Reconsidering the Roles of Urban Waterways: An Opportunity for Khlong Rop Krung

By

Supapim Gajaseni

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Signature of Author _____
Supapim Gajaseni
Department of Urban Studies and Planning
May 21, 1998

Certified by _____
John de Monchaux
Professor of Architecture and Urban Planning
Thesis Advisor

Certified by _____
J. Mark Schuster
Associate Professor of Urban Studies and Planning
Thesis Advisor

Accepted by _____
Lawrence Bacow, Professor
Chair, MCP Committee

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Abstract

Urban waterways are elements that have often been forgotten. Due to neglect and lack of care, waterways in many places have suffered from severe pollution, released offensive smell, and produced a bad image for the city. As a result, they have often been considered as liabilities.

This thesis considers urban waterways as resource that could be used to improve the city. It examines physical approaches to re-integrate urban waterways back into the contemporary life by using Bangkok, Thailand as a case study. One particular canal, Khlong Rop Krung, is selected to represent the waterways in Bangkok and is studied in detail.

The methodology used in this thesis is three tiers: first it investigates the changing roles of Bangkok's canals and ideas for rejuvenating them. Second, it studies waterway development precedents and sums up the possible roles that might be applied to waterways in Bangkok. Third, ideas generated from this research are conceptually applied to Khlong Rop Krung with the hope that they will broaden the thinking about the future of urban waterways.

Thesis Advisor: John de Monchaux
Title: Professor of Architecture and Planning

Thesis Advisor: J. Mark Schuster
Title: Associate Professor of Urban Studies and Planning

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PART III: KHLONG ROP KRUNG

Introduction

Inland waterways used to be major and dynamic components of both the rural and urban landscape worldwide serving as transporting routes. In some places, these waterways were the lifelines on which people depended for food, drinking water, and bathing. In some cultures, waterways played an integral role in peoples' everyday lives: as a form of protection, as sacred spaces, and as settings for social interactions.

Sadly, many of these waterways are now abandoned, as they have been perceived as no longer a competitive means of transportation. New technologies have allowed people's lifestyle to change and they need not depend on these 'lifelines' any further. These waterways have changed their roles. Many of them have been filled in, especially ones in urban areas, and have become unpleasant urban elements. They are treated as backyards and open sewers due to lack of concern for their immense value in the past.

This thesis attempts to find solutions to plan for the coexistence of urban waterways and the urban context in which they live in. It emphasizes new roles for these waterways and finds ways to reintegrate them back into our lives. It considers these abandoned urban waterways as 'dormant' assets lie within cities, which could yield numerous benefits if they were well exploited.

While this thesis seeks to provide a wider application, it focuses on a study area in Bangkok, a city with many canals which are commonly know as 'khlongs.' Bangkok is a typical example of poor urban waterway management. Once called 'Venice of the East,' Bangkok settled in the confluence of canal network

within the city, its people now suffer from the poor quality of life, as well as numerous urban problems due to rapid and unplanned growth.

This thesis gives suggestions to improve the canals in Bangkok and to re-integrate them into modern urban life in attempt to help lessen the city's numerous problems. It seeks appropriate roles for these canals by studying 4 possible scenarios based on the rejuvenation of urban waterways in many parts of the world. Ideas generated from their lessons and implementation processes will be applied to Khlong Rop Krung as a prototype of canal redevelopment in Bangkok with the hope that it will broaden the thinking about urban waterways in the future.

PART I
BANGKOK WATERWAY CONTEXT

This part is intended to provide an understanding of the Bangkok urban waterways context, which is used as a case study throughout the thesis. In chapter 1, I will lay out the waterways map of Bangkok and investigate what roles these urban waterways have played in the city and how those roles have changes through time. Urban problems related to waterways will also be discussed.

In chapter 2, the planning efforts on the canal system, both to improve the waterways themselves and to use waterways as tools to solve urban problems, will be discussed and further scrutinized. Results or outcomes from this part (Part 1) will serve as a threshold towards fulfilling the intention and final goal of this thesis, that is, to reconsider the roles of urban waterways and to assess how these roles could be achieved through urban design and implementation processes.

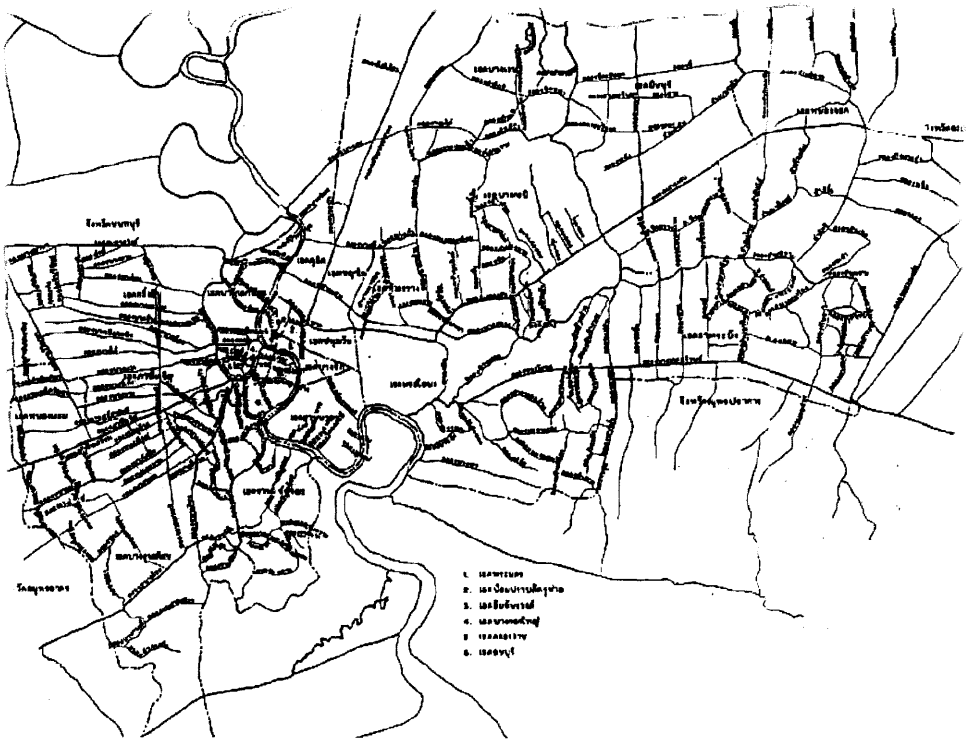

Fig. 1-1 Bangkok waterways map (Lelahajeva)

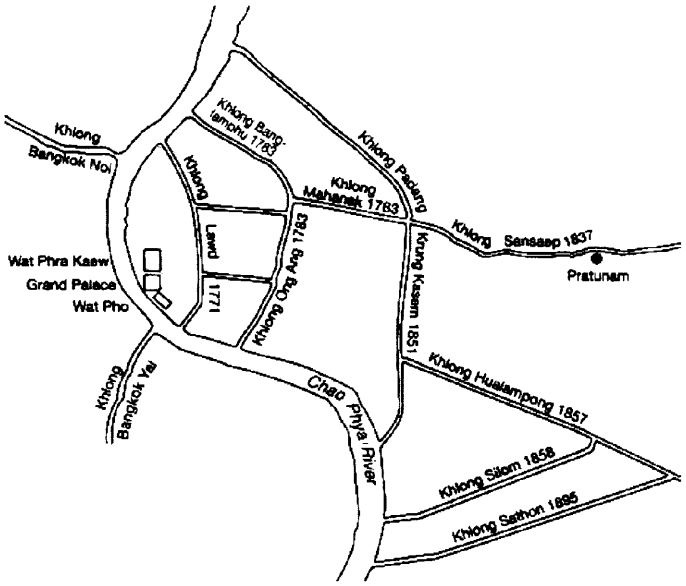

Fig. 1-2 Early network of canals in old Bangkok

(Van Beek)

Chapter 1
Canals in Bangkok: Past to Present

Bangkok was once called 'Venice of the East", as the city was full of canals, which were the center of the city's life. As a victim of motorization, like many canal towns all over the world, many of Bangkok's canals have been neglected and filled in.

However, a large number of them still exist and make an intricate system of waterways within the city. Although they might not look as attractive at present, if they were exploited, they could make Bangkok a much more livable city than now.

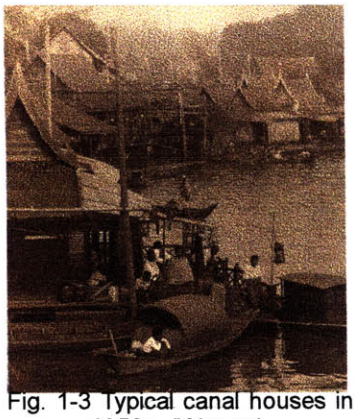
Fig. 1-3 Typical canal houses in 1850s. (Warren)

Started as a small village on the low-lying flood plain of the Chaophraya River, in 1782 Bangkok was established as the capital city of Thailand at the beginning of Rattanakosin period. King Rama I took Ayuddhaya, the old and formerly powerful capital city of Thailand as the model of this new city (Bunnag, p15). In order to replicate the model, he ordered canals to be dug as the city's defense and transportation routes, a process that created the well-utilized canal network for Bangkok.

Following the era of King Rama I, the number of newly dug canals continued to increase for more diverse reasons. Some canals such as the Klong Rop Krung and the Klong Padungkrungkasem were dug for defense. The Klong Mahanaga was dug to be a recreational canal, with its banks as a place for playing "sakkava," a poem game that has been popular since

the Ayuddha period. Klong San Saeb and many more canals were dug to allow travel into the inner part of the country and to expand power to distant towns under the rule of Bangkok.

Furthermore, others canals were dug for economic reasons to introduce irrigation systems for rice cultivation and transportation of goods. Together, these canals were the main mode of transportation since, at the time, land travel had very little significance. Nevertheless many journals indicate that roads already existed in Bangkok in the early Rattanakosin period. But due to the lower convenience that they provided as compared to water travel and the higher cost to build, canals were then much more popular and were regarded as development tools for the city (Bunnag p63).

Nevertheless, under the reigns of King Rama IV and King Rama V (1851-1910), land transportation multiplied. However, the canal system was not neglected, but surprisingly, was enhanced to its full extent under this period. Twenty-five new canals were dug and the dirt used to construct roads. As a consequence, there were roads with canals along their sides. The landscape along the canals was treated nicely and provided the townspeople with places to sit and relax by the water. The canal also beautified the city by its pleasant appearance.

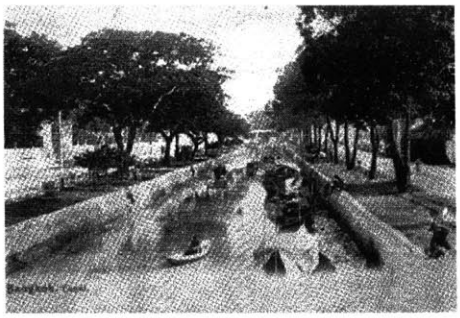

Fig. 1-4 Khlong Lod South in the 1860s (S. Plynoi)

As a result of putting greater emphasis on developing the canal system for transportation routes and for economic purposes since the beginning of the Rattanakosin period, the water character of Bangkok was strengthened. The canals acted as strong advantage for the city. First, as canals were regarded as the city's primary arteries, the early settlements including

Fig. 1-5 Khlong Bangkok Noi in the 1860s (S. Plynoi)

houses, temples, and so on occurred along the canal banks, with their fronts facing the canals. Consequently, most daily activities, such as bathing, giving alms to monks, selling goods, and so on, took place in these canals and on their banks. Thus, they were places of urban interaction.

Second, canals were important sources of food and other commodities such as fish and drinking water. Occasionally, the water in the canals was used for fire fighting. Third, canal banks were mostly lined with trees which provided cool shady leisure areas for the city. Furthermore, canals are also wind channels, so the temperature by the canals was lower and more comfortable than in other areas. Fourthly, they served as the city's natural drainage system and as flood protection.

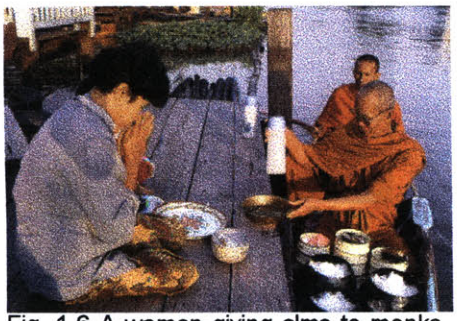
Fig. 1-6 A woman giving alms to monks in a Thonburi canal (Van Beek)

These unique and pleasant characteristics of Bangkok's canals in the first half of the Rattanakosin Period may be traced to five attributes:

First, canals were well-maintained. Besides constant repairs to allow easy flow and circulation of water, which would keep the water clean, some canals were widened to increase transportation and economic capacity.

Second, the governments of King Rama IV and King Rama V imposed a number of laws to protect the canals for efficient use and to develop traffic rules for the waterways.

Third, Bangkok was not very crowded as the number of population during the King Rama IV period was only 400,000 (Jumsai p.101). Settlement along canal banks was not very dense. The amount of garbage

from canal front households was much less than it is today.

Fourth, activities on canal banks consisted mostly of agricultural, residential, commercial, and cultural uses, unlike today with industrial uses mixing with other uses and polluting the water.

Fifth, the earlier form of settlement was that rivers and canals were the fronts of people's houses and they would want to keep them clean.

Bangkok's Canals Today (1957 - 1998)

In contrast to the first half of the Rattanakosin Period when Bangkok used rivers and canals as main transportation routes, during the period of King Rama VI canals began to lose their importance. No canals had been dug in the Bangkok urban area nor had they been regularly repaired since 1910, as the governments emphasized land transportation (Bunnag p167) As a result, these canals became more shallow. Furthermore, bridges and locks were constantly built, impeding the natural water circulation system. And also slums as well as industrial sites started to be built up along the banks of these canals. As a result, the roles of canals were reduced to acting only as giant open sewers and surface runoff collectors. As water pollution began to build up and become more and more severe, the government decided to fill in some of these canals.

As Thailand began using the first National Economic and Social Development Plan in 1960, the number of canals decreased dramatically. Land 'reclamation' required more canals to be filled in order to construct

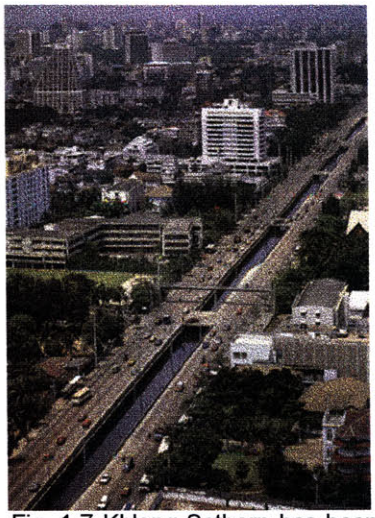

Fig. 1-7 Khlong Sathorn has been encroached by roads. (Warren)

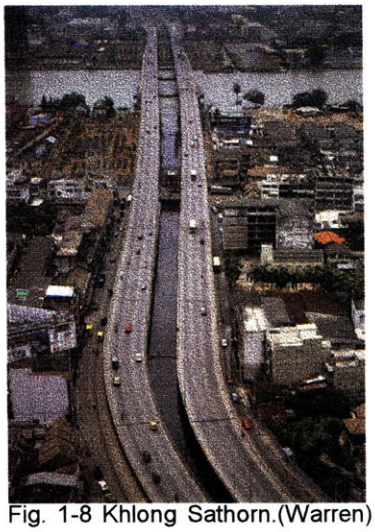

Fig. 1-8 Khlong Sathorn.(Warren)

roads (Bunnag p134) Pipes were laid underground in place of these canals as drainage devices yielding much less efficiency than the old canal system. Other surviving canals that used to be major 'roads' were transformed into a gigantic sewage system that collected runoff and waste water. Some were obstructed by new roadways with low-deck bridges that would not allow through transportation.

Many canals have been filled in since 1910, and the drainage collecting capacity of the canals has reduced markedly. Bangkok started to be extremely vulnerable to floods. In 1983 the whole city was flooded for one month and businesses stagnated. Also, in 1995, parts of Bangkok stayed under more than one meter of water for longer than three months. This problem has still not been solved.

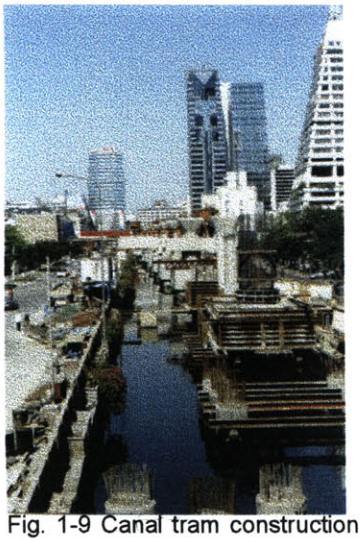
Fig. 1-9 Canal tram construction in Khlong Chong Nontri

Moreover, land traffic congestion is also worsening, as the average speed of traveling in Bangkok's streets is now down to 3 kilometers per hour. The average time to travel to work and school in the morning is 2 hours as there are frequent and mostly long stops. Consequently, the carbon monoxide level in the air has increased markedly over the years and pollution has became untolerable. In 1995, the World Health Organization (WHO) declared that children under 12 should not travel to Bangkok because air pollution was at a danger level (Bangkok Post, July 8, 1995).

Despite this critical level of air pollution in Bangkok, the situation could not be improved much because the number of parks, which would help reduce air pollution, is very limited. The figures from the Bangkok Plan, a study done by an MIT consulting team revealed that Bangkok has only 0.46 square meters of parkland per person, which is 60 times less than London, or

even 8 times less than Tokyo (Bangkok Plan p15). If cities were given a score for the quality of life of their citizens, judging by air quality, level traffic congestion, and recreational opportunities, Bangkok would rank among the lowest.

Trying to respond to the traffic problem, for the past few years the Bangkok Metropolitan Administration has investigated the possibility of utilizing water transportation along the waterway network in Bangkok. They are examining the possibility of utilizing 19 canals, of which 10 are in the Bangkok area and the other 9 in the Thonburi area for water transport. At present, 7 of the 10 canals in the Bangkok area are being utilized for long-tailed boat services. These are Klong San Sab, Klong Pra Kanong, Klong Mahanaga, Klong Padung Krung Kasem, Klong Rop Krung, Klong Lad Prao, and Klong Prem Prachakorn.

Canals served so many purposes in the past. Although many of them have been filled in, many still exist. However, with worsening problems in Bangkok such as air and water pollution, floods, traffic congestion, and lack of recreational opportunities, canals were still left there, mostly unutilized, except for being giant sewers and serving as a few transportation routes.

Fig. 1-10 A mini canal bus in a Thonburi canal. (Van Beek)

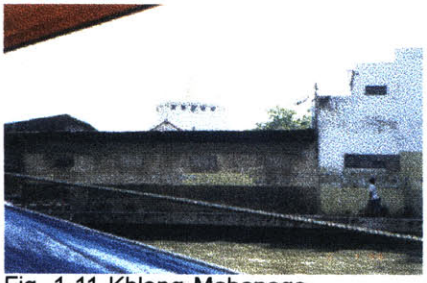

Fig. 1-11 Khlong Mahanaga

Fig. 1-12 Khlong San Saeb

Looking at the canal network that has been left in the city, there are many prospects for it. Some problems such as floods and lack of recreation areas might be able to be solved, and many more opportunities could be created, by utilizing this dormant resource.

The canal network exists in the city should be able to fulfill more roles than it does now. If they were regarded as a development tool for the city, like in the past, there could be many opportunities for people to exploit them. In the past 20 years, there have been many efforts and plans for the canals in Bangkok, most of which share the final goal: to improve living conditions in Bangkok. Surprisingly, although they share the same goal, some of their means are dramatically different, as will be discussed in the next chapter.

Fig. 1-13 An expressway built over Khlong Prapa (Water Supply Canal)

Fig. 1-14 Khlong Prem Prachakorn has lost its amenity value as the street along its side becomes congested.

Chapter 2
Previous Studies and Plans for Bangkok's Canals

In order to cope with the problems caused by the declining number of canals in Bangkok, there have been many studies and plans for these canals. Some of these tried to revitalize the canal themselves, and some tried to use canals as a mean to solve other problems.

In the past 20 years there have been many plans for canals in Bangkok. Most of the plans were area-based conservation plan which aimed to revitalize the historic canals in the old Bangkok area.

However, there have been some plans that looked more comprehensively at the canals as a physical system in the city. These plans tried to deal with the problems caused by the declining numbers of canals and tried to conceptualize the roles of canals as a mean to solve other problems in the city. Here I have gathered plans that are worth discussing, not because they have had an influence on planning for the Bangkok canals, but because they present interesting ideas of what Bangkok canals could be like in the future.

Previous Studies & Plans for Bangkoks Canals

	The Sincron Group, Rattanakosin Island Bicentennial Plan
1982	Piyanart Bunnag, Duangporn Noppakun, and Suwattana Thadaniti,
1982	Canals in Bangkok
1986	Gingpetch Lelahajeva. Study of the potential of the canal system as a device to help solve urban planning problems of Bangkok. Masters Thesis in Urban Planning, Chulalongkorn University.
	Sumet Jumsai, Water: the Origin of Thai Culture
1986-1993	Various professionals, Symposium on Thai Canals.
1990-1994	The Sincron Group, New Plan for the Rattanakosin.
1992	MIT Consultant Team, the Bangkok Plan.
1996	Pichit Ratkul and Krung Thep Thanakom, "Canal Tram Project."
1996-present	

The year 1982 was of a historic importance to Bangkok as the city celebrated its bicl in that year.ntennial. The year was also a landmark fr f physical improvements in the- city-a plan to revitalize the old city was about to be implemented to reestablish pride of the people in their city.

There were many plans proposed for the development and conservation of the old Bangkok area. Among these plan, the Rattanakosin Island Bicentennial Plan by the Sincron Group was one of the most ambitious.

The Sincron Group, *Rattanakosin Island Bicentennial Plan*

While other plans studied a series of smaller areas in Bangkok, this masterplan by the Sincron Group planned for the whole Rattanakosin Island, which covered the area of more than ten square kilometers. In their designated area, four historic canals were included.

