



**REVIEW OF CONSERVATION GUIDELINES IN RELATION TO LAND USE PLANNING ASPECTS
OF BUFFER ZONE AFFECTIVE URBAN HERITAGE PLACES,
CASE STUDY: THE SETTING OF KING NARAI'S PALACE, LOP BURI PROVINCE**

**By
Panayu Chairatananonda**

**A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree
DOCTOR OF PHILOSOPHY
Program of Architectural Heritage Management and Tourism
(International Program)
Graduate School
SILPAKORN UNIVERSITY**

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The Graduate School, Silpakorn University has approved and accredited the Thesis title of “Review of Conservation Guidelines in Relation to Land Use Planning Aspects of Buffer Zone Affective Urban Heritage Places, Case Study: The Setting of King Narai’s Palace, Lop Buri Province.” submitted by Mr.Panayu Chairatananonda as a partial fulfillment of the requirements for the degree of Doctor of Philosophy in Architectural Heritage Management and Tourism

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The setting conservation around the cultural heritage place is to ensure to protect the significant value of that cultural heritage place. A buffer zone is an effective tool for protecting the significant value of the cultural heritage place, if it has been established circumspectly. The goals of the study were to (1) To suggest the criteria for appropriate delineation of the buffer zone and to integrate into land use planning to protect the values of the cultural heritage place in the historic urban area; and (2) To suggest guidelines to control and manage setting within the buffer zone of the cultural heritage place in the historic urban area. The objectives of the study were to (1) To review the concept of the buffer zone and case studies of implementation of buffer zone in other countries; (2) To review land use planning, regulations, guidelines, and relevant laws for cultural heritage conservation in Thailand and other countries; (3) To identify both King Narai's Palace and settings' characteristic of cultural environment caused by development regarding to historical, cultural and socio-economic dimension; (4) To analyze limitations and requirements of surrounding communities, related institutions for conservation and land use planning; and (5) To integrate delineation of the buffer zone into the land use planning to be an effective legal mechanism for urban historic conservation. Qualitative and quantitative analysis method were used to analyzed the background information, especially, case studies of buffer zone implementation in various documents were analyzed by the analytic induction. This study has three keys implementations. (1) the criteria of delineation of buffer zone for the cultural heritage place in the historic urban area; (2) the management guidelines within the buffer zone; and (3) integration with urban land use planning. This study can define the criteria for delineation the buffer zone for cultural heritage place in the historic urban area, and management guidelines for control the condition within the buffer zone. Furthermore, these processes can be implemented by integration with the urban land use planning process as the possible way to conserve historic urban area with spatial planning process

Student's signature

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Chapter 1

Introduction

Statements and Signification of the Problem

All historic urban areas in the world, whether they have been established intentionally or have developed gradually over time, are an expression of diverse societies throughout history. Usually, most historic urban areas consist of cultural heritage places, such as palaces, temples, pagodas, churches, city walls, moats or other historic monuments which have cultural significance. The value of those cultural heritage places enriches people's lives, often providing a deep and inspirational sense of connection to community and landscape, to the past and to lived experiences. They are national identity and experience, and must be conserved for present and future generations. In addition, the setting, adjacent areas around those cultural heritage places are also defined as the immediate and extended environment that is part of, or contributes to, its significance and distinctive character. The special character of historic urban areas does not come from the quality of their cultural heritage places alone. The historic layout of roads, paths and boundaries; characteristic building even other simple buildings and paving materials; a particular 'mix' of building uses; public and private spaces, such as gardens, parks and greens; and trees and street furniture, which contribute to particular views - all these and more make up the familiar local scene. They are products of several historical periods and of specific social, cultural, anthropological, geographical, political, and economic relationships.

However, especially in developing countries, the traditional and functional whole of historic urban area whether cultural heritage places or settings is being threatened, physically degraded, damaged or even destroyed, by the impact of the urban development that follows industrialization in societies everywhere. Among the numerous causes of decay are:

- demographic growth and the migration of population from rural areas towards urban areas, leading to social changes and dilapidation in the historic centre, where palaces become commercialized and dwellings often overcrowded and unhealthy;
- increasing use of private motor transport, which generate atmospheric pollution and destructive vibration;
- development of high-rise-buildings, which suffocate historic urban centres by changing their microclimate;
- changes in the methods and scale of industrial and commercial operations, which affect the economic functions of historic areas;
- the drift from craft production to mass production, which demands larger buildings and consequent accumulation of traffic that historic areas cannot accommodate;
- introduction of modern functions and services to replace traditional infrastructure, causing redundancy; and
- lack of maintenance of old buildings and a failure to understand their cultural and functional values, increasing the dangers of decay and collapse (Feilden and Jokilehto, 1998).

Moreover, some modern planners have failed to recognize the authenticity and cultural values of historic urban areas. The insensitive insertion of modern buildings and unsuitable activities lacking both cultural roots and good environmental performance into setting of places has been continuously damaging to historic urban areas and places. These situations often lead to irreversible cultural, social and even economic losses. As a result, many international conventions pay great attention to better safeguarding cultural heritage places by providing adequate care and management in their settings. There are many international and professional interest for the conservation of the setting of cultural heritage places as expressed in the *International Charter for the Conservation and Restoration of Monuments and Sites – the Venice Charter (1964)* - and in many texts of ICOMOS National and International Committees, as well as the *Nara Document on Authenticity (1994)* and conclusions and recommendations of international meeting like the *Hoi An Declaration on the Conservation of Historic Districts in Asia (2003)*, the *Seoul Declaration on Tourism in*

Asia's Historic Towns and Areas (2005), and the *Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas* (2005). In addition to the concept of setting in UNESCO conventions and recommendations are expressed in the *Recommendation concerning the Safeguarding of Beauty and Character of Landscapes and Sites* (1962), the *Recommendation concerning the Preservation of Cultural Property Endangered by Public or Private Works* (1968), the *Recommendation concerning the Safeguarding and Contemporary Role of Historic Areas* (1976), the *Convention for the Safeguarding of the Intangible Cultural Heritage* (2003), the *Vienna Memorandum* (2005), and more specifically the *Convention concerning the Protection of the World Cultural and Natural Heritage* (1972) and its *Operational Guidelines for the Implementation of the World Heritage Convention*.

It should stress that the need to address adequately the rapid or incremental transformation of urban historic areas which result from changes in lifestyles, agriculture, development, tourism or large scale disasters of natural or human origin, and to recognize, protect and sustain adequately the meaningful presence of heritage structures, sites and areas in their settings are the way to reduce the threat these transformation processes constitute against the cultural heritage in the full richness of its authenticity, meaning, values, integrity and diversity (ICOMOS, 2005). Control of change and planning of the built environment tend towards a dynamic process with the purpose of satisfying emerging needs. In addition to safeguarding physical structures and environmental relationships, urban conservation also needs to encompass the maintenance of appropriate functions and, where feasible, traditional types of use (Feilden and Jokilehto, 1998). Beyond the physical and visual aspects, the setting includes interaction with the natural environment; past or present social or spiritual practices, customs, traditional knowledge, use or activities and other forms of intangible cultural heritage aspects that created and form the space as well as the current and dynamic cultural, social and economic context. Importantly, Meeting in the ancient city of Xi'an (China) in October 2005, at the invitation of ICOMOS China on the occasion of 15th General Assembly of ICOMOS, Participants of the meeting adopt the following Xi'an declaration on the conservation of the setting of heritage structures, sites and areas which the setting is listed as an attribute of authenticity and as needing protection through the establishment of buffer zones. The concept of the

buffer zone was inscribed in the revision of the operational guidelines in 1980. It was recognized that the universal value of a cultural heritage site could be jeopardized by alterations in its broader surroundings. Buffer zones are an important mechanism for improving care, protection and management of those cultural heritage sites. The concept of buffer zone is inextricably linked with the concept of setting (ICOMOS, 2008). In The International Expert Meeting on World Heritage and Buffer Zones (March 2008, Davos, Switzerland) in collaboration with the UNESCO World Heritage Centre, the meeting noted that buffer zones were able to be more effective in countries that already recognize this concept in legislation. Recalling Article 5 of the World Heritage Convention, the meeting recommended that World Heritage properties and buffer zones be taken into account, as appropriate, in the legal systems of State Parties. Similarly, buffer zones delineation for other cultural heritage places in the historic urban area should be also taken in basis in the national or local planning laws. The lack of a buffer zone inhibits the ability of state parties or local administrative authorities to protect the cultural heritage places from unwelcome development pressures planned for adjacent territories which might have negative effects on cultural significance. Nowadays, cultural heritage preservation is a major part of urban planning. Land use planning is the core of legal urban planning practice. A land use plan is usually one component of a comprehensive plan, and it is an expression of a community's intent as to what its future pattern of land uses should be. The nature of land use plans can vary with the type and size of the community, its governmental structure, and the state and local laws governing it (Roberts, 1988). This is one of legal instruments to protect cultural significance of cultural heritage places in the urban historic area.

The urban planning process in Thailand has also land use plans and regulations to conserve cultural heritage places. The land use plan is a spatial legislative instrument to control arising activities or uses in a planning boundary. Practically, The Department of Public Works and Town & Country Planning restricts boundaries of the cultural heritage places in the land use plan. The light brown colour is used to represent cultural heritages or conservation areas in the plan. The main substance of the regulation is to control arising activities that have to relate and support values of places, to encourage the public use areas, and to disallow arising harmful activities.

However, in the land use plan, this regulation is only used to control the cultural heritage areas. Most setting of cultural heritages is usually stipulated in various colours that follow the existing land use and the trend of growth in the future. As a result, there are many inappropriate activities around the cultural heritage places such as, invading the cultural heritage places, destroying the physical characters of historical structures, constructing disorderly buildings by using the land without refined planning, the exceed height limitation of the surrounding buildings, apathy of traffic and circulation problems, lacking of shading areas and pedestrian walkways, and so forth. These problems affect overall cultural environments of the historic urban area. Therefore, conservation is not only the historical remains but also the setting and environment of the cultural heritage places. The land use regulation for setting of cultural heritage places in the historic urban area is necessary to conserve the historical evidences and cultural environments of nation.

In Thailand, there are many cultural heritage places located throughout the country. Those of cultural heritage places are located in various natural, rural, and urban environments. From situations mentioned above, urban historic areas in many provinces have been also confronting with those problems. Lop Buri, a province in the central region of Thailand, is located approximately 154 kilometers north of Bangkok. It borders Chaiyaphum and Nakhon Ratchasima Provinces on the east, Phetchabun and Nakhon Sawan Provinces on the north, Sing Buri, Ang Thong, Ayutthaya and Saraburi Provinces on the South. Lop Buri Province is one of several provinces in central Thailand where many significant cultural heritage places and prehistoric settlements have been discovered. Formerly known as “Lawo”, Lop Buri had for centuries been ruled by several Kingdoms. The remains of Lop Buri, dating over 1,200 years attests to the strategic significance of Lop Buri to many rulers. These relics, ranging from the Bronze Age to the Ratanakosin period (since 1782 up to the present), have made Lop Buri a blend of east and west; ancient and modern, revealing the city’s turbulent and alluring history and a glimpse of Thailand’s extraordinary past. Most cultural heritage places in Lopburi are located in historic urban areas such as Wat Phra Si Ratana Mahatat, San Phra Kan Temple, Prang Sam Yod, Prang Kaek, Constantine Phaulkon Residence, Wat Sao Thong Tong, and the case study: King Narai’s Palace.



Fig.1 The map of Thailand shows the location of Lopburi province
(<http://www.thailandtourismus.de/images/maps/provinces-maps/lopburi.gif>)



Fig.2 The map of Lopburi province shows the location of the city of Lopburi
(http://www.ntu.edu.sg/home2001/s8008880i/tibbetts/maps/map_lopburi.jpg)



1. Vichayen House
2. Phra Prang Sam Yot
3. San Phra Kan
4. Prang Khaek
5. Wat Sao Thong Thong
6. King Narai's Palace
7. Wat Phra Si Rattana Mahathat

Fig.3 The map of the historic urban area of Lopburi city shows the location of cultural heritage places

Like other cultural heritage places in Thailand, King Narai's Palace contained historical evidence of the past which has survived to the present day. These places have high cultural significance such as, aesthetic value, historic value, scientific value, and social value. At present, The Department of Public Works and Town & Country Planning stipulates this place and surrounding areas in the land use plan of Lopburi with the light brown colour to represent as a conservation area for protecting and supporting the cultural environments. However, its settings are stipulated in various colours that follow existing land uses and policies of urban development in the future. Other activities such as residential areas, commercial areas and modern commercial buildings, and official buildings are located around the palace and within its settings. This circumstance is an important cause of the contrastingly inappropriate cultural environment setting.

Therefore, the rationale for this study is:

- To focus on the urban physical, social, and economic aspects that affect to King Narai's Palace conservation, and suggest the criteria of delineation of the buffer zone for King Narai's Palace in the land use plan. Importantly, setting within the buffer zone that contributes to King Narai's Palace and the significant historical evidences must be conserved and guided in the appropriate directions.
- To control and manage land uses, building uses, physical characters of buildings, activities, open spaces, and traffic circulations in the setting of King Narai's Palace should be included in provisions of Land use planning instruments to effectively control the impact of incremental or rapid change on setting.
- To ensure as a result, the historic urban area of Lopburi still keeps the cultural significance of the cultural heritage place for historical study and tourism. This circumstance is not only to make the local people very proud in national heritage conservation in their community, but also to make a good impression on tourists in destinations.



Fig.4 The main entrance of King Narai's Palace
(Pic. from surveying)



Fig.5 The main entrance in King Narai's Palace
(Pic. from surveying)



Fig.6 Elephants stables in King Narai's Palace
(Pic. from surveying)



Fig.7 Chanthara Phisarn Hall in King Narai's Palace
(Pic. from surveying)



Fig.8 Phiman Mongkut Pavillion in King Narai's Palace
(Pic. from surveying)



Fig.9 Landscape in King Narai's Palace
(Pic. from surveying)



Fig.10 The contrast between new development and King Narai's Palace
(Pics from surveying)

Goals and Objectives

Goals of the Study

1. To suggest the criteria for appropriate delineation of the buffer zone and to integrate into land use planning to protect the values of the cultural heritage place in the historic urban area.

2. To suggest guidelines to control and manage setting within the buffer zone of the cultural heritage place in the historic urban area.

Objectives of the Study

1. To review the concept of the buffer zone and case studies of implementation of buffer zone in other countries.
2. To review land use planning, regulations, guidelines, and relevant laws for cultural heritage conservation in Thailand and other countries.
3. To identify both King Narai's Palace and settings' characteristic of cultural environment caused by development regarding to historical, cultural and socio-economic dimension.
4. To analyze limitations and requirements of surrounding communities, related institutions for conservation and land use planning.
5. To integrate delineation of the buffer zone into the land use planning to be an effective legal mechanism for historic urban conservation.

Scope of the Study

Scope of the Contents

1. To study the process of urban planning, conservation planning and to review the relevant laws and regulations in this area and case studies of implementation of buffer zones from other countries.
2. To study the physical and socio-economic characteristics of King Narai's Palace and its setting.
3. To study the significant roles and development of King Narai's Palace and its setting from the past to present day.
4. To analyze and to assess the opinions regarding to the buffer zone and guidelines of setting of King Narai's Palace from local communities and related institutions to meet the requirements of public and possible practices.

5. To propose the appropriate criteria of delineation of the buffer zone, and guidelines to control and manage setting of King Narai's Palace for conserving the cultural significance in the urban historic areas.

Scope of the Area

The area of the study is setting of King Narai's Palace that is located in the historic urban area of Lopburi province.



= The boundary of King Narai's Palace

Fig.11 The scope of the study area, setting around King Narai's Palace

(Pic. from Google maps, 2009)

Expected Benefits

1. To be a pertinent instruments for urban planning to conserve and enhance the historic urban area.

2. To inspire the government, local administrative authorities, local communities and relevant institutions to perceive the significance of cultural heritage conservation.

3. To conserve the cultural environment and cultural landscape in the historic urban area.

Hypothesis and Key Concept

“The delineation of the buffer zone of the cultural heritage place should be integrated in the land use plan as an effective legislative urban planning instrument for cultural heritage preservation to control and protect the significant value of historic properties and their settings.”

Definitions

For this dissertation, there are some definitions that can be defined as follows;

1. Land Use Planning: Land use planning is the core of urban planning practice. The process of land use planning is the process of the Department of Public Works and Town & Country Planning to identify the principles and standards that should be applied in the development or conservation of urban areas in Thailand.

2. Urban Conservation: On an urban scale, conservation involves not only cultural and historic values but also their inherent economic and social implications. The historic town or city raises conservation problems stemming from the political and economic approach rather than from any physical aspect. The town is the product of several historical periods and of specific social, cultural, anthropological, geographical and economic relationships (Feilden and Jokilehto 1998, p.80).

3. Cultural Significance: Cultural significance is a concept which helps in estimating the value of places. The places that are likely to be of significance are those which help an understanding of the past or enrich the present, and which will be of value to future generations. Although there a variety of adjectives used in definitions of cultural significance in Australia, the adjectives “aesthetic”, “historic”, “scientific”

and “social”, given alphabetically in the Burra Charter, can encompass all other values (Australia ICOMOS, 1999).

4. Place: According to The Burra Charter, place means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views (Australia ICOMOS, 1999). In this dissertation, place means the King Narai’s Palace located in the old town of Lopburi.

5. Setting: According to The Burra Charter, setting means the area around a place, which may include the visual catchment (Australia ICOMOS, 1999). In this dissertation, setting means the area around the King Narai’s Palace in the old town of Lopburi.

6. Buffer Zone: According to Operational Guidelines for the Implementation of the World Heritage Convention, a buffer zone is an area surrounding the nominated property which has complementary legal and/or customary restrictions placed on its use and development to give an added layer of protection to the property. This should include the immediate setting of the nominated property, important views and other areas or attributes that are functionally important as a support to the property and its protection (UNESCO, 2008).

8. Outstanding Universal Value (OUV): According to Operational Guidelines for the Implementation of the World Heritage Convention, the OUV means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as a whole. (UNESCO, 2008).

Abbreviations

ICCROM	International Centre for the Study of the Preservation and Restoration of Cultural Property
ICLAFI	International Committee for Legal, Administrative and Financial Issues
ICOMOS	International Council on Monuments and Sites
IUCN	International Union for Conservation of Nature
OUV	Outstanding Universal Value

UNESCO United Nations Educational, Scientific and Cultural Organization
WHC The World Heritage Centre

Chapter 2

Review of Critical Concepts

This dissertation focuses on the delineation of buffer zone and integration with the urban land use plan to protect cultural heritage places in the historic urban area. Controlling activities and uses effectively in their setting is the way to reduce the threats from the rapid or incremental transformation of cities, landscapes, and heritage routes which result from changes in lifestyles, agriculture, development, tourism or large scale disasters of natural or human origin. According to the Vienna Memorandum on “World Heritage and Contemporary Architecture Managing the Historic Urban Landscape”, however, the various continuous changes that manifest themselves in the form of structural interventions in the inherited historic urban landscape may be acknowledged as part of the city’s tradition, and require a policy of city planning and management that takes conservation as one key point for conservation. In this process, the historic urban area’s authenticity and integrity, which are determined by various factors, must not be compromised. It is fundamental to guarantee an urban environmental quality of living to contribute to the economic success of a city and to its social and cultural vitality.

This requires the review of relevant concepts and associated literature concerning the cultural heritage conservation and setting. This review forms the conceptual framework for the study and addresses the following:

1. The concept of the buffer zone and case studies
2. The concept of integrity and authenticity
3. The concept of the conservation of setting
4. The concept of cultural landscape
5. The concept of land use planning
6. The management guidelines for the urban historic area

The Concept of the Buffer Zone and Case Studies

The concept of the buffer zone is the main idea of this study. Thus, elaborate reviewing for these concept in various international documents and implementations in other countries is necessary.

