQG8noCwBA&bvm=bv.44011176,d.aWc&psig=AFQjCNGayyEGzHip6p3HiizgFsdgai5ZKw&ust=1363905505141157](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&docid=KfeywoxrYhl0RM&tbnid=18Y0O3l9fX7m_M:&ved=0CAQQjB0&url=http%3A%2F%2Fwww.archdaily.com%2F48181%2Ftransbay-transit-terminal-pelli-clarke-pelli-architects%2F&ei=aDtKUarqOKXDyQG8noCwBA&bvm=bv.44011176,d.aWc&psig=AFQjCNGayyEGzHip6p3HiizgFsdgai5ZKw&ust=1363905505141157)

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Downtown

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Promenade

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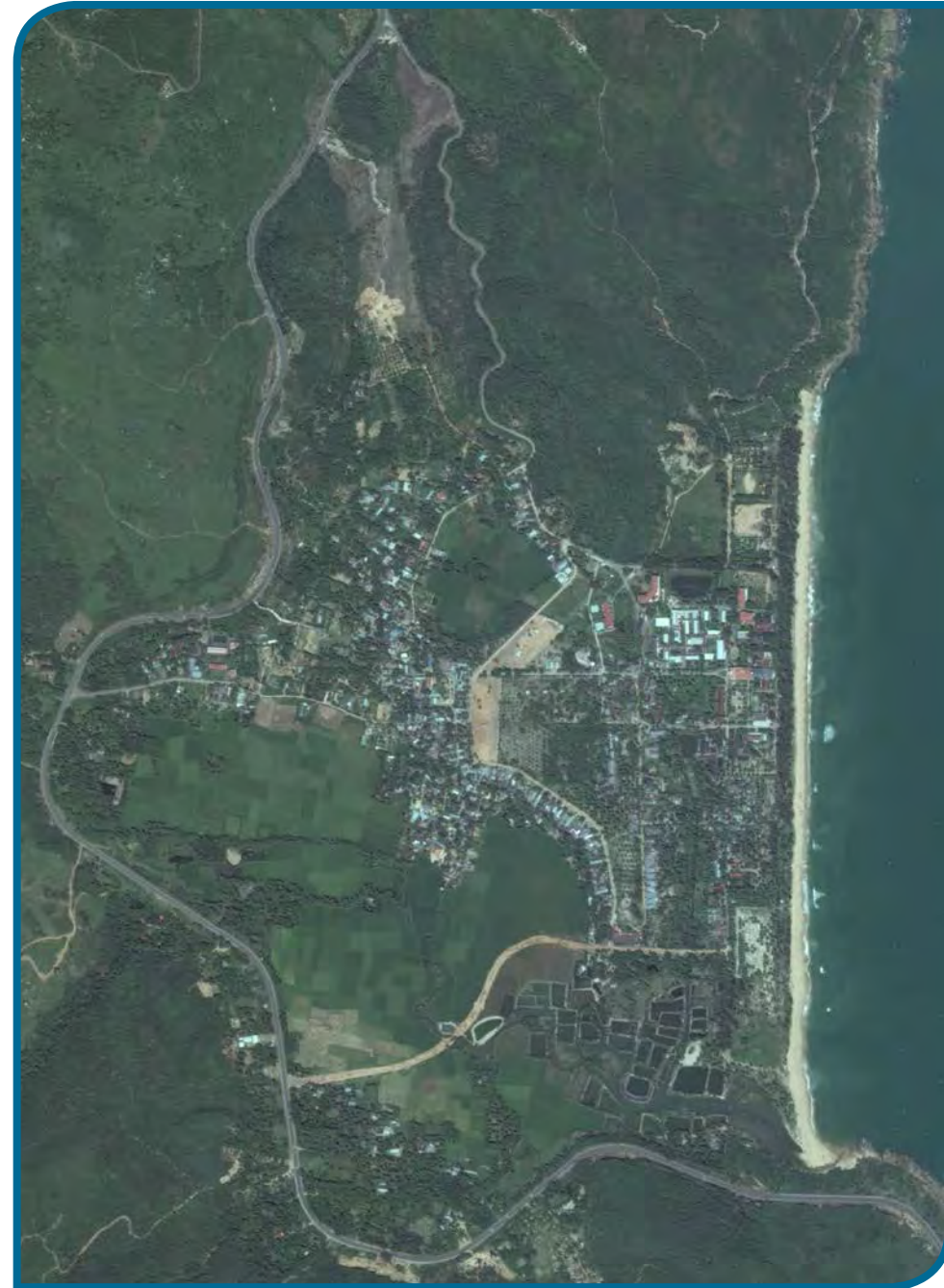
# Chapter 5

## Final Remarks

The 2013 Organic Design Challenge - Sustainable Visions for the Future of Vietnam offered a rare opportunity for three teams of city and regional planning students at Cal Poly San Luis Obispo to vision futures for Ghenh Rang a ward of the city of Quy Nhon. In the context of general overview information but little in the way of technical details about the settlement the teams were emboldened to sketch broad brush visions of possible futures. Challenged to apply, in the short time frame of nine weeks, an organic design approach to envisioning catalytic interventions that would jump start development, the three teams developed discrete solutions. Each has differing goals and key objectives. Their designs aim to steer the direction and character of future corporate, institutional, private and individual investments in the region, so that the settlement grows in synergy with local cultural, social and economic realities, and ecological context. It is a broad-brush approach that sets out major trajectories, not detail and technical specificity. The narratives amplify the guidance and articulate future aims and objectives of these initial investments.

Although challenged by the distance to site, depending only on secondary sources of information such as the internet, literature, and talks by guest experts, the teams have defined credible and diverse approaches to the task of envisioning sustainable futures for Ghenh Rang. Their work points to directions that can make the settlement a place where locals and visitors can thrive.

The students have appreciated this opportunity to be visionary and creative and to look outside of California, in an international and rapidly changing context. Delving into other cultures, climate, history and traditions, as well as experimenting with building types and materials not the norm in North America has been stimulating. The work needs to be tested in the realities of context, and opportunities for this, if they emerge, will allow further refinement and clarity to these visions.





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# ORGANIC DESIGN CHALLENGE 2013

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sustainable visions for the future of vietnam

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