The plan proposed a major transformation of old Bangkok. Many structures were to be cleared to make way for public spaces that would help enhance the visibility of many historical sites. There were some interesting design schemes for the canalside such as providing ample public space for cultural activities, allowing the people to have more contact to the water and using canals to give a distinctive character to the city by visually exposing them.

However, there were major flaws in the plan. They had many wonderful nice looking site plans and perspectives, but did not suggest how their design could be achieved. The Sincron Group envisioned the revitalized historic canals as new found assets in the city. Thus they planned the canalside area, where decent low income and middle class communities were then settled, to be an exclusive place, filled with 'ultra luxury residential projects,' canal side restaurants, parking spaces, and other facilities to cater to the high-end market. There were suggestions that many buildings and communities be torn down without indicating sufficient reasons.

Piyanart Bunnak, Duangporn Noppakun, and Suwattanna Thadaniti, *Canals in Bangkok*

In 1982, besides the many physical plans for the city in commemoration of the Bangkok Bicentennial, many books were written about the events in Bangkok in the past 200 years. In the architecture book series, urban elements of Bangkok since its earliest days were gathered and published in separate volumes. The topics included: Houses in Bangkok, Palaces in Bangkok, Temples in Bangkok, Markets in Bangkok, and Canals in Bangkok .

The authors of Canals in Bangkok, Bunnag, Noppakun, and Thadaniti, were three professors from Chulalongkorn University. Bunnag and Noppakun were professors in the Department of History and wrote the parts about the history of Bangkok canals. Thadaniti was a professor from the Department of City Planning and wrote about the present state of Bangkok canals.

It was the intention of the authors that this book would emphasized the history and description of the canals. The authors hoped that their study would stimulate people to look back to Bangkok in the past, when the canal system was extensively utilized, and to realize the importance of the canals to Bangkok. However, in the last chapter, the authors gave suggestions for the revitalization of Bangkok's canals:

1. Control uses of land, including suburban growth, to affect the canal water quality.

2. Establish land use policy for the canal banks to prevent trespassing onto public land. Provide recreational space by the canals at the local, community, and urban and regional scales.
3. Increase the capacity of wastewater treatment facilities in order to cope with the extreme increase of population in Bangkok and protect the canals from further degradation.
4. Establish rules and enforce wastewater treatment for industrial sites and commercial buildings as well as for residences and adapt canal-related laws to cope with the present situation.
5. In order to solve the traffic congestion problem, integrate the canal system into the street and the mass transit patterns in order to utilize all of these resources more efficiently and more comprehensively.
6. Create awareness among the Thai people about the importance and the benefits of the canal system in order to build a consensus to keep the canals as a national treasure and as a resource for the future.

This book was the first attempt to gather all the development history of the canals in Bangkok. Although it did not suggest much concerning the development potential of these canals, this book provided a background for understanding many of the canal issues that would need to be addressed in any canal related development project.

Gingpetch Lelahajeva, *Study of the potential of canal system as a device to help solve urban planning problems in Bangkok* , 1986.

Gingpetch Lelahajeva was an advisee of Suwattana Thadanithi, one of the authors of Canals in Bangkok, at the Department of City Planning, Chulalongkorn University. In her Masters Thesis, Lelahajeva focuses her interest on the old main structure of canals that remain intact in Bangkok and asks to what extent can they be used to solve urban problems. The author studies the conditions, problems, networks, and the relationship of canals to communities in the Bangkok Metropolitan area from the past to present and then makes recommendations which would use the canals to solve city planning problems in the Bangkok area:

1. Drainage and flood control. The author provides guidelines which would prioritize the canals into 3 levels: major, auxiliary, and feeder canal. The guidelines also suggest the improvement of water gates, the dredging of shallow canals, the construction of levees, the improvement of canal-side communities, and the digging of canals parallel to newly constructed roads for drainage purposes instead of laying drainage pipes.
2. Traffic congestion. The author recommends canal routes between offices, residences, and factories in conjunction with the flood control system to offer alternatives to the congested land travel.
3. Lack of green space and recreational parks. The author recommends using canal-side areas to solve the lack of public parks by developing vacant land along canals for community recreation.

Lelahajeva also calls for a review of the policies for canal use in the Bangkok Metropolis; a determination of the functions, objectives and goals of the canal system, and a comprehensive plan that would incorporate the improvement of canals into the Metropolitan plan.

This thesis provides a comprehensive idea for the canal system in the city and Lelahajeva reasonably assesses the roles that Bangkok canals could fulfill. However it lacks power. As this is a masters thesis which has not been published, Lelahajeva's suggestions now only sit on the shelf.

Sumet Jumsai, *Water: the Origin of Thai Culture*, 1985-1996.

One of the committee members for Gingpetch Lelahajeva's Masters Thesis was Sumet Jumsai, a renowned Thai architect, who is known to be a keen writer on water topics. Jumsai was a student of Buckminster Fuller at Cambridge University, where he completed his Doctor of Philosophy with a dissertation titled 'Water.'

This book, *Water: the Origin of Thai Culture*, was an extension of his dissertation. Jumsai traces the history and epics that reveal the relationship of Thai culture to the water through chapters on water symbols, water culture, and the water instincts of Thai people through architecture and city plans.

In this book, it is difficult, though, to understand the relationship of one part to another. Jumsai puts much emphasis on the water symbols showing that much of Thai cultures comes from the water such as Naga, a water creature in Thai and Indian epics that is used as a decoration on boats and so on. Most of the part of this book are to convince the reader that Thai people really lived with the water in the past.

The last chapter in which he presents his ideas on the 'ideal form of Thai settlement' is the most interesting content of the book. Ideas such as trying to go back to the water instinct by literally building floating communities on rafts or by going back to build on stilts are fascinating but very impractical.

Most Thai cities cannot go back to being built on stilts now that they are modernized, especially big cities like Bangkok. If there were a way to make this possible, it would have to be demonstrated, otherwise such an idea is not convincing. The idea of floating houses, restaurants and so on is also not applicable in most of the canals and rivers as they will obstruct the waterways. To put them in the ocean, as Jumsai also suggested, might be more feasible, in terms of the space required for those rafts.

One interesting idea that he mentions is that these new settlements could be self-financed if they were done in the form of concessions from the government, an interaction which could also be used in other forms of development.

Various Participants, *Khlong: a Report from the Bangkok Canal Symposium, Chulalongkorn University,* 1990-1994.

In 1990, a group of Chulalongkorn University professors, led by the authors of *Canals in Bangkok*, formed an interest group on the topic of Bangkok canals. In order to seek solutions to canal problems, they organized a canal symposium. Monthly, they invited professionals in various fields, such as planners, architects, engineers, government officials, environmentalists, lawyers, and journalists, to lead discussions on canal related topics. The issues covered various canal subjects including: canals and the city, canals and society, canal architecture, canal ecology, canals and public health, canal and government organizations, and laws related to canals.

As each session of the symposium was very short and the participants were limited to only invited guests, the symposium was not very effective. Furthermore, the report from the symposium was not well publicized and can be found only in a few libraries.

Although many of the participants were key decision-makers, it was very hard for them to implement the ideas presented in the discussion. Most speakers spent most of their time talking about what their agencies had been doing and their responsibilities. Also, more than half of the presenters spent considerable time speaking about the history of the canals or some nostalgic aspects of life on the khlongs in the past, which was very repetitive from the previous sessions. Most of the ideas presented in the symposium were merely an introduction to the problems of the canals. There were some good suggestions, such as using canals for transportation and strip parks. However,

the ideas were not developed due to limited time. In fact, the symposium would have been much more fruitful if it had allowed more time for the presentation and discussion, and had invited the public to express their ideas. If more time and access had been provided, many well-polished ideas might have been being implemented by now.

One important issue arose from the summary of discussion. As the representative from each agency spoke about his or her work, it was revealed that the responsibilities for canals overlapped many authorities and that these agencies did not have enough officers and budget to keep up with the canals. Thus, something needs to be done for the canals to be taken care of properly.

Sincron Group, *The New Master Plan for Krung Rattanakosin*, 1992.

This new and improved masterplan is the second attempt by the Sincron Group. It was submitted to the Department of Environment, the Ministry of Science. The plan proposes 20 mini plans for the revitalization of Krung Rattanakosin area, 8 of which deal with ancient canals in the area, including Klong Ku Muang Derm, Klong Rop Krung, Klong Lod North, and Klong Lod South. These plans make suggestions including: the replacement of bridges to promote water travel, the provision of walkways along the canals and canal-side public parks, and the reorganization of the existing retail activities along the canals.

However, there were still many flaws. Unlike the first plan, although they were both doing an area-based proposal, in the mini plans that dealt with harder is-

sues, such as making canal walkways on private lands, there were no illustrations of the site plans. It is very hard to imagine what the scheme would look like and how it could be achieved, as there are no implementation strategies indicated.

Recently, this new plan proved to be ineffective again. The plan designated the canalside area behind the old city wall at Bang Lamphu to be a park, but now (1998) a private townhouse project is being built on that site.

Massachusetts Institute of Technology, *The Bangkok Plan*,1996

From 1993-1996 during the Prof. Krisda Arunvongse (an MIT alumnus) administration, an MIT Consulting Team was hired to be the city planning advisor to the Bangkok Metropolitan Administration. The team was led by Professor Gary Hack. Along with other professors, research assistants, and representative of various other governmental agencies in Bangkok, they produced a comprehensive plan for the city. The complete plan, the Bangkok Plan, was published in 1996. To cope with the many problems of Bangkok, in one part of the plan, MIT proposed solutions such as creating a park system in Bangkok and using these parks as flood detention areas. The Plan also suggested assigning open space in community centers, close to main streets and public transportation. Furthermore, it introduced ideas for combining the ecological and historical characteristics of Bangkok together and using the Chaophraya River as the core of the new park system because of its potential as a linkage to different open spaces in the city. The canals on the Thonburi side were proposed to be developed as a water route through the old canalside residential areas.

This is an appropriate plan for Bangkok as it addresses

the urban ecology system and flood protection by using the canal system in Bangkok. However, as this is a comprehensive plan which covers the whole city, this part constitutes a small part of the plan.

Unfortunately, as Professor Arunvongse lost his second mayoral election to Pichit Rattakul in mid 1996, this plan was foiled. Rattakul has had his own plans for the canals in Bangkok which will be discussed next.

The Bangkok Metropolitan Administration and Krungthep Thanakom Co.,Ltd., *Canal Tram Project,* 1996 to present.

by the Mayor of Bangkok, Pichit Rattakul, and Krung Thep Thanakom, 1997

In the 1996 mayoral election, Pichit Rattakul called himself a 'dream salesman'. In his campaign he promised quick positive changes to the city if he were to be elected. One of the changes that he promised, the canal tram, was the most controversial. In response to the growing traffic congestion in Bangkok, the Office of the Commission for Management of Road Traffic (OCMRT) has developed a Mass Transit Master Plan of the Bangkok.

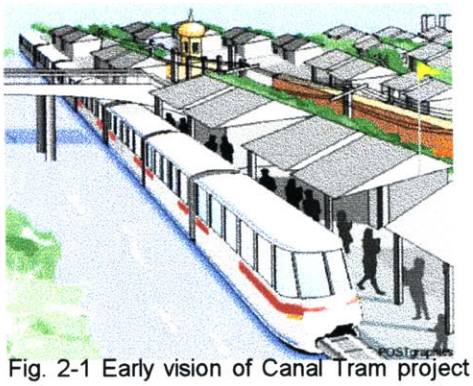

Fig. 2-1 Early vision of Canal Tram project that Ratkul used during the mayor election campaign.

The Bangkok Metropolitan Administration (BMA), in 1997, furthered the plan of the OCMRT by developing the BMA 'Light Rail Along Klong', an elevated tram system with it rails above the canal.

The final study suggests these routes for the canal tram:

* The North Corridor would run along Klong Lad Prao, one of the major water bus routes to the north.
* The East Corridor would run along Klong San Saeb, the busiest water bus route to the east.
* The West Corridor would run along Klong Pasi Chareon, one of the widest canals in Thonburi, with traditional communities along the canal.
* The South Corridor would run along Klong Chong Nonsi-Rama III.

Rattakul claimed, in his proposal for the Light Rail Along Klong or the Canal Tram, that the project would not require any land expropriation (*Bangkok Post*, Mar. rch 19, 1997), for the posts and rails would be all in the canals. However, three of the four routes suggested already have the canal bus system. Moreover the canal tram is now experiencing serious opposition from various groups including conservationists, ecologists, architects, planners, and others. It is perceived as anti-cultural preservation and as an obstruction to the canals' water drainage system. The Khlong Lovers Group referred to the project as "the grand deceit of the people." (*Bangkok Post*, May 20, 1996)

This canal tram plan is a real threat to the canals and must be stopped in order to preserve the remaining canals that still have pleasant characteristics such as Khlong San Saeb, Khlong Pasi Chareon, and Khlong Lad Prao.

From the ideas presented in this chapter, it reveals that the future of canals in Bangkok could be much better that what they are today if the right action is done. Especially in an ill city like Bangkok, with the

problems of traffic congestion, lack of green space, flood and bad image of the city, its existing canals could be tremendous help if they are exploited in the right way. These canals deserve to be more than foundations for any roads, elevated express ways or tramways.

A compelling vision is needed to show that there are alternative approaches that could satisfy the same goal to help relieve the problems of Bangkok, but could retain the characteristics of the city.

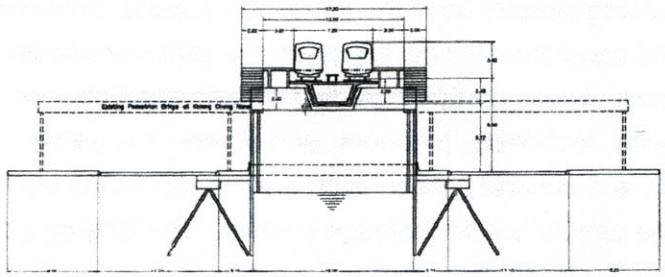

Fig. 2-2 Canal tram elevation (Canal Tram Proposal)

Fig. 2-3 Khlong San Saeb will be partly covered by the canal tram if the project is implemented.

PART II
ASSESSING ROLES FOR BANGKOK'S CANAL

In chapter 3, selected examples of good uses of waterways and their immediate areas as well as successful waterfront regeneration schemes from all over the world are considered as possible precedents for Bangkok. These schemes have successfully saved urban waterways in many parts of the world, where they were transformed and put to good use to help improve the cities or their settings. I will study these precedents and will discuss what lessons can be learned from these examples. In chapter 4, ideas and lessons gathered together from part I and the precedents in chapter 3 will be gathered in order to reconsider and develop appropriate forms of urban waterway usage.

Fig. 3-1 Gas Street Basin in the 1960s (Breen)

Chapter 3
Examples of Successful Uses of Urban Waterways: Examples of Major Waterways Transformations

The examples selected here have not only experienced problems similar to those in Bangkok, their results are inspring and should be replicated.

The British Example

England is among the best known examples for its strong efforts to save the once thriving waterway network. At present, there are many canal-side revitalization projects that spur economic growth in many regions and provide people with recreational opportunities. In some cases, these projects have even given a new life to a declining downtown.

England has an extensive network of waterways. These waterways are the remnants of the industrial age that left its trace on much of the English landscape. For a long time, these canals underwent a dreadful state of dilapidation much like what Thai canals are now experiencing. However, with careful planning and efforts by different constituencies, canals in England are becoming increasingly attractive and valuable for the diverse activities that can take place on and alongside the water. The network is now a unique combination of waterway environment and the industrial heritage.

"There is a great opportunity before the Government completely to revolutionize at surprisingly small expenditure the management of a national asset extending all over the land and capable of bettering the life of the people at many different points: a national asset which has been, to an extent

hardly to be paralleled elsewhere, brought near to a point of destruction by public ignorance and inertia and the manipulations of hostile parties. Upon our inland waterways converge, as in few other places the argument of low cost and human amenity. No Government representing on a broad basis the people of England can possibly allow them to go to waste; can possibly do other than restore and free them: for an efficient system could, directly or indirectly, lower the real cost of almost every commodity, and bring much happiness to the larger part than half of our population when lives near some section of it." (De Mare, *the Canal of England*)

Birmingham Case Study

History

Surprising but true, Birmingham has more miles of canals than Venice (http://www.birmingham.gov.uk). Located in the West Midlands, Birmingham was once the flourishing Industrial center of 19th century England, where canals interlaced the city to feed water to mills and to provide the city with an 'efficient' mode of transportation for water freight. Today, it is still the center of England's extensive canal network.

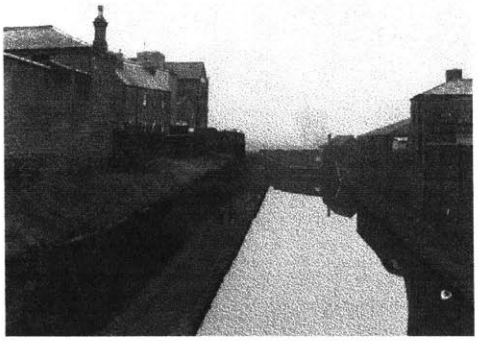

Fig. 3-2 A Birmingham's canal before redevelopment (Breen)

Birmingham is situated at the confluence of the Worcester, Birmingham, Fazeley, and Main Line Canals. However, after the invention of the railroad, water freight lost its competitiveness and gradually declined. Due to neglect the canals were seriously polluted with heavy metals and finally abandoned. These once thriving areas of the city turned into a derelict landscape that spread across the city.

However, the late1980s marked a decade of improvement to the canal network when a collaborative plan was adopted to revitalize the declining downtown of Birmingham itself. Areas by the canals were among the most promising. Thus they became targets for

flagship projects, beginning with Brindleyplace, a large-scale development formed by a collaboration of the Birmingham City Council, British Waterways, and a private developer.

Before the project took place, the city began the revitalization of the canals in the central Birmingham area. The water quality improved dramatically and the national Rivers Authority has upgraded the canals from a 3 classification to 1b. This is the result of a 2.2 million pound, three-year clean up effort to remove two hundred years' worth of accumulated pollutants. Fish now swim in the canals. Significantly improved water quality, the City has also refurbished the canal towpath, locks, and walls, which make the area look even more impressive. (*Waterfront Spotlight*)

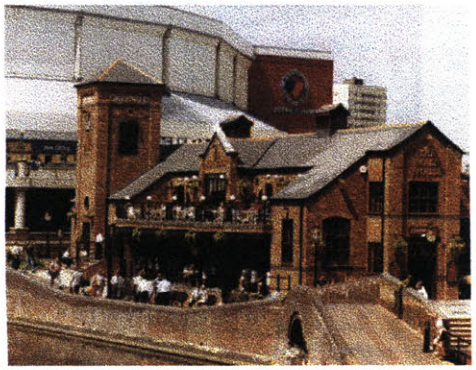

Fig. 3-3 The Malt House (Breen)

Design Features and Program:

Brindleyplace is a private mixed-use development worth more than 250 million pounds. It is located by the canal junction and is thriving with a group of sixteen shops, restaurant, pubs, and outdoor cafes. Nearby are office buildings and new residential construction. The construction of the National Aquarium, designed by the renowned architect, Sir Norman Foster, is now complete. The full development calls for 1.1 million square feet of office and convention space, 143 homes, a major public square, a 300 room hotel, and 2,600 parking spaces, covering 17 acres in total.

The development of Brindleyplace has had a vast impact on nearby areas. The regeneration is spreading making Brindleyplace only a part of the larger scheme of Birmingham's canal-front revitalization. Another project in the area is Regency Wharf, a 5 million pound and 30,000 square feet residential and leisure com-

plex in a renovated canal building. There is also a substantial amount of restoration work, including the Holiday Wharf Antique Center, the Malt House Pub and the towpath bridges, which have beautiful iron structures dating from 1827.

Key Planning Principles

According to Les Sparks, the Director of Planning and Architecture of the Birmingham City Council, the key planning principles in the Brindleyplace Plan are as follows:

* Positive Use of Heritage

The Plan looks to provide a higher profile for the area's historic artifacts whilst regenerating the area in a way which does not overwhelm them. The majority of older buildings are modest in appearance and the Plan seeks to maintain a fine-grained approach with new buildings which are of similar scale.

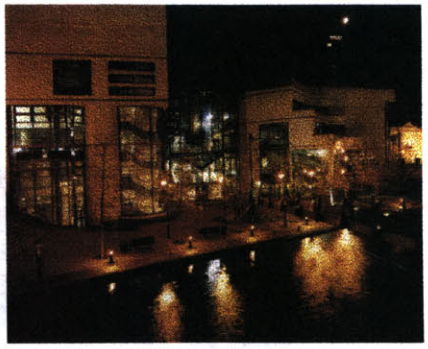

Fig. 3-4 Internation Convention Center at night. (Breen)

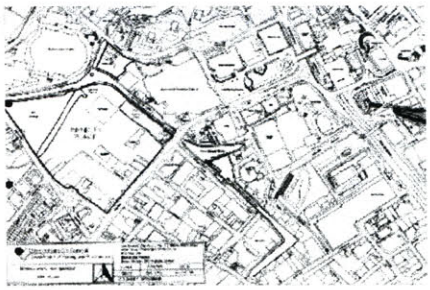

Fig. 3-5 A map showing the canal system converging in central Birmingham (Breen)

* Better Links

The Plan generally identifies key pedestrian corridors through the area with links into adjoining quarters and into the core area.

* Mixed Uses

The fine-grained approach applies equally to land use with a preference for a mixture of small-scale workshops, studios, leisure uses, pubs, restaurants and housing. The canal-side locations are particularly favored for mixed use development.

* Introduction of City Living

Brindleyplace is seen as a particularly good opportunity to further the Council's ambition to greatly increase the number of residents living in Central Birmingham.

With its cosmopolitan feel, it should be attractive to a wide range of residents, but particularly to younger people and those with a taste for the cultural opportunities of the area.

* Use of Canals

Birmingham's extensive network of canals provides the city with a distinctive character and compensates for the absence of any major natural features or outstanding architectural heritage. Developments at Brindleyplace and Gas Street Basin have demonstrated the potential of canal-side locations and the network offers great possibilities for future tourism.