The Concept of the Buffer zone

Generally, the buffer zone is a strip of land created to separate and protect one type of land use from another; for example, as a screen of planting or fencing to insulate the surroundings from the noise, smoke, or visual aspects of an industrial zone or junkyard (http://www.sactaqc.org/Resources/primers/Glossary_Land_Use.htm). In the beginning within the heritage field, the concept of the buffer zone was first used in the area of natural heritage, which is, separating the natural park or other protected area from incompatible areas, human use. On the cultural heritage sites in some countries, this concept has been used in a similar way for many years in relation to archeological sites where typically a buffer zone of 200-400 meters would automatically be put in place around site to separate it from incompatible use (ICCROM, 2009). However, the notion buffer zones for cultural sites is considered to be different than that for natural sites and was less developed (WHC, 2009).

Buffer zones are an important tool for conservation of properties inscribed on the World Heritage List. Many conventions and documents that mention this concept are broadly expressed by international organizations such as UNESCO, ICOMOS, and ICCROM. Even if many preceding international conventions, dealing with the protection of cultural heritage, do not mention the expression buffer zone, they do pay great attention to the safeguarding of settings of places, landscapes and archaeological goods. However, buffer zones are of substantial importance for better preserving the World Heritage properties and their essential values of authenticity and/or integrity in relevant context. The basic document, which deals with the issues of buffer zone, is “Operational Guidelines for the Implementation of the World Heritage Convention” from UNESCO

World Heritage Centre. This concept has been treated in every version of this convention from the first version produced in 1977, forward to the latest version in 2005. The initial concept, then defined as one which may be applied, appears as an optional inscription requirement, and one without a clear purpose.

In 1977, the Operation Guidelines stated:

“26. When setting the boundary of a property to be nominated to the List, the concept of a buffer zone around the property may be applied where appropriate. In such instances the nominations would include: a precise definition of the surface area of the property itself, including the sub-surface area where necessary an indication of the buffer zone around the property itself (i.e. the natural or man-made surroundings that influence the physical state of the property or the way in the property is perceived). Such buffer zones will be determined in each case through technical studies and provided with adequate protection.”

In 1980, the Operational Guidelines were revised and extended by inclusion of statements to emphasize explicitly that the buffer zone concept should be defined and strengthened. It stated:

“12. Whenever necessary for the proper conservation of a cultural or natural property nominated, an adequate “buffer zone” around a property should be foreseen and should be afforded the necessary protection. A buffer zone can be defined as an area surrounding the property which has an essential influence on the physical state of the property and/or on the way in which the property is perceived; the area constituting the buffer zone should be determined in

each case through technical studies. Details on the size and characteristics of a buffer zone, as well as a map indicating its precise boundaries, should be provided in the nomination file relating to the property in question.”

In 1988, some significant changes to wording were made. The Operation Guidelines replace the phrase “an adequate ‘buffer zone’ around a property should be foreseen” by “an adequate ‘buffer zone’ around a property should be provided”

In 2005, the Operation Guidelines were completely reviewed again by the Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage. Under section II.F Protection and management, the numbers 103-107 are dedicated to the subject and contain quite a complete set of rules.

“103. Wherever necessary for the proper conservation of the property, an adequate buffer zone should be provided.

104. For the purposes of effective protection of the nominated property, a buffer zone is an area surrounding the nominated property which has complementary legal and/or customary restrictions placed on its use and development to give an the immediate setting of the nominated property, important views and other areas or attributes that are functionally important as a support to the property and its protection. The area constituting the buffer zone should be determined in each case through appropriate mechanisms. Details on the size, characteristics and authorized uses of a buffer zone, as well as a map indicating the precise boundaries of the property and its buffer zone, should be provided in the nomination.

105. A clear explanation of how the buffer zone protects the property should also be provided.

106. Where no buffer zone is proposed, the nomination should include a statement as to why a buffer zone is not required.

107. Although buffer zones are not normally part of the nominated property, any modifications to the buffer zone subsequent to inscription of a property on the World Heritage List should be approved by the World Heritage Committee.”

Moreover, the number 96-102 in section II.F of the Operation Guidelines could be condensed to describe the objectives of protection. The OUV (Outstanding Universal Value), the conditions of integrity and/or authenticity should be maintained at the time of the inscription or enhanced in the future (96). There must be long-term legislative, regulatory, institutional and/or traditional protection and management at the national and local levels within adequately delineated boundaries. How protection works must be clearly explained (97). Development and change must not negatively impact the OUV, integrity and/or authenticity of the property (98). The delineation of boundaries for effective protection should be drawn to ensure the full expression of the OUV and the integrity and/or authenticity of the property (99). Boundaries for properties nominated as cultural heritage should include all areas and attributes which are a direct tangible expression of the OUV, as well as areas which in the light of future research possibilities offer potential to contribute to and enhance such understanding (100). Boundaries may coincide with one or more existing or proposed protected areas, such as national parks, protected historic districts etc (102). It seems clear that the requirements under numbers 96-102 cover all necessary aspects of legal protection. A boundary should be set, within which development and change must not negatively impact the value of the nominated property, including its full tangible expressions (Adlercreutz, 2006).

In the international level, there are two important international meetings that have the use of buffer zones to be subject of the meetings. The former meeting is the World Heritage Convention and the Buffer Zone ICOMOS Symposium Hiroshima, Japan 28-29

November 2006, and the latter is International Expert Meeting on World Heritage and Buffer Zones Davos, Switzerland 11-14 March 2008. The results of these meetings are several significant conclusions and recommendation for State Parties and conservation organizations to use the concept of buffer zones to protect cultural heritages.

In the first meeting, in Hiroshima Japan, Staneva (2006), Vice President of ICLAFI, President of ICOMOS/Bulgaria noted that the State Party, assisted by experts from UNESCO and the Council of Europe had to elaborate more comprehensive criteria for defining buffer zones for the monuments and sites in Kosovo. It was suggested that buffer zones should include the following criteria:

1. Functionality-what is the function of the site, how it is developing, what are the connections with the local community, are there conditions for social and economic sustainability in the context of the concrete circumstances,
2. Visual-preserved aesthetic values of cultural landscapes and sites as part of their integrity and authenticity,
3. Spatial-organic link with the environment (land and settings immediately around the monument, rivers, roads, etc.), assessing the social aspect, and
4. Vulnerability-development pressure, tourist flow, potential political or other type of intervention

The meeting's recommendations are very general that stress the following:

1. need for further study, involving co-operation of ICOMOS committees,
2. need to increase awareness of potential for use of buffer zones in the Asia-Pacific region,
3. need for efforts to convince those whose actions can affect heritage places to be respectful of such places and their buffer zones, through encouraging ethically responsible commitment within the corporate sector and its business communities, and responsible citizenship,
4. need to strengthen through education greater global awareness of the kind of measures needed to protect World Heritage properties, related buffer zones and their intangible aspects and dimensions.

Later, in the second meeting, ICOMOS, ICCROM, IUCN, and WHC attempt to review the concept of buffer zone in the Operation Guidelines of the World Heritage Convention for discussion in the International Expert Meeting on World Heritage and Buffer Zones Davos, Switzerland 11-14 March 2008.

According to ICOMOS position paper (ICOMOS, 2008), ICOMOS reviewed issues and questions useful in improving use of the buffer zone concept in World Heritage inscription and management. There are two particular sources of contemporary scientific input are reviewed as follows:

1. Analysis provided (2006-2007) by ICOMOS Treasurer-General Giora Solar of previous buffer zone case studies and debates

In this paper, Solar pointed that buffer zone boundaries and conditions must be defined in legal terms, and also proposed the check-list of factors in relation to wise use of buffer zones as follows:

- the value of heritage property,
- the potential threats to a site,
- the activities and actions which could compromise heritage values,
- the size of buffer zone and its establishment,
- the kind of restrictions in place for effective buffer zone,
- the management and control system for the buffer zone,
- the status of buffer zone as a legal instrument,
- the necessary of marking boundaries of a buffer zone on the ground,
- the process for altering a buffer zone by a State Party,
- the levels of buffer zone (for areas closer to the property, and beyond them to solve a visual impacts)

2. Comments by members of the ICOMOS World Heritage Working Group

There are useful comments which were provided by several members of the ICOMOS World Heritage Working Group in the preparation of ICOMOS position paper as follows:

Denyer noted that it was important to give more attention to the issues of setting and visual integrity and the way these relate to buffer zones, and set out a number of linked framing considerations as follows:

- “setting” has been noted as an essential part of the authenticity of the property as noted in the Operational Guidelines (1977),
 - setting is related to visual integrity,
 - setting can be wider than buffer zones,
 - there is a need for the State Party to protect/manage change inside and outside buffer zones,
 - buffer zones protect/manage change in the immediate setting (Operational Guidelines) not necessarily in the wider setting,
 - the wider setting may need to be protected in other ways,
 - both wider and immediate setting can sometimes be protected without a buffer zone: the lack of a buffer zone should not imply that protection or appropriate management of change is absent,
 - buffer zones normally cannot be defined to protect the whole setting or the wider area related to visual integrity of most sites –especially if threats are from tall buildings or wind-farms or noise,
 - to consider visual integrity where threats are outside buffer zone,
 - for most properties there is a need to manage change in their settings to protect visual integrity and thus the OUV; buffer zones with formal protection are one instrument which can offer a degree of protection/management for part of the setting but cannot provide the whole answer,
 - in response to increasing and larger threats, setting and visual integrity, and of the limits of change appropriate in these areas, and thus how buffer zones can contribute to this process in the “immediate setting” have to be defined in better ways.

Zhan noted that great concern must be given to the factors outside current buffer zones that affect severely the OUV. Apart from theoretical issues, coping with the problem still involves legal principles, laws, practicability, and giving the State Party a

strong reason and rational means to protect the OUV.

Fejerdy noted that there are several key principles to consider as follows:

- that it was important to be able to recognize zone(s) with different purposes and roles around the inscribed zone,
- that it was important to recognize that the tools in such zones should be different, in relation to those different purposes and different roles,
- that it was important in considering the use of buffer zones to be able to include and to integrate with the linked concepts of “setting” and “integrity”,
- that it was important in evaluating the proposed approach and the associated tools to be able to use that approach to control risks to the OUV, and that this was really the bottom line criterion in evaluating effectiveness of buffer zone controls: impact on the OUV.

In the conclusion of ICOMOS position paper, premises for testing are offered for use in the meeting as a means to identify and test key assumptions in discussion as follows:

1. The use of buffer zones has generally been understood within the Committee as a means to ensure the “proper conservation of the property”;
2. Within the buffer zone, it has generally been understood that the goal is to manage or control a range of qualities of proposed developments (height, density, use, design (form, image, patterns) etc.) in order to minimize negative impacts on OUV of the inscribed property;
3. The growing strong concern for visual impacts has involved examination of development proposals in buffer zones (as in the past) but also beyond, in a larger undefined zone that some would call “setting”;
4. The increased emphasis and attention being given the meaning of setting, and concern for application of integrity for cultural heritage in the World Heritage context have increased the number of factors being assessed in buffer zones and in adjacent settings in order to protect the OUV, e.g., functional, visual, structural integrity indicators;
5. Any effort to embrace setting (understood as something beyond buffer zone) as

an important factor in protecting the OUV may have many merits but at present this is not supported by any clear World Heritage Committee policy commitment to use of the concept;

6. It should be recognized that in many jurisdictions, zoning is an outdated planning tool, especially where the goal is to maintain diversity of social and cultural interaction within living sites. Zoning may be appropriate where homogeneous forms of development are desired, but is not easily able to deal with maintaining complexity, diversity or multi-faceted character;

7. However any tendency to discard zoning could be immediately replaced with a fully comprehensive and easily implementable approach to managing change in Buffer zone/setting to protect the OUV of nominated or inscribed properties.

According to ICCROM position paper (ICCROM, 2008), the definition of buffer zone number 104 in the current Operational Guidelines, in practice this definition has taken us away from the idea of a buffer zone as a separator or barrier, and brought us closer to the idea of a buffer zone as a management tool to deal with the transition from the site to its surroundings through added protection, which safeguards certain aspects of the site. While the Operational Guidelines emphasize setting and views, ICCROM would argue that there is a much larger range of issues related to use and function, form and design, traditions and techniques, and spirit and feeling that may also need to be protected when setting a buffer zone for a cultural heritage site. In addition, the strengths and weaknesses of buffer zone are noted as follows:

Strengths:

1. Buffer zones can be a very important management tool in protecting World Heritage sites;

2. A buffer zone may set limits to protect views, settings, land use, and other aspects, but may also positively encourage developments that would be beneficial to the site and community;

3. The line on the map and the accompanying regulations can make it very clear to all interested parties what is allowed, what is not allowed, and where.

Weaknesses:

1. Buffer zones in the World Heritage context often are ambiguous and confusing;
2. Buffer zones have no basis in the national or local planning laws;
3. Even when the line on the map is clear and enforceable, often there are not the necessary regulations and policies to make them useful;
4. World Heritage buffer zones may not correspond to already existing planning zones. The administration of buffer zones may also be problematic if different government agencies/institutions have overlapping or conflicting responsibilities;
5. It is often difficult to place a large enough buffer zone around a site to ensure adequate protection;
6. Many people associate buffer zone at cultural heritage sites, only with the visual impact and setting. When used only to deal with “visual issues” a great opportunity is often missed to positively influence many development decisions in the buffer zone that will both improve protection of the site and the quality of life of the community.

ICCROM suggested a number of possible tools that can be used in conjunction with or apart from buffer zones to help in the protection of the OUV of World Heritage sites. However, this list is not exclusive, and needs to be developed. The list of tool that suggests the following:

1. The Statement of the OUV: It could be a powerful tool for planning if adopted as part of the normal site/urban planning instruments. A clear Statement of the OUV could be referred to in justification with the concerns expressed in the heritage community. Similar to the Operational Guidelines, the Statement of OUV should include a summary of the determination that the property has the OUV, including the assessments of the conditions of integrity or authenticity, and of the requirements for protection and management in force.
2. Field of View or View Shed Analysis: This technique, which involves doing studies of the visual impacts of a proposed development from key viewing points around the territory can be a very useful tool for measuring impacts before construction begins.
3. Integrated Planning: This is probably the most important tool to be considered. Through an integrated planning process, the heritage values of the World Heritage site (as

well as other heritage values in the territory) are taken into account while at the same time ensuring appropriate economic development and improved quality of life from the social, environmental, and cultural points of view. An integrated approach also has a tendency to focus, not just on limitation and regulation, but on positive, proactive planning policies that will benefit the area concerned. It will consider not only spatial aspects but various others such as function, festivals, and community interactions with the sites.

4. Historic Urban Landscape: The landscape approach may be a very useful way to promote integrated development which takes into account the continued evolution of the landscape, making room for both protection and compatible development.

5. World Heritage Impact Assessment: Similar to the already existing environmental and cultural impact assessments, these areas of concern could correspond to a much larger territory than a traditional buffer zone. Such a system would serve to put developers on notice as they plan their projects that they will be subject to an analysis to make sure that impacts to the World Heritage site would be minimized or eliminated.

In conclusion of the position paper, ICCROM noted that a buffer zone can be an important tool in helping to manage and protect the OUV of a World Heritage site. In order to be effective, however, it is necessary to ensure that it has a logical and clear boundary, and that regulations and policies have been developed which provide for all of the necessary protection of the OUV of the World Heritage site. Buffer zones should be seen as part of a large integrated planning process which brings together the concerns for the heritage with the needs of development and improved quality of life. This planning process and its resulting management system should be effectively implemented and monitored over time, and where necessary regulations and policies should be adjusted in order to make improvements.

According to IUCN position paper (IUCN, 2008), there are two important dimensions to buffering World Heritage properties and other protected areas.

The first is the need to protect the values of the property from threats that originate outside its boundaries, thus enhancing its integrity. Some examples of roles a buffer zone can play in relation to different threats could include:

1. Adopting land-use policies to prevent the location of disturbing or intrusive industrial uses that would impact on the values of the protected area;
2. Protecting catchments providing water supply upstream of a protected area from pollution;
3. Regulating the scale and location of tourism facilities and access to manage levels of human disturbance;
4. Regulating agricultural practices, for example to avoid introductions of alien species or limit impacts from intensive farming techniques.

The second dimension is to create linkages between a protected area and the wider area that surrounds it. Buffer zones can also create linkages to facilitate cultural and spiritual, social and economic benefits for communities, and to create the space to provide for the recreational and educational needs of visitors.

In summary IUCN considers that the following functions are required within an effective buffer zone:

1. A buffer zone should be clearly defined by the State Party, and should have sufficient protection or management provision to be effective at addressing key threats, and to provide enhanced protection and management of the World Heritage site. Further exploration is required of models for legislation that can provide suitable planning protection to buffer zones. It is also essential that all organizations with management authority within the buffer zone, as well as private property owners, NGOs, and local communities, recognize the need to protect the values of the World Heritage property and are engaged in planning and implementing the agreed protection and management of the buffer to achieve this aim.
2. There should be coherent management policies, plans, and actions that incorporate both the World Heritage site and the buffer zone; and these should be clearly delineated in the management plan for the property. These should ensure that there is effective recognition of the overriding importance of protecting the World Heritage site as a key planning and management requirement within the buffer zone.
3. Buffer zones should be defined at a spatial scale that is manageable and realistic and should be able to be understood, recognized, and supported by the relevant regulatory

organizations and stakeholders. Buffer zones should ideally be defined according to boundaries that can be both clearly mapped and readily understood in the field

4. An integrated management plan and system jointly for both the World Heritage property and its buffer zone should be developed, and managed with clearly understood objectives and supported by the necessary human, financial and other resources to implement management prescriptions, and monitor their effectiveness.

5. Buffer zones can increase the level of contact between the World Heritage property and surrounding communities, including indigenous people who live in the buffer zone. An integrated approach combining protection/conservation with promotion of education/interpretation and community and economic benefits within the buffer zone should be encouraged.

According to World Heritage Centre (WHC) position paper (WHC, 2008), among the threats related to buffer zones that were encountered, some problems reoccurred multiple times. WHC summed up some of the predominant issues related to buffer zone issues are:

1. Urban developments within buffer zones: Urban development pressure is frequently endangering World Heritage Sites. Whether a high rise construction is located inside or outside the buffer zone, it is mostly the strong visual impact. Tourism may be triggered by or be correlating with an increase in urban density and the development of hotels and tourist centres in proximity to the sites.

2. Unclear boundaries: The presence of precise boundaries is crucial for the efficient protective functioning of buffer zones. In many case the problem is also related to a lack of background studies and expertise that are necessary before establishing the limits of a buffer zone.

3. Absence of buffer zone: There are a lot of sites that lack a buffer zone, since it is only recommended in the Operational Guidelines of the World Heritage Convention but not mandatory to include a buffer zone into a nomination. The buffer zone was requested by several Committee decisions and was finally submitted in 2008. However, in exceptional cases a buffer zone may not be necessary for the protection of a site, as other protection schemes replace it.

4. Legal aspects: Many buffer zones are not or insufficiently protected by national or local legislation. For that reason, a protective status for buffer zones is not possible. Therefore, any zoning for a World Heritage property and its buffer zone needs to be reflected in the management plan for the property. The management plan needs to clearly define the legal status and appropriate activities in the buffer zone.

These threats may be very detrimental to the conservation of heritage properties as it prevents the establishment of a coherent system of legal protection, monitoring and maintenance. However, in the framework of the World Heritage Convention, the purpose of buffer zones is still exclusively linked to the function of providing an additional layer of protection, but the level of protection that shall be provided by a buffer zone is different from the protection level assigned to the core zone of property. Although,

paragraph 107 of the Operational Guidelines of the World Heritage Convention shows that the notion of buffer zone has gained importance over years within the World Heritage processes but further guidance on how to create a buffer zone (how it contributes to protect the OUV of the property, degree of legal protection, size, etc) is not provided. The different methodologies have been adopted in the process of identification or revision of buffer zones, and sometimes they have been combined. Depending on the typology of property, the buffer zone is represented by:

1. an area of land around the core;
2. the cadastral parcel on which the property is located;
3. one of the protection layers established through national legislation concerning heritage safeguarding;
- 4 the territory of the municipality in which the property is situated.