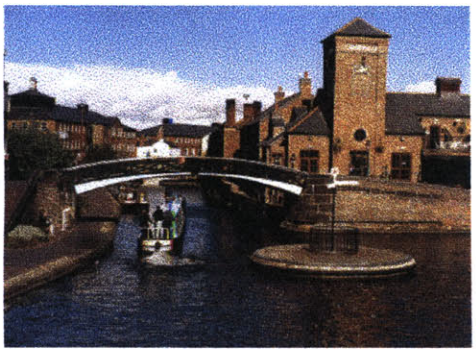

Fig. 3-6 A tour boat approaching the Malt House (Breen)

* Enhancement of Spaces

Years of neglect have left the area in a run-down state and the public realm is particularly shabby. However, the area has escaped the unsympathetic developments of the 60s and 70s which have undermined the character of many parts of Birmingham. With tender loving care it will be possible to cultivate the same richness and human scale which distinguishes Birmingham's Jewelry Quarter. (*Urban Design Quarterly,* Vol.62)

Implementation and Success

From a derelict landscape transformed into one of the city's liveliest areas, the newly redeveloped Brindleyplace now serves tour boats carrying visitors around the canals. Joggers and walkers enjoy an extensive network of paths adjoining the revitalized canals.

Recently, Birmingham waterfronts received the top honors award from the Water World Spotlight. The efforts of the Birmingham City Council, the British

Waterways, and the developer of Brindleyplace was highly praised,

"The exciting Birmingham regeneration taking place is heartening. It is evidence of what determination and the willingness to invest in a water body can mean to a city. The canals were once a symbol of Birmingham's decline. Now, the residents and visitors enjoy both the canals and the rebirth of the city's heart." (*Waterfront Spotlight*)

The United States Example

San Antonio Case study

History:

San Antonio is one of the few American cities that convey an historic legacy. The city is located at the headwaters of the San Antonio River, at the southeast corner of the Edwards Plateau inTexas. Its historic role as a Spanish-Mexican outpost, its cultural links with Mexico and the significant percentage of the population that is of Spanish-Indian origin are reflected in the city's character. In the eighteenth century San Antonio was a Spanish mission settlement, and in the early nineteenth century, being within Texas, it became for a time part of Mexico. Although Texas' first city, San Antonio has been superceded in importance since the 1930s by Houston and Dallas. Since the First World War it fell behind as a business and industrial location, but gained importance as a military and air force establishment and government administrative center. Tourism, based on successful conservation of local features, is the second largest industry.

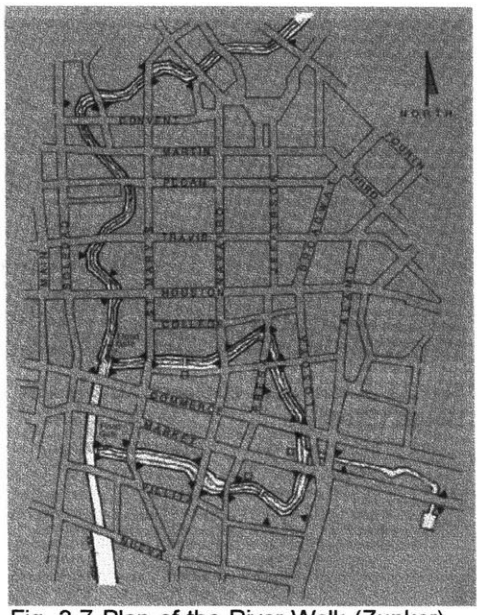

Fig. 3-7 Plan of the River Walk (Zunker)

The San Antonio River was originally a spring-fed meandering watercourse that flooded periodically. San Antonio City developed around the horseshoe bend in the river, the Paseo del Rio. As the city grew, peri-

odic flooding caused havoc and in 1921 a grim forecast became a reality with loss of life and damage to property. The scenic value of the river to the city was nearly lost when the authorities proposed to remove the bend in the river and pave over the downtown section of the river, to provide parking areas and to form storm-water drainage.

The vision

There was opposition to the proposal. The City Federation of Women's Club and the San Antonio Conservation Society led the fight to save the Big Bend area and preserve the natural channels of the river. It was suggested that the river banks be converted to a city park.

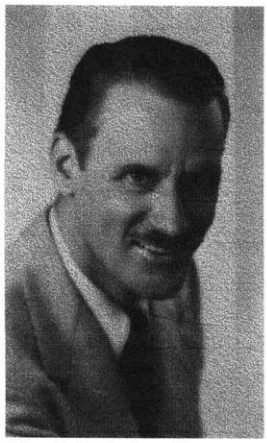

Fig. 3-8 Rober Hugman (Zunker)

The river park concept was also the dream of a young architect, Robert H.H. Hugman. He came up with a proposal to beautify the river, which he presented and discussed with the city's officials in 1929. The plan was called "The Shops of Aragon and Romula." He described the river as " the lazy little river with quaint old cobblestone streets of old world appeal, cabaret, court of roses, plazita, and gondolas of Venice."5

The river banks then were littered and its stream was sometimes foul. Hidden from view and used as backyard by many, the river was considered to be an undesirable element in the neighborhood. The deteriorating buildings along the river banks were a symbolic reminder of this negative community attitude. Conversely, several organizations such as the Conservation Society had advocated the preservation of the natural beauty of the river. Buttressed by a shared desire for finding a solution to the river's future, the group gathered.

In the proposal, Hugman pointed out the merits of promoting a unique river walk in the heart of the city, only a few blocks from the Alamo. He attempted to intrigue property owners with the economic advantages his plan would provide. He addressed city government with the advantages his plan would have for advertising the city and increasing the tourist industry. To the conservationists, he spoke of the preservation of history and the unique character of the river. He summed up his plan, "The shops, lighting effects, advertising -everything must be designed to created the right atmosphere. To do this, it will be necessary that we unite our interest. Will you work with me to this end?" (Zunker)

The plan to convert parts of the San Antonio River to the Shops of Aragon and Romula required considerable effort developing the concept. Although Hugman received positive reactions from numerous organizations in the early 1930s, including the city government, the depression made it difficult for any group to commit the necessary funds to beautify the river. But Hugman did not give up; he continued with his efforts to promote the San Antonio River as a viable part of the city's development and future.
He spent six years speaking to civic groups and businessmen to promote the river beautification project. In the *The San Antonio Light* October 15, 1935 issue he was quoted, " We have a priceless beauty spot in our river and could easily make it so that homes and even business places would be remodeled to face the river instead of turning their back doors to it" (Zunker)

Hugman was supported by many authorities. He claimed that the San Antonio Conservation Society was very instrumental in the development of the river as they convinced the city government to maintain the

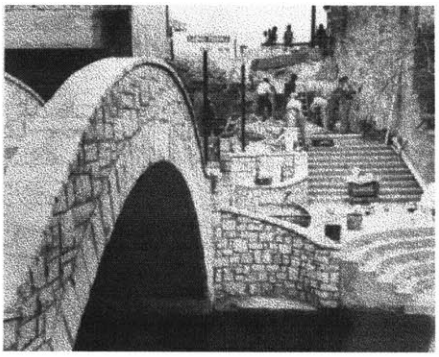

Fig. 3-8 Construction of stairway access to the River Walk from the street. (Zunker)

natural beauty of the river. Several other civic groups also joined the fight to support the beautification of the river such as the City Federation of Women's Club, the local chapter of the Daughters of the American Revolution, The San Antonio Advertising Club, and the Real Estate Board.

In late 1938, construction began and Hugman was employed as architect of the San Antonio River Beautification project. On March 14, 1941, the river beautification project came to an end. The total cost of the entire project was $430,000 of which the city spent $75,000. The area improved included 21 blocks, totalling 8,500 feet of river bank. Additional cypress trees as well as 11,000 other trees and shrubs were planted along the river edge. The city also installed 31 stairways, 21 bridges, 17,000 feet of walkways, artwork, fountains, and an amphitheater. (Garvin)

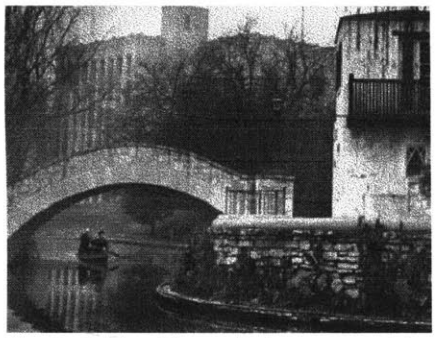

Fig. 3- 9 The Riverwalk became quiet and dangerous in the 1940s to 1950s. (Zunker)

However, the project was not successful in the beginning. Hugman was dismissed from his position in 1940 before the project was completed. Despite the fact that the area was much improved, only 3 restaurants were open on the river walk. During the next ten to fifteen years the river walk was ignored and also developed a tainted reputation. It became know as a dangerous area; derelicts had made it their home. For a period of time the river was declared off-limits to military personnel. Vandalism was prevalent and once again the river walk was proclaimed as a bad element of the downtown area.

The Rebirth of the Riverwalk

During the late 1950s and early 1960s, members of the Chamber of Commerce, the Department of Parks

and Recreation, and businessmen were instrumental in renewing an interest among the downtown busi

nessmen in the river walk. The San Antonio Chamber of Commerce was able to raise $15,000 which was matched by the City for a feasibility study to determine the appropriate use of the river bend area.

The River Walk District and The River Walk Advisory Commission were created in 1962. Working with the Chamber of Commerce, these groups elicited the aid of the San Antonio Chapter of the American Institute of Architects for preparing a developmental master plan for the river bend area. Eventually, the plans were submitted to property owners in this area for developing their own holdings.

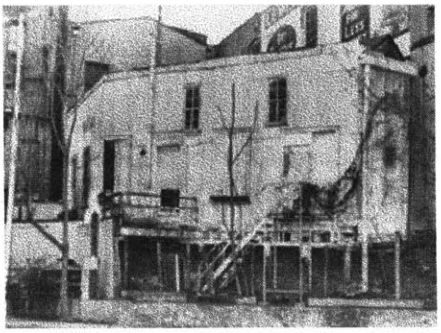

Fig. 3-10 Before: a building turns its back to the river. (Zunker)

Fig. 3-11 After: same building after alteration. (Zunker)

Approximately $500,000 for improving the river bend area was approved in a municipal improvement bond issued in January 1964. Shortly thereafter, the Chamber of Commerce founded the Paseo del Rio Association, consisting of property owners and businessmen along the river walk. Once again, a major effort to beautify the river walk began.

The River Walk Policy Manual was published to guide developers on matters of design, including concern for landscaping furniture, awnings, exterior cleanliness, refuse disposal, drainage and compliance with noise control. A River Walk Advisory Commission was established to approve preliminary plans before building permits could be issued.

The goal was to preserve and protect the distinctive character of the river, to review schemes that affect the visual impact of the River Walk area, and to advise the city authorities concerning applications for

Fig. 3-12 Before: another back door.. (Zunker)

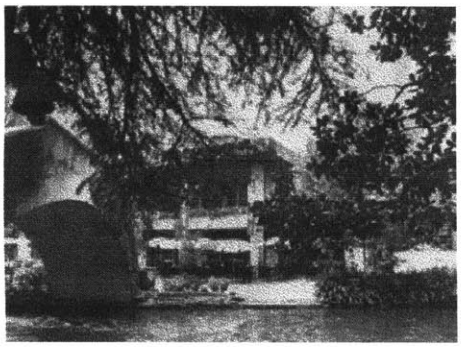

Fig. 3-13 After: turn into a river square (Zunker)

building permits and land use within the river bend. The guidelines are concerned with contracts such as the right to operate boats and barges for hire, permits for sidewalk vendors and registration of sidewalk entertainers. The design recommendations encourage the use of traditional materials (bricks, native limestone, painted brick, stucco and Mexican masonry products). Reference is made to roof form and materials used are copper, painted standing seam Terne, or galvanized iron (not corrugated), clay barrel or shingle tiles. The recommendations make suggestions for paneled or carved wood or painted steel windows, bronze anodized aluminum in preference to natural aluminum for storefronts, the use of wrought-iron, canvas awnings, louvered shutters, rough hewn wood beams and lintels. For landscaping, native trees (oaks, elms) were used in preference to cactus and palm trees, which also suggests an attempt to maintain a continuity of character.

Today, the San Antonio River corridor contains most of the city's major open spaces, cultural facilities and significant historic sites. With these efforts, Paseo del Rio developed the strong old world Mexican character that Hugman initially envisioned. The area gradually became more enlivened. As the project was completed, the rear sections of the area's underutilized commercial buildings became more attractive than their fronts. Stores and restaurants started to occupy the area. In 1968, a second channel was created to connect the Paseo with the convention center. There were 30 retail and tourist-oriented businesses that fronted the Riverwalk. A third channel, connecting the Paseo del Rio with the Alamo, was added in 1981.

Alexander Garvin described the success of the Paseo del Rio in his book,

"Today the Paseo del Rio is lined with outdoor cafes, shops, art galleries, bars, and hotels. City residents and office workers in large numbers walk by the tall cypress trees and dense banks of plants and flowers on their way to downtown appointments. Motor boats give guided tours to fascinated visitors. What had been a costly eyesore has become a profitable tourist attraction and an attractive setting for new real estate development." (Garvin, *The American City: What Works, What Doesn't*)

Design Features and Program


Fig. 3-14 A cafe by the river

Paseo del Rio is 20 feet (6m) lower than the busy streets of the surrounding city. The level difference provides the corridor with a strong sense of enclosure and in the summer the presence of the water makes the river walk 10 degrees cooler than the streets above. This gives the river a distinct quality of being isolated from vehicular traffic, a rare feature in American cities and a quality more associated with theme parks.

The river traffic is relaxed. The majority of tourist boats consist of wide barges for dining and music in the evening, with a buffet, bar and guitarist at one end. The dining boat glides along the river, occasionally drawing alongside the candlelit riverside restaurants. The quiet leisurely mobility provided by the river is used to great effect. The evening lighting and music-embellished terraces are protected from a view of empty shopping streets. The canyon river corridor form creates an exclusive ambience.

At the same time, the river walks, restaurants, terraces and sheltered landscaping are visible from the bridges and sections of the adjoining street pavement. The buildings enclosing the river corridor are varied; landing terraces, historic structures, institutional buildings,

an open-air theater, and hotels. The process of extending the river corridor to existing historic buildings and amenities is exemplified by the water features and cascades that provide a new link from the river near the Hyatt Hotel to the eighteen-century Alamo chapel.

Implementation and Success

A public-private partnership was formed between the city and the hotel developer for the project, and the scheme includes a parking garage, restaurant space and a plaza. As the street level at Alamo Plaza is rather higher than the river, the linkage includes a descending water feature starting as a fountain at Alamo Plaza, moving through a series of small falls and cascades to a pool in the atrium of the hotel, achieving the appearance of an extension to the river. The design of the Hyatt Hotel also includes a series of gardens and platforms, terraced up from the river walk.

Following the success of the first phase, there were later additions. Today, Paseo del Rio is flocked with tourists all year round. Currently, there are proposals to construct an extension river walk to relieve the congestion in the Paseo del Rio.

The Paseo del Rio in San Antonio is separated from urban congestion. At the same time and on its own terms, links are being created with significant parts of the city as the river corridor is extended and used to generate urban renewal.

Japan Example

Japan is one of the countries that used to have intact waterway systems within its cities. Although most of the waterways have been filled in as a result of motorization, such as in Tokyo, once a thriving canal city, the system still exists in many parts of Japan. In the 1980s, there was a movement to save severely polluted canals in many cites and reinstate them for their amenity value. Yanagawa was one of these cities.

Yanagawa Case Study

History

The canal network of Yanagawa fell into disuse and became increasingly contaminated during the post-war period. It was destined to be filled-in, but instead, the plan to fill in the canals was abandoned, the canals were reanimated, and the beautiful water-side space was revived by the residents. In recent years the Yanagawa movement has had a great impact on the history of town-building in Japan.

Yanagawa is a small city in the Kyushu region in the south of Japan. It was built under severe natural conditions as the area of the city was in the marshland near the Ariake Sea. The tide range reaches a maximum of 6.5 meters and is effectively utilized to supply water constantly to waterways stretching to every corner of the city.

In the 17th and 18th centuries, the network of canals in Yanagawa played an important role in protecting the castle and towns from enemy invasion. At the same time, the waterway was effective in protecting the town from flood damage. The canals also played

an important role in transporting people and goods by boat, providing drainage for domestic wastewater and supplying drinking and domestic water. In addition, the earth and sand excavated from the canals were used to build embankments for land improvements. Fishing developed with the practice of sailing out at low tide and sailing back at high tide, taking advantage of the tide range. The people of Yanagawa are familiar with water in the natural environment, and they have both controlled water and exploited it in the service of the economy and life of the city. Yanagawa represents a good example of coexistence with water and it is a beautiful waterside city.

The residents of Yanagawa differentiate the freshwater canals running through the city area from the real river that contains seawater by calling the former "rivers" and the latter "seawater river." The characteristics of the community of Yanagawa can be found in these names for the water. A linear community could be said to have formed around the axis of freshwater canals running through the city. As long as this structure of waterways exists, the traditional community will also continue to live.

Yanagawa has maintained its close relationship with water in all aspects including culture, economy and living. This is most symbolically shown through the fact that many shrines have approaches from the waterways.

In Yanagawa, there are also many traditional gardens that make use of water from the canals. However, Tetsushi Okamoto, a Japanese planner, feels that what constitutes the waterways landscape in Yanagawa is in fact its residential area, as he describes in *Aquapolis*,

"Stepping into the back streets during a walk through the

lively shopping area, one fines waterways running in every direction and a quiet atmosphere even now. There remain warehouses which are not used any longer and stone steps built for bringing in cargoes from the waterways. These stone steps are seen all over the town, and tell us that goods were transported over the waterways in those days. This water-side space, which has now become the back side of the town, has a nostalgic appeal." (Okamoto)

Since 1970, the ancient waterway system in Yanagawa has faced a severe challenge. Affected by motorization from the early 1960s, the city's structure has changed. Canals in many cities in Japan were filled-in to make roads. And Yanagawa, too, was affected as the mode of transportation shifted from boats to automobiles.

Until the1930s, drinking water came mostly from the canals, but modernization of the water infrastructure made people forget about taking care of their natural water sources. During the postwar period, Yanagawa's water supply in the waterway deteriorated markedly. This was partly due to the delay in constructing a sewer system.

Implementation and Success

At the beginning of the1970s, all kinds of refuse were dumped and consequently piled up in the waterway that ran through the City. The City decided to fill in the canals but Hiromatsu Tsutae, a city official who was in charge of the sewer project did not agree with the plan. He took the initiative to explain to the mayor the importance of canals and the need to revitalize them. Impressed by Tsutae's enthusiasm, the mayor gave Tsutae a grace period of six months.

During this period he conducted a survey of the canals. Encouraged by the findings that fresh water was still flowing unobserved as an undercurrent on the canal bed despite the bad smell of the piled-up refuse, Tsutae launched a campaign to support canal revitalization work. He led employees from the city office into the filthy water of the canals, dredged the bottoms, and removed the refuse. Before long, this activity expanded to a movement involving the citizens, and many townspeople participated as volunteers.

Yanagawa came to life again and its experience was made into a film, "A Story of Yanagawa's Canals", which has been repeatedly shown throughout Japan and has made a great impression on many people.

The success of Yanagawa, a result of the united efforts of residents, has become an incentive for administrative measures and civil monuments related to the water environment in various parts of Japan. With the revival of the canals, Yanagawa has not only regained an excellent living environment for its citizens, but its charm has also attracted a large number of tourists, thereby giving the city's economy a boost.

Observation and Lessons Learned from the Precedents

Institutional lessons

From the 3 precedents discussed in this chapter, it is clear that success always begins with a clear and strong vision. And a vision could not be brought into reality if there were no continuing processes--a main ingredient especially in the cases of San Antonio and Yanagawa is persistence.

In San Antonio, the wonderful Paseo del Rio would not have been conceptualized if it had not been because of Robert Hugman. Because he came up with a vision to transform the Horseshoe Bend of the San Antonio River into what it is today and persuaded many constituencies to support his ideas, a distinctive character for San Antonio was developed.

In Yanagawa the canals would also have been filled if it had not been for Tsutae who developed a vision for Yanagawa and successfully convinced the authorities to accept his idea. As a result, today the canals are now the distinctive character of the city.

But no matter how strong the vision is, it could not overcome one harsh reality-the economic situation. As the United States was experiencing the Great Depression, Hugman had to carry his enthusiasm through for 10 years. The transformation of Birmingham was delayed many years due to economic hardship. Development could occur only at the right time.

Besides a vision and the right timing, what these 3

precedents have in common is the support from many constituencies and a person or an organization that takes the leading role. In Yanagawa, as the locals gave full support and helped Tsutae physically in his canal clean up initiative, the results were the product of the community in which they all took pride.

As Hugman won a consensus from the constituencies involved, ranging from property owners, and conservationists to the city government, in the planning for the Horseshoe Bend, the project began to take shape. But when Hugman was dismissed from his duty, the project fell apart for more than 20 years until a commission for the Riverwalk was formed. As a result, the fund raised through municipal bonds enabled the project could come to life.

For the Brindleyplace project, the development process was not complicated as the development structure and responsibilities were clear. The Birmingham City Council worked closely with the British Waterways and the developers and their commitment was very strong. They all shared the same goal: to make Brindleyplace a lively place with the canals as the main feature which would finally result in a rejuvenation of the city.

The financial approach used by the Riverwalk and Brindleyplace projects is an interesting model for a large-scale development. In both projects, a public-private partnership was formed. Thus, an investment which neither developers nor local authorities alone can typically afford became affordable.

Physical lessons

In terms of physical results, an approach shared by the precedents is integration into the existing

city fabric. The Paseo del Rio has more than access at 40 points from the streets. The later additions incorporated the Paseo del Rio into the downtown of San Antonio and other tourist sites. The two sides are lined with shops, restaurants, and hotels creating pedestrian activities. Local people also use it as a route to work and shop.

The design of Brindleyplace also tries to forge links between the project and the city center as the location of buildings and entrances is carefully planned to integrate with its surroundings. The promotion of pedestrian environment is at the top list of the urban design principles.

The degree of pedestrian uses is also enhanced in the Paseo del Rio and Brindleyplace by the mix of uses. Both projects have diversity of uses from residential, offices, shops, restaurants to bars, and pubs. These activities generate uses beyond just daytime and weekdays. In the other extreme, the lessons from San Antonio's river walk in the 1940s show that even once the riverside was transformed into pleasant walkways with trees and benches added, the area could be a dangerous place because it was isolated and there were no other uses along the sides.

For the Paseo del Rio and Brindleyplace projects, there are guidelines that controlled construction in the area. Despite Hugman's concern that the Riverwalk would turn into a boat canal or a creek if big projects were allowed in the area, the later additions of the Convention Center, a shopping mall, and hotels proved to be not harmful to its distinctive character as they were done cautiously. Instead,

these later additions helped strengthen the character of the Riverwalk and did not interfere with the human scale that he envisioned.

The quality that all the three examples share is the enclosure of space. The Yanagawa canals, Brindleyplace, and Paseo del Rio are all shielded either by buildings or trees from traffic on the streets outside. The quality of these waterways areas is also accentuated by the movement of tourist boats that animate the place.

Conclusion

These three cases demonstrate dramatic transformations of waterways that helped rejuvenate the city, an even more significant achievement. It will take no less than a strong vision and enthusiasm at the right time, a collaboration of different constituencies, and a financially sound and good physical design with respect to the surroundings to make a successful urban transformation.

Chapter 4
Urban Design Opportunities for Urban Waterways

As can be seen in the ideas for waterways from chapter 2 and in the lessons of the transformed water channel precedents in chapter 3, there are many opportunities and possible roles for Bangkok urban waterways. These opportunities can be usefully categorized into four groups:

1. *Waterways as transportation routes*
2. *Waterways as ecological greenways*
3. *Waterways as distinctive characteristic of the city*
4. *Waterways as development magnets*

These approaches to developing urban waterways are not mutually exclusive. A waterway might have many different roles, and where it is possible to take on more than one role, this should be done.

1. Waterways as Transportation Routes

In *Cities on Water and Transport*, it is suggested that in places with urban waterway networks, the city should attempt to use the network as another urban transportation alternative (Bruttomesso). Especially in those cities with traffic congestion and limited road expansion capacity, using waterways as a mean of mass public transportation should be seriously considered.

Among places with intact systems of waterways, certainly the best known is Venice where canals are the only 'vehicle streets' in the city, an extremely rare case in urban settings. However, there are also some places where urban waterways are used for transportation

routes in conjunction with land transportation such as in Amsterdam and Bangkok. In the latter case, Bangkok has been trying to cope with its notorious traffic jams. Its existing network of canals may well be among the best solutions to the problem. However, there are still many limitations on the extent to which the canals can be used for transportation in Bangkok. Of the 250 canals in the city, 100 are navigable but only 7 currently used as a mean of public transportation. (Lelahajeva)

From chapter 2, Lelahajeva, Bunnak et al, and various participants in the Canal Symposium such as M.R. Charnvut Varavan, Professor Krisda Arunvongse, and Suvit Rasmiputhi suggested that Bangkok consider reusing its khlongs as travel routes. This is not for a nostalgic reason, but for a functional reason— to reduce traveling time. The most efficient use would be for mass water transportation.

According to Arunvongse, the main factors constraining the usability of these waterways for mass water transportation are the width and depth of the canals, the height of the bridges, the water level, and the locks (Arunvongse). In Lelahajeva's thesis, she also suggested upgrading the water bus service, access to the canals, and canal routes that would reach into the existing community patterns, where the demand for public transportation would be highest. (Lelahajeva)

Summing up, there are several generic approaches to using urban waterways as mass transportation routes:

Individual Canal level Studies

A. Improving the transportation capacity of the waterways.

The extent to which a waterway can be used as a sound route for mass water transportation depends on its navigability by bigger boats. Therefore the design of the waterway's elements is extremely important, particularly the width and depth of the waterway, the waterway's edge, and the bridges' heights.

The time efficiency of travel is another important issue since the system should be able to compete favorably with land transportation. The biggest issue here is the number and efficiency of locks.

* The width and depth of the waterways.
To allow an efficient mass transportation system, water buses should have enough passenger carrying capacity and should run frequently (Arunvongse). These two factors depend on the demand pattern. The waterway must be wide enough to accommodate two-way boat traffic unless a one way loop is functionally and economically feasible. Waterways that do not have enough width and depth for two-way water bus traffic must be widened and dredged5.

* The waterway's edges.
Due to the high speed of a water bus, the waterway's edges are subject to erosion from the wakes of boats. Natural edges are more vulnerable to erosion. Thus, retaining walls should be constructed along the edges by using durable materials.

* Bridges

While many bridges add nice features to the waterways, sometimes they are obstructions to larger boat traffic. The decks of the bridges across transportation corridors should be of sufficient height to allow boats to pass through easily. In case of obstruction of designated water bus routes, the bridges must be raised. However, bridges with higher decks are more costly and harder for cars to cross. Thus, the decision on the heights of bridges should be planned in accordance with land traffic patterns.

* Locks

It is very important that the water level remain high enough for boats to run along the waterways. Thus locks are required to maintain the water level, especially in places where high and low tides are very different. However, the locations of the locks must be planned not to obstruct the water bus routes since it takes more than half an hour to go through a lock (Lelahajeva).

B. Improving the water transportation services

One way to make a mass water transportation feasible is to increase ridership. Improving efficiency, reliability, and safety of water transportation service to the level of regular bus service will attract more passengers to use the water bus. (*Bangkok Post*, June 12, 1996)

* Ability to accommodate passengers' demand

Like land public transportation, in order for water transportation to meet the demand of passengers, the frequency of boats must be enough to accommodate a

large number of passengers, especially during rush hours. The boat size is also an important factor in the capacity of transportation system.

The smaller the water buses, the more frequently they must run.

* Safety

The water bus in Khlong San Saeb in Bangkok known among Bangkok commuters as the 'boat that would never stop' (*Bangkok Post,* June 12, 1996)--it only slows down enough to allow people to jump on and off the boat. Passengers have to jump down to the boats or up to the poorly designed loading docks that do not correspond to the boats' height. Many workers have to go back home in the morning after they fall into the water, which is known to have the most offensive smell.

In order to make water transportation a viable alternative, safety must be enforced. Loading docks must be designed to allow easy boarding onto the boats; and the boats must stop completely at loading docks. The docks must also be designed to carry large numbers of waiting passengers. Water bus stops should be designed to allow the easy flow of passengers in order not to overload the docks.

Boat collisions are another major concern (Tanaburioon). To prevent accidents, occur mostly between parked and moving boats, space should be set aside for boats to park, so as not to be in the way of traffic.

C. Improving the water bus stations

Water bus stations are key locations which will have considerable influence on the attractiveness of using the water transportation system. In Bangkok, water bus stations are mostly hidden and are not easily accessible from other transportation systems. The facilities are also run down and rarely provide amenities for passengers.

To attract more water bus users, improvements to the water bus stations must be made including: accessibility and visibility from the streets, 'legibility' of the stations, connections to other transit systems, safety in the stations, and amenities such as public toilets, benches, and shade for the passengers.

* Accessibility and visibility from the streets
Water bus stations should be located where it is convenient for passengers to make connections to the other means of transportation. They should be close to other transit stops and easily accessible and visible from the streets.

* Visibility of the loading docks from the boats and signage
Traveling by waterbus is a different experience from traveling on regular streets. While the many waterways provide passengers with a cooler, shadier, quieter, and less chaotic atmosphere, some passengers might feel lost if they cannot establish connections to the outside world. Thus, a strong connection/ association to the streets and areas/ districts outside must be strongly established to create confidence in water bus users. Actions required include: making loading docks easily visible from the boats and installing legible signage along the water bus routes.

* Safety

All water bus stations must be safe in order to be able to attract a wide range of passengers. Currently, many water bus stations in Bangkok are below street level or in hidden areas which are more susceptible to crime. Ideally, the stations should be located in more active

areas where there are activities taking place throughout the water bus operating hours. Keeping the stations well-lit at night and orienting the buildings in the areas to 'keep an eye on the station' can be useful strategies.

* Amenities for passengers

Amenities that should be provided for passengers in water bus stations are: shelter from the weather (rain, sun, or snow) and seats in the waiting areas. More generous schemes might consider including other supporting facilities such as toilets and magazine or refreshment stalls.

Regional Canal Level Studies

The extent to which the waterway system will be used also depends on regional functionality (Lelahajeva). The number of passengers must be large enough to justify new water bus lines and the cost of making improvements to the waterways. Thus, mass water transportation routes must be carefully planned to serve the areas where the demand is sufficiently high, especially between residential and commercial (office and shopping) areas.

In addition to route planning, the waterway system should be restructured to provide an effective mass transportation system and should be incorporated into

the transportation masterplans. Where plausible, widening the waterways should be considered.

2. Waterways as Ecological Greenways

Michael Hough in his book, *City Form and Natural Process*, has pointed out the ways to utilize canals in urban areas as 'communication links.' He suggested that they could provide physical and biological links through the city. In some cases, their location in the city makes them the best routes between destinations. In such cases they should incorporate essential linkages. They provide opportunities for cycle and pedestrian access to link residential communities, parks, schools, and commercial areas. They should be integrated into the open space planning network of the city. (Hough)

Thus waterway networks in urban areas are extremely useful as tools to improve urban ecology and the well being of the people in the city. While the most basic function that still exists in many cities is to collect drainage and run-off as parts of a flood protection plan, their functionality could be increased greatly if they were well exploited. Building on the ideas from Hough, Lelahajeva, and MIT, there are many opportunities to use the canal to enhance the quality of urban ecology and the quality of life include providing cities with park systems of recreational and cultural areas.

A. Collecting run off as part of flood prevention

An ecologically oriented design should be applied to preserve water quality. In her thesis, Lelahajeva suggested canals be used as a flood protection device by linking them together (Lelahajeva). In the *Bangkok*

Plan, MIT suggested that the area by the canal be used as detention basin to collect and filter the run-off (MIT). Building on the green corridor idea of Hough, the waterway network of Bangkok demonstrates the potential to to improve the ecological aspects of Bangkok, both reducing pollution and the severity of the flooding problem.

According to Hough, waterside uses that contaminate the water should be removed and the edge should be re-landscaped with plants to filter the water before it is absorbed into the ground. Softscape and perforated paving surfaces are more desirable than hardscape and impervious paving surfaces as pervious surfaces help reduce the amount of the run-off that will go directly to the waterways, thus slowing the rate of flooding.

As the flood problem in Bangkok could be very severe, the widening and dredging of waterways could also increase the capacity of the drainage network, providing a plausible reason for land acquisition along waterways in urban areas.

B. Provide park systems and recreation opportunities within the city

In places like San Antonio's Riverwalk, the waterway was planned not only to provide its visitors with shops and restaurants but also with a system of linked shady walkways which have proven to be very successful. Planning the urban waterways network as a park system would provide more pleasant connected walking routes and cleaner air within the city (Hough). Water is always an attractive amenity, especially in hot countries like Thailand where the waterside is even more desirable as it cools down the temperature.

Besides creating urban waterside parks, urban waterways can also be used as recreation facilities themselves, such as for boating, rowing, and fishing. These activities could work even in smaller waterways and will create significantly more recreational opportunities in the city. People would not have to travel too far as they could find leisure activities closer to their homes (*British Waterways Handbook*). Some features in the waterways such as fountains could help to further lower the temperature while adding oxygen to the water and purifying it, allowing more fish to survive in the waterways.

Some amenities such as benches, drinking fountains, bins, or refreshment stalls could help make the waterway park more pleasing (Wylson).

With urban parks, safety is extremely important; thus, the design must not disregard this issue. The lesson from San Antonio shows that even a pleasant strip river walk could be perceived as dangerous if it is deserted and has no occupied buildings that face the park. (*Metropolis*) Thus for safety reasons, buildings should have one of their major sides facing the walkway and the area should have more open access to this walkway.

3. Waterways as Distinct Character of the City

In both Birmingham and San Antonio, the distinctive character of the waterways is associated with local identity and the history of the waterway is connected to the place, and the activities generated in the area.

In many cities such as Amsterdam and Venice, water enhances the character of the city. Even in places where waterways were symbols of decline such as Birmingham and San Antonio, the once neglected canals have been transformed into wonderful features that attract many tourists into the city because of their originality.

The design of Birmingham waterfronts and the Paseo del Rio share one major aspect— the local design elements of the waterway and the city. For Paseo del Rio, guidelines for elements, forms, materials and colors have been drawn up and have to be followed strictly in order to retain the old world Mexican feel of the place (Wylson). In Birmingham waterfronts, the well preserved historic buildings and the canal elements such as locks and warehouses make the place identifiable as a canal town (Sparks).

However, to retain this distinctive character, the functions of the waterside buildings and the waterways need not be the same. In Birmingham, old canal buildings have been adapted to be restaurants and pubs (Breen). The canals are no longer used for freight transportation, but for tourist boats that move slowly and enjoy the amenity of the water.

The distinctive quality of waterside space differs from place to place, depending on local identity and the relationship of the people to the water. In the Rattanakosin Masterplan by the Sincron Group, the character of the Thai waterside space was very well conceived. The plan suggested setting aside canal side area for cultural activities because water plays a big role in many local festivities such as Loy Kratong and Songkran.

Enhancing the character of the city by using waterways could be achieved at three levels: first by site planning, second by waterwayscape improvement, and third by generation of activities in the area.

A. Site Planning

Improved site planning is a very important approach to any waterways corridor transformation. In many places, such as Bangkok, canal-side buildings turn their backs to the canals, some owners put fences on the property line between the canals and their land, some deliberately locate their parking structures or parking lots by the canal side. Without recognizing the aesthetic potentials of the waterways, the ill-advised locations and orientations of buildings are major problems to be solved in site planning and design.

There are other big problems concerning canal-side structures in Bangkok. Many canal-sides are lined with low quality rundown buildings that do not have any architectural value. In some parts of the canals there are squatters intruding directly onto the waterways.

To use the urban waterways corridor to bring back the distinctive feature of Bangkok, these structures should be removed or reorganized in a way that will produce a pleasant environment for the corridor. Also, at least in every community by the waterway, a public space by the water should be provided to set the stage for cultural activities.

Actions might include land readjustment, land sharing, consolidating activities, and façade improvements to readdress the waterways as their front yards.

However, there are serious questions to be answered: how can we remove these eyesores and how can we

relocate or reorganize activities in such a limited space? Is it justifiable to evict businesses and people

from where they live? Spending money on canal corridor conservation alone is not a sufficient justification (Arunvongse). There needs to be a more convincing answer to these questions.

B. Waterwayscape Improvements

Waterwayscape improvements include landscape and graphic improvements. Landscape improvements might include planting, paving the canal walks, and provision of other waterwayscape furniture such as lighting, and so on. Graphic improvements might include signage controls and burying utility lines underground to eliminate the visual chaos of the waterway corridors.

All these features should be designed together to produce a nice and consistent overall scheme for the whole length of the corridor. An example of this approach is the Riverwalk in San Antonio where all developments are forced to comply with the elaborately written waterwayscape design code. The result is a dramatic waterway corridor that is, perhaps, the best known feature of the city.

C. Generation of Water-Related Activities

Generation of activities in the revitalized waterfronts helps bring life back to the area, such as in the Paseo del Rio and the Birmingham waterfronts. Besides enlivening the area, these activities can also help maintain the waterways. As there are activities to at

tract people, people recognize the water more and feel the importance of the revitalization efforts. As people perceive the water as an amenity, they tend to take better care of it. (Arunvongse)

4. Waterways as Development Magnets

Water is always a magnet for people. In many large scale development projects, waterways are used as a main feature such as Brindleyplace, Birmingham and the Riverwalk, San Antonio.

Besides having this unique feature, large-scale development projects along the waterway corridor have considerable potential. First, they could attract new development to underutilized land along the waterfronts. Second, they will allow fully integrated commercial, entertainment, civic and residential uses. Third, they will set a precedent for future projects on the waterways.

In any case, large mixed-use redevelopment projects provide new opportunities for the waterways. They can attract a critical mass of quality development to underutilized or neglected areas and enliven them with 24 hour activities, making waterways even more attractive to use (Bruttomesso).

However, there is a main issue concerning this approach: how can new development projects coexist with existing development in the same area? As a large-scale redevelopment project is anchored in one part of the waterway, the property values will certainly rise making current marginal uses more difficult to sustain.

Another issue that might be raised from the precedents is the possibility of overcommercialization, an issue that the Riverwalk is now facing. Essentially, the project becomes another open-air shopping mall with other functions added to it, decorated cosmetic local features. The appearance of the architecture and open space not withstanding, there is no uniqueness in the place.

The best case scenario is that the redevelopment project will help improve the surrounding areas and coexist with them in harmony; each having its own character. But the worst case scenario might be that the property values keep escalating and start to affect the surrounding areas, posing a threat to the surrounding communities and businesses. They might be forced to leave and be replaced by other more profitable activities that are more 'suitable' to the new area.

Integrated Approach

All of the four approaches suggest possible roles for waterways in the city. However, planning for a waterway should not take only one approach into consideration while disregarding the others. One approach might work best to solve problems in one area but neglect other possibilities that could have taken place if the other approaches were adopted.

For example, in the transportation approach, a lot of attention is put on efficiency of the system by widening the waterways, but the human factor is overlooked. The strip park creation scheme may consider humanizing the space more than the transportation scheme, but the feasibility of redevelping the whole waterway

corridor to become just parks is questionable, as it does not provide any financial return to the city. A large-scale redevelopment scheme might be more feasible in the economic sense, but the project would not attract visitors other than from the street side if the waterway corridors are still not a safe, pleasant place to walk.

Because opportunities and constraints vary for each waterway corridor, the treatment of each of them should certainly be different. However, most waterway corridor planning efforts should try every opportunities to find what would best suit to their potential and their needs.

PART III
KHLONG ROP KRUNG

I have selected Khlong Rop Krung as a representative case study for Bangkok's canals and I will use it as a stage to test urban design applications. In this part, roles developed in the previous chapters will be applied to Khlong Rop Krung.

Khlong Rop Krung, besides being considered one of the most important canals in Bangkok, is among the canals that have faced the most serious threats. Nowadays, it shares most of the problems common to other urban waterways ranging from neglect, misuse, intrusion, and water pollution, to producing a bad image for the city. These problems have accumulated over the years and the issues have become more complex.

Khlong Rop Krung's history is recounted in Chapter 5 to provide a basic understanding not only of its deep-rooted problems but also of its importance to the city. Through its changing physical form, policies, and actions, I will examine these issues by focusing on its ever-shifting roles to the City over time.

In chapter 6, the current conditions of Khlong Rop Krung and its environs are discussed, with a focus on existing problems and development potentials. In chapter 7, a generic design approaches (from chapter 4) will be applied to a selected stretch of Khlong Rop Krung and will be evaluated.

Fig. 5-1 Khlong Rop Krung at Mahagarn Junction (with the Golden Mountain at the back)

Chapter 5
Khlong Rop Krung In History

Khlong Rop Krung is an old canal located in the historic part of Bangkok. The canal was dug in 1873 as the city moat when Bangkok was being established as the capital city of Thailand. A city wall was built along this canal and the Chao Phraya River to further enforce the city's defense. The whole city was contained within the city walls. There were 16 formal gates; seven led across the Khlong Rop Krung.

Originally, Khlong Rop Krung was 2.9 kilometers long, 24 meters wide, and 3.5 meters deep. It was dug to join two natural canals together: one upstream to the north, Khlong Bang Lamphu, and one downstream to the south, Khlong Ong Ang. Linked together, the canal system was then formally named 'Khlong Rop Krung', which could be translated literally as 'canal around the city'. However, Khlong Bang Lamphu and Khlong Ong Ang are still the more familiar names to most people.

Although Khlong Rop Krung was a rather short canal system, each of its different sections has embodied dramatically different characteristics since its earliest days.

Early Rattanakosin Period (1782-1851)

Historically, the northern part of the Khlong Bang Lamphu area was full of dense vegetation and wild creatures such as snakes, crocodiles and monkeys.

There is evidence that a floating market existed on the canal but it was not nearly as active as the other ones since there were not many settlements in the area—either on land or on water. Even in the 1820s, the area was still very underdeveloped as a well-known Thai urban historian, Thepchu Tapthong, reflected in the *Letter of Rattanakosin*, "The area was so quiet that a man was eaten by a crocodile while he was swimming in Khlong Bang Lamphu." (Tupthong)

At the other extreme, at the southern end of Khlong Rop Krung, the area around Khlong Ong Ang has been one of the busiest areas of the city for the last two centuries. The northern end where it meets with Khlong Bang Lamphu was a big junction where Khlong Mahanaga originated. This area was perceived as the main gate to the city; thus, the Mahanaga Junction was bustling with settlements along the edges of the canals-either on land, boats, or even rafts. One of Bangkok's biggest floating markets was also located at this junction. (Saksri et al)

Located further down Khlong Ong Ang, was another densely inhabited area by Pratu Phee. Literally meaning 'the ghost door', Pratu Phee was a specially designated gate where dead bodies were carried out of the city to be cremated at the nearby temple outside the city wall. Despite the name and what took place there, communities with markets thrived along both sides of the city wall.

The busiest part of the Khlong Rop Krung stretch was by Saphan Han (or the turning bridge) and further down, where the city gate welcome the people going in and out of the city every day. At the time, there was only one bridge that linked the outside of the city to the inside. This area outside the city wall was the


Fig. 5-1 Saphan Han in the early 1900s

largest Chinese community—the only area with specialty and exotic goods such as silk from China and India, cigarettes, perfume and so on. To the south, at the mouth of Khlong Rop Krung, was another thriving floating market famous for selling pots and jars, from which Khlong Ong Ang-directly translated as 'canal of pots and jars—got its name.