Finally, the conclusions and recommendations in this International Expert Meeting on World Heritage and Buffer Zones were adopted by the World Heritage Committee at its 32nd session, 02-10 July 2008, Quebec City, Canada. A series of main conclusions and recommendations related with delineation of a buffer zone are summarized as follows:

A. Summary of key points arising from the meeting

1. The expert meeting agreed that a World Heritage property is the area that contains the OUV, and buffer zones provide additional protection for the OUV and

integrity of a property, but that buffer zones do not themselves include the OUV;

2. Buffer zones are only one means to achieve protection and management. As outlined in the Operational Guidelines, there are also legal, regulatory and other methods available. Buffer zones should be integrated with any other such methods;

3. Buffer zone boundaries, and activities within buffer zones, may be considered as part of evaluation, state of conservation and reporting processes;

4. The basic characteristics of buffer zones were common to natural, cultural and mixed properties. How buffer zones might be implemented for any particular property would vary. Capacity building and guidance should be enhanced to assist States Parties to establish and implement buffer zones;

5. Buffer zones provide an important mechanism to share the benefits of World Heritage designation with local communities and stakeholders and enhance sustainable use.

B. Recommendations

These recommendations are addressed to the World Heritage Committee, States Parties to the World Heritage Convention, the Advisory Bodies and the UNESCO World Heritage Centre, as appropriate:

1. Buffer zones were able to be more effective in countries that already recognize this concept in legislation. Recalling Article 5 of the World Heritage Convention, World Heritage properties and buffer zones should be taken into account, as appropriate, in the legal systems of States Parties;

2. The following steps are noted in relation to the tasks required in establishing a buffer zone, although the order of them could vary:

- Analysis of the characteristics and the OUV of the property and integrity define the external issues;
- Delineation of buffer zone(s), as appropriate;
- Analysis of the potential positive opportunities of the zone;
- Consideration of national law and local legislation/regulations relevant to the implementation of the buffer zone;

- Ensuring effective implementation and mechanisms in relation to the functions of the buffer zones;

3. The following standards are considered by the World Heritage Committee in relation to the establishment and amendment of World Heritage buffer zones by State Parties:

- The relationship between the function, extent, protection, and management of any World Heritage buffer zone and the World Heritage Property needs to be made clear by the State Party;

- The State Party should demonstrate that there is an effective integrated approach to protection of the OUV value and integrity/authenticity of the World Heritage property, within its boundaries and through measures in any buffer zone;

- Management responsibility will vary depending on the specific situation of the site. The State Party should demonstrate adequate institutional commitment and coordination arrangements between the management authority for the World Heritage property and those responsible for implementing measures to protect and/or realize benefits from sustainable use within any World Heritage buffer zone;

4. The role of buffer zones in supporting cultural and natural heritage through encouraging positive measures which enhance the value and provide benefits for local communities requires greater emphasis by State Parties. In particular World Heritage buffer zones had an important role in delivering the requirements concerning sustainable use. The governance of buffer zones provides an important opportunity to give appropriate recognition of local people.

The Case Studies of Implementation of Buffer Zones

In this part there are many case studies from many countries in Asia, Europe, America, and Australia. These case studies are reviewed to study the implementations, benefits, and limitations of buffer zones around cultural heritage places.

In the 7th Seminar on the Conservation of Asian Cultural Heritage 1997, in Japan, Ishikawa (1997) presented the protection of the buffer zone of the World Heritage Site, historic monuments of ancient Kyoto and the urban planning policy of the city of Kyoto that “Historic Monuments of Ancient Kyoto (Kyoto, Uji and Otsu)” were inscribed on the World Heritage List in 1994. The inscribed property is composed of seventeen historic monuments which are located in separate areas in the current administrative territories of the cities of Kyoto, Uji and Otsu. The core zones of all of the sites are strictly protected as historic monuments under the national Law for the Protection of Cultural Properties. There are two levels of buffer zones to protect historic and natural features of their setting. One is a set of zones which protect the immediate vicinity of each site, and the other is a single wider zone covering all of the seventeen sites and their immediate buffer zone in one area. In the setting around each site, buffer zones are established by the City of Kyoto in accordance with the existing measures for landscape control. Within the buffer zones, the design of buildings, including such factors as building height and site coverage area, are limited to meet the needs of each zone. In Kyoto, the suburban areas are regulated to conserve the natural and historic landscape, and most of them are designated as protection areas to prevent development there. These landscape-control regulations are also effective in protecting the overall environment around the nominated properties. On the other hand, the inner city is dedicated to achieving a harmonious urban landscape, and therefore the policy is to maintain the urban setting by providing appropriate guidance together with the necessary restrictions. As a result, a relatively broad area is established as a buffer zone around the properties in these suburban areas. The settings around these properties had already undergone changes over a long period of time, and therefore the main purpose of the buffer zones was to create the appropriate atmosphere to match the historic monuments rather than to concentrate on preserving the present state of the buffer zone environments.

In addition, in 2006 the World Heritage Convention and the Buffer Zone ICOMOS Symposium Hiroshima, Japan, participants from 15 countries participated in the workshop. This meeting provides an excellent overview of a wide range of concerns and difficulties in applying the buffer zone mechanism effectively in a variety of national

contexts. Many of case studies detail particular local circumstances in various contexts, and also illuminate important principles and observations. Some of the most notable of these case studies are reviewed as follows:

Case study of Sweden

Adlercreutz (2006) presented that Sweden has 14 World Heritage sites, most of them accepted on cultural criteria, only a few of them have formal buffer zones, and that the information as to what protective regime applies in these is rather scant. The Swedish internal legislation applicable to protection of World Heritage properties consists of the following acts.

1. The Environmental Code (SFS 1998:808): It is a fairly modern legal instrument, working with area protection as a primary tool relevant to World Heritage properties. There are other provisions in the Environmental Code that serve similar purposes as buffer zones. National government agencies are charged with monitoring *zones of national importance* to certain interests specified in the code. The aim of this kind of very comprehensive zoning is to protect the zones from physical measures that might considerably impair the protected interest. However, the prohibition on measures detrimental to national heritage interests does not involve any clear rights of use of land within the national importance zone. In order to implement protection in such a zone, tools have to be used which are provided in the Planning and Building Act. There is still a considerable lack in this implementation.

2. The Planning and Building Act (SFS 1986:10): It mandates the local governments to adopt their own physical planning ordinances and regulate the use of land and water areas within rather wide frames. It is possible for a local government to ban the demolition of buildings and other structures of heritage importance. A way to safeguard World Heritage sites is to adopt *detailed development plans* or *area regulations* with precise provisions for the preservation of heritage values. However, adverse economic effects of planning and building ordinances and decisions may result in the local government having to pay compensation to the land owner.

3. *Cultural Monuments Act* (SFS 1988:950): There are buffer zone implementations in this act, but they are regulated differently depending on what kind of a

heritage object they are aimed at safeguarding.

- Monuments of primarily an archaeological interest, ancient remains, are legally protected directly by the act. Protection also includes “a large enough area of ground or on the seabed to preserve the remains and to afford them adequate scope with regard to their nature and significance”. However, this area is almost never delimited in advance; it will be decided whenever necessary. So it is primarily up to the land user to ascertain whether a project will affect the protected area in consultation with the responsible authority. However, protection in the area around monuments is not really relevant to call the area a buffer zone. Ambiguity could arise from the fact that it is not decided beforehand how large the area is within which land users will have to seek permission. A buffer zone can be created by administrative order “in the vicinity of” a protected area, and also in places where ancient finds have been made. In this vicinity, restrictions can be placed on public access and also on land use. In the latter case the restrictions must not seriously impede current use of the land. Moreover, there are no rules on damage compensation to land users whose rights might be impaired by provisions protecting ancient remains.

- The architectural heritage protection means a prohibition to perform any changes to the building in regards itemized in a protective order. Typically, the exterior must not be changed at all, and the interior cannot be changed as far as lay-out is concerned. In addition, the rules for historic buildings may also be applied to a group of buildings, parks, gardens and other amenities of historic interest. A buffer zone provision is added in the following wording: “If necessary, the protective order may also include provisions to the effect that an area surrounding the building is to be kept in such a state that the appearance and character of the historic building will not be travestied”.

- The Cultural Monuments Act also covers the ecclesiastical heritage. Church buildings and church sites must not be altered in any essential respect without permission from the responsible authority. A church site is an area surrounding a church building, connected with the function and environment of the building and not constituting a burial ground. There is no formal procedure available for setting the

boundaries of a church site, and questions as to the duty to seek permission will then have to be solved in each case arising. In addition, a similar protection is upheld for burial grounds. Permission is also needed for the erection of new buildings and permanent installations and for demolition and essential alteration of existing buildings and permanent installations. However, there are no buffer zone provisions for church properties and burial grounds.

Finally, Adlercreutz summarized that the concept of buffer zone would be useful if it rested on a clear perception of the difference between what applies in a buffer zone and the core of the World Heritage site. However, in Sweden, the buffer zone provisions in the heritage legislation are not really very helpful. They do cause some ambiguity.

Case study of Croatia

Antolović (2006) presented that the Law on the Protection and Preservation of Cultural Goods is a new law established recently in 1999 to concern the protection of the complete fund of cultural goods in the Republic of Croatia. There is a provision that regulates the matter of buffer zone in Article 10 as follows:

“In a decision that establishes preventative protection for real estate it is obligatory to determine the physical boundary of the good to which the preventative protection relates”.

Antolović considered two examples of Croatia sites to clarify how these legal measures are applied in practice as follows:

1. Poreč, Episcopal Complex of Euphrasian Basilica: The group of religious monuments in Poreč constitutes the most complete surviving complex of its type. The basilica, atrium, baptistery and Episcopal palace are outstanding examples of religious architecture. The Cathedral complex is situated within the protected monument complex of Poreč which means that protection is implemented in its surroundings, and a buffer zone is established. The function of the buffer zone is achieved through:

- strong conservators' surveillance together with the continuous presence of the Conservation Department in Pula, as well as with continuous cooperation with local authorities;

- detailed protective measures for the complex (Zone A) and buffer Zone (Zone B).

The system of the protective measures of the Zone A is as follows: (1) Full protection and preservation of the cultural and historical values with maximum respect for the traditions and functions of space and content; (2) Strict control of the permission for new structures and contents; (3) Minimal interventions in the historic structures- the acceptable methods of recovery, conservation, restoration, conservation reconstructions and presentations.

The system of the protective measures of Zone B-Buffer Zone: (1) The protection of the basic elements of the historical pan matrix and characteristic building clusters; (2) Interventions in the way of adapting the functions and contents to contemporary needs, but without significant physical changes of the preserved elements of the historical structures; (3) Methods of conservation, reconstruction, interpolation, recomposition and integration in order to blend the historical and new structures.

2. Dubrovnik, Old City: Dubrovnik is a city-monument whose architectural and urban richness bears witness to the existence of a strong commercial and cultural community throughout the centuries. Numerous works of art, situated mostly within the churches and museums, as well as in the public space, contribute to the City's identity as a monument. Today Dubrovnik is one of the most attractive cultural and tourist centres of the world. Dubrovnik was added to the List of Endangered Sites in 1991, as a direct consequence of the war. The reconstruction of the Imperial Hotel in Dubrovnik is an example of a threat which could involve the use of a buffer zone.

- During the work, a concrete annex was added which serves as the hotel garage and services premises. It was not planned in the reconstruction project;
- Afterwards, an addition to the building permit was issued, as well as a

new decision regarding prior authorization by the Conservation Department;

- The contact zone was not obeyed and the surrounding objects were physically in danger due to excessive excavation;
- The annex does not comply with the existing urbanistic matrix, attempts were made afterwards to fit in it.

Antolović concluded that it is necessary to clearly set the boundaries of the protected monument complex due to the relations with the local authorities as well as owners of real estate in the protected area. It is essential that a buffer zone be a component of the protected area so as to be able to implement the protective measures established by the laws.

Case study of Netherlands

Wit (2006) presented that Netherlands has no legislation under which buffer zones have been granted a special legal status. Effective protection of World Heritage sites should include complementary legal and/or customary restrictions which apply to a larger area. The main strategy used in Dutch Heritage management to deal with this can be described as “preservation by development”. Make cultural heritage values a starting point for development. Heritage protection and spatial planning in the Netherlands are based on a system of checks and balances between the different layers of government. There are many kind of legislation that can be used in several ways to achieve the desired level of protection for World Heritage sites and the surrounding areas as follows:

1. Monuments and Historic Building Act 1988: This act contains national regulations concerning the protection of monuments and sites. To alter, demolish or move any part of a protected monument or a monument subject to a current procedure must be permitted by the municipal authority or the Minister of Culture. This affords a large degree of protection, yet it has no legal impact on the surrounding area. Relatively large areas can be designated as protected townscapes. The effect is that the local municipality must draw up (or adjust) its zoning plan as stipulated in the Spatial Planning Act.
2. Spatial Planning: All municipalities must produce zoning plans. It also

stipulates regulations concerning the designated use of land and outlines activities which are subject to a permit. Every zoning plan needs approval from the provincial authority. In this way provincial authorities can prevent developments at places with important cultural values. If the provinces fail to do so, the government has the power to force them.

3. Protecting the area surrounding the Kinderdijk-Elshout mill complex: This is a good example of how the legislation available has been successfully used. This complex comprises a group of buildings forming part of a man-made landscape. The boundaries of the World Heritage site encompass not only the important buildings (the windmills) but part of the landscape as well. The zoning plan of this area only permits the area to be used in ways that reinforce the cultural value. However, there is no buffer zone surrounding the World Heritage site here.

In addition, Wit raised the question that if the protected area is large enough, a buffer zone is an actual need for protecting the cultural values or not.

Case study of Poland

Kowalski (2006) presented that the beginnings of legally formalized protection of WW II places of extermination in Poland date back to the early post-war years. The Nazi concentration camps at Auschwitz-Birkenau and Majdanek including all buildings and facilities were preserved as a Memorial of the Martyrdom of the Polish People and other Peoples. In order to accomplish that, the laws on “commemoration of the martyrdom of the Polish People and other Peoples” established new museums and directed the Minister of Culture and Art to delineate the boundaries of the grounds assigned to them, which were then to be expropriated in favor of the State Treasury. The problem of special protection of the areas directly adjoining the museum boundaries emerged much later, because the Auschwitz-Birkenau complex was located within the town limits. Seeking to limit or eliminate such activity in the direct vicinity of the museum, the building authorities issued in 1962 “a decision on the location of a protective zone for the State Museum at Auschwitz-Birkenau”. Under decision, the zone was delineated and conditions were elaborated for building activity in the zone for example; to preserve the immediate vicinity of the Nazi camp at Birkenau, to prevent new buildings being erected close to the

camp boundary, to prohibit new buildings and inappropriate development in the protective zone, and to preserve an open view and open spaces of the camp. However, fifteen years after that it became apparent that its provisions were no longer sufficient in view the growing investment activity in the area not only in the neighborhood of Auschwitz-Birkenau, but also in the vicinity of the camps at Stuthoff and Majdanek. The Ministry of Local Economy and Environment Protection instructed the competent building authorities to address the problem, and they were directed to institute protective zones around the camps. The legal situation remained in force until the introduction in 1999 of a general systemic regulation. A law on the protection of the territories of former Nazi death camps was adopted. The protection it envisages consists in the establishment of protective zones and the introduction on the territory of the Monuments of Extermination, and their zones, of special rules concerning:

1. Erection of buildings, temporary buildings and other facilities: The law prohibits the erection of any buildings on the territory of the Monuments of Extermination and their protective zones delineated. The ban does not apply to objects and facilities needed to protect the values of the Monument of Extermination or to provide services for site visitors.

2. Expropriation of real estate: The law introduces a special expropriation procedure. This matter is also within the competences of the voivode (province administration head); only plots with cultural places and residential buildings are exempted from expropriation. All other real estate is subject to the procedure, with expropriation possible only in favor of the State Treasury.

3. Business activity: The law only permits activity necessary to protect the Monument from destruction or damage, to ensure order and cleanliness within its site, to provide its ongoing conservation, marking of its boundary or those of the protective zone, and provision of services for visitors.

4. Holding of public assemblies: These are also governed by special rules. They also require the consent of the voivode.

Finally, Kowalski concluded that tendencies of establishing protective zones around monuments have appeared recently to enter such zones into monument registers,

which reinforces their protection from the threat of buildings being erected on their territory. In such cases “the surroundings of the monument” constitute the protective zone. Under the law on the protection of monument, the monument’s surrounding are defined as “the area around or at the monument, determined in the decision on the entry of that area into the register of monuments for the purpose of protection of the visual values of the monument or its protection from the harmful effect of external factors”. Such broad definition of the protective zone offers substantial possibilities of protecting monuments, though it may lead to conflict with owners of the land within the zone, whose rights of ownership this become substantially restricted.

Case study of Germany

Treuttschler (2006) presented a buffer zone dispute that the Wartburg is the first German castle placed on the World Heritage List in 1999. it is rich in cultural associations, most notably its role as the place of exile for Martin Luther, who wrote his German translation of the New Testament there. It is also a powerful symbol of German integration and unity. Neither a buffer zone nor a management plan was explicitly laid down, because at that time it was not a condition of listing. However, it was sufficient to note that the Wartburg is managed by the Wartburg Foundation. All forms of development around the monument were restricted within the planning zone of the city of Eisenach to protect area of the Wartburg. Later, in 2005 GEWI Planning and Distribution Ltd applied for a building permit for the construction of two wind energy plants with the hub being 100 metres high and the rotor 82 metres in diameter built on hills called the Milmesberg, and the district granted the building permit. The linear distance from this location to the Wartburg is 7.5 kilometres. However, the community of Marksuhl staged a protest against the building permit and applied to the administrative court in Meinigen asking it to suspend the permit until a final court ruling. Since, these windmills are placed on top of Milmesberg. There is a danger that the almost unspoilt view of the Wartburg praised by Goethe and later by the Romanticists, as well as the unique landscape, will be severely disturbed. Finally, the court has ordered reinstatement of the suspension of the building permit. This means that at present the permit cannot be used. The court has

argued that the erection of the windmills could impair the interests of monument protection according to the Thuringian Law for the Protection of Monuments and Sites. The court also sees in the World Heritage status of the Wartburg a special additional need for protection.

In conclusion, Treuttschler concluded that the Thuringian Law for the Protection of Monuments and Sites does not contain a definition of how far the surroundings of a monument are worthy of protection. Decisive is the sphere of impression of a monument can reach very far. Since, the law protects the surrounding of monuments effectively, as this case has shown, no necessity is seen to change this law or introduce additional legislation for World Heritage. As this case also shown, that judges are conscious of the importance of the World Heritage status of a monument.

Case study of Bulgaria

Staneva (2006) suggested new mechanisms and instruments for improvement of the state of the art of heritage conservation in Bulgaria, namely:

1. Stimulating legislation should give enough guarantees for the social and economic activity in the field of the heritage, without neglecting the requirements for preservation of the cultural continuity.
2. Improvement of the management of the heritage by optimal de-concentration and decentralization of competencies at various levels is needed, and stimulate the local initiatives for the preservation and utilizing the heritage.
3. To raise the social and economic activity in the field of the heritage is necessary. It may have stabilizing social influence, to become a source of economic activity.
4. The role of the non-profitable associations in the field of the heritage should be rapidly raised to that of partner. Thus civil society will be properly built.

Moreover, Staneva stated that the co-ordination between protection and territory planning was regulated by the Territory Management Act. A very important specific feature of the territory management plans, as stipulated within the Territory Management Act, is that they can be devised both for the separate localities with their adjacent territory

as well as for portions of them. This provides for the establishment of some important spatial, functional and semantic links between the elements of the cultural and historic heritage located at different places within the urban fabric. Together with some other areas, the areas with cultural and historic heritage are defined by the general Territory Management Plan, which also specifies the general regime for management with the respective terms and regulations. These regulations do not restrict, they rather “channel” the investment process by assisting the administration in curbing the ruthless expansion of construction that endangers the heritage, cultural and natural alike. However, Bulgarian legislation does not contain a special law or regulations with regard to buffer zones. Nevertheless, in the case of cultural heritages, in a series of laws and according to heritage specificity, this matter is being dealt with as follows:

1. The Law on Monuments of Culture and Museums stipulates the creation of protected territories. These territories contain generally a clearly defined buffer zone, with delimited boundaries and regimes. All new development in the protected areas is compulsorily approved by the National Institute for Monuments of Culture.

2. The Territory Management Act is an extremely important regulative document defining the strategy and the mechanisms for territory management, and plays a key role in the preservation and revitalization of the heritage.