Over time more canals were dug for other purposes, such as for transportation, defense and irrigation. An intricate network of canals was formed both inside and outside the city wall. Khlong Rop Krung then became a center of both transportation and commercial activities.

Besides serving as the city moat, Khlong Rop Krung had roles similar to those of other canals of its time. It was not only heavily used by boats as a 'water street' but also served as an address for many floating households that resided on the canal itself. The water was used as a source for drinking and for food (such as fish and shrimp) as well as for bathing and for collecting refuse from the residences. Occasionally, there were King's processions around the city, and Khlong Rop Krung was one of his highness's major routes.

The Modern Era (1851-1957): the Peak of Khlong Rop Krung?

As the city grew, the area around Khlong Bang Lamphu became a more popular location for residences and businesses. By the 1850s a large community of Thai people settled in the Bang Lamphu district. The population was so large that a large temple Wat Bawonnivet Viharn and a big market, Talaad Yod, were built in the area (Saksri et al). Bang Lamphu had developed its

own reputation as a fashionable garment district.

On the Khlong Ong Ang stretch, the commercial activities and interaction inside and outside of the city wall at Saphan Han became even more intense. A new Indian market, Pahurat, was built within the city wall directly opposite the old Chinese Market, Sampeng. The area was very popular for people of all ages. While the Indian market attracted female shoppers with its large supply of fabric selections from Europe and India, the Chinese market drew mostly men into their 'fun houses' and opium halls. The children were also entertained, as there were many puppet theaters playing day and night (Tupthong).

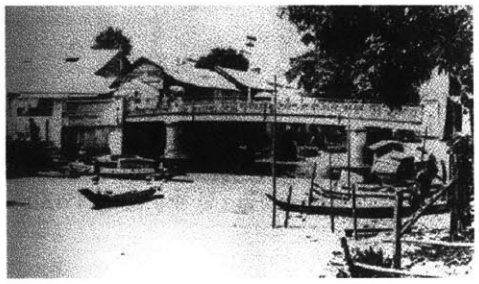

Fig. 5-3 Saphan Lek in the 1910s. (Tupthong)

In 1920, two roads were constructed parallel to both sides of Khlong Rop Krung and the areas became more dense through newer settlements. Although there were streets, canals were still a popular mode of transportation. The newer buildings still addressed Khlong Rop Krung as an 'other front of the house'.

Fig. 5-4 Baan Dok Mai in the 1930s (Tupthong)

From 1957 to Present Day: the Death or the Rebirth of Khlong Rop Krung?

Following the age of motorization, the canal system began to fall into disuse and Khlong Rop Krung was no exception. Poor quality "row houses" began to fill up the frontage along Khlong Rop Krung. Since Khlong Rop Krung was neither pleasing physically (dirty and bad smell) nor a viable transportation route, there

was no reason that these row houses would want to face it.

In 1967, the government named Khlong Rop Krung

as a national heritage site under the protection of the Department of Archaeology. (Department of Archaelogy) Ironically, not long after, the city signed a contract to rent the area on both sides of Khlong Ong Ang to Bunyapanluck Company to turn into a retail market, where stalls that were evicted from the nearby Khlong Tom Market would be relocated. Later the city began construction on both sides of the canal to provide the rental space. (Institute of Environmental Research) The structure included bridges with very low decks filled with shops over the canal at an interval of 10 meters. These intrusive structures reduced the effective width of the canal to only 7 meters, making it impossible for boats to go through.

To further add insult to injury, during the 1970s there was a plan to build an elevated mass transit system in Bangkok and Thonburi and Khlong Rop Krung was designated as part of the main route. The plan suggested building rails over the whole length of the Khlong Ong Ang (Sincron). Fortunately the plan did not go through, as there was a strong opposition from many parties who believed that the new transit will be a visual obstruction to many historic sites.

However, Khlong Rop Krung was not able to escape from other threats. In 1980, the Electric Generator Authority of Thailand (EGAT) needed to string new high voltage electric lines across the old city area, Khlong Ong Ang was picked as 'a perfect site for hiding not such a wonderful sight at an incredibly low cost.' As Khlong Rop Krung was perceived as an ordinary polluted canal, EGAT did not know that they needed to ask for permission from the Department of Archaeology. However, no one was punished from this 'unintentional' unlawful action (Rasmiputhi). Today, in 1998, gigantic 8 story steel-structured posts

still stand in Khlong Ong Ang every 10 meters.

In January 1998 there was a one-day event, held by the Bangkok Metropolitan Administration with the collaboration of residents in the area. The event was held in an attempt to encourage more people to come visit the area by organizing a street fair and using the history of the neighborhood as the main focus. Surprisingly Khlong Ong Ang, which was a major component of the lives of the people in the area, was not included in the plan, which might be because it is not very visually pleasing at the moment. However, Khlong Rop Krung came up as a fond memory to many people. In the January 20th, 1998, issue of the *Bangkok Post*, there was an article on the event with interviews of long-time residents of the Bang Lamphu area. One of them, Suprawat Pattamasutra, who spent his childhood and teenage years in the area, remembered, "Fifty years ago my friends and I always played in this canal."

Now that the construction of the central sewage treatment plant is almost finished, the water has a chance to be clean again.

Chapter 6 Khlong Rop Krung Today: Problems and Prospects

The purpose of this chapter is to assess planning opportunities for Khlong Rop Krung by examining aspects that might affect the development potential of the area. It will first consider Khlong Rop Krung in two stages: first it will look at the bigger picture to provide an understanding of the relationship of the Khlong Rop Krung area to the city as a whole; then it will look more closely at the present conditions and the physical attributes of Khlong Rop Krung. These 2 stages of investigation are intended to determine the advantages and disadvantages of using this canal as a site to be developed according to the schemes suggested in Chapter 4.

Fig. 6-1 Khlong Rop Krung from Golden Mountain

Overview of Khlong Rop Krung Areas at Present

The Macro View: Khlong Rop Krung and the City

Khlong Rop Krung Neighborhoods as a Part of the City

Over the last fifty years Bangkok has dramatically expanded in all directions. While the city structure has changed tremendously, the dynamics of the areas around the Khlong Rop Krung have not changed as greatly. Although the center of economic activity has moved further east to the Silom and Sukhumvit areas, and suburban shopping malls have been mushrooming, the areas around Khlong Rop Krung are still thriving with commercial activities that have been the

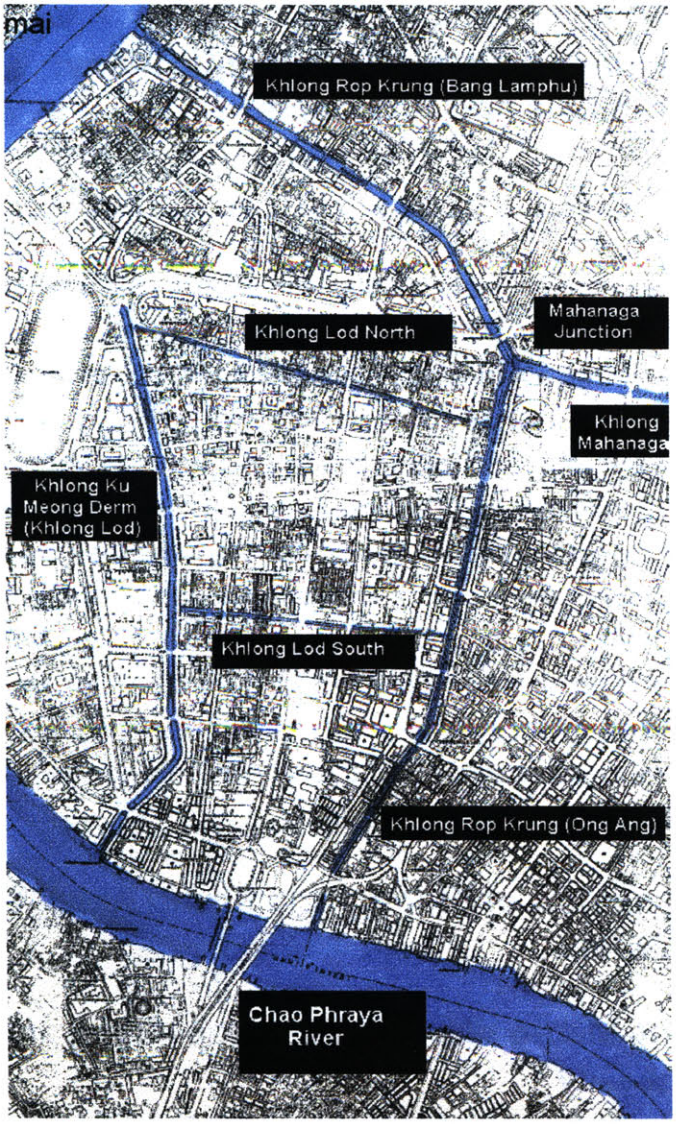

Fig. 6.2 Canal connection

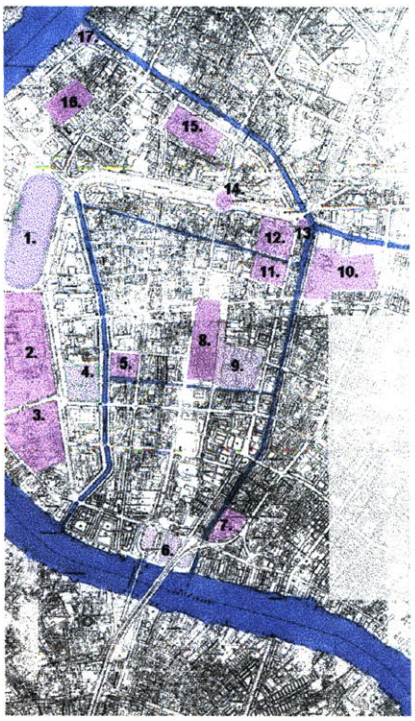

Fig. 6-3 Historical Sites Around Khlong Rop Krung

main image of the area for more than two centuries.

Besides commercial activities, tourism is another major draw of the area. Because Khlong Rop Krung surrounds the historic city, there is a concentration of historic sites which attract thousands of visitors to the area every day. There are also many cheap accommodations for tourists, especially around the Khlong Bang Lamphu stretch.

At present, the Bangkok Metropolitan Administration and the Tourism Authority of Thailand are planning for a new tourist loop which will include even more areas around Khlong Rop Krung, including Chinatown, Indian Town, the markets, and so on. The expectation is that tourism will start growing no matter how the city expands or how its structure has changed.

However, today there is a major effect from the explosive suburban growth of Bangkok. As in many cities with old centers, the number of residents that have moved out of the old city due to extreme density and dirtiness from pollution in the last 10 years is quite appalling. This is especially true around the Khlong Ong Ang stretch, resulting in many vacancies on the upper floors of the rowhouses, while the ground floors are still occupied with shops. While businesses continue to flourish in the areas, residential activities are declining.

Fig. 6-4 Khlong Rop Krung in Bangkok Waterways Context

Khlong Rop Krung as a Part of Bangkok's Waterway Network: the water connection to other parts of the city

As mentioned earlier, in the past 80 years the roles of canals in Bangkok have diminished greatly; many of the canals have been filled in to make way for roads. Despite the drastic decrease in the number of canals, the canal network still exists and could be utilized in many different ways; one of them is for mass transportation.

Khlong Rop Krung still has an excellent connection with the waterways system of Bangkok. Part of it, the Bang Lumphu stretch, now serves as a water bus route that could go as far as Hua Lampong, Bangkok's main

train station by Khlong Padung Krung Kasem. Furthermore, passengers could board the Khong San Saeb water bus line at the Mahanaga junction. This would allow Khlong Rop Krung to connect to the new downtown areas and to places as far as Chacherngsao Province further to the east.

In addition to the canal bus system, there are also river bus lines and river ferries in the Chao Phraya River. Some major stops of the river bus and ferry lines are within walking distance of the north and south ends of Khlong Rop Krung, such as Phra Arthit Pier, Phra Sumen Pier, and Saphan Put Pier. At present, many passengers use Bang Lamphu as an interchange, walking from Phra Arthit or Phra Sument Piers to board the canal bus at Hong Utis Bridge. With this interchange, passengers using Khlong Rop Krung could have a connection to many parts of Bangkok, and Thonburi, and up north to as far as Nontaburi Province where the Chao Phraya Express boats end. For people with their own boats, the connection could be infinite.

The Micro View: A look at Khlong Rop Krung and Its Environs

Khong Rop Krung Today: Current Conditions

The 2 stretches of Khlong Rop Krung look more like two different canals than like two parts of the same canal. While the northern part around Khlong Bang Lamphu stretch, is relaxed, the southern part, the Ong Ang stretch continues to be an ethnic melting pot with dense, crowded, and bustling commercial activities that go on day and night.

Fig. 6-5 Land Use Map

The Khlong Bang Lamphu Stretch

Today the area by the market around Khlong Bang Lamphu has many distictive characteristics. Its character as a high-end and fashionable garment district has vanished and has been replaced by lower grade fashion activities. However, it is still very popular among shoppers who like to look for bargains.

The other growing business of the Bang Lamphu area in the last 10 years has been tourism. There are many historic attractions including Wat Bawornnivet Viharn and the Phra Arthit Fortress, as well as many cheap accommodations for tourists along Phra Arthit Road. While commercial activities and tourism seem to dominate the areas aroung Khlong Bang Lamphu, a significant part of the land use in this area is single family houses that are hidden behind the rowhouses. Offices and schools are also important, drawing thousands of people into the area at least 6 days a week.

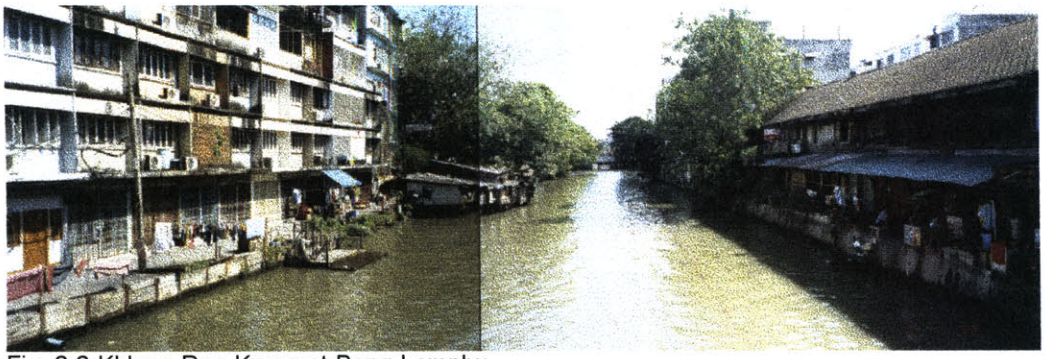

Fig. 6-6 Khlong Rop Krung at Bang Lamphu

Characteristics of the Khong Bang Lamphu

Although the street is lively, hidden behind buildings the canal is like a different world. At its north end where the canal meets the river, the canal is cool and quiet. There is an old refurbished fortress, Pomm Phra Arthit, and the land adjacent to it is now being cleared and turned into a small park. On the other side of the canal is a temple with its own secondary school of more than 600 students. There are also houses.

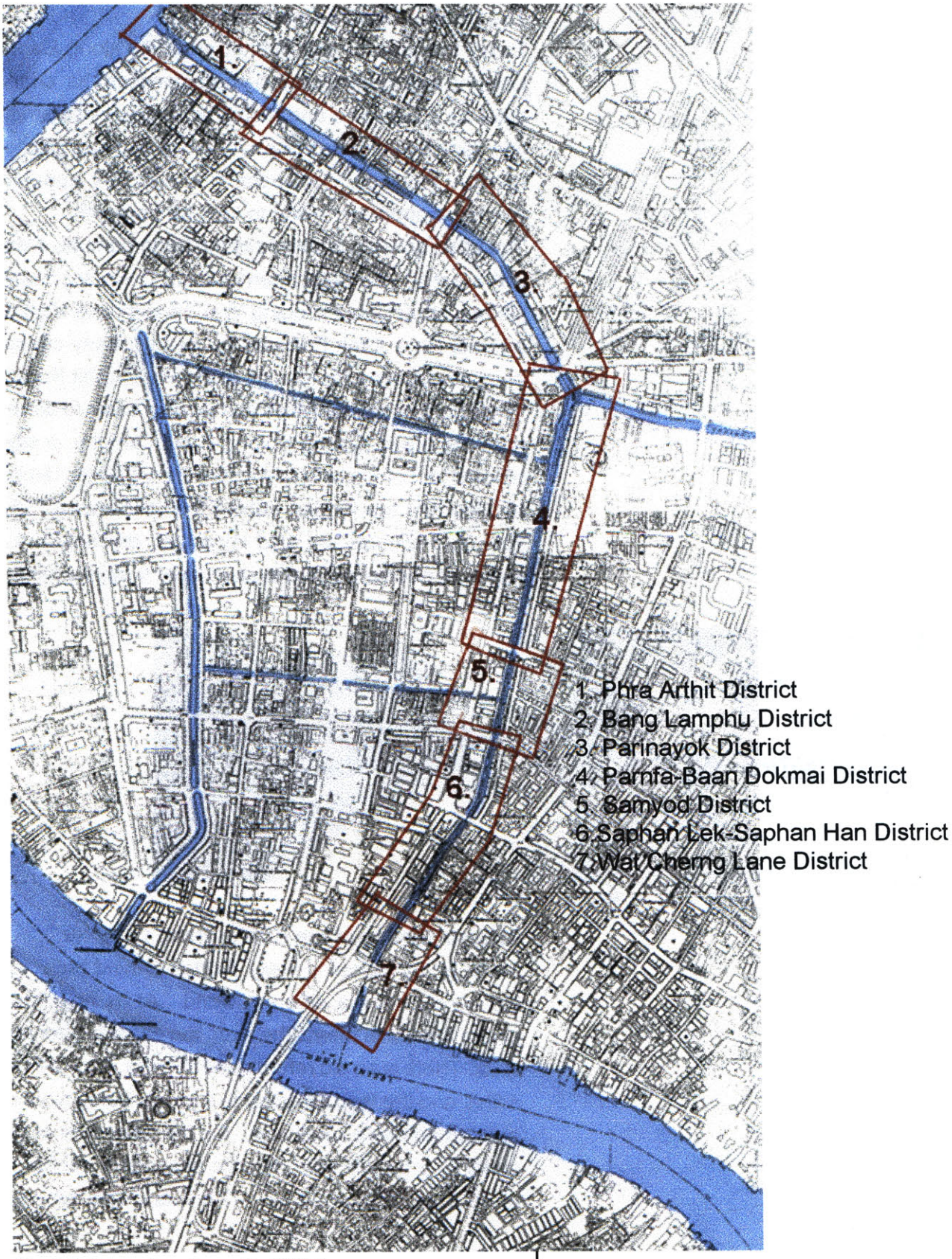

Fig. 6-7 Khlong Rop Krung By Districts

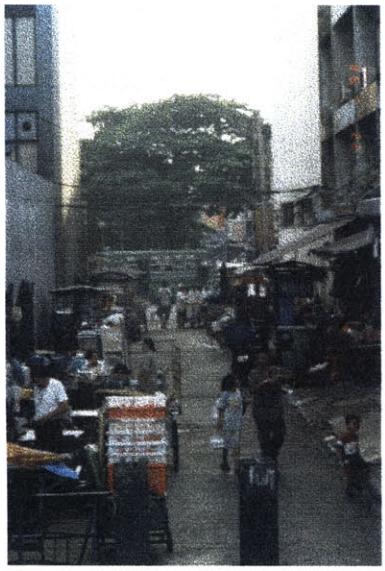

Fig.6-8 Street scene near Bang Lamphu

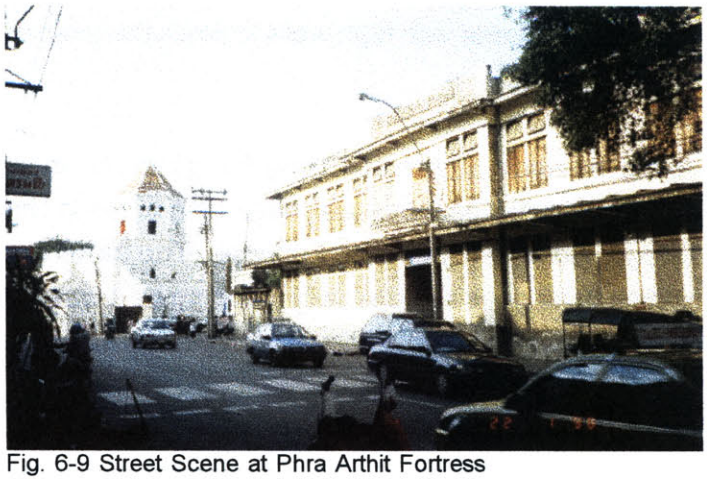

Fig. 6-9 Street Scene at Phra Arthit Fortress

Fig. 6-10 Street scene at Sam Yod (Pratu Pee)

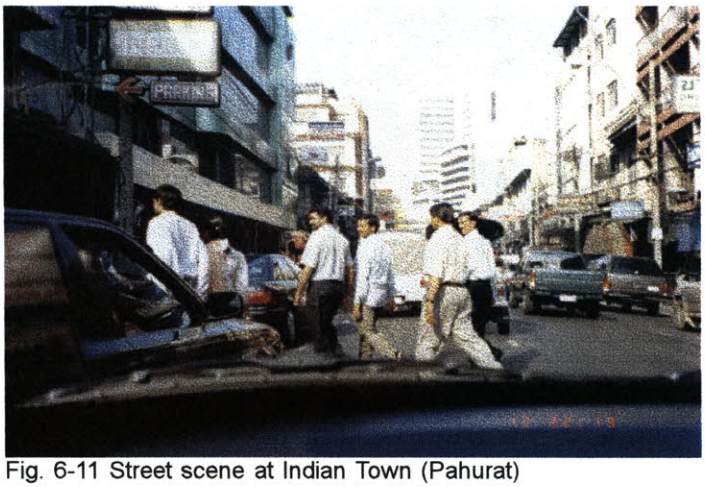

Fig. 6-11 Street scene at Indian Town (Pahurat)

Except for the new park, most buildings turn their back to the canal, some with high walls to block themselves from the canal.