The policy for the heritage protection constitutes an integral part of the policies for use of the territories, the development and planning policies. It means that the adoption of a new Law on Cultural Heritage is needed. This law should create working mechanisms for co-coordinating the activities for preservation and development, should grant the necessary decentralization and de-concentration for the heritage management, as well as efficient control on the preservation of monuments of culture at all levels and at each stage of the devising and implementation of the territory management plans. They should be more comprehensive when dealing with buffer zones, namely formulation of criteria for definitional of buffer zones, functional restrictions, strict building and infrastructure regulations and request for specific rules. Finally, Staneva concluded that the importance of buffer zone, adjacent to properties with world or national significance is increasing gradually due to the dynamic changes both on global and local scale. As the manner of

protection of World Heritage, buffer zones should be used as a model for applying to heritage of national significance also.

Case study of Spain

Villanueva (2006) presented that the use of buffer zones in Spanish legislation regarding the protection of the patrimony originates in the protection standards that were established at the beginning of the twentieth century for monuments and historical areas. Accordingly article 21 of the Real Decreto Ley of August 9, 1926, concerning protection and conservation of artistic richness declared that in cities and towns which are totally or partially declared as, or that are included in, artistic national treasures, there will be protection by way of the city plans. Circles were to be drawn around those places where development was limited, with different colors for artistic or historic buildings, places, streets, squares, picturesque locations and central plazas. Later on, the Law of 13th of May 1933, article 33, and the Decreto of 16 of April 1936 confirmed complete protection of immovable cultural goods through “protection areas”, Spain’s first regulation of buffer zones. A buffer zone in the Spanish legal system is a physical space that surrounds the cultural heritage place without having its own cultural value. Its mission is to provide suitable space for the conservation, protection and contemplation of a cultural heritage place. Villanueva concluded the legal rules governing buffer zones spread around Law 16/1985 regarding the Spanish Historical Heritage as follows:

1. Both Cultural Interest Goods and Buffer Zones are one unit: An immovable property declared to be of cultural interest is inseparable from its surroundings. It cannot be displaced or moved unless this is essential for reasons of force majeure or social interest.

2. Under all circumstances, authorization must be obtained from the Administration for any activity on Buffer Zones: With Cultural Interest Goods, no internal or external building work may be carried out that will directly affect the building or any of its parts or belongings without express authorization from the Administration responsible for enforcement of Law 16/1985. The same authorization is necessary for placing any type of sign or symbol on facades or roofs and for carrying out any work in the

surrounding area covered by the declaration.

3. Urban and Rural Planning can fulfill the role of Buffer Zones: the Plan for the protection of a historical unit may allow urban remodeling but only when this implies an improved relationship with the territorial or urban surroundings or avoids any use that is damaging for the unit.

4. Benefits are also for the Buffer Zones: The budget for any public works that are financed completely or partially by the State shall devote at least 1% of the funds provided by the State to financing work on the preservation or enrichment of the Spanish Historical Heritage or for promoting artistic creativity, preferably on the actual site of the work or in its immediate surroundings.

Case study of Finland

Virtala (2006) presented a case study on Rauma, Finland's third oldest town that was the commercial and ecclesiastical centre of the region. Three buildings of note in Rauma are the old Franciscan church, the ruins of the fifteenth century church, and the Town Hall built in the eighteenth century. Despite some changes made in the nineteenth century, Rauma has preserved its historical core while the modern city grew up around. People still live, work, spend their leisure time and do business in Old Rauma. The Middle Ages is reflected in the narrow winding streets and alleyways and the irregularly shaped lots. Moreover, Virtala explained the legislation in Finland where the Land Use and Building Act and the Act on Protection of Buildings apply to World Heritage Sites. According to the Land Use and Building Act, the Government may approve national land use guidelines. These guidelines are meant to support and promote the implementation of the general goals laid down in the Act. The basic goals are sustainable development and a good living environment. The national land use guidelines are part of the land use planning system, which also includes regional land use plans, local master plans and local detailed plans. For the land use planning system to function properly and lead to favourable results, there has to be nationwide agreement on the national land use guidelines that guide land use and its planning. The main idea of the national land use guidelines is to ensure that issues of national interest are taken into account regionally and

locally by all government authorities.

According to the Land Use and Building Act, when an area requires protection due to its landscape, natural values, built environment, cultural and historical values or other special environmental values, or when a historical building requires protection, the necessary regulations for this purpose may be issued in the local detailed plan. The protection regulations must treat landowners reasonably. For Old Rauma, the local plan for this area is sufficient in its regulations concerning preserving and protecting the area. The local detailed plan for the buffer zone around Old Rauma required that plans concerning building and business activities take into account the area's architectural and historical value. In 2004, the amendment of the local detailed plan was approved by the local council to find a solution for commercial activities in the town centre which would support its balanced development, Old Rauma being the town's core. In the amended detailed plan, large retail units are located less than 500 metres from the centre of Old Rauma and a little more than 300 metres from the Franciscan church. However, this local council's decision was appealed by several parties, including the National Board of Antiquities and the Society of Old Rauma. The Board stated that the building rights granted to large retail units were too extensive, and that the decision was unfit for the buffer zone of a world Heritage Site. The architectural significance of Old Rauma is based on interconnected life in historical town centres where housing, services and businesses form a many-sided town community. Too large retail units would change the nature of the business premises in the old town centre and force out those business with the consequence that this area would be turned into a dormitory town, which would be fatal for its existence. The large retail area would cause the commercial centre to shift away from Old Rauma, and it is possible that building maintenance would be neglected or business premises would change to housing premises. Afterward, the city of Rauma claimed in its plea that the main considerations were the attraction of the old town centre and attainability of services. The solution was seen as integrating the town structure and bringing retail units offering perishable goods close to the people living in the centre. The detailed plan gives specific regulations on the quality and size of the units. In addition, the allotted space is regulated so that it competes as little as possible with the shops in Old

Rauma. Finally, the Supreme Administrative Court dismissed all appeals. In its reasoning the Court stated that regardless of the amendments in the local plan, economic changes in Rauma, as well as elsewhere, have resulted and probably will also result in the future in the concentration of commercial supplies in larger retail units. The location of these units may lessen the attraction of the shops in Old Rauma, but the commercial emphasis in the town centre may support the preservation of Old Rauma as an active town community.

Case study of Australia

Wiffen (2006) presented the case of the Sydney Opera House that in the event that this place is inscribed on the World Heritage List, a buffer zone will come into force by an amendment to the Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (Harbour REP): This plan aims to establish a balance between promoting a prosperous working harbour, maintaining a healthy and sustainable waterway environment and promoting recreational access to the foreshore and waterways. The buffer zone will be subject to additional planning rules and provisions aimed at further protecting the World Heritage values of the property. To be approved any development will need to preserve the World Heritage values of the Sydney Opera House; to preserve views and vistas between the property and other public places within the buffer zone; and to avoid any diminution of the Sydney Opera House when viewed from other public places within the zone. Any proposed development within the buffer zone would need to address these matters in its application. Kappagoda (2006) reported the buffer zone application in Sydney Regional Environment Plan (Sydney Harbour Catchment) 2005 (Amendment No.1) that the proposed buffer zone covers parts of the City of Sydney and North Sydney local government areas. It includes the waters of Sydney Harbour, headlands and bays and places on the foreshores. On land, the buffer zone corresponds with the Foreshores and waterways Area of the Harbour REP. It covers the foreshores of the Rocks, City of Sydney and North Sydney up to one street back from the waterline. Wiffen stated that the strategy common in protecting Australia's World Heritage properties is the use of planning legislation. These are relied on when the property is near a centre of population. Planning laws are very flexible and, as in the case of the Sydney

Opera House, can be very useful in controlling development that might impact on a World Heritage property. He concluded the importance of the buffer zone legislation that legislation dealing with buffer zone issues in Australia is a so far successful mix of national legislation based on the model of environmental impact assessment and State legislation for national parks and land use planning. Further thought needs to be given to important aspects of this legislation that provide for discretionary decision making by elected officials.

Case study of United States

Reap (2006) presented one possible model to protect the national heritages in the United States that National Heritage Areas (NHA), created by the United States Congress, are areas where natural, cultural, historic, and recreational resources combine to create a distinctive and cohesive entity that represents important aspects of the nation's heritage. Not only are the natural and manmade physical features important, but also the traditions of the people that created the cultural landscape. Here setting is not only important as a visual enhancement of landmarks and monuments but has a greater significance in its own right. Although Congress creates NHA, they depend for their success on a partnership forged in a particular geographical region by multiple political jurisdictions and many non-governmental organizations. Activities in the heritage area often include, in addition to protection, the development of an interpretation plan, rehabilitation of historic sites, opening and operating visitors' centers, creating a network of trails, etc. The overall goal of the heritage area is to promote the development of short and long-term solutions to conservation of the heritage resource by the local partners. This heritage area approach could be used as a template for a comprehensive program involving governmental, non-governmental and private partners that could protect the buffer zones of World Heritage sites in the United States. Some of the components of the comprehensive program will be discussed as further below:

1. Historic Preservation Districts: The National Register of Historic Places is the official list of resources in the United States worthy of preservation. However, the most important listing mechanism to protect cultural properties is found at the local level.

States delegate authority to local governments to enact laws or ordinances for the protection of heritage resources. The specific scope and content of local preservation legislation varies considerably due to the differences among the states in the authority delegated to local governments, community need, and the type of resources protected.

2. Conservation Districts: These areas are often applied in areas that do not possess a degree of significance or integrity high enough for designation as historic districts. Many conservation district ordinances regulate demolition or new constructions of vacant lots. Others focus on general urban design issues such as height, scale, building placement, setback, materials, or landscape features. These criteria may be implemented through incentives in addition to or in lieu of legal mandates. In fact, conservation districts have been used to provide buffer zones protecting historic landmarks and districts in the United States.

3. Planning: Historic preservation efforts can often be significantly enhanced when the preservation ordinance is closely coordinated with other land use laws and regulations such as those governing comprehensive planning, zoning, and subdivision regulations as well as other government programs such as transportation and housing. The US/ICOMOS Preservation Charter supports this approach, declaring that the preservation of historic towns and historic districts or areas must be an integral part of every community's comprehensive planning process. In Georgia, the Georgia law requires that historic resources be considered along with land use, economic development, community facilities, population, housing, and natural resources. Such planning approaches would be key to protecting the resources in a buffer zone. Two of elements of private property law, passed by states, are conservation easements and transferable development rights. These techniques are described as follows:

- Conservation Easements: This device is a legal agreement between a landowner and governmental agency or non-governmental organization that permanently restricts future development on a piece of land to protect its key values. Conservation easements are created through a legal document signed by a property owner (called a grantor) and an eligible organization (called a holder) and recorded in the official land

records of the political jurisdiction where the property is located. The owner either donates an easement (and receives tax incentives for the donation) or sells the easement to the holding organization at a price that is less than the cost of purchasing the property outright. Conservation easements can protect all kinds of conservation values including, for example, farmland, scenic vistas, historic facades, and sensitive ecological areas. Increasingly, this tool is being used in an expanded way to ensure the setting of an historic structure or area remains undeveloped or is developed in a way that is compatible with the heritage resource. For example; the Olana State Historic Site in New York, the historic villa and its surroundings were made famous by the paintings Frederick Church, a nineteenth century landscape artist. To protect the setting, a NGO bought scenic easements to protect 1,060 acres of the Olana viewshed. Where planned gardens are key components of the setting of a heritage place, their conservation can also be addressed in a conservation easement. Other aspects of historic character such as barns, fences, orchards, pastures and woodlands may be the subject of an easement. The value of the easement is based on the difference between the appraised fair market value of the property prior to conveying an easement and its value with the easement restrictions in place. The more the easement restricts the property's development potential, the more valuable it is. In most cases, the easement donor can take a one-time deduction of the value of the easement from his adjusted gross income for federal taxes. Many states also have provisions that will allow individuals to similarly reduce their state income taxes.

- **Transferable Development Rights (TDR):** Where such buildings are designated as historic under local ordinances, the TDR concept may prove useful in providing the owner an opportunity to realize some return on the unused development potential while preserving the historical, architectural or landscape character of the property or district. This approach can help retain, for example, a low-rise neighborhood in an area where economic pressures would result in high-rise development, thus destroying the setting of the historic structures. A feature shared by nearly all TDR programs is the designation of sending and receiving areas. Sending areas are designated where community plans call for preservation of development limitations and landowners

are restricted from making the maximum economic use of their land by preservation and zoning ordinances or other regulations. Owners within these areas are permitted to sever and transfer their development rights. On the other hand, receiving areas are designated where more intensive development is deemed appropriate. Owners within these areas can purchase transferred development rights and develop at a higher or greater density than would otherwise be allowed by underlying regulations. This approach will not work in isolation, but needs to be used in conjunction with other land use and preservation techniques. Other significant factors in its successful use include:

1. State enabling legislation which provides clear authority and guidance while allowing localities to tailor the program to their specific circumstances;
2. A participating financial institution can help to promote the program, facilitate transactions and provide information about the value of the TDRs;
3. A public education component; and
4. Support from the real estate and development community. Most important of all, these programs require leadership and commitment from local elected officials, appointed boards and professional staff.

Finally, Reap concluded that these tools could be used in an effective way to protect the buffer zones of World Heritage listed properties, as well as other designated heritage properties. The federal regulators can take a creative approach to the buffer zone issue, utilizing some of the tools described above as well as other regulatory and planning approaches. In Reap's opinion, it would not be necessary to rely solely on property ownership and individual execution of perpetual protection documents for buffer zones as has been the designated World Heritage property itself.

Moreover, in the International Expert Meeting on World Heritage and Buffer Zones, in Davos, Switzerland, there is a case study of the buffer zone to protect cultural heritages in the urban area. This case was presented by a participating expert from Israel as follow:

Case study of Israel

Berkovitz and Hoffmann (2008) presented the case of the White City of Tel-Aviv

in Israel that the district “White City” was constructed from the early 1930s until the 1950s based on the urban plan by Sir Patrick Geddes, reflecting modern organic planning principles. Tel-Aviv’s White City has no clear borders to define the different historic developments. Consequently, the area of the World Heritage site and the buffer zone are separated from areas of urban fabric with similar characteristics, resulting in borders that separate neighborhoods and thereby unintentionally effecting some change in the surrounding areas. Berkovitz and Hoffmann raised one example of the borderline of the buffer zone in Tel-Aviv. On the street of “Iben Gbirol”, a central avenue in the city, the borderline of the buffer zone is placed in the middle of the street. Its southern section is entirely included in the buffer zone, and the northern section is entirely outside of the buffer zone. This current condition will influence the future development of the “Iben Gbirol” as a main artery in the city, because the street is severed into two different parts. Perhaps all borderlines connecting the buffer zone with the rest of the city should be a wider strip that allows for gradual change, generating a continuous landscape.

Berkovitz and Hoffmann suggested characteristics of the buffer zone in the urban area as follows:

1. Support: The buffer zone can be very useful in helping to maintain the World Heritage site as a lively part of the city by offering communal facilities such as public parks, office spaces, parking and public buildings such as schools and hospitals. This allows for a more active community and will prevent the site from becoming a museum and disabling activities of daily life.

2. Osmosis: The buffer zone can be seen as a connection between the World Heritage site and the rest of the city. A buffer zone that borders on one edge to a World Heritage site and on the other to a high rise development should adapt an intermediate height in order to bridge between the two areas in a gradual manner.

3. Balance: Parts of the historic heart of the city, which are of local but not global significance, may become part of the buffer zone of the World Heritage site, which becomes the centre of attention. Since, a city is composed of different parts, each one with its own values and qualities. The nomination of one of these parts as a World Heritage site with its surrounding buffer zone may cause a shift in the delicate balance of a city.

4. Identity: The buffer zone may be composed of different areas, each one with its own identity, history and character. All these areas still belong to the same entity. Despite being part of the buffer zone, each one of these areas should grow and develop in an organic way, preserving its initial identity.

5. Integration: The area of the declared site and the buffer zone are new urban “layers” that have been imposed on preexisting city plans. In different places, there are different forms of city planning. The buffer zone regulation may be adapted to acknowledge the fact that there are different existing city plans.

The findings of this part indicate the concept of the buffer zone to protect OUV of World Heritage sites and other cultural Heritages. Many case studies of the implementation of buffer zones from many countries are reviewed to learn the benefits and problems. Although the buffer zone is an important tool for protecting OUV of World Heritage sites or other cultural heritages, there are related principles that could make the buffer zone to be more effective to enhance additional protection. Main principles are legal aspects, integrities and authenticities, boundaries and establishment of the buffer zone, setting and adjacent areas, and integrated planning.

The Concept of Authenticity and Integrity

The aim of this part is to review the definition and conditions of authenticity and integrity. Authenticity and integrity are unquestionably two of the most definitive criteria applied to the assessment of historic resources as well as related treatments in modern times (Yeh, 2003). Frequently, these concepts are treated as if it were a single undifferentiated concept. “Authenticity and integrity” are often ignored or mis-used in the cultural heritage conservation.

Authenticity

Since the adoption of the Venice Charter, heritage properties have continued to multiply in terms of range and variation in physical character as well as related

associations and meanings. The conditions of authenticity are examined with a practical basis which is provided in the international acknowledged document, the Nara Document on Authenticity. The purpose of this document was to explore the meaning and applicability of the concept of authenticity in different cultures; it gave due emphasis on the diversity and specificity of heritage resources, as well as to the diversity of values associated with them (Jokilehto and King, 2000).

Feilden and Jokilehto (1998) defined that authenticity is a crucial aspect in the assessment of heritage resources. It is ascribed to a heritage resource that is materially original or genuine as it was constructed and as it has aged and weathered in time. With regard to an historic monument or site conceived as a work of art, being “authentic” can be understood in relation to the creative process that produced it as a genuine product of its time, and includes the effects of its passage through historic time. Authenticity derives from the definition of the resource, and so authenticity may be understood in different ways depending on the context of its historical significance.

At its official debut, the test of authenticity was primarily applied to physical recreation in the case of restoring a monument. The core concerns lied with the validity, the legitimacy, and the realness of the references on which architectural restoration is carried out, including designs, materials and construction. Whereas new materials and technology may be permitted, a genuine distinction between the new and the old is required in the same spirit of upholding authenticity (Yeh, 2003). According to Nara Document on Authenticity (1994), the essential contribution made by the consideration of authenticity in conservation practice is to clarify and illuminate the collective memory of humanity. The diversity of cultures and heritage in our world is an irreplaceable source of spiritual and intellectual richness for all humankind. Cultural heritage diversity exists in time and space, and demands respect for other cultures and all aspects of their belief systems. Values and authenticity are also indicated in this document that Conservation of cultural heritage in all its forms and historical periods is rooted in the values attributed to the heritage. It recognized that our ability to understand such values depends on the degree to which information sources about these values may be understood as credible or truthful, thus forming the ‘basis for assessing all aspects of authenticity’. The

understanding of authenticity plays a fundamental role in all scientific studies of the cultural heritage, in conservation and restoration planning, as well as within the inscription procedures used for the World Heritage Convention and other cultural heritage inventories. Depending on the type of cultural heritage, and its cultural context, properties may be understood to meet the conditions of authenticity if their cultural values are truthfully and credibly expressed through a variety of attributes including:

1. form and design;
2. materials and substance;
3. use and function;
4. traditions, techniques and management systems;
5. location and setting;
6. language, and other forms of intangible heritage;
7. spirit and feeling;
8. and other internal and external factors.

The use of these sources permits elaboration of the specific artistic, historic, social, and scientific dimensions of the cultural heritage being examined.

Integrity

The general meaning of the word “integrity” refers to material wholeness, completeness, and unimpaired condition. In the case of cultural heritage, this can lead to contradictions in the presentation of ancient architectural remains in fragmentary condition. However, the notion will be useful for conservation management purposes, once the heritage resource and its qualities have been defined. This is particularly the case with historic settlements and cultural landscapes, which often have strong historical integrity and where the notion of functional integrity would relate single elements (buildings, squares, gardens) with the system of infrastructures and functions as these evolve over time (Jokilehto and King, 2000). The test of integrity, while emphasizing completeness, or wholeness, along with soundness in moral and artistic conviction, also started with aesthetic and the historical concerns related to the physical aspects of

monuments and their surrounding areas (Yeh, 2003).