Fig. 6-12 Khlong Rop Krung from Hong Utis Bridge

Along the whole stretch of Khlong Bang Lamphu there is an operating canal bus line, beginning at Hong Utis Bridge, close to Phra Arthit Fortress. The canal bus station itself does not look very pleasing as it was not very well designed. It is also hidden behind an abandoned building below street level.

Further down the canal, the sides of the canal are mostly similar to the north end, where buildings treat the canal as their rear sides. These buildings are of all types and uses, ranging from houses, schools, old warehouses, and offices, to a mid-rise dormitory. However, in some parts the canal is used as an amenity. Along the canal in some parts there are markets, with some very casual restaurants. Diners sit by the waterside and enjoy the sight of the wide canal. There is also another good amenity use in the Soi Parinayok community, where there is space set aside for a recreation area by the canal.

Fig. 6-13 Khlong Rop Krung from Wan Chart Bridge

Fig. 6-14 North End of Khlong Rop Krung

Fig. 6-15 Lock at Bang Lamphu

Fig. 6-16 Parinayok Community

Fig. 6-17 One of canalside vacant houses

Areas Around the Khlong Ong Ang Stretch

Besides the extreme differences between the Bang Lamphu and the Ong Ang stretch, Khlong Ong Ang itself has such a multiple personality that it changes in every block that it passes through.

When Khlong Ong Ang is mentioned, people tend to think of the bustling commercial district of Chinatown and Saphan Han, where retail businesses seem to dominate the land use. In fact there are also other uses of no less importance and a number of commercial activities. These uses include temples, schools, houses, and offices of both the private sector and government agencies.

The upper part of Khlong Ong Ang is, at present, a historic district. There are major historic attractions such as the Golden Mountain, the Metal Castle (Loha Prasart), the Mahagarn Fortress and the old city wall, and Wat Sutat and the Giant Swing. These attractions draw thousands of tourists into the area each day. Mixed in with these historic sites are houses and businesses of various kinds ranging from old mom and pop grocery stores, 7-11s, restaurants, and antique stores, to car show rooms and gas stations. Some industrial uses are also located here, such as wood product factories, printing houses, car repair garages, and warehouses.

Further down the canal, looking at both sides of Khlong Ong Ang from Boripat and Mahachai Streets, the area looks like a very expansive market with a large diversity in both goods and shoppers. This is because on the west side is the Indian Market (Pahurat) and on the right side is the Chinese Market (Sampeng). Khlong Ong Ang is right at the seam between the 2

markets and Saphan Han is the main linkage between the two districts.

Apart from retail activities, there are also many other uses hidden behind the facades of retail stores and rowhouses such as single houses, secondary schools and colleges, temples, second or third class hotels, offices, and government agencies.

Characteristics of Khlong Ong Ang

Though they have an excellent view of the Golden Mountain and Mahagarn Fortress, at the northern end, both sides of Khlong Ong Ang are occupied by run down shacks and rows of wooden product factories. Further down, there are rowhouses on both sides of the canal. The atmosphere of this stretch of Khlong Ong Ang is almost like Khlong Bang Lamphu: quiet, wide, with buildings turning their rear sides to it.

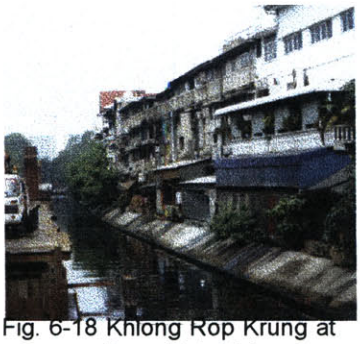

Fig. 6-18 Khlong Rop Krung at Baan Dok Mai

Fig. 6-19 Khlong Rop Krung at Sam Yod

Further down, Khlong Ong Ang gets narrower, and becomes more lush with trees on both sides. In some parts there are narrow streets along the canal behind office buildings and factories. These streets are now used as parking lots andt are filled with cars during the day. Khong Ong Ang at this stretch is quiet and cool. The uses and the run down condition, the space and the scale is almost like Amsterdam.

Fig. 6-20 Khlong Rop Krung at Saphan Han

The next 2 blocks, the Saphan Lek and Saphan Han area, is a completely different story. One side is occupied by 7-8 story rowhouses in poor condition and the other side is occupied by even taller buildings. Encroaching the water on both sides are stalls and bridges filled with shops that cross the canal every 10-20 meters. These stalls are in semi-temporary structures and are built on iron plates. The goods sold in the Saphan Lek and Saphan Han area vary from mini

Fig. 6-21 Saphan Han Market

Fig. 6-22 Saphan Han Market

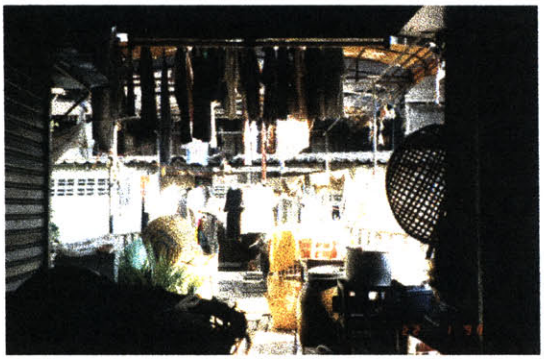

Fig. 6-23 One of the briges at Saphan Han

Fig. 6-24 Canalside restaurant at Saphan Han

aquariums, fake watches, stereo and television sets, cameras, and casual clothes to Bridal gowns. There are also some canalside restaurants, but the food there does not seem to worth risking.

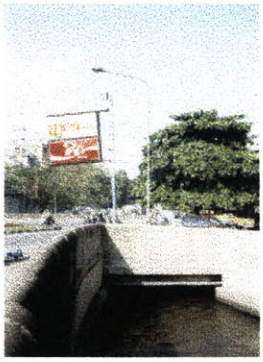
Fig. 6-25 South end of Khlong Rop Krung

Towards the south end of Khlong Ong Ang, the canal sides become lush with trees again. On one side, there is a beautiful old building, which is now occupied by the Department of Agriculture, and there is a 300 year old+ temple on the other side. Beyond this block, Khlong Rop Krung goes under a wide roadway. The last part that can be seen is at its mouth where it rejoins the Chao Phraya River.

Physical Attributes of Khlong Rop Krung Areas

Building Conditions

More than ninety percent of buildings occupying both sides of Khlong Rop Krung treat the canal as their back, making the canal even less attractive. Although these buildings are in various conditions, more than half of them are in more or less run-down condition. Rowhouses with houses on top of the ground floor shops are the most common building typology found along the whole length of Khlong Rop Krung. However, the upper floors of these rowhouses are not as fully occupied as 10 years ago, so most of the vacant ones are being used as storage instead.


Fig. 6-26 Canalside buildings at Saphan Lek

Along some parts of the canal there are settlements over the waterway, which are supposed to be removed according to the law. One of these settlements is the stalls at Saphan Lek and Saphan Han, run by Bunyaluk Company Limited. Although the contract expired in 1993, nothing has happened. The other illegal settlements are the shacks that are built over Khlong Bang Lamphu.


Fig. 6-27 Illegal shacks

Path & Accesses

There are some parts of Khlong Rop Krung that have strips of land set aside along the canal that could be used as walkways. However, only people in the areas know them. This is largely due to the fact that Khlong Rop Krung is mostly hidden behind rows of buildings and access to the canal sides is very rare. Most people do not even know where the canal is since they have never seen it.

At present, these canal side paths are in varying condition. But most of them are not very well kept. Some are safer than others, but most of the are not very safe at night. This is because most of them are treated like quiet back alleys rather than as decent pedestrian ways.

Fig. 6-28 Access to Khlong Rop Krung through a private property

Vegetation

In many parts of Khlong Rop Krung, there are very nice shade trees that cover both the canals and the areas on both sides. These trees now provide shade for people resting by the canal side as well as for people who pass by. Many of these trees are very old and very big, and are worth preserving.

Urban Ecology

The areas around Khong Rop Krung, especially on the east side are very low-lying land that used to have many canals. As those canals were filled in, the areas became much more susceptible to floods.

As Khlong Rop Krung's width has decreased over the years, especially at the Ong Ang stretch, its capacity to collect the drainage has reduced considerably. Moreover, the scum that has been accumulating for centuries has also made the canal much shallower than before.

Fig. 6-29 Vegetation at an area close to the south end of the canal

According to the Ministry of Science and Environment, the water quality of Khlong Rop Krung is very bad. However, a lot of improvement is underway as the central sewage treatment plant alongside Khlong Rop Krung side will be operating in a few years.

Navigability

At present navigability on Khlong Rop Krung is limited to the Bang Lamphu stretch where the canal is much wider and the bridges'decks are higher than the Khlong Ong Ang stretch. At present the width of Khlong Ong Ang ranges from only 7 to 15 meters which bigger boats cannot pass through. The flat structures of the stall bridges at Saphan Lek and Saphan Han also prevent boats of any size from navigating through the canal since they are less than 2 feet above the water. At the north end of Khlong Rop Krung there is a lock that is opened once or twice a day to let the river water flow into the canal. This also allows boats to go in and out between Khlong Bang Lamphu and the Chao Phraya River. The south end of Khlong Rop Krung is under a very wide roadway which renders the connection between Khlong Ong Ang and the Chao Phraya River unnavigable.

Fig. 6-30 Bridges structures at Saphan Lek make Khlong Ong Ang unnavigable

The Canal Bus

As mention earlier in this chapter, a canal bus line currently runs through the Khlong Bang Lamphu stretch, from Hong Utis Bridge to Hua Lampong Train Station. The canal buses serving this line have a maximum capacity of 40 passengers at a time and are packed during the rush hours.

Fig. 6-30 Mahagarn canal bus interchange

At present there are 6 canal bus stations on the Khlong Bang Lamphu stretch. These stations are hidden behind buildings or shopping stalls, which makes them very hard to find. Most of the loading docks are in

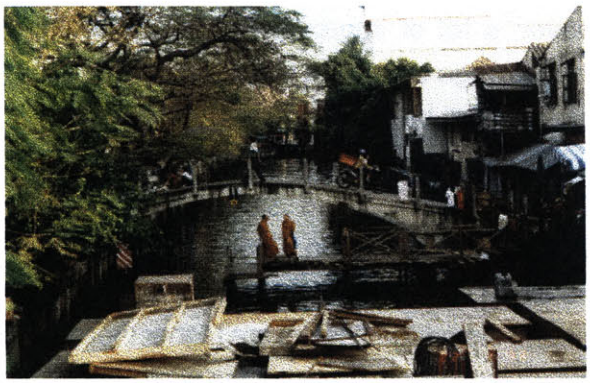

Fig.6-31 Loading dock at Parinayok

Fig. 6-32 Loading dock at Hong Utis Bridge

Fig. 6-33 Loading dock at Bang Lamphu

Fig.6-34 Canal width at Hong Utis Bridge

Fig. 6-35 Canal width at Bang Lamphu

Fig.6-36 Canal width at Rapee Pattanapark Bridge

Fig. 6-37 Canal width at Saphan Han

poor condition and need significant improvements.

Comprehensive analysis

Looking at Khlong Rop Krung as a whole, there is still a lot of room for improvement. While some systems seem to work well such as the canal bus, and the canal walks and the recreation areas on some parts of Khlong Rop Krung are good, some actions might help enhance these qualities to a far greater extent.
For example, the canal bus stations and the river bus and ferry stations were not planned together so they are at different spots. Although some of them are within walking distance of each other, it is not a very efficient way to travel.

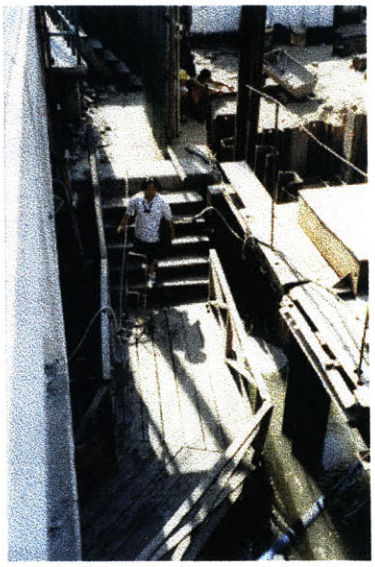
Fig. 6-38 Poor access to loading dock at Hong Utis Bridge

If the canal bus stations and the river bus and ferry stations were put in the same spot, the friction of moving from one station to aother would be much less. The water transportation system would be much more efficient, and water transportation would gain in popularity. As a result, Khlong Rop Krung might become a major thoroughfare for the city.

Other attributes that are not well exploited are the shady pathways on the sides of the canal. Many of these pathways are treated as the back of the city, which makes them very quiet, even during the day, but people might not feel very safe there. If they were well planned, they could be urban oases well-shielded from the bustling world outside.

One last major concern of the areas around Khlong Rop Krung is the flight to the suburbs that has caused the area to decay. This trend will continue if nothing is done to solve the area's present problems. The challenge is how to improve the environment, provide the areas with an efficient mass transit system, and

create a safer and more pleasant place to walk. If these goals are met, the area will be a much more attractive place to live than it is now.

Lessons learned from Khlong Rop Krung

From the previous discussions of Khlong Rop Krung and other Bangkok canals, there are lessons that could be learned.

According to the law, canals in Bangkok are owned by the Treasury Department, but the Department of Irrigation is designated to take care of these canals. As urban canals have nothing to do with irrigation, the Department of Irrigation gave the responsibility to the Drainage System Control Division, which is a subdivision of the Bangkok Metropolitan Administration (BMA or the City.) The BMA also gave the rights to protect the canals to the Districts. The Port Authority also has authority over canals that 'have water-related activities.' Both the BMA and the Port Authority have the right to evict any intruders in the canals by using the police power.

Khlong Rop Krung is a historic canal, protected by the Archaelogy Act. It is unlawful for anyone to fill in, to build over, to intrude, or to claim possession. Any actions that will affect the canals must be reported to the Department of Archaeology. However, it has been built over, partly filled in, and intruded upon by both shacks and high voltage electric posts, a mix that could lead to the loss of many lives if a mishap occurs.

The disaster that Khlong Rop Krung is now facing is the result of actions by many parties, though whether through greed, thoughtlessness, or pure ignorance is hard to determine. With overlapping responsibilities, no one wants to take this difficult job on their shoulders. Nor has there been a coordinated effort to seriously plan for this registered historic canal.

This is an expensive lesson to learn--to really take care of any urban element, the organizational authority structure must be clear and solid. To really be effective, the administrative framework of canals in Bangkok must be restructured.

The remedies for this situation are to eradicate the overlapping responsibilities among different authorities and assign them to only one agency. This agency would be entitled to manage and care for the Bangkok canals, and it must be given power to deal with any wrongdoings on the canals.

More important, to make good use of these canals, strong leadership is needed. Having a leader with a clear vision who thinks creatively and knows how to enforce the rules is very critical to the extent to which these canals could be shaped in the way they ought to be. The City should also act as a better coordinator to oversee the whole plan.

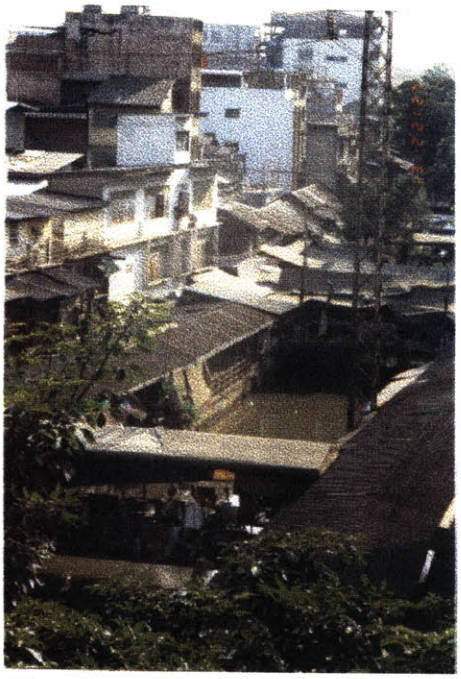

Fig. 6-39 Khlong Rop Krung at Saphan Han

Chapter 7
Opportunities for Khlong Rop Krung

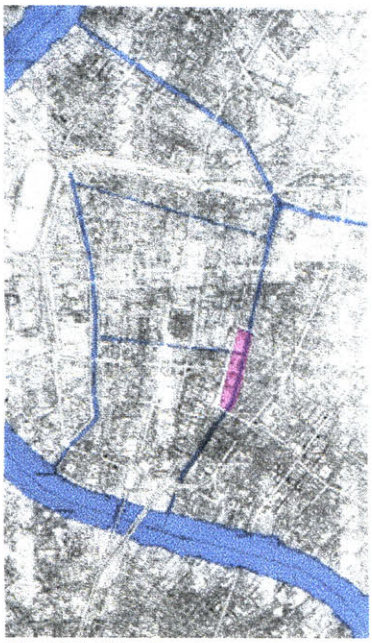

Fig. 7.1 Site Location

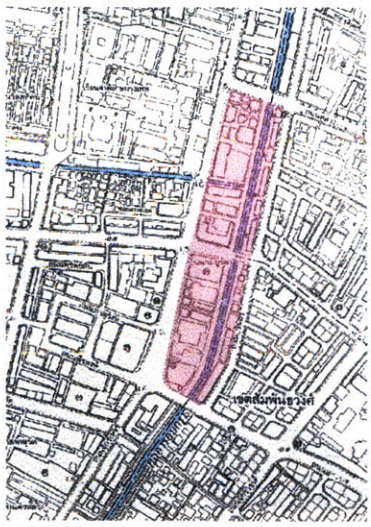

Fig. 7.2 Site Loca-

In this chapter, a section of Khlong Rop Krung will be further examined. The four approaches from chapter 4 will be applied separately to this stretch and will be evaluated by discussing the advantages and disadvantages of each scheme. Finally, an integrated approach will be presented combining the best aspects from each scheme while trying to minimize the negative impacts on the area and maximize the value of redevelopment.

To apply design solutions to Khlong Rop Krung, I have chosen the stretch between Panupan and Damrongsathit bridges, which presents two totally different characters: one part is a deserted landscape and the other is extremely dense. Yet, they are facing the same problems. This area represents the problems of urban waterways: extreme levels of pollution, intruding structures in the waterway, no public access to the waterway, and run down buildings. All these ingredients produce an overall bad image for the place. Thus a solution for this stretch should be applicable to attempts to improve urban waterways elsewhere.

The framework for reconsidering this stretch of the canal will be as follows: first, I will list the strengths and weaknesses of the area, summing up the findings on an opportunity map. Then, I will specigy goals for redeveloping the waterway and its immediate area. Next, urban design opportunities will be determined

by applying each of the schemes to the canal. Finally, each scheme will be evaluated and they will be combined to find an appropriate mix for this site.

Strengths and Weaknesses

While this section of Khlong Rop Krung reveals a very high degree of problems, at the same time, it has a very high redevelopment potential if it is exploited in the right way.

There are many strengths of the site: first, it is in a central location with lots of commercial activities. Thus, it has a high potential to attract new investment if the area is revitalized. Second, the predominant model of shophouses, with shops on the ground floor and residences on the upper floors, fills the area with 24-hour activities. Third, hidden in this stretch of Khlong Rop Krung, there are many lush trees that could be used as part of landscape improvement at no extra cost.

However, the area also has many weaknesses.
First, this portion of Khlong Rop Krung is much narrower than the north portion of the canal. To enable a water bus system in this part would require the canal to be widened. The reduced size of Khlong Rop Krung has also decreased the drainage capacity of the canal. Thus the area is more vulnerable to floods. Second, the majority of the land is owned by private entities, which makes it harder and more costly to acquire land to redevelop the area. Third, the environmental problems in this part of Bangkok are among the highest, especially air pollution.

Fig. 7-3 Northern portion of the site.