The 2005-2008 Operational Guidelines define integrity for cultural heritage to include a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes. Integrity requires assessing the extent to which the property:

1. includes all elements necessary to express its OUV;
2. is of adequate size to ensure the complete representation of the features and processes which convey the property's significance;
3. suffers from adverse effects of development and/or neglect.

For the cultural heritage, the Operational Guidelines indicate that the physical fabric of the property and/or its significant features should be in good condition, and the impact of deterioration processes controlled. A significant proportion of the elements necessary to convey the totality of the value conveyed by the property should be included. Relationships and dynamic functions present in cultural landscapes, historic towns or other living properties essential to their distinctive character should also be maintained.

However, ICOMOS has been using many unauthorized explanations to understand and apply integrity in a tangible way. The favoured unauthorized interpretation – involving questions around visual, functional and structural integrity – derives from the 1996 La Vanoise expert meeting in Integrity for Cultural Heritage. The experts suggested that the notion of authenticity and integrity could be reviewed to develop one common approach to integrity. This would lead to a more coherent interpretation of the Convention and its unique strength in bringing the protection of both nature and culture together.

Jokilehto (2007) illustrated how these unauthorized concepts can credibly creep into practice:

“The social-functional integrity of a place is referred to the identification of the functions and processes on which its development over time has been based, such as those associated with interaction in society, spiritual responses, utilization of natural resources, and movements of peoples. The spatial identification of the elements that document such

functions and processes helps to define the structural integrity of the place, referring to what has survived from its evolution over time. These elements provide testimony to the creative response and continuity in building the structures and give sense to the spatial-environmental whole of the area. Visual integrity, instead, helps to define the aesthetic aspects represented by the area. It is on such dimensions of integrity that one can base the development of a system of management so as to guarantee that the associated values would not be undermined.”

The findings of this part indicate the concept of authenticity and integrity that used to assess the cultural significance. Although authenticity and integrity have proposed merging the two concepts for over a decade now, this proposal has not yet been accepted by those involved with cultural heritage. It has promoted continuing efforts to strengthen parallels within application of qualifying conditions to cultural and natural heritage properties. It would be useful to clarify implications and modalities of use of the integrity concept for cultural heritage in much more detail than at present and to integrate this understanding within any effort to improve application and use of the buffer zone concept (ICOMOS, 2008).

The Concept of the Conservation of Setting

The aim of this part is to review the concept of setting in various international documents. In the conservation field, setting is an area surrounding a cultural heritage place that may enhance safeguarding the OUV of World Heritage sites or other cultural heritage places. Conversely, the rapid or incremental transformation of setting may increase detracting of the OUV severely. To review the concept of setting would help to establish boundaries of buffer zones to protect cultural heritage places properly.

The Definitions and Significance of Setting

The chronological examination of heritage documents aids in gaining an understanding of the evolving concept of setting as an important element of protection of the heritage values of a protected resource (O'Donnell, 2005). In 1931 the Athens Charter set forth an international declaration for the protection of cultural monuments throughout the world. The specific term setting was not used in this charter however surroundings was used. This charter contains statements on the aesthetics of the surrounding areas of ancient monuments calling for care in the development of constructions near them citing that “surroundings should be given special consideration”. In 1964 the Venice Charter includes the setting in Article 1 stating that “The concept of an historic monument embraces not only the single architectural work but also the urban or rural setting in which is found the evidence of a particular civilization, a significant development or an historic event.” The setting is defined as important but secondary to the designated historic monument.

Moreover, there are many similar definitions of setting expressed in various UNESCO conventions and recommendations, and ICOMOS National and International documents. In accordance with the UNESCO Convention of 1972 addressing World Heritage considers cultural assets to include monuments, groups of buildings and sites. The setting of these cultural assets that have a defined boundary related to their history and cultural value is the presumed to be the immediate surrounds beyond that boundary. The dimensions of the setting, how far it extends beyond the protected heritage property, are often vague and require site-specific definition. Setting has been one of the key indicators in analysis of authenticity since the development of the Operational Guidelines. While the Nara Document of 1994 extended the list of authenticity indicators, setting remained an important part of that analysis to permits elaboration of the specific artistic, historic, social, and scientific dimensions of the cultural heritage being examined. The Burra Charter (1999) gave the definition of setting shortly that the area around a place, which may include the visual catchment. By definition, place refers to site, area, land, landscape, building or other work, group of buildings or other works, and may include

components, contents, spaces and views. Aspect of the visual setting may include use, siting, bulk, form, scale, character, colour, texture and materials. Kerr (2000) gave the interesting definition of setting that it is an area surrounding a place whose limits may be determined by sensory criteria: for example, visual (enclosing ridgelines, roofscapes or plantations), auditory (adjacent waterfalls or gravel quarries) and olfactory (tannery district). According to Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas (2005), the setting of a heritage structure, site or area is defined as the immediate and extended environment that is part of, or contributes to, its significance and distinctive character. Beyond the physical and visual aspects, the setting includes interaction with the natural environment; past or present social or spiritual practices, customs, traditional knowledge, use or activities and other forms of intangible cultural heritage aspects that created and form the space as well as the current and dynamic cultural, social and economic context.

Besides the concept of setting, the similar definitions of areas surrounding historic places should be also considered. The focus on historic areas and their surroundings was concerned in the Recommendation Concerning the Safeguarding and Contemporary Role of Historic Areas presented at the General Conference of the UNESCO in Nairobi, 1976 (The Nairobi Recommendation). Among the categories of areas recognized are urban quarters as well as historic towns. These historic and architectural areas are recognized for their archaeological, architectural, prehistoric, historic, aesthetic or socio-cultural values. Accordingly, aside from the architectural framework acknowledged in the preceding charters, the Nairobi Recommendation also acknowledged a related social and economic context for historic conservation. In defining the parts that compose the whole, the guideline stresses that "human activities as much as the buildings, the spatial organization and the surroundings" should be included. Most significantly, the importance of diversity is highlighted. Historic areas are viewed as "part of the daily environment" and that "they provide the variety in life's background needed to match the diversity of society, and that by so doing they gain in value and acquire an additional human dimension" (Yeh, 2003). Subsequently, in the ICOMOS Charter for the Conservation of Historic Towns and Urban Areas adopted in Washington, D.C. (The Washington Charter 1987), historic areas and

their surrounding are defined as an expression of the diversity of societies throughout history. Beyond their role as historical documents, these areas embody the values of traditional urban cultures. This Charter states the qualities of the historic character that should be preserved especially:

1. Urban patterns as defined by lots and streets;
2. Relationships between buildings and green and open spaces;
3. The formal appearance, interior and exterior, of buildings as defined by scale, size, style, construction, materials, colour and decoration;
4. The relationship between the town or urban area and its surrounding setting, both natural and man-made; and
5. The various functions that the town or urban area has acquired over time.

According to the Hoi-An Declaration on Conservation of Historic Districts of Asia (2003), the state of conservation intended to protect and manage the historic district in Asian countries; historic districts constitute a major part of the living cultural heritage. These are often the expression of a rich and fruitful history of cultural exchange.

The Conservation of Setting

Setting is listed as an attribute of authenticity and as needing protection like other cultural heritage places. Providing adequate care and management of the setting could help to protect the significance values of heritage structures, sites and areas such as historic cities, cultural landscape, cultural routes and archeological sites in the context of accelerated change and development. These processes are expressed in many international charters and documents to better protect and conserve the cultural heritage structures, sites, and areas in their settings.

According to the Venice Charter (1964), setting was also defined as important to be kept like other ancient monuments in articles 6 as follows:

“Article 6. The conservation of a monument implies preserving a setting, which is not out of scale. Wherever

the traditional setting exists, it must be kept. No new construction, demolition or modification, which would alter the relation of mass and colour, must be allowed.”

Commentary on the Principles for the Conservation of Heritage Sites in China (2000) stated the treatment of the setting that there are three factors affected the quality of the setting of sites as follow:

1. Natural phenomena, including storms, floods, cave-ins, impacts, sand, and dust.
2. Social factors such as vibration from traffic and industry, wastewater and air pollution, traffic congestion, local disputes, and problems with social order.
3. Impacts on the landscape such as surrounding buildings that are obtrusive or block lines of sight, and accumulated rubbish.

These harmful factors should have been addressed to prevent severe damage to the setting. The following work should have priority to treat each factor.

1. To treat natural factors:

- A comprehensive plan for research and control of environment quality should be established.
- Creation of a specific plan for treatment of the setting and ensuring adequate funds for this purpose.
- Drawing up an emergency disaster response plan and providing rescue facilities and equipment.
- Treatment of the setting by elimination of structures and accumulated rubbish that threaten the safety of a site. Based on research and investigation, a long-term plan for the setting should be implemented.

2. To treat social factors:

- A comprehensive plan should be undertaken to eliminate all sources of pollution with the involvement of the public.
- Serious pollution must be brought under control by administrative measures in cooperation with the relevant authorities.

- In the case of traffic problems, local disputes, or problems with social order, the issues should be dealt with in cooperation and partnership with the public.

3. To treat impacts on the landscape:

- All structures that negatively affect the landscape should be dismantled and accumulated rubbish removed.

- The conclusion of a systematic analysis and expert appraisal should determine the best appearance of a landscape, and parameters for protecting the viewscape should be established, together with restrictions on height, colour, and form for surrounding structures.

- Structures and buildings, roads and lanes, and ruins in proximity to the site that have become integral to its values should be retained and given appropriate treatment.

- New service buildings for the public should be of the smallest scale possible, unobtrusive in appearance, and located away from the main features of the site.

- Improvement to existing landscaping should be done according to the overall plan. Nontraditional techniques and plant varieties should be avoided.

- Building a new thematic landscape within the heritage setting is not permitted. In particular, creation of new heritage-style buildings using the name of a heritage place is not permitted.

An acknowledged process of conservation of setting was expressed in the Xi'an Declaration (2005). The conservation of setting could be summarized into 4 steps as follows:

1. Understand, document and interpret the setting in diverse contexts; the definition of setting requires an understanding of the history, evolution and character of the surrounds of the heritage place. Defining the setting is a process of considering multiple factors to include the character of the arrival experience and the heritage resource itself. Cultural traditions, rituals, spiritual practices and concepts as well as history, topography, natural environment values, use and other factors contribute to create the full range of a setting's tangible and intangible values and dimensions. The definition of

settings should carefully articulate the character and values of the setting and its relationship to the heritage resource.

2. Develop planning tools and practices to conserve and manage settings; legislation, regulation and guidelines for the protection, conservation and management of heritage structures, sites and areas should provide for the establishment of a protection or buffer zone around them that reflects and conserves the significance and distinctive character of their setting. Planning instruments should include provisions to effectively control the impact of incremental or rapid change on settings. Heritage impact assessments should be required for all new development impacting on the significance of heritage structures, sites and areas and on their settings.

3. Monitor and manage change affecting settings; incremental as well as rapid transformation of the urban landscape, the ways of life, the economies or the natural environment can substantially or irretrievably affect the authentic contribution that the setting makes to the significance of a heritage structure, site or area. Change to the setting of heritage structures, sites and areas should be managed to retain cultural significance and distinctive character. Qualitative and quantifiable indicators should be developed to assess the contribution of the setting to the significance of a heritage structure, site or area. Indicators for monitoring should cover physical aspects such as intrusion on views, skylines or open spaces, air pollution, sound pollution, as well as economic, social and cultural dimensions.

4. Work with local, interdisciplinary and international communities for co-operation and awareness in conserving and managing settings; co-operation and engagement with associated and local communities is essential as part of developing sustainable strategies for the conservation and management of settings. Professional training, interpretation, community education and public awareness should be encouraged to support such co-operation and sharing of knowledge as well as to promote conservation goals, improve the efficiency of the protection tools, management plans and other instruments.

In the first step of the process of conservation of setting expressed in the Xi'an Declaration, to define the value of setting could adopt the concept of cultural significance.

According to Burra Charter (1999), cultural significance means “aesthetic, historic, scientific or social value for past, present or future generation”. Cultural significance is a concept which helps in estimating the value of places. It should be noted that they are not mutually exclusive, for example, architectural style has both historic and aesthetic aspects. The meaning of these terms in the context of cultural significance is discussed as follows:

1. Aesthetic value: Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use.

2. Historic value: Historic value encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event.

3. Scientific value: The scientific or research value of a place will depend on the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information.

4. Social value: Social value embraces the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group.

The categorization into aesthetic, historic, scientific and social values is the approach to understanding the concept of cultural significance.

In addition, there are some international and professional interests for the conservation of the surroundings of cultural heritages as expressed in other charters and documents.

The Nairobi Recommendation (1976) recommended safeguarding measures to protect historic areas and their surroundings that the specific measures being determined according to the legislative and constitutional competence and the organizational and economic structure of each State as follows:

1. Legal and administrative measures: Laws concerning town and regional and housing policy should be reviewed so as to co-ordinate and bring them into line with the laws concerning the safeguarding of the architectural heritage. Safeguarding plans and documents should be established systematically for safeguarding historic areas and their environment. Safeguarding plans and documents should define: the areas and items to be protected; the specific conditions and restrictions applicable to them; the standards to be observed in the work of maintenance, restoration and improvements; the general conditions governing the establishment of the supply systems and services needed in urban or rural life; the conditions governing new constructions. These plans and documents should be participated with the public concerned, and approved by the body designated by law.

2. Technical measures: A survey of the area as a whole should be made. A survey should include demographic data and an analysis of economic, social and cultural activities, ways of life and social relationships, land-tenure problems, the urban infrastructure, the state of the road system, communication networks and the reciprocal links between protected areas and surrounding zones for preparing safeguarding plans. Historic areas and their surroundings should be protected from the disfigurement caused by the erection of poles, pylons and electricity or telephone cables and the placing of television aerials and large-scale advertising signs. The new buildings should respect to the harmony of heights, colours, materials, forms, the volume of buildings and the spatial volume, proportions, and position. Moreover, historic areas and their surroundings should be protected from the increasingly serious environmental damage caused by certain technological developments such as various forms of pollution, destructive effects of motor traffic, and overexploitation by tourism.

3. Economic measures: Availability of the necessary funds for the level of public investment provided for in the plans for the safeguarding of historic areas and their surroundings should be ensured by including adequate appropriations in the budgets of the central, regional and local authorities. All these funds should be centrally managed by public, private or semi-public bodies entrusted with the co-ordination of all forms of financial aid at national, regional or local level and with the channeling of them according

to an overall plan of action. Grants, subsidies, loans at favourable rates, or tax concessions should be made available to private owners and to users carrying out work provided for by the safeguarding plans and in conformity with the standards laid down in those plans. These tax concessions, grants-and loans could be made first and foremost to groups of owners or users of living accommodation and commercial property, since joint operations are more economical than individual action. Special funds should be set aside in the budgets of public and private bodies for the protection of groups of historic buildings endangered by large scale public works, pollution and natural disasters.

4. Social measures: Safeguarding measures should not lead to a break in the social fabric. To avoid hardship to the poorest inhabitants consequent on their having to move from buildings or groups of buildings due for renovation, compensation for rises in rent could enable them to keep their homes, commercial premises and workshops and their traditional living patterns and occupations. This compensation would help those concerned to pay the increased rentals resulting from the work carried out.

According to Washington Charter (1987), various methods and instruments were adopted for the protection, conservation and restoration of historic towns and urban areas. These methods and instruments could be summarized as follows:

1. Planning for the conservation of historic town and urban areas should be preceded by multidisciplinary studies and supported by the residents of the historic area.

2. Continuing maintenance is crucial to the effective conservation of a historic town or urban area.

3. New functions and activities should be compatible with the character of the historic town or urban area.

4. When it is necessary to construct new buildings or adapt existing ones, the existing spatial layout should be respected, especially in terms of scale and lot size.

5. Traffic and parking areas inside a historic town or urban area and major motorways outside must be planned to protect the historic fabric or its environment.

6. Historic towns should be protected against natural disaster and nuisances such as pollution and vibrations.

7. A general information programme should be set up for all stakeholders to

encourage their participation and involvement.

In Vienna Memorandum (2005) that focuses on the impact of contemporary development on the overall urban landscape of heritage significance, recognized that the contemporary architecture in the historic urban landscape should respond to development dynamics in order to facilitate socio-economic changes and growth on the one hand, while simultaneously respecting the inherited townscape and its landscape setting on the other. Living historic cities require a policy of city planning and management that takes conservation as one key point for conservation. The historic city's authenticity and integrity must not be compromised. In this Memorandum, guidelines for conservation management and urban development were expressed for protecting the historic urban landscape.

1. Guidelines for conservation management: The basis for all structural interventions is a comprehensive survey and analysis of the historic urban landscape as a way of expressing values and significance. Urban planning, contemporary architecture and preservation of the historic urban landscape should avoid all forms of pseudo-historical design.

2. Guidelines for urban development: Architecture of quality in historic areas should give proper consideration to the given scales, particularly with reference to building volumes and heights. Preservation also involves the design of public space: particular attention is to be paid to functionality, scale, materials, lighting, street furniture, advertising, and vegetation. Urban planning infrastructure in heritage zones must include all measures to respect the historic fabric, building stock and context, and to mitigate the negative effects of traffic circulation and parking. Townscapes, roofscapes, main visual axes, building plots and types are integral parts of the identity of the historic urban landscape.

Moreover, this Memorandum also emphasized that economic aspects of urban development should be bound to the goals of long-term heritage preservation. Historic and contemporary architecture constitute an asset to local communities, which should serve educational purposes, leisure, tourism, and secure market value of properties.

The findings of this part indicate that the importance of the concept of settings and their value in protecting cultural heritages should be fully developed and clarified. Setting should not be seen only as a buffer or frame for cultural heritage places, they should also be considered in their own right as places with specific character that evolved simultaneously with the heritage properties they relate to (O'Donnell, 2005). Therefore, providing adequate care and management of setting is the necessary requirement to protect the significance and integrity of cultural heritage places.

The Concept of Cultural Landscape

The aim of this part is to review the concept of cultural landscape and its values. The concept of cultural landscape has evolved over several generations. Yet that concept is still relatively new to the field of historic preservation, and while it has made a substantial contribution, it remains misunderstood or marginalized in many quarters (Longstreth, 2008). The main point of this part is to review definitions, characteristics, and values of cultural landscape in the field of cultural heritage conservation.

Taylor (2003) described that the term “cultural landscape” is now widely accepted internationally. Recognition was extended in 1993 to World Heritage status with three categories of cultural landscapes of the OUV:

1. Clearly defined landscapes designed and intentionally created by man.
2. Organically evolved landscapes in two categories:
 - A relict or fossil landscape in which an evolutionary process has come to an end.
 - Continuing landscape which retains an active social role in contemporary society associated with a traditional way of life and in which the evolutionary process is still in progress.
3. Associative cultural landscapes: the inclusion of such landscapes is justifiable by virtue of the powerful religious, artistic, or cultural associations of the natural element rather than the material cultural evidence.

These definitions are reasonably inclusive. They have aided in addressing the issue of universal values of cultural landscapes. Thirty-six evolved continuing or relict, designed and associative landscapes have received World Heritage listing between 1992 and 2003. These cultural resources are no longer confined to narrow thinking as isolated monuments but are defined as large areas of living culture (O'Donnell, 2005).

Council of Europe (1995) defined the term “cultural landscape” as:

“ specific topographically delimited parts of the landscape, formed b various combinations of human and natural agencies, which illustrate the evolution of human society, its settlement and character in time and space and which have acquired socially and culturally recognized values at various territorial levels, because of the presence of physical remains reflecting past land use and activities, skills or distinctive traditions, or depiction in literary and artistic works, or the fact that historic events took place there.”

According to Operational Guidelines for the Implementation of the World Heritage Convention (2005), the term “cultural landscape” was defined in number 47 that:

“Cultural landscapes are cultural properties and represent the “combined works of nature and of man” designated in Article 1 of the Convention. They are illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal.”

Buggey and Mitchell (2008) explained that considering cultural landscapes led

to the inclusion of diverse worldviews, cultural traditions, and natural resources as determinants of heritage values and management objectives. The concept of cultural landscape thus recognizes that many human relationships to the land and sea- religious, artistic, spiritual, and cultural- are not primarily reflected in material evidences. The exploration of landscapes as cultural processes focuses on people's relation to place. Intangible traditions related to place preserve cultural memory through social structure, economic activity, language, and spiritual beliefs. They also concluded the successful in the field of conservation of cultural landscape. Conservation of cultural landscapes presents many challenges, in particular, sustaining the traditional functions that shaped the landscape in the context of changing social and economic conditions. Successful conservation of such living places accommodates change while retaining landscape character, cultural traditions, and economic viability.

Kerr (2000) illustrated positive consequences when landscape is invested with cultural meanings for its inhabitants. It creates a sense of belonging and attachment to the site, place or tract of land. This progressively reinforced relationship is a universal experience and helps give identity and stability to both community and individual.

Taylor (2003) compared cultural landscape as historical landscape with their heritage values that have reached centre stage in the field of cultural heritage conservation and planning. The historical landscape is inter-relationship between places, people, and events, through time. Further, and through historical cultural landscape study, there has been a growing understanding that cultural landscapes as an imprint of human history are the richest historical record we possess. Moreover, Taylor has quoted the kind of place classified by Edward Relph that carry meaning and significance for human beings. The following different types of space are not separated by the human mind, but rather they are linked in thought and experience. These places include the following kinds:

1. Pragmatic or primitive space structured unselfconsciously by basic individual experience. This is organic space; it may have biological roots in our need for shelter and home.
2. Perceptual space which involves direct emotional encounters with the spaces

of the earth, sea, sky or with built and created spaces.

3. Existential or lived in space where we create patterns and structures of significance through building towns, villages, houses, and the whole business of landscape making. It is space or place that is culturally defined.

4. Architectural and planning space.

5. Cognitive space with its reflective qualities referenced in maps, plans and designs.

6. Abstract space which is a creation of human imagination and logical relations that allows us to describe space without necessarily founding these descriptions on empirical observations.

In addition, O'Donnell (2005) exemplified a comprehensive list in current use in cultural landscape preservation practice in the United States. The character-defining features are identified and enumerated as a series of interrelated, unique aspects of the cultural landscape as:

1. Spatial Organization and Land Patterns- The three-dimensional organization and patterns of spaces in the landscape, land uses and visual relationships, shaped by both cultural and natural features; the uses of the land and the views and visual relationships that organize the landscape as defined by topography, vegetation, circulation, built elements, and often a combination of these character-defining features to create the overall patterns of the landscape.

2. Natural Systems- The ecological, biotic and aquatic systems in situ on the ground today, and the evolution of these systems under climate, natural event and human influence.

3. Topography- The shape of the ground plane and its height or depth; topography occurs naturally and as a result of human manipulation.

4. Vegetation- its cover and groups of plants, individual plants, agricultural fields, planting beds, formal or informal tree groves, woodland, meadow, or turf.

5. Circulation- May includes roads, drives, trails, walks, paths, parking areas individually sited or linked to form a network or system. Alignment, width, surface and edge treatment and materials contribute to the character of circulation features.

6. Water Features, Surface Drainage- May be aesthetic as well as functional components of the landscape and typically include fountains, pools, cascades, irrigations systems, ponds, lakes, streams, aqueducts and surface drainage patterns.

7. Non-habitable Structures, Site Furnishings & Objects- Structures are non-habitable, constructed features such as walls, bridges, secondary buildings, arbors, gazebos, terraces, steps and fences.

The character of the unit is part of the character of the property as a whole. Identifying and defining these areas or units clarifies the spatial organization of the property and facilitates a clearer understanding of the historic evolution of the property.

Taylor (2003) also compiled the values that it holds preparatory to evaluating significance from China ICOMOS and Australia ICOMOS Charters. Establishing values will help interpret and present the rich history and associations in the cultural landscape, including:

1. Historic values related to physical structures and also to customs, traditions, and social practices over historic periods telling the story of people, events and places through time.

2. Artistic (aesthetic) values related to the sheer sense of awe and fit that the main monument has in the landscape and to the overwhelming sense of creative processes and means of expression seen in the decorative arts.

3. Scientific values particularly in the monuments and archaeological remains, but also the ecology and hydrology of the area, are important.

4. Interpretative values related to the ability of a place to inform and enlighten us on social history, promote sense of place feeling, create links with the past.

5. Associative values related to the ability to put into context what has occurred and who promoted the actions. This value meshes with social value.

6. Integrity covers survival of components and patterns in the landscape and physical evidence from earlier periods. It related to tangible criteria such as design, materials, and setting and to intangibles such as association, and feeling.

These analyzed values could summarize the statement of significance that is particularly important for future actions and management.

Apparently, in essence cultural landscapes are about interrelationships between people and place. In this connection the increasing interest in historic urban landscapes under the rubric of cultural landscapes waiting to be read is timely. Their theoretical study and professional planning require holistic approaches inherent in the cultural landscape construct (Taylor, 2009). The concept of the historic urban landscape has emerged as a helpful tool encompassing many new approaches developed since 1976 (UNESCO, 2009).

According to Vienna Memorandum (2005), the historic urban landscape, refers to ensembles of any group of buildings, structures and open spaces, in their natural and ecological context, including archaeological and palaeontological sites, constituting human settlements in an urban environment over a relevant period of time, the cohesion and value of which are recognized from the archaeological, architectural, prehistoric, historic, scientific, aesthetic, socio-cultural or ecological point of view. It is embedded with current and past social expressions and developments that are place-based. It is composed of character-defining elements that include land use and patterns, spatial organization, visual relationships, topography and soils, vegetation, and all elements of the technical infrastructure, including small scale objects and details of construction. The historic urban landscape acquires its exceptional and universal significance from a gradual evolutionary, as well as planned territorial development over a relevant period of time through processes of urbanization, incorporating environmental and topographic conditions and expressing economic and socio-cultural values pertaining to societies. As such, protection and conservation of the historic urban landscape comprises the individual monuments to be found in protection registers, as well as ensembles and their significant connections, physical, functional and visual, material and associative, with the historic typologies and morphologies.

For the moment Taylor (2009) stated the following definition was captured at the Expert Planning Meeting that took place at UNESCO Headquarters in November 2008:

“Historic Urban Landscape is a mindset, an understanding of the city, or parts of the city, as an outcome of natural,

cultural and socio-economic processes that construct it spatially, temporally, and experientially. It is as much about buildings and spaces, as about rituals and values that people bring into the city. This concept encompasses layers of symbolic significance, intangible heritage, perception of values, and interconnections between the composite elements of the historic urban landscape, as well as local knowledge including building practices and management of natural resources. Its usefulness resides in the notion that it incorporates a capacity for change.”

Taylor (2009) also suggested the assessment of historic urban landscapes as follows:

1. Identify type of historic urban landscape and its setting: The urban cultural landscape and historic interrelationships is multifaceted. It is possible to recognize a thematic list which can be applied to urban settings and used as the first step in reading the urban landscape such as streets, neighbourhoods, districts, small towns, planned communities, new towns, and so forth.
2. Document history: Essentially, this important early work identifies and sets out and develops the all important historic context of the landscape.
3. Assessment: A comprehensive system for organizing presentation of information on landscape characteristics, values and significance is advisable given that cultural landscapes are a montage, or series of layers through time.
4. Analysis and evaluation: This is the stage where close cooperation and interchange with city planning and other urban management agencies is vital leading to proposals for future action.

The findings of this part indicate the importance of the concept of cultural landscape and its values. Cultural landscape may be a part or a whole of setting that is adjacent the cultural heritage places. Evaluation of cultural landscape and setting provides the foundation for establishing the buffer zone. The significance of cultural

landscape and setting is particularly important to ensure the delineation of buffer zones' boundaries.

The Concept of Land Use Planning

The aim of this part is to review the concept of land use planning, and process of land use planning in the urban historic area. Safeguarding physical structures and environmental relationships, urban conservation also needs to encompass the maintenance of appropriate functions and, where feasible, traditional types of use. Land use planning is one of tools to protect heritage values and the significance of historic structures, as well as to establish criteria for the introduction of new structures and facilities. This plan should also consider that historic towns are part of a larger setting, the, environment that surrounds them; the only way to ensure proper safeguarding is to extend policies to include the larger planning context (Feilden and Jokilehto, 1998).

The Overview of Land Use Planning

Chapin and Kaiser (1979) stated that land use planning is used by a locality to determine what courses of action are appropriate in shaping the built environment of facilities and land uses for the collective good. Land use planning is the process of identifying and analyzing problems and exploring and assessing options open to an urban community in the pursuit of general goals and specific land development objectives. They also defined a land use plan as a spatial arrangement of land uses and a proposed course of governmental action to influence land use. The land use plan or its subsequent revisions indicate the distribution and intensity of development of industry, the wholesale, supplier, and transshipment functions, centers for retail and related functions, and residential areas relative to open space, transportation systems, and other community facilities. It serves as the land use element of a comprehensive plan, for those communities having one, which from time to time may be adopted and amended by the community as a guide to the planning commission and decision-makers.

Planning decisions and actions can be long-term or short-term, city-wide or site-specific, and involving all or any particular type of land use (Leung, 1989).

On the other hand, Keeble (1983) regard land use planning as deciding what a town should look like before it is built or, as is more often the case, deciding in what way a town should be kept as it is and in what way it ought to be altered.

Roberts (1988) defined land use planning is the core of urban planning practice. While it is properly classified as functional planning, it is the key to guiding urban development. It identifies areas that are to be devoted to various types, densities, and intensities of use categories, such as residential, commercial, industrial, and various public uses. It also identifies the principles and standards that should be applied in the development or conservation of these areas. Roberts also described that a land use plan is the centerpiece of the entire comprehensive plan. It determines what kind of activities are to go where, and it tells when, how, how much, and why. The land use plan lays the groundwork for the details that are provided in many other aspects of the comprehensive plan, such as conservation, transportation, utilities, community facilities and services, recreation and open space, housing, and historic and scenic preservation. Normally, a land use plan consists of a text and a map or series of maps. The text includes policies, and the map(s) illustrate the spatial application of these policies, either in general fashion or in detail, specifying certain types of use for specific areas.

Moreover, Roberts also stated that a land use plan is normally only one functional element within a comprehensive planning process. Although it is the most critical element, it is accompanied by other functional elements and supportive studies. The studies that normally precede the preparation of a land use plan include:

1. A population study
2. An economic-base study
3. An environmental analysis
4. An identification of community issues, goals, and objectives

Leung (1989) offered the statement about land use planning that “land use planning is defined as the process of protecting and improving the living, production and recreation environments in a city through the proper use and development of land”.

The chief aim of good planning is to strain human adaptability as little as possible. In this way, a planned environment will enhance the quality of life and impose less strain on human adaptability than an environment created by nonplanned development. The essential justification for land use planning is the public interest. It has come to be generally accepted as the mandate for land use planning such as health and safety, convenience, efficiency, equity, environment and energy, visual amenity, and so forth. Heritage conservation is also one component of public interest elements. Heritage conservation can apply to a single building or to a whole area. The usual requirement is that the building or a whole area should have special architectural or historic merit, worthy of conservation or enhancement. Land use planning is about using and developing land in such a way as to protect and enhance the public interest.

Roberts (1988) also explained the length of planning period that land use plans also vary as to the length of their planning period-that is, how far into the future a plan looks. Along-range plan will typically have a target year 20 or 25 years into the future, whereas a land use plan geared to a specific development program may have a 5-year planning period or less.

The Process of Land Use Planning

In practice, planning is most frequently used to tackle perceived problems, and to ensure that such problems do not occur in the future (Leung, 1989). In addition, the allocation of land to housing, businesses or institutions depends essentially on needs. It also depends on the suitability of the land use. The needs of the people can be determined through the consultation of citizens or by eliciting their input into the planning process (Unaegbu, 2004). Land use planning is about matching user needs with land in order to produce an equitable and efficient land use pattern (Leung, 1989).

Roberts (1988) proposed a typical land use planning process that includes 10 steps as follows:

1. to identify community problems and opportunities
2. to collect information

3. to analyze information
4. to form community goals
5. to develop alternative plans
6. to compare alternative plans
7. to select preferred plan
8. to translate plan into programs and projects
9. to carry out programs and projects
10. to monitor results and changing conditions

Generally, this is more of a generic planning process because it applies equally, in one form or another, to all community planning, including comprehensive planning, land use planning per se, and land use planning as a part of comprehensive planning. Roberts also divided broadly the types of information used as input to a land use plan in to three categories: existing conditions, studies, and plans.

In addition, the process of land use planning at a city or town scale can be summarized from Leung (1989) as follows:

1. Problem identification- problems are defined by reference to some expectation or goals.

2. Formulating goals and objectives- goals are ends toward which the planning effort is directed. They are expressed ideals. Objectives are intermediate milestones on the way toward a goal. They are expressed in a form that is measurable and achievable (Chapin and Kaiser, 1979).

3. Collecting information- the conventional categories used to organize planning information are physical, social and economic (Loew, 1979; and Lynch, 1971). In addition, Chapin and Kaiser (1979) suggested seven key information files for land use planning: economic, population, activity and space quality, land use, environment, transportation-utilities-communications, and guidance system.

4. Information analysis-it examines the match between user needs and land supply. The match can work in both directions: finding appropriate land for use, or finding appropriate use for a piece of land.

5. Information synthesis- it is about matching user needs and land supply within

the frame work of the public interest.

6. Implementation (control-oriented)-land use control, often referred to as development control, is a tool to implement a plan. Development control covers all aspects of siting, sizing, and environmental impact of any type of land use. The rationale for control may include a full range of public interest, from health and safety to economic viability and social desirability.

7. Implementation (action-oriented)- it is about providing to private development the condition and stimulation for the desired development. Planner must influence the activities of the private sector so that developments of the kind indicated in the plan materialize in the time and place specified.

Similarly, Chapin and Kaiser (1979) defined the urban land use planning program as land use planning methodology that the land use planning program is conceived as a series of activities purposefully organized to bring about a built environment that corresponds as closely as possible to the wants and needs of the metropolitan community. The program includes both a land use design aspect and a guidance system planning aspect. These two aspects must be dealt with in one integrated planning strategy of land use and guidance system planning if the three systems-the activity, development, and environmental systems-are to be mutually compatible in the built environment. The value of a land use planning program derives from its contribution to community decision-making affecting activity patterns, development and redevelopment, and environmental processes. The land use planning program should provide three types of services:

1. Intelligence function-the gathering, organization, and dissemination of information

2. Advance plan making-the formulation of coordinated sets of land use and guidance system proposals, set up ahead of time to assist in making whole classes of subsequent planning and action decisions

3. Action planning-active, on-line participation in on going decisions about land use issues

Chapin and Kaiser also suggested five elements of a land use planning program. Each element supports and receives support from others of the planning and community decision system in spanning from problems to solutions. Five elements of a land use planning program are:

1. The plan for planning: an early task is that of determining certain basic parameters of the overall land use planning program itself. This includes:

- Determining the overall short-and long-range agenda of land use issues
- Defining the role of the land use program in defining and assessing community issues and in guidance system decision-making
- Determining the resources available in the form of personnel, budget, and the legacy of past planning studies
- Formulating a “plan for planning”

2. Building the information system base for planning and decision-making: this element encompasses the activities of designing, building, maintaining, and then, using an information system to support both planning inquiry and decision-making. It is the whole organized approach to obtaining, storing, retrieving analyzing, and presenting data in response to specific information needs.

3. Problem analysis and goal specification: the function of this element is to transform indeterminate situation into usable patterns of facts, estimates, and criteria for planning and for decision-making. Problem definition contains several separate though not independent subelements:

- Problem identification (including needs or deficiencies)
- Summary of existing and projected states of the relevant functioning systems
- Problem structure analysis
- Specification of goals and objectives
- Inventory of ideas about available relevant policies, goal forms, and action instruments and strategies

- Tentative specification of scenarios for the future

4. Advance formulation of policies/plans: urban land use policy is any decision guide, including plans, seeking to influence the private and public use of land in relation to one or more defined objectives; it is established ahead of time to provide consistency to a class of subsequent decisions. The advance planning process attempts to address both spatial goal forms and programmatic forms of policy.

5. Action planning: this element focuses on proposed actions and immediate problems, and emphasizes improving the quality of present action. The outputs of this activity differ from those of advance planning. The results of action planning are likely to be expressed in brief memos and oral reports or arguments in advocacy and adversary proceedings rather than in substantial publications. Certain general preparations can be made to facilitate action planning as an effective role for the planning program in community decision-making.

- It helps to formally recognize this as an important part of a land use planning program and to set aside resources.
- Easy accessibility to the information system is desirable.
- A rich inventory of solution ideas from which to draw is a valuable resource.
- Building an impact assessment system that can be applied to the more prevalent types of problems and proposals can facilitate rigorous yet swift analysis of alternatives.

Considerably, Feilden and Jokilehto (1998) recommended the planning techniques between new town and old town that in the case of historic cities and towns of World Heritage status, the normal urban planning techniques-such as studies of demographic trends, population movements, traffic and transport (including growth in motor-car ownership), and proposals for zoning of activities and allocation of space for new development and improved traffic circulation-are often too rigid and generally inadequate. In terms of cultural heritage, this new approach will strengthen the demand for integrated conservation planning, with realistic management and sustainable

development of our existing cultural resources.

The Tool of Land Use Planning

Importantly, the implementation of land use plan must not be viewed as an activity separate from the land use planning function itself. The various ways that are available or potentially available to translate a land use plan in to reality should be kept foremost in mind in the formulation of plan. Since a land use plan is implemented through the day-to-day and year-to-year actions of decision makers. Therefore, decision makers can realistically deal with in the conduct of their regular affairs (Roberts, 1988). Levy (2003) stated the tools available to the municipality or decision makers to effectuate the land use plans. Essentially, there are two broad categories of direct actions by which a municipality or decision makers can shape its land use pattern:

1. Public capital investment: it is the more powerful shaper of the pattern of development. Public capital investment creates very powerful economic forces that shape development and, unlike land use controls, public capital investments are not easily altered. The public investment on infrastructure systems such as roads, highways, water and sewer lines, and facilities such as schools, universities, parks, airport, harbor facilities and so forth can also be major shapers of the land use pattern.

2. Land use controls: their development and implementation constitute a major share of the work effort of most planning agencies. Levy divided the categories of land use controls to implement plans:

- Subdivision regulations: these regulations control the manner in which blocks of land over a certain size may be converted into building lots. Before building lots can be sold or the owner can make improvements, the municipality must approve a plat (map) of the property. The ordinance will require at a minimum that the map show streets, lot lines, and easements for utilities. It also will stipulate what improvements must be made before building lots can be sold or before building permits may be granted. Similarly, it can also compel property owners or developers to provide

internal street, sewer, water, and drainage facilities that link up in a satisfactory manner to the municipality's system. Sub division regulations give communities substantial power to ensure that new development meets community standards and fits in with community development plan.

- **Zoning ordinances:** it is the best-known form of legal land use control, which is generally prepared by the community's planners or planning consultant. Normally, there are two parts to the zoning ordinance. The first part is a map that divides the community into districts. The second part is the text, which lists the types of uses permitted in each district and sets forth regulations governing the way in which these uses may occur. Typically, these regulations establish the following: the minimum lot sizes; the allowable size, shape, and height of structures; the maximum density of development; and the minimum setback and yard requirements. Usually, the text also regulates such other aspects of development as signs and off-street parking, and sometimes it regulates landscaping and building appearance. Both the map and text can be amended from time to time. As urban land use issues have become more complex and controversial in recent years, many variations have been added to the original concept of homogeneous zoning districts with uniform standards. Roberts (1988) stated the following partial listing that indicates their diversity and complexity: transferable development rights, conditional zoning, performance zoning, planned unit development, bonus (incentive) zoning, tax-increment financing, municipal enforcement of restrictive covenants, environmental impact ordinances, amortization of nonconformities, historic district zoning, floor/area ratios, site plan review, architectural review, landscaping requirements, mixed-use developments, moratoriums, floating zones, sinking zones, overlay zones, down zoning, impact fees, hearing examiner, zero lot line, regional and state reviews, cluster developments, compensable regulation, controlled-growth ordinances, air rights zoning, mandatory dedication or fees in lieu of dedication, mandatory insurance and warranties, inclusionary zoning, and extraterritorial zoning. Ironically, Roberts suggested that homogeneous zoning districts may not always be a good idea anyway-for mixed-use developments combining

employment, business, recreational, shopping, and (in particular) residential opportunities in one center can offer major advantages. Mixed-use developments are a welcome relief from strictly single-purpose zoning districts. However, zoning, in conjunction with other development controls, is an important part of implementing a land use plan. In terms of implementation, zoning has three significant limitations: First, zoning is a restriction of private-property rights. Second, zoning is a constraint on undesirable activity, not a producer of desirable activity. Third, since the most significant zoning decisions are legislative that made by elected official, thus, such nontechnical factors as popular sentiment and political sensitivity are taken into account along with technical considerations and land use planning policies.