One thing that can be either a strength or a weakness

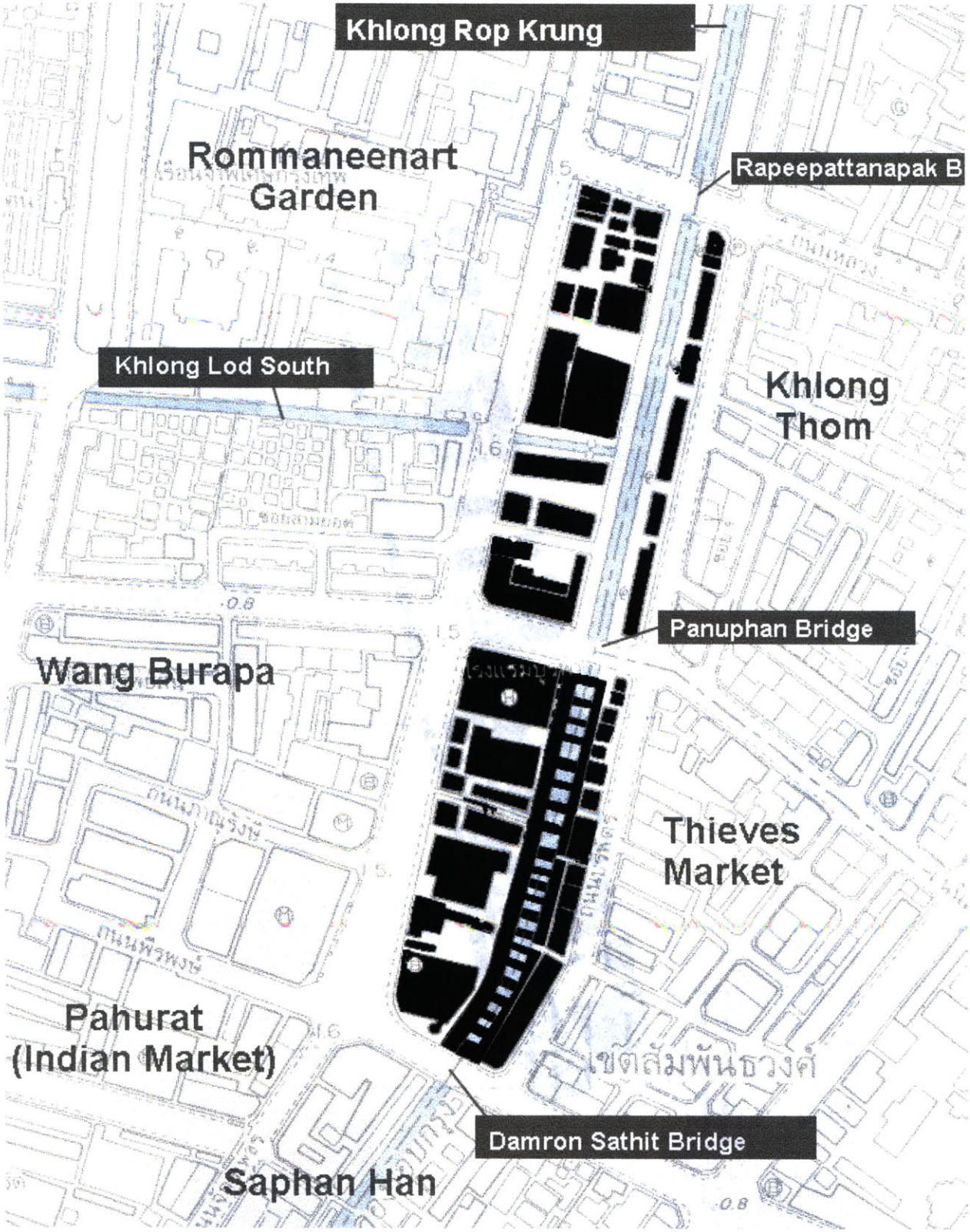

Fig. 7-4 Context Map

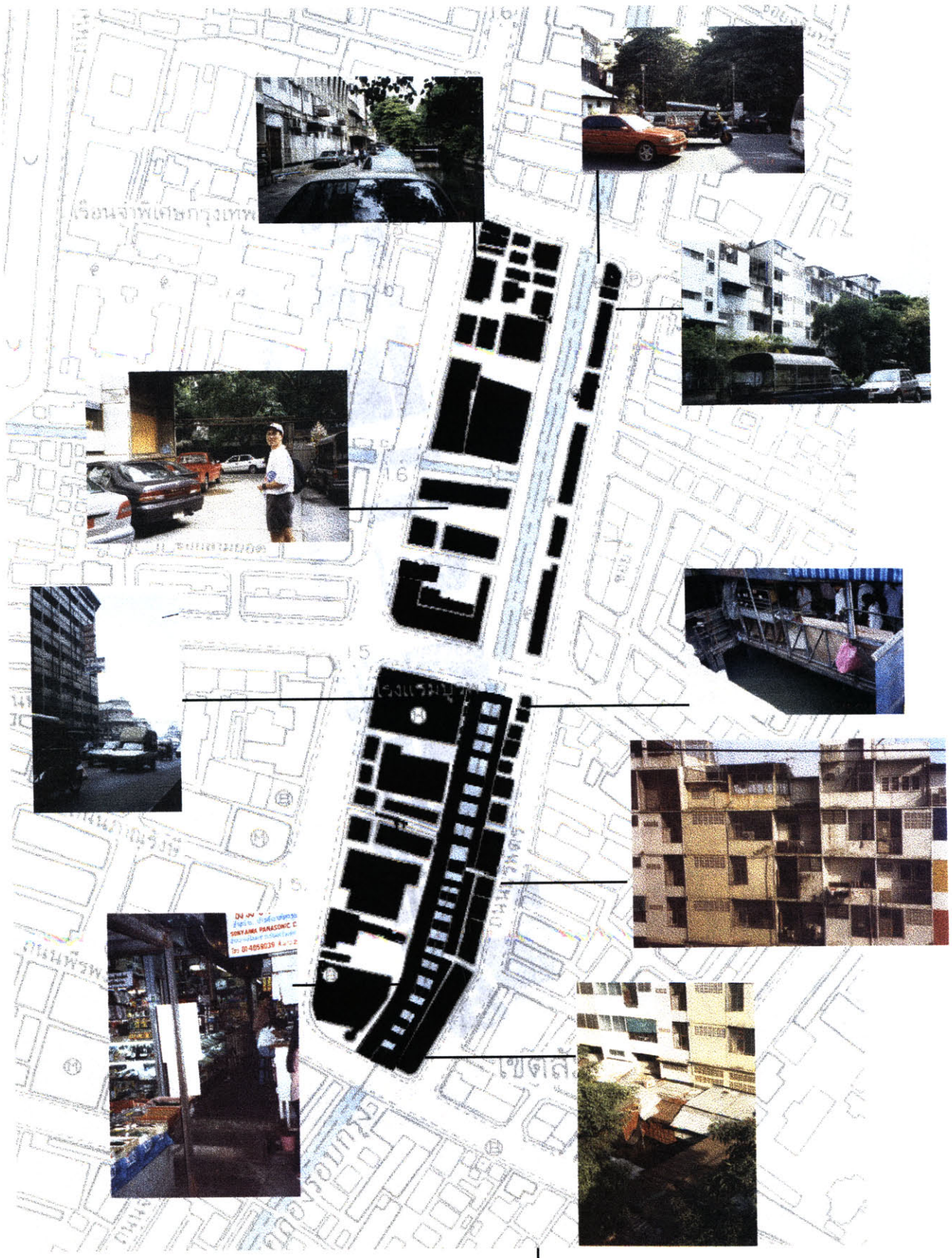

Fig. 7-5 Representative photographs of each area.

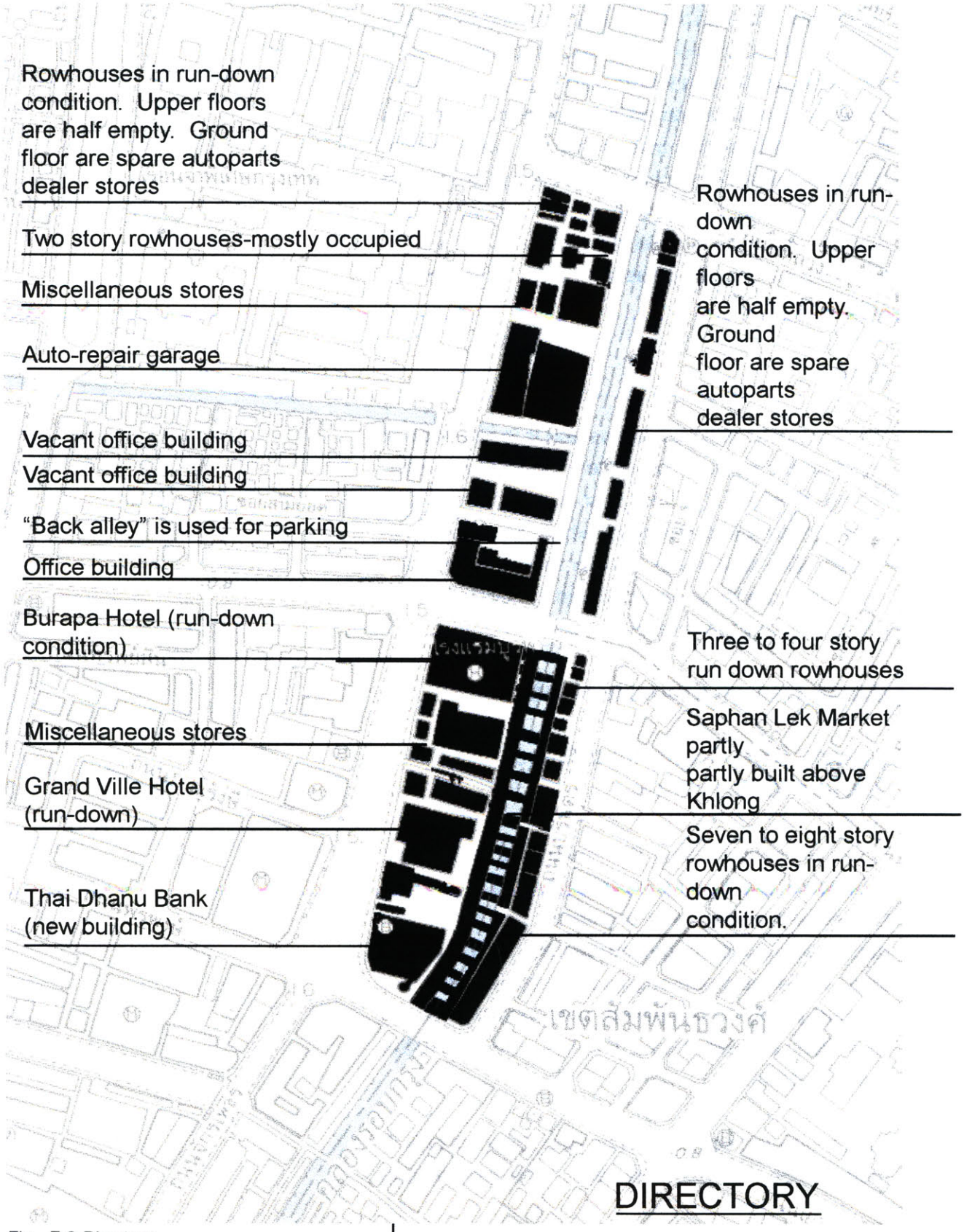

Fig. 7-6 Directory

of the area: although the area is still thriving with many activities, it is also facing the problem of urban flight. Residents are leaving this shabby quarter to move to areas that are less congested and less dense. On the negative side, this means that the area consists mostly of derelict landscape and buildings which tend to be very quiet at night. However, looking on the positive side, having derelict buildings is not such a bad thing as it makes it easier to acquire the land for redevelopment.

Goals

This area lacks natural features and is in dire need of an efficient transportation system. Most of the existing buildings are also very poor and there are structures intruding into the canal which have to be removed. The area needs a major facelift to keep the area thriving with commercial and residential activities in a more decent setting.

Urban Design Opportunities

Khlong Rop Krung as a Mass Tranportation Route

When someone thinks of Chinatown and Indian town in Bangkok, one clear impression is the bustling streets flocked with pedestrians on narrow foot paths and narrow alleys, with congested car traffic almost all day long. While this clearly suggests the demand for more efficient public transportation, unfortunately, Khlong Rob Krung at present is not part of the solution to the traffic problem.

At this selected stretch, Khlong Rop Krung is only 7 meters wide, its narrowest part. The 2-block long

canal is squeezed by illegal semi-permanent stall structures on both sides with rows of shops on the 'bridges' that cross the canal every 10 meters. The 2 commercial blocks are literally built on the water.

Because the water level in Khlong Rop Krung can be kept constant by the locks at both ends, public water transportation can be made possible by widening the canal and raising some bridges. However, this will have to be done at the cost of relocating businesses and people's houses.

To support a transportation scheme, these actions and interventions would need to be taken:

1. The lowest degree of intervention would be to widen the whole stretch of Khlong Ong Ang back to its original width of 15-20 meters to allow 2-way water bus traffic to easily pass through and set aside some space for boat parking. For this purpose, all the stall structures would need tot be removed. The bridges at Luang Road and the New Road would also need to be reconstructed since the decks are too low. Even with this low degree of intervention, there would be no areas left for walkways along the khlong.

There are also vacant buildings in poor condition close to major bus stops, such as the Granville Hotel, which could be removed at not much extra cost. These new vacant spots could be used for a new water bus station.

It must be noted that even at the lowest degree of intervention, to create a viable transportation route, the canal would have to be widened all of the length designated as a route. Thus the costs of widening the canal in other parts, the reconstruction of other

bridges, and the provision of other loading docks would have to be taken care of.

2. A higher degree of intervention would be to try to further support the water transportation canal network to serve more people. The adjoining Khlong Lod South which links Khlong Rop Krung to Khlong Ku Meong Derm (Khlong Lod) could be made navigable again for the water bus system. To widen Khlong Lod South, many houses to the south of the canal would have to be removed. The bridges on Jakpetch Road, Siripong Road, Ti Tong Road, Tanoa Road, and Fuang Nakorn Road would have to be raised at the points where they cross Khlong Lod South.

The feasibility of a higher degree of intervention would need further scrutiny. As the roads mentioned above would have to be raised for a new but rather short transportation route, it is questionable whether it would be a worthwhile action to pursue.

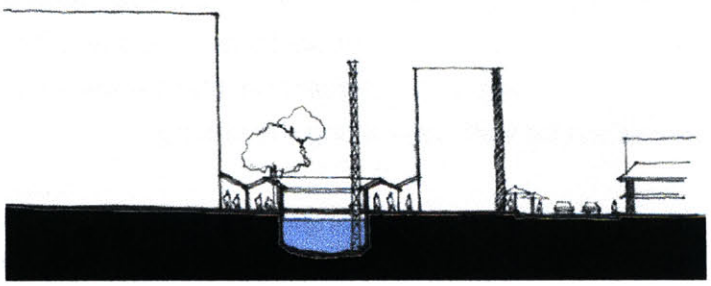

Fig. 7-5 Section of Saphan Lek area at present

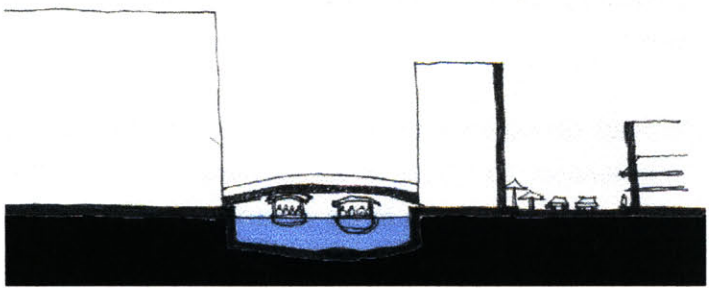

Fig. 7-6 Section of Saphan Lek area according to transportation scheme

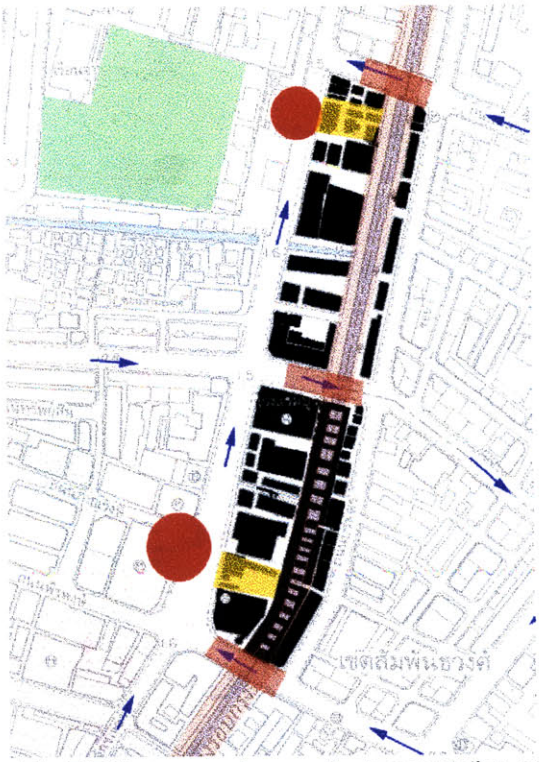

Fig. 7-7 Necessary changes for transportation scheme

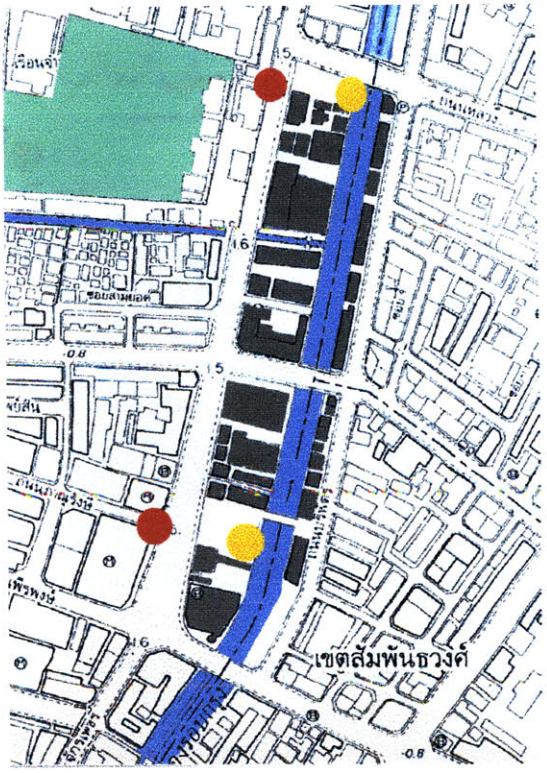

Fig. 7-8. Complete site plan for transportation scheme

Fig. 7-9 Existing boat stops.

Fig. 7-10 Proposed river bus and canal bus stops.

Khlong Rop Krung As A Greenway

There are three major issues concerning urban ecology in this area. First is the traffic congestion on the streets that causes extreme level of air pollution. Second is the lack of amenities in the area such as recreation and green space. And third is the area's vulnerability to floods.

Although there are connected 'passable' ways along this portion of the Khlong Rop Krung corridor, they cannot be considered as decent walkways for pedestrians.

On the official map, there is a street running along the western side of Khong Rop Krung for its whole length. But at present the north portion of this site is filled with cars parking on the street. The south portion has become part of the dense and dirty 'Iron Bridge' market. A decent path way must be recreated once this mess is removed.

Interventions to foster urban ecology in the area by using Khlong Rop Krung would include:
1. Widening the canal to increase its drainage and flood protection capacity.
2. Clearing and relandscaping the streets on the west side of Khong Rob Krung (or what is known as Phra Nakorn) to make a pleasant walkway for pedestrians. Panupan, Rapee Pattanapark, and Damrongsathit Bridges should be reconstructed to raise their decks, or there must be a traffic calming measure to ensure safety for pedestrians at the road crossings.
3. A higher degree of intervention would force buildings by the canal side to have a main orientation facing the canal in order to watch over the walkway as safety measure.

Fig. 7-11 Necessary changes for ecology scheme

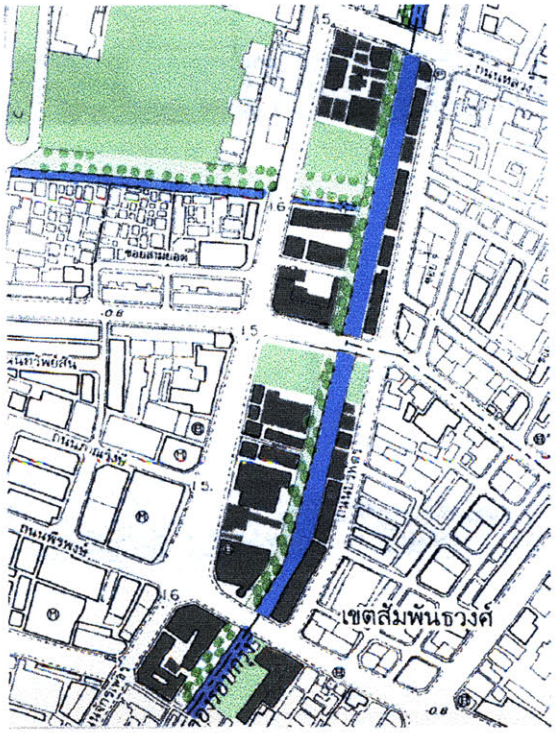

Fig. 7-12 Complete site plan for ecology scheme

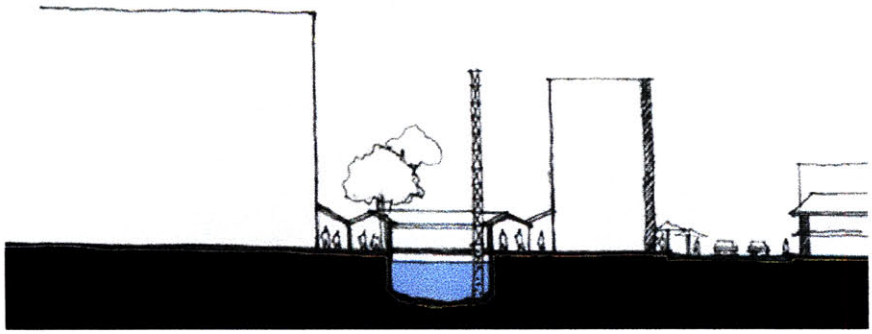

Fig. 7-13 Section of Saphan Lek area at present.

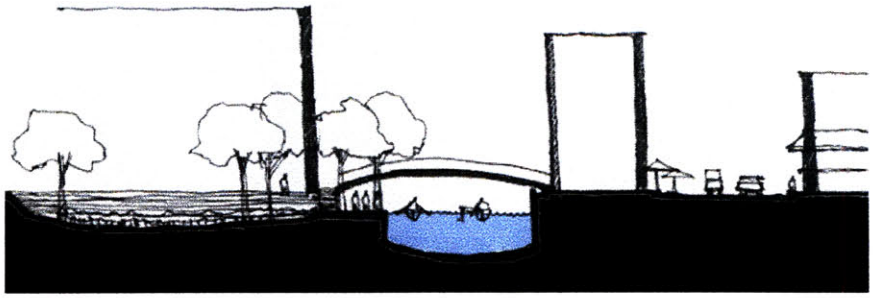

Fig. 7-14 Saphan Lek area according to ecology scheme.

Fig. 7-15 Proposed green system along the canals

Khlong Rop Krung As A Distinctive Feature

Hidden behind buildings, the landscape along the northern portion of Khong Rop Krung is filled with lush shade trees and a peaceful, though dirty sheet of water in the canal. The scale is almost like canals in Amsterdam but with a lack of care and a lack of any planning effort.

While the north portion of the selected area shows a high potential for adding nice features to the city, the south portion does not possess any aesthetic qualities, as it is currently occupied by the Saphan Lek Market.

The biggest enemies of the area are the old and run-down buildings that not only block the visibility of the canal but also turn their backs toward the water. Most of these buildings do not have any architectural value and do not have any qualities that associate them with the khlong that they are situated next to.

Goals for using Khlong Rop Krung to bring out the distinctive quality of the city can be fulfilled by different degrees of interventions.

1. Reorienting the existing buildings through façade improvement to address the canal as one of their main facades.
2. Celebrate the canal to the fullest by demolishing buildings that have already served their useful economic life with the exception of buildings with historic preservation or adaptive reuse value. New buildings would have to comply with new regulations for orientation, height, materials, and open space.
3. Set aside ample space for cultural activities that might take place for the surrounding communities.