The Land Use Planning in Thailand

In Thailand, the Department of Public Works and Town & Country Planning (DPT) is responsible for assignments on town and country planning at every level, public works; building design and building construction control. Moreover, it carries out and supports local administrative authorities on town, area and rural development by formulating and supervising land use policies, relocation system and infrastructure. By complying with the good town and country planning system which will lead to sustainable development, it also prepares construction quality and standard on Architecture, Engineering and Town and Country Planning in order to get good environment, public safety standard and orderliness of towns and buildings. Its mission is to create a better environment and a superior quality of life. The town planning Act of Thailand was enacted in 1975, succeeding the Town and Country Planning Act. The 1975 act was the first legislative measure that introduced zoning concept to Thailand. Designation of Comprehensive Plans and Specific Plans were specified by the act.

According to the Act, the comprehensive plan is defined that is plans, policies, projects, and general control measures as the guidance for development, and conservation of rural and urban areas in various elements such as resource utilization, transportation, infrastructures and facilities, and environment to achieve the town and

country planning objectives. The specific plan is defined as plans, and projects for development and conservation of an urban or rural specific area to benefit the town and country planning.

Both the comprehensive plan and the specific plan consist of maps and texts to control the area that is planned. The maps or plans indicate the whole planning boundary, and show aspects of land use, transportation, infrastructure, and open space. The text is the Ministerial Regulation including land use regulations list the type of uses permitted and prohibited in each district, transportation regulations, the list of factory specification, and boundaries of planning. In July 2002, the Thai Cabinet finally mandated the DPT to develop comprehensive land use planning processes throughout the country. However, a specific plan, which has stronger controls on land use, has never been established. Moreover, the controls specified by the act are still quite lax. (Yokohari, Takeuchi, Watanabe, and Yokota, 2000).

Interestingly, Rangsiraksa (2004) commented on the Town and Country Planning Act 1975 in various aspects as followings:

1. Planning objective: Most comprehensive plans in Thailand often formulate planning objectives similarly. Actually, potential, socio-economic characteristic each town or city is different, so planning objectives should be formulated conformingly with existing aspects of such areas.
2. Land use regulation: Land use regulations in comprehensive planning of Thailand are in the form of permitted and prohibited uses. The local officials can not use discretion to determine other activities that want to be established in such areas. In some countries, condition use could be permitted by discretion of the local official.
3. Implementation: The implementation measures are not defined clearly in the Ministerial regulation as how to achieve the planning objectives.
4. Legal enforcement: Usually, the comprehensive plan used in USA or the structure plan used in UK are not legal document. These plan are only the policy plan, but can be detailed by using legal tool of land use planning such as zoning ordinance. However, in Thailand, the comprehensive plan is not only used as policy plan but also

legal document to permit or to prohibit activities in several areas. This circumstance may be one reason that caused difficulty in practice.

The findings of this part indicate that land use planning is the mainstay of urban planning. A land use plan can be used to guide the direction of urban development and conservation. To understand the process and tools of land use planning can use to integrate with delineation of buffer zone to protect OUV of cultural heritage places and their setting.

The Conservation Guidelines for the Historic Urban Area

The aim of this part is to review the measures of conservation for the historic urban area, especially in the town or city planning approach. Sustainable management strategies for change which respect cultural heritage require the integration of conservation attitudes with contemporary economic and social goals, including tourism. The particular values and characteristics of historic towns and traditional rural settlements should therefore be seen in the larger context of regional or national development planning. Authenticity in setting is reflected in the relationship between the resource and its physical context. This includes landscape and townscape values, and also the relationship of man-made constructions to their environmental context (Feilden and Jokilehto, 1998).

The Management in the Historic Area

According to the Operational Guidelines, the content of management systems are specified in No. 108-118 that can be summarized that as appropriate management plan or other documented management system should be established to specify how OUV of a property should be preserved. An effective management system depends on the type, characteristics and needs of the property and its cultural and natural context. It may incorporate traditional practices, existing urban or regional planning instruments, and

other planning control mechanisms. The common elements of an effective management system could include:

1. a thorough shared understanding of the property by all stakeholders;
2. a cycle of planning, implementation, monitoring, evaluation and feedback;
3. the involvement of partners and stakeholders;
4. the allocation of necessary resources;
5. capacity-building; and
6. an accountable, transparent description of how the management system functions.

Feilden and Jokilehto (1998) gave precedence to the general management plan that should take into account national and local plans as far as they apply, as well as forecasts of demographic growth or decline, economic factors, motor traffic projections and industrial zoning. One of the principle actions to be taken is to guarantee that the resource is systematically recorded and documented before, during and after any intervention. The first requirement of site management is the conservation and protection of its cultural resources and, where possible, the enhancement of features of special interest. Feilden and Jokilehto also suggested some aspects that should be considered for the general management plan of historic areas, including:

1. enhancing the significance of the site by minimum intervention;
2. investigation of plan for alternative use and their application, together with assessment of their feasibility and cost;
3. designation of use zones;
4. control of the height, size and scale of new, infill building;
5. designation of conservation areas, with subsidies to encourage both maintenance and suitable improvements;
6. control of infrastructure elements and furniture streets such as electrical cables, wires, signs, shop fronts, advertisement, and so forth;
7. establishment of zones for compatible activities of benefit to all user of heritage sites, excluding-by preventing permission for-incompatible use.

English Heritage (2006) prepared Guidance on the Management of Conservation areas to identify the key aspects of good practice that need to be taken into account by local authorities in managing their conservation areas. Proposed components of a management strategy might include as appropriate:

1. consideration of the resources needed to sustain the historic environment in the area concerned;
2. procedures to ensure consistent decision-making, based on the published policies and guidance;
3. a mechanism for monitoring change on a regular basis, including periodic, dated, photographic surveys and recording;
4. an enforcement strategy to address unauthorized development;
5. proposals for the imposition, following detailed survey and justification;
6. intended action to secure the repair and full use of any buildings at risk in the conservation area, based as necessary on detailed survey of building condition and occupancy;
7. proposed enhancement schemes and ongoing management/improvement strategies for the public realm, recognizing that many local authorities are not highway authorities;
8. proposals for developing an economic development and regeneration strategy for the area, including grant-aid for the repair and restoration of architectural features to buildings;
9. a strategy for the management and protection of important trees, greenery and green spaces; and guidance on the need for an assessment of the area's ecology/bio-diversity value and its implications; and
10. proposals for an urban design and/or public realm framework, dealing with spaces, movement, etc.

Definitions of Historic Conservation Concepts

Conservation of cultural and natural heritage is an essential part of modern socio-economic planning and development. As such it must compete with other aspects of the planning process. It is therefore essential to make a realistic and critical assessment of each site in its physical, cultural and social context (Feilden and Jokilehto, 1998).

Cohen (2001) discussed the conservation of the web that preservation of single buildings or a group of buildings is rarely successful and occurs only when no other alternative exists. It has become increasingly obvious that conservation of the urban context is the only viable alternative that is both flexible and has a chance of succeeding. Even historical buildings that have benefited from conservation efforts for centuries are located in urban settings that have held similar status.

For historic cities, the principal root is architectural conservation, whose starting points include archaeology and the geocultural diversity and historical evolution of architectural styles, building materials and techniques. The secondary root of urban conservation is townscape and a morphological and aesthetic approach to the management of change in historic cities (Rodwell, 2007).

Feilden and Jokilehto (1998) provided definitions of the most commonly used conservation concepts in the following:

1. Protection: it is understood in legal terms as related to the physical protection of historic sites to ensure their security against theft or vandalism as well as environmental attack and visual intrusions.
2. Preservation: it aims to take the measures necessary to keep the site in its existing state. Preservation measures include regular inspections and cyclical and routine maintenance.
3. Conservation: it implies keeping in safety or preserving the existing state of a heritage resource from destruction or change. In relation to urban or cultural landscapes, conservation is part of an integrated approach to management. The primary aim of conservation is to preserve the authenticity and integrity of the cultural resource.

4. Consolidation: it is the physical addition or application of adhesive or supportive materials to the actual fabric of the cultural property in order to ensure its continued durability or structural integrity.

5. Restoration: according to Venice Charter, the aim of restoration is not only to conserve the integrity of the resource, but also to reveal its cultural values and to improve the legibility of its original design. In addition, the aim of modern restoration is to reveal the original state within the limit of still existing material

6. Reconstruction: it means building anew. The term may be used in reference to work executed, using modern or old material, or both, with the aim of rebuilding dismembered or destroyed elements, or parts of them.

According to the Burra Charter (1999), definitions of conservation concepts are offered in Article 1 as:

“1.4 Conservation means all the processes of looking after a place so as to retain its cultural significance.

1.5 Maintenance means the continuous protective care of the Fabric and setting of a place, and is to be distinguished from repair. Repair involves restoration or reconstruction.

1.6 Preservation means maintaining the fabric of a place in its existing state and retarding deterioration.

1.7 Restoration means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material

1.8 Reconstruction means returning a place to a known earlier state and is distinguished from restoration by the introduction of new material into the fabric.”

Moreover, Kelly (2004) gave some more definitions of historic conservation concepts that are tools can be used for historic site preservation as:

1. Rehabilitation and renovation: Rehabbed, or renovated, structures are adapted, or changed for safety and maintenance purposes. In some cases the exterior is refaced to the original and the interior is modernized. Unlike restoration, where the buildings return to their original state, rehabbed buildings may be renovated for a different use.

2. Replication: It can be used when a building or structure has symbolic importance, especially for tourist purposes. This historic site preservation technique requires plank-by-plank imitation of the original. The structures, at least for the exteriors, are authentic reproductions. The interiors may be modernized for comfort and safety. Usually replication is recommended for buildings that represent a historic event or cultural period in the nation's history.

3. Relocation: In this case the character of the building is important to the community in some way, but the area where it currently exists is being razed for a major planning project. A decision is made to relocate the historic property to a designated part of the city that was not going to be affected by that major project. Although the historic property is no longer in their characteristic setting, the relocation technique can preserve a piece of the heritage of a city.

4. Facades: Saving facades is a tool that preserves the façade although the rest of the building is demolished. Historic site preservation supporters usually totally discount this as a preservation tool, but advocates of architectural vibrancy often defend its use if a building cannot otherwise be saved. From a broader perspective, it can be argued that architectural compatibility is as important as preservation, perhaps much more so.

5. Urban renewal: This term, originally referred to as urban redevelopment, is the process of clearing slums in decayed areas of old cities. It also involves reconstruction and restoration of dilapidated structures that have been neglected or misused. Urban renewal efforts try to correct the abuse and serves as a strategy for reducing overcrowding, restoring the quality of built environment and clearing the blighted areas of the city (Unaegbu, 2004). Kelly also described steps of the urban renewal process as follows:

- Land acquisition
- Relocation
- Site clearance
- Site improvements
- Disposition of improved land
- New construction

As the aim of this study is to delineate an appropriate buffer zone to protect the OUV of a cultural heritage place and its setting, the treatments related to authenticity in setting should be also considered to protect integrity of whole area. Feilden and Jokilehto (1998) suggested treatments related to authenticity in setting that authenticity in setting includes landscape and townscape values, and also the relationship of man-made constructions to their environmental context. The particular values and characteristics of historic towns and traditional rural settlements should therefore be seen in the larger context of regional or national development planning. Sustainable management strategies for change which respect cultural heritage require the integration of conservation attitudes with contemporary economic and social goals, including tourism. Buffer zones of sufficient size should be established in order to protect the landscape or historic town context from intrusive elements that diminish cultural values. Planning at local and regional level should take into account the *genius loci* and the enhanced status of a cultural heritage place, and ensure that negative threats of all types are prevented or strictly controlled.

Integrated Conservation

Bizzarro and Nijkamp (1996) referred to The Council of Europe the European Charter of the Architectural Heritage (1975) that the notion of Integrated Conservation, as introduced by the Council of Europe, has almost been universally accepted. It incorporates both the principles of protection and management of historical and cultural heritage within all decision-making processes, especially in the context of urban planning.

This concept of integrated conservation provides also for the use of built heritage as part of the social life of the community and for the benefit of present and future generations. Moreover, it aims to foster concertation and a multidisciplinary approach, in which a balanced evaluation may play a strategic role.

Feilden and Jokilehto (1998) stated that declining historic areas can be made into attractive livable foci for all social categories by reinstating a mixture of residential, commercial, small-scale industrial and leisure activities. Urban management should aim to create harmony, avoid undesirable uses and maintain the existing scale of buildings, as well as their functional and cultural values. The methodology of this approach is called integrated conservation. In their book, the description of “integrated conservation” was expressed that

“Integrated conservation implies reconciling conservation requirements and town planning objectives, i.e., considering the values and interests of the existing historic fabric as equal in status to other factors in the general planning process”.

Integrated conservation involves the conservation and rehabilitation of historic buildings and areas and the provision of appropriate public services. In order to be successful in the long term, this process should generally be carried out in collaboration with inhabitants, using planning legislation and norm as a tool. The basic for any planning and intervention in an existing fabric is the knowledge and understanding of the resource concerned, in terms of both its history and its present condition. These analyses will assist in the physical definition of the existing significant historic areas and eventual buffer zones, and in the preparation of planning norms for their appropriate conservation. Feilden and Jokilehto also recommended activities that affect to historic areas such as large intrusive buildings, undesirable traffic flows, out-of-scale functions, tall office blocks, water towers, industrial buildings, and so forth. The integrated conservation of historic areas implies joining all political and technical forces and bringing together the skills of the archaeologist, ethnographer, sociologist and historian with those of the architect and

engineer in an interdisciplinary collaboration, under the leadership of a conservation-conscious, qualified town planner.

The findings of this part indicate that the effective urban historic conservation should be integrated with other planning processes. The existing conditions of economics, social, and environment are essential elements to analyze concurrently with historic significance of a cultural heritage place and its setting. The basic for any planning and intervention in an existing fabric is the knowledge and understanding of the resource concerned, in terms of both its history and its present condition. This reading of the fabric is best done through a systematic analysis of the architectural, structural and functional typology of these buildings and their respective urban areas (Feilden and Jokilehto, 1998).

In conclusion, in order to establish a buffer zone as a legal for protecting the OUV of a cultural heritage place and its setting, one of spatial legal that could be integrated with is the land use plan. The theoretical frameworks of this dissertation can be shown in Figure 12

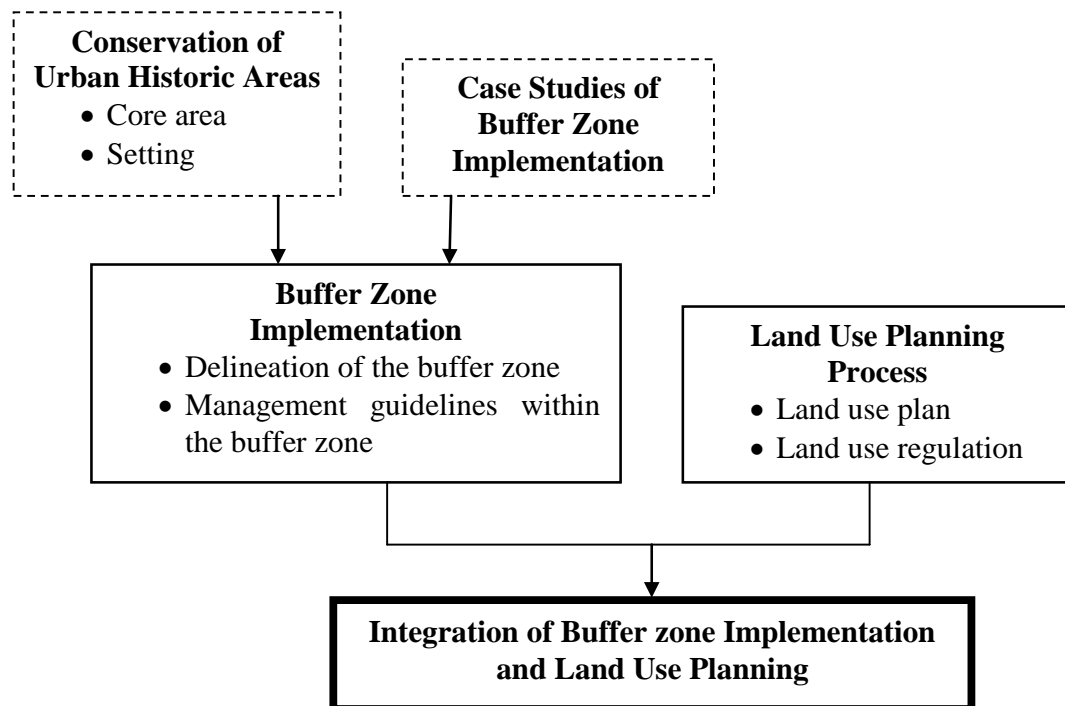


Fig.12 Theoretical frameworks of the study

Chapter 3

Research Methodology

This chapter describes the process of deriving criteria of the buffer zone delineation for King Narai's Palace in the land use plan. The research methodology for this study needs to be considered systematically to determine the research approach correctly. This chapter is organized into four main parts as follows:

1. Research design
2. Data collection
3. Data Analysis
4. Interpretation

These procedures are developed for dealing with the research framework of this study shown in the previous chapter.

Research Design

This research is the exploratory research based on the qualitative study approach. The main objective of this study is to find the criteria for delineation of the buffer zone to protect the OUV of King Narai's Palace and its setting in the historic urban area. One of qualitative studies that could be used reliably is the qualitative case study approach. The qualitative case study tries to follow case study structure-the problem, the context, the issues, and the "lessons learned." The epilogue at the end of the study brings our personal experiences into the narrative without disrupting the flow of the narrative in the study (Creswell, 1998). The context of the case involves situating the case within its setting,

which may be a physical setting or the social, historical, and/or economic setting for the case. Since there are many case studies of implementation of buffer zones in Asia, Europe, USA, and Australia, these case studies could be used to analyze how to set appropriate criteria for delineation of a buffer zone in this study.

Moreover, this study also focuses on the physical environment, socio-economic condition, and cultural significance of King Narai's Palace and its setting. Importantly, there are some statistical data from the study of opinions and requirements of local community and related institutions regarding to delineation of a buffer zone and guidelines for setting of King Narai's Palace. In addition, the process of urban land use planning has been reviewed and analyzed with other factors to find the appropriate implementation in the urban land use plan. However, although case studies and in-depth data could be analyzed by the qualitative method, on the other hand, the statistical data could be analyzed by the quantitative method. Therefore, both qualitative and quantitative study approaches have been used to analyze the data in this study.

Data Collection

In the data collection part, two main issues should be concerned as follows:

Data Category

The data for this research can be specified in 2 categories as follows;

1. Primary Data is data that collected from site survey, in-depth interview, and questionnaires from local communities and related institutions.

- Data from the field survey: As collecting primary data from observation in the study area, the field survey could be used to collect the information about physical condition, land uses, building uses, building height, building condition, infrastructure systems, traffic routes, and so forth.

- Data from the in-depth interview: In-depth interview could be used to collect the information particularly opinion and attitudes towards delineation of buffer zone to protect a cultural heritage place from related institutions.

- Data from the questionnaire: The questionnaire could be also used to collect the opinion and attitudes towards delineation of buffer zone to protect a cultural heritage place from local communities.

2. Secondary Data is data that collected from books, reports, newspapers, local records, statistic records, journals, maps, site plans, photographs, and internet; for example, geographic information, attribute of populations, land use plans, policies, case studies of the buffer zone implementation, relevant laws and regulations, and so forth. These data could be inquired from the international organizations, government organizations, local authorities, public sectors and private sectors.

Sample Units and Sampling

The sample units are divided into 2 groups, and the sampling technique of each group is different.

1. The first group is the administrators or related institutions that have responsibility to govern, control, and manage in the study area. The indepth interviews could be used for data collection in this group. These persons can give the deep information about the place, its environment, problems, and policies. Therefore, the purposive sampling can be used for this group.