Fig. 7-16 Necessary changes for distinctive character scheme

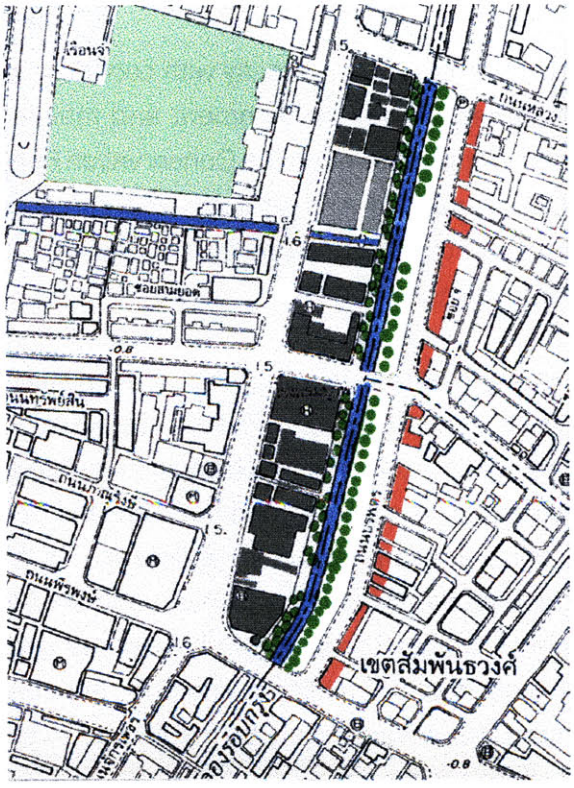

Fig. 7-17 Complete site plan according to the scheme

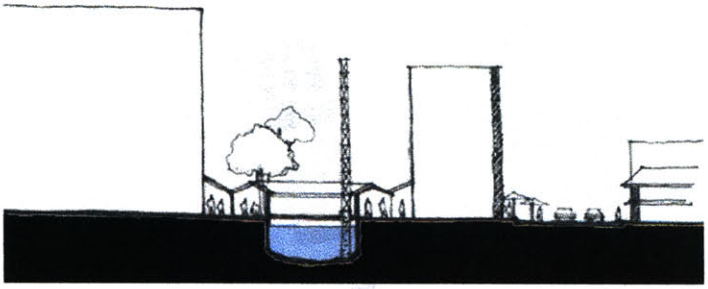

Fig. 7-18 Section of Saphan Lek area at present

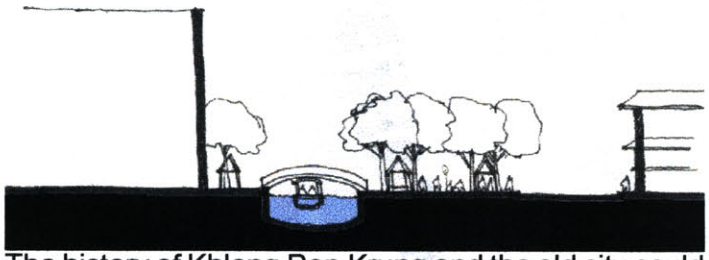

Fig. 7-19 Proposed section according distinctive character scheme.

The history of Khlong Rop Krung and the old city could be part of the design, such as in a community museum.

4. Generate water-related activities, such as leisure boats for tourists.

As this approach deals directly with conservation, the funds necessary for development and maintenance might be obtained through the Conservation Fund from the Department of Archaeology and some income generating activities such as from tourist boat operation and selling souvenirs.

The strength of this approach is that the distinct character of Khlong Rop Krung and the city could become another tourist attraction which could generate income and create pride in the neighborhood and the city. However, there are some major weaknesses. As the fund for conservation work is very limited and the transformation of Khlong Rop Krung would be very costly due to a great deal of building demolition, the conservation fund alone would likely be insufficient to cover all the necessary expense.

Khlong Rop Krung As Development Magnet

The image that dominates the south block of the selected site is a picture of run down buildings and the stalls of Saphan Lek Market, surrounded by the bustling streets of Chinatown and the Indian market.

By contrast, next to the north block is a much less busy area. A new park was constructed on a site that was once a jail for serious criminals, and Khlong Lod South is being cleaned. There is a strong indication that improvements are currently underway, especially since the contract that rented out the space for Saphan Lek market has expired. The area is now on the verge of change.

There are many development opportunities in the area. At present, to rent a commercial spot in this area is very expensive since ground floor space has run out. Once the Saphan Lek is removed, the demand for commercial space will increase even more.

But the area also lacks decent housing stock. Although there is a trend of people moving out of the old town, if there were quality housing development in the area, it could be worth sacrificing the bigger lot of a suburban home for a view of the canal and a much more convenient location.

Both of these scenarios are not possible without a redevelopment project for the site. The form and the appearance of the buildings must be changed in order to accommodate more users. Khlong Ong Ang could become a magnet for redevelopment projects.

A large scale redevelopment project could be done more efficiently by a public-private partnership. The public can choose two degrees of interventions:

1. At the low degree of intervention, only Saphan Lek Market structure would be removed, while the buildings on the two sides of Khlong Ong Ang could continue to be shops on the ground floor. With some building alterations such as the improvement and reorganizing of interior space, the new redeveloped area would be able to accommodate more commercial space and some housing.

At this low degree of change, the City need not intervene much. They could act as a coordinator or they could just let the landowners take care of redevelopment projects in their own properties under guidelines set by the City.

2. At the high degree of intervention, as most of the buildings on the site do not have any good features, they would be torn down. The whole two blocks would be filled with new buildings and Khlong Ong Ang could be reconfigured in order to make the project look most attractive.

In this large scale of development, the City has to play a big role in acquring, assembling the land, and deciding how to deal with the existing inhabitants that will be affected by the project. On the other hand, the developerwould provide the necessary funds and expertise to develop and manage large properties, driven by profits.

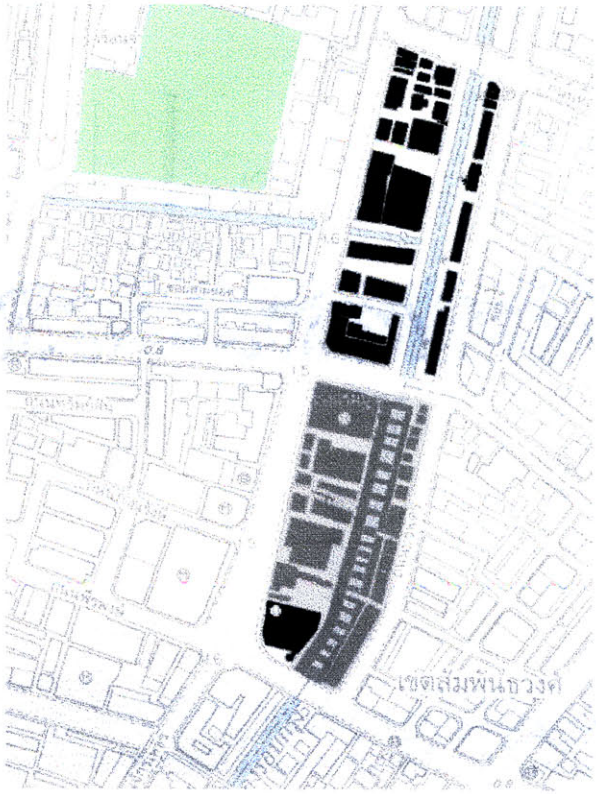

Fig. 7-20 Changes for urban redevelopment scheme.

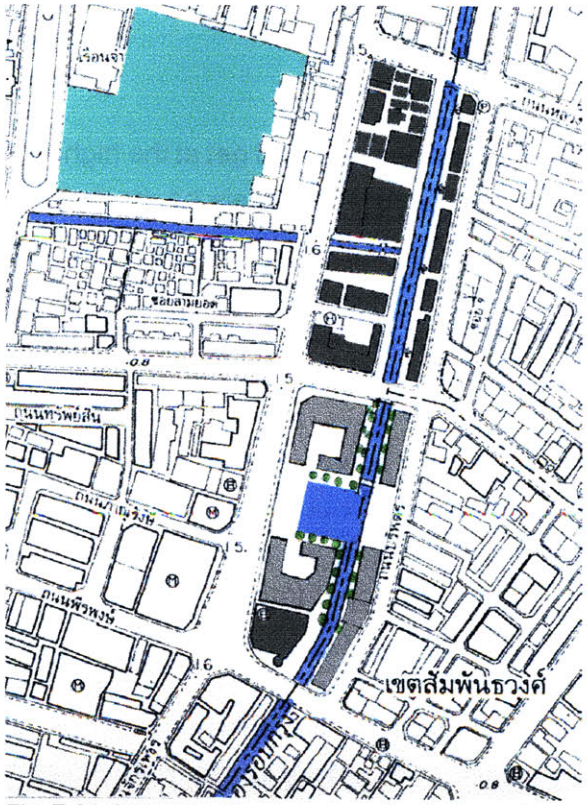

Fig. 7-21 Complete site plan according to the scheme.

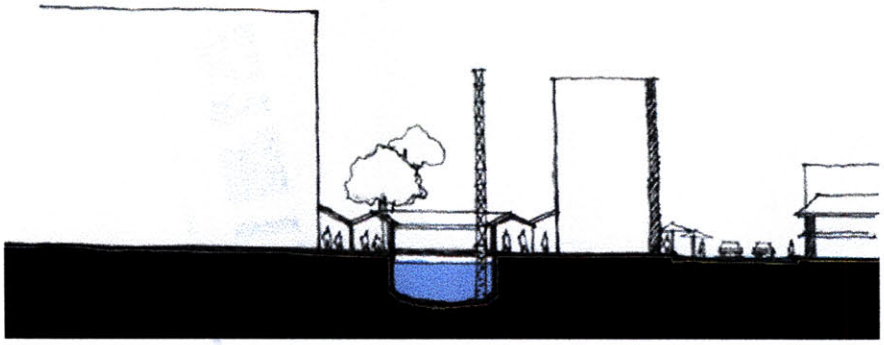

Fig. 7-22 Section at Saphan Lek area at present

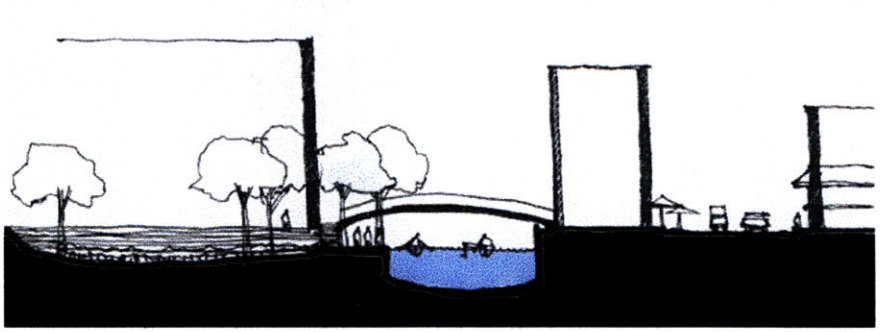

Fig. 7-23 Proposed section for redevelopment project.

The return that the city would get at the higher degree of intervention would very likely be much more than with the low or no interventions. As the site is redeveloped, the physical condition become better, and naturally, the land value of the surrounding area would increase.

However, there is a main weakness in this approach. lAlthough the public would have control over the development of the land, the project must yield enough return for the developer to give him a good incentive to invest. A project that generates high return often is for a higher market than what is the characteristic of the area is at present. Is it doable to evict people and business *just* to provide a land for such *private* development?

Integrated Scheme

As there are many different needs in the area, an integrated scheme for Khlong Rop Krung seems to be the best answer. Besides its ability to fulfill most goals, an integrated scheme is also more feasible both financially and institutionally.

In terms of investment, by integrating the different goals, many of the interventions needed to satisfy these goals are the same. For example, to increase the drainage carrying capacity of the canal, the canals need to be widened. This also satisfies the goals of making mass transportation viable in the canal. With the same amount of investment in the integrated scheme, the benefits and financial returns in proportion to the investment is much higher than taken separate actions at different times.

In terms of institutional reality, when considered separately these goals seem to be very hard to achieve. Since each scheme requires considerable improvement to the site, it might be too much for only one constituent to pay for. In Bangkok, there has never been one agency that has had the power to make this kind of major transformation. For example, to acquire land for redevelopment projects alone would be made much easier if the land were also used for public benefits such as transportation and a park. At the same time, making parks does not generate enough money to keep up with the maintenance. Mixing goals together through a coalition of different constituencies can help tremendously to support the goals of all of them.

Although these four approaches support one another in some ways by sharing the expense of necessary improvements, there are many conflicting ideas among them.

For example, both the ecology and the redevelopment schemes view the widening of canals favorable, but their views on the use of the land are very different. While the ecological scheme needs a lot of green space, the redevelopment scheme would not view this as a sensible way to use the land.

As there are always competing interests, the choice has to be determined depending on priorities. What are the most severe problems of the area? What would help solve problems and what would enhance the characteristic of the area? Having big, frequent and *fast* waterbuses might make a good public mass transportation system but the pleasant atmosphere of leisure boating would be lost. To satisfy one goal could always affect the others.

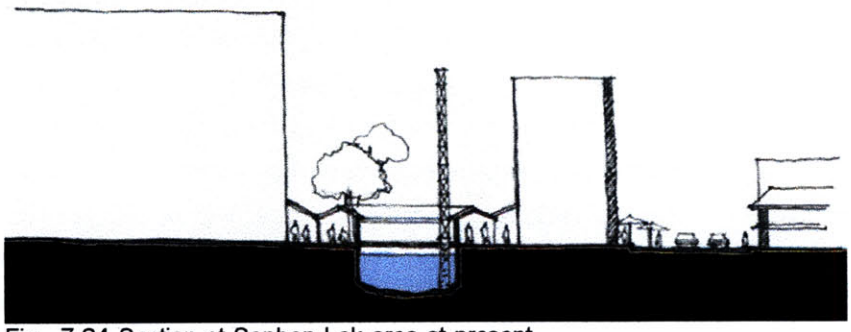

Fig. 7-24 Section at Saphan Lek area at present

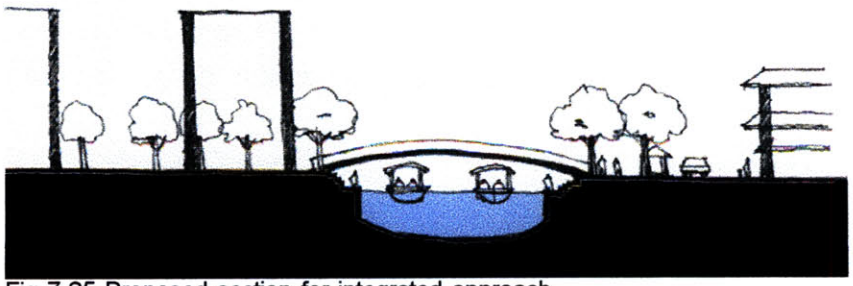

Fig 7-25 Proposed section for integrated approach.

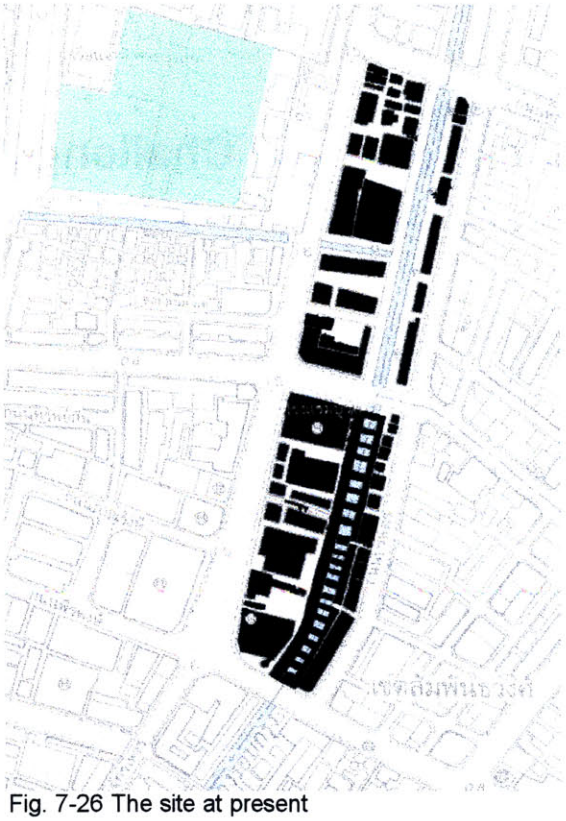

Fig. 7-26 The site at present

In the integrated scheme that I propose here, the qualities of each of the separate schemes have to be compromised. Some conflicting qualities could coexist if they were put together in a way more considerate of each other. For example, the water bus operation might not necessarity spoiled the environment and the charm of the city. It might be designed in a way that would not spoil the atmosphere of the old town too much. They don't have to run too fast. Actually, it could be a pleasant ride that tourists could also enjoy.

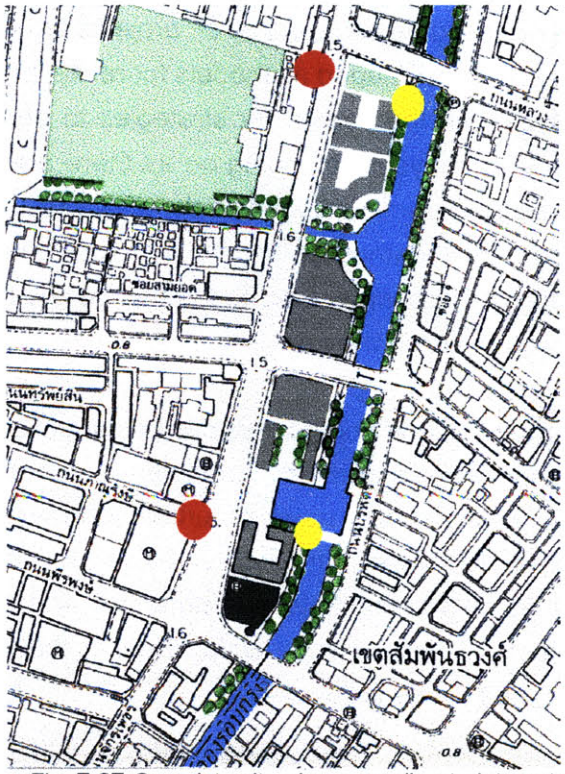

Fig. 7-27 Complete site plan according to integrated approach

Conclusion
Implications and Challenges

Urban waterways are resources that are often forgotten. In the past cities and towns relied on these waterways for transport, for irrigation, for fire fighting, for bathing, or even for drinking. The technology revolution and new inventions have freed people from reliance on these waterways. The once heavily used water channels were left abandoned and left to decay and, finally, many of them were filled in for other uses.

There have been many efforts to save urban waterways around the world. Their values have begun to be appreciated once again after decades or even centuries of negligence. A variety of projects have been successfully developed as models for revitalizing waterways. Yet, the search for strategies to deal with urban waterways is still going on as there are many dynamic issues involved. These dynamics include the ecology of the waterways and the ever-changing relationship of these waterways to the people and the cities through which they pass.

Opportunities and approaches can be sought by looking at precedents and ideas from various waterways. However, the extent to which urban waterways can be re-utilized varies, as each waterway has its own story, its own context, its own potential, and its own problems. There are no specific formulas that can be prescribed for all waterways.

This thesis has attempted to provide a framework for

reconsidering the possible roles of waterways. By first realizing the potential of the waterways in the bigger picture as a network in the city, broad ideas and goals, such as using waterways to partly solve urban problems, can be developed. And by looking closely at the waterway and its context, specific design ideas and opportunities can be proposed. Once these design ideas are tested on the site with respect to society's goals, the possibilities of bringing the waterway back to life will be demonstrated.

At present, many opportunities exist for waterways around the world. While many waterways are still regarded as liabilities, the selected precedents demonstrate how once neglected urban rivers and canals were transformed into invaluable assets to the city as new roles were conceived. The success of these projects was built upon three main ingredients: first, cooperation from the community, second, collaboration of different constituencies and at least one organization which took charge of the project, and third, a vision and determination.

In Yanagawa, the canals would not have been appreciated if the community had not taken part in the clean up and beautification activities in those canals. With these shared efforts in reshaping their environment, they have created a sense of pride of their own city. The San Antonio River Walk also would not have been a wonderful, harmonious feature safe walkways if the landowners along the river had not agreed to follow the ideas.

In Birmingham, the use of canals to revitalize the city center would never have been successful if there had not been cooperation by many constituencies: the City Council, the British Waterways Board, and the private

sector. With this collaboration, the once heavily polluted canals were cleaned and became attractive sites ripe for development.

For all three of the precedents selected, these projects would not have happened if there were no visions for those waterways. The San Antonio River and the canals of Yanagawa would have been filled in and the canals of Birmingham would have continued to be liabilities of the city.

Bangkok's waterways have the potential of being utilized in a variety of ways: a transportation mode, green corridors, great public spaces, and investment magnets. However, very little has been done to try to exploit this resource.

Among these canals, Khlong Rop Krung demonstrates particular potential to be a wonderful resource. It has a strong connection with the waterway network, it goes through a vibrant part of the city, and it has a beautiful character, but it remains hidden by buildings that turn their backs to it.

In the past 30 years, little has been done to improve this canal, except for a new sewage treatment plant that will help clean the water in the canal. It should be understood that if this canal remains hidden and continues to be the back door of the buildings that occupy its sides, the attempt to clean the water will be almost fruitless as people will still have no opportunity to appreciate the canal. Those who live by the canal will not treat it with more care and respect as it will still be at their backs. Unless some action is taken to give stronger recognition to the cleaner canal as a community asset, the newly improved and clean canal will never be appreciated.

Any plan for Khlong Rop Krung would need a lot of cooperation from the community. In the past, there have been no collaborative efforts to comprehensively improve this canal, nor has there been a strong and clear vision for Khlong Rop Krung.

To successfully transform Khlong Rop Krung, or any urban waterway, it would take no less than these three components: the community's cooperation, the collaboration of constituencies, and most important, a strong and clear vision.

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