2. The second group is the people who live in the setting around the King Narai's Palace. Questionnaires can be used for data collection in this group. Because there are a lot of communities around the place, the appropriate technique should be the area sampling. The sample size is 350 units that are people who live in the setting around the King Narai's Palace and in the boundaries of urban planning delineated by the Department of Public Works and Town & Country Planning (DPT).

Data Analysis

Regarding the research design, the main approach of this study is the qualitative study. Many case studies of buffer zone implementation are information in documents. However, some statistical data such as opinion of local communities are used to analyze with other aspect. Therefore, both qualitative and quantitative data analysis have been used in this study.

As qualitative data analysis, case studies of buffer zone implementation in various documents would be analyzed by analytic induction. Analytic induction refers to a systematic examination of similarities between various case studies in order to develop concepts or ideas. Analytic induction could be used to search for those similarities in broad categories and then develop subcategories (Ragin, 1994). Statistics are not always used in the data analysis, but offer supplementary data. Especially, the data from opinions of local communities collected by questionnaires could be statistically analyzed and described the result on available software package. In addition, the opinion and attitudes towards delineation of buffer zone to protect a cultural heritage place from related institutions, the existing physical and socio-economic condition, and statement of significance of King Narai's Palace and its setting would be also analyzed together with other aspects.

Interpretation

The last section of research methodology is the data interpretation. The results of this study can be concluded by these two principles as follows:

Implementation and Integration

Conclusions analyzed systematically could define criteria to establish buffer zones. Importantly, conclusions should be considered in the implementation of these criteria to practical principles. Therefore, two main principles should be concerned as follows:

1. Actions as legal: As reviewed in the previous chapter, the buffer zone to protect OUV of a cultural heritage place and its setting should be legislation. Enforcing the law for delineation of buffer zones could be more effective in practice. One of spatial laws in Thailand that has been used widely as applicable framework to guide a city or a town's development is the urban land use plan. Therefore, in practice, this is possible to integrate the criteria to establish buffer zones with the urban land use planning.

2. Management in the buffer zone: In addition to stipulated buffer zones on the land use map, the land use regulation and other measures should be also promulgated to control inappropriate activities and threats, and to manage with traditional practices, existing urban planning instruments, both formal and informal. The purpose of a management system is to ensure the effective protection of King Narai's Palace and its setting for present and future generation, as a living heritage place.

Conclusions and Reporting

Reporting should summarize the statements of the problem, the objectives of the study, the review of relevant critical concept, the description of the process of research design, the summary of data, the detail of the data analyses, implementation and conclusions.

Chapter 4

Background Information of the Study Area

This chapter describes the background information of the setting of King Narai's Palace. This information forms important base data for analysis to set the criteria of delineation of the buffer zone to protect the significance and meaning of a cultural heritage place in the historic urban area. Presentation of this background information is divided into 4 main issues as follows:

1. Background and history of Lop Buri City
2. Physical conditions of the study area
3. Social and economic situations of the study area
4. The comprehensive planning of the study area
5. Problems and limitations

Each main issue consists of relevant details of base data that show the important characteristics in various aspects of study area. These relevant details are described respectively in sections below.

Background and History of Lop Buri City

This part aims to review the background information and history of the old city of Lop Buri to understand the history of settlement and significance of the old city of Lop Buri. The information of King Narai's Palace is also reviewed in the last section. This part is divided into 6 main sections as following below.

History of Lop Buri City

Lop Buri was first developed into a major town during the Davaravati Kingdom (6th – 11th centuries). Most historians believed the first settlers of the town

were the Lawa (an ethnic group related to the Mons) which is the reason for naming the town Lawo. In 10th century, the town came under absolute sovereignty of the Khmers who made it one of their oldest provincial capitals. The Khmer Mahayana Buddhism style was a major influence on the town's architecture and was later commonly referred to as "Lop Buri Style". Remains of Khmer-Hindu architectural motifs found in the city include the Shiva's Shrine (Prang Khaek), San Phra Kan, Phra Prang Sam Yot, and Wat Phra Si Mahathat. It was in the late 13th century when the Thais, who migrated from the North, fought against the Khmers and declared their independence. Since then, Lop Buri has been ruled by Thai Kings. Lop Buri first became known when King U-Tong, who established the Ayutthaya Kingdom, sent his son, Ramesuan the Crown Prince, to govern the city. The Prince commanded the building of moats, city walls and battlement towers. Lop Buri reached its height in 1664 when King Narai the Great of Ayutthaya named Lop Buri the Kingdom's second capital, which came after a threat of invasion from the Dutch. King Narai the Great rebuilt Lop Buri with the help of French architects and ruled the Kingdom from there, instead of Ayutthaya. Thus the city's architecture mostly reflected a mixture of Thai and Western styles, which can be seen today in the remains of the Royal Palace, the Royal Reception House and other buildings. Lop Buri gradually faded from the political scene with the death of King Narai the Great. It, however, made a comeback approximately 200 years later in 1863 when King Rama IV of the Ratanakosin Era decided to restore the city. He also commanded the restoration of the old Palace and named it "Phra Narai Ratchaniwet" (King Narai's Palace) in honor of King Narai the Great. After Thailand's democratic revolution, Marshall Plaek Pibulsongkram rebuilt a military camp near the city's railroad. Therefore, the new Lop Buri was constructed as a military city on the east side of the railway covering a wide territory, while the old one was on the west side. Lop Buri has, therefore, become a strategic centre at present. It is 153 kilometers from Bangkok with a total area of 6,586.67 square kilometers (TAT Lop Buri, 2008).

Physical Development of Lop Buri City

Lop Buri is a planned city that has been continuously developed since

Dvaravati era. There are many moats, city walls, ditches, and ridges to protect the city. These archaeological evidences show that Lop Buri is suitable for settlement since the past. As considering in urban physical development, changes of urban structures, urban plans, and size of city, the urban development of Lop Buri can be divided into 3 eras as follows:

1. Davaravati Era: In this era was the first time of settlement of the city. Territory of the city was established evidently and clearly. The main objective of settlement was to build the city as a port of trade. Moats and ridges were built around the city as the boundaries of the inner city. The width of the moat was approximately 20-30 meters. Ridges were built by soil as the city wall, and the base width was approximately 4-5 meters. There were 8 entrances to the inner city around the city wall. The size of the inner city was approximately 0.90 square kilometers. The West side of the city was adjacent to the Lop Buri River. Significant components were located within the inner city such as palaces, warship places, and pools. In addition to the area outside the moat to the East, there was a moat that was located approximately 300 meters away, and was built in parallel with the old moat in all 420 meters long. This outer area had also other significant components such as Wat Tong Pu, Wat Laworang, and small disused pools. It has been assumed that the moats and ridges of the old city were destroyed in the reign of Somdet Phra Maha Chakkraphat, the king of Ayutthaya Kingdom from 1548 to 1568.

2. Ayutthaya Era: In the reign of King Ramathibodi 1, Lop Buri was an important border city in the North East. The King sent his son, Ramesuan the Crown Prince, to govern the city. The prince had developed the city by establishing moats, battle fortresses, and city walls around the city to prevent enemies' invasion. Later in the reign of Somdet Phra Maha Chakkraphat, these constructions were destroyed, because Lop Buri was considered that this city would be advantage for enemies, whenever this city was occupied. Therefore, there were not evidences of moats, forts, and city walls in that time. The significance of Lop Buri decreased until the reign of King Narai the Great (1656-1688). During that period, Lop Buri was greatly restored due to the invasion of the Dutch who traded with the Thais. King Narai realized that Ayutthaya was not quite safe from the blockade and fire of the enemies in wartime. Therefore, the king had Lop Buri reconstructed as the second capital city due to its

strategic suitability. To do as such, King Narai the Great received assistance from French and Italian architects. The palace and the battle fortresses were strongly built as a barrier line. The king also mostly resided in Lop Buri and allowed the diplomatic corps and foreigners to pay courtesy calls in this town on several occasions. In this period, physical characteristics of the city had been extended to the east in another two parts. The first inner part was about 1.40 square kilometers. This part was intended for residential area and agriculture. There was a new moat dug to be the boundary on the east side. This part was illustrated in various maps. The second part was assumed that it had been expanded in the same period. However, there was not clear evidence appearing on the maps in that period, but it was found clearly in surveying in 1907. Unfortunately, after the reign of King Narai the Great, the importance of the city reduced. Somdet Phra Phet Racha moved all the official authorities back to Ayutthaya. During the later reigns, kings did not reside in this town again.

3. Ratanakosin Era: Until, the reign of King Rama IV in 1863, the king had Lop Buri renovated by fixing the walls, fortresses and the broken palace gates, as well as, the Phiman Mongkut Throne Hall constructed within the palace and granted its name as “Phra Narai Ratchaniwet” (King Narai’s Palace). Therefore, Lop Buri became a significant city once again. Later, in the reign of King Rama V, the northern rail line had been built through the old city area of Lop Buri. Afterwards, in the reign of King Rama VIII, the World War II was arisen in Europe and expanded into Southeast Asia in 1940. Marshall Plaek Pibulsongkram, the Prime Minister in that time, selected Lop Buri to be the central military city. The new Lop Buri was constructed as a military city on the east side of the railroad covering a wide territory, while the old one was on the west side. Narai Maharat Road was constructed from the old city of Lop Buri to the east through Sri Suriyothai roundabout, and Thep Satri roundabout respectively. Modern buildings were constructed along this road as well (ONEP and other institutes, 2005).

Key Elements in the Old City of Lop Buri

Since the status of Lop Buri that used to be a border city and the second capital, according to the military strategy, key constructions of the city must be

constructed indispensably to prevent enemies' invasion. These constructions consist of three main types as follows:

1. Moats, ridges, and city walls: These elements are important archaeological evidences that show the development of communities' settlement within Lop Buri from the past. The main objectives of establishing moats and city walls are to show the boundary of the city, to prevent enemies' invasion, and to manage infrastructure systems sufficiently. Firstly, these elements were assumed to have been constructed in the Dvaravati Era. Later, in the reign of King Narai the Great, the old city of Lop Buri was restored considerably. City gates and fortresses were constructed along the boundary of the old city of Lop Buri. From historical evidences, moats and city walls were constructed to expand the boundary of the city in several times. As a result, the urban area of Lop Buri had been expanded to four parts in Ayutthaya Era and Ratanakosin Era respectively. These expanded areas were planned as residential and agricultural areas.

2. City Gates: Normally, city gates were set within the city walls. However, only two city gates remain. The first is Chai Gate located in the south of the old city. It was constructed as a big point arch gate. The other is Phra Nait Gate located in the Fort Somdet Phra Narai Maharat. There are some mounds as important evidences that show this area used to be an elephant corral in the reign of King Narai the Great.

3. Fortresses: Some assumptions stated that some fortresses had been constructed around the old city of Lop Buri before the reign of King Narai the Great. Later in the reign of King Narai the Great, the new fortresses were constructed, and some dilapidated fortresses were renovated by La Mare, a French engineer, in 1685. However, it was assumed that construction and renovation of all fortresses might be completed in the next reign, Somdet Phra Phet-Racha. Nowadays, only two fortresses remain. The first is Tha Pho Fortress located on the mound in the north of the old city of Lop Buri. The other is Chana Songkharm Fortress located in the east side of Lop Buri railway station. These fortresses had been constructed from bricks and mortar on three sides, but the rear was the ridge of the city wall (ONEP and other institutes, 2005).

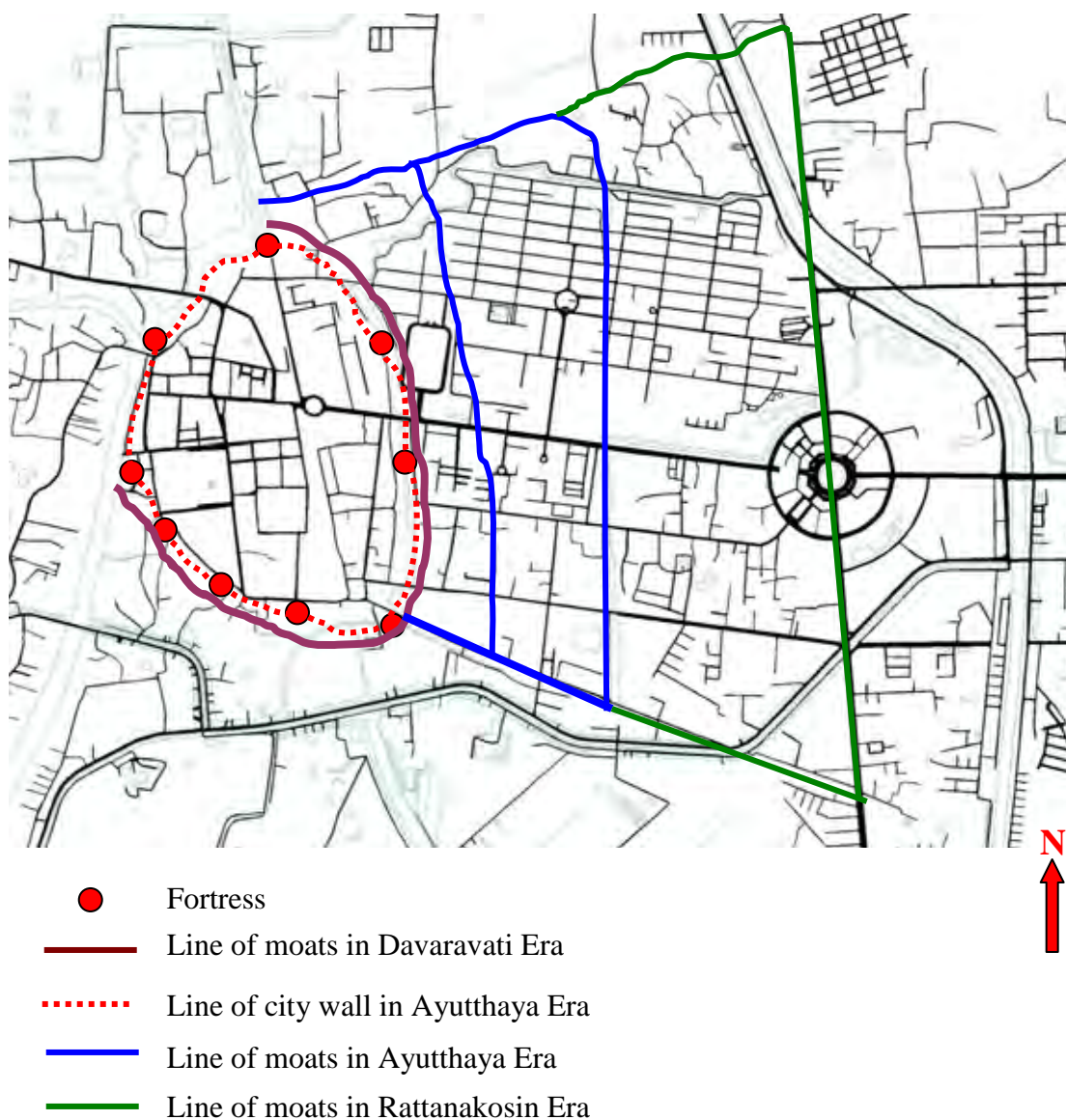


Fig.13 The map shows the line of moats and city walls in Davaravati, Ayutthaya, Rattanakosin Era (ONEP, 2005)

Historical Overview of Expansion of Urban Area

In the past, the boundaries of Lop Buri have been expanded several times. Each time of expansion, moats, ridges, city walls, and city gates were built to show territories and to protect the city from invasion. These elements were located in several parts of the city as follows:

1. The inner city: The boundary of the city liked elliptical shape. Moats, ridges, and city walls were built around the city. The significant places such as palaces, worship places, and pools were located in this area.

- Moats had been dug around the inner city area. There are three canals such as Tor Canal, Tha Kra Yang Canal, and Bang Pee Canal that were moats in the east side, the north side, and the south side respectively. Lop Buri River was the moat on the west side as well. The width of these canals was approximately 20-30 meters. Soil and mud that were dredged from these canals were brought to pile up as the ridge and city wall. However, nowadays, some parts are shallow, but some parts still have the same width.

- Ridges served as the city wall that the width was approximately 10-15 meters, and the height was approximately 4-5 meters. These ridges were constructed by piling up with compacted soil and mud. It was assumed that the traditional ridge was built firstly in Dvaravati Era, and was restored again in Ayutthaya Era.

- City gates were constructed within city walls. There are eight gates around the city, and the important gate named “Pratoo Phee” (Ghost Gate) that was the way for removing the dead body out of the city to prepare the funeral rites as the traditional practice. Furthermore, there are some historical assumptions that Chai Gate, the city gate in the south, was an important city gate. It was assumed that it might be the main entrance of the old city of Lop Buri in the past, since this gate was a masonry building constructed specially as point arch gate adorning with Bai Sema (Sema leaves) on the gate.

- Fortresses were constructed from bricks and mortar that protruded like acute angle from the city wall. The characteristics were similar to the French Fortress called Voubon. These fortresses were located along the city wall. From evidences, the old maps written by foreigners in the reign of King Narai the Great, there were only seven fortresses in Lop Buri, but the map in the reign of King Rama VII, 1932 in Ratanakosin Era, showed that there were eight different sizes of fortresses. Firstly, the largest fortress was located at the middle of the wall city in the west side near Lop Buri River. Nowadays, the remains are only the base of the fortress. The second is the large size fortress. Only two large fortresses remain, Tha Pho

Fortress and Chana Songkharm Fortress in the old city of Lop Buri. The third is the medium size fortress. Only two medium fortresses remain as well. These fortresses located in the east, and were built as turrets protruding from the ridge into the moat. The last are small size fortresses that the character of these fortresses resembles the medium size fortress. These small fortresses were located in the south of the old city of Lop Buri.

2. The expanded urban area to the east; Part I: The boundary of the expanded area was rectangular shape. The new area was expanded away from the old moat to the east side approximately 300 meters, and the length was paralleled with the old moat approximately 420 meters. The total expanded area was approximately 0.90 square kilometer. The significant cultural heritage places located in this area are Wat Tongpu, Wat Lawo Rang, Wat San Paulo, and various sizes of pools. In addition, the King Narai's Garden, Vichayen's Garden, and the elephant training area were assumed that located in this expanded area. However, at present, no historical evidence remains, but these gardens were shown in some maps in the reign of King Narai the Great. The important purposes of expansion of urban area were as follows: To protect the city from enemies' invasion; And to be the location for establishing the religious places of Aran Yawasi, a sect of monks who lived in the jungle, which had to be located outside the city walls. This traditional practice has been inherited from the Ayutthaya Era to the Ratanakosin Era. Key elements in this area were as follow;

- Moats consist of two canals, Tha Kra Yang Canal and Bang Pee Canal, that served as moats in the north and the south respectively.
- Ridges served as the city wall, and were only piled up in the north side and the south side. The width of ridges was approximately 10-15 meters same as other parts, but the height was approximately 6-7 meters that was higher than other parts.

3. The expanded urban area to the east; Part II: The boundary of the expanded area was also rectangular, and was expanded from the boundary of expanded part I approximately 460 meters. The new moat was dug more linearly to indicate the boundary. This area was the location of the royal metal foundry in the reign of King Narai the Great. The main purpose of this expansion was to increase the new agricultural area. Key elements in this area were as follow;

- Moats of this area were Tha Kra Yang Canal and Bang Pee Canal in the north and the south respectively. Sai Bua Canal served as a moat in the east. Sai Bua Canal is one of the large moats that the width was approximately 10-25 meters. Nowadays, some parts of this canal have been filled for establishing buildings and roads.

- Ridges served as the city wall, and were constructed along every side of the moats except the old moat in the west. The width of the ridge was approximately 10-15 meters, and the height was about 3-4 meters. Some part of ridges had been destroyed to construct buildings and roads. However, in 1990 Sai Bua canal was dredged and piled up as high as the city wall remains.

- City gates remain only two locations. The first is Saphan It Gate. In the past, this gate was used to be a gateway between inner city and outer city. The width of this gate approximately 1-2 meters, and was built from bricks and mortar. The second is Phra Nait Gate that resembled Chai Gate. This gate is main entrance to the elephant corral that used to confine wild elephants.

4. The expanded urban area to the east; Part III: This part was expanded in Ratanakosin Era. The new moat was dug linearly in the north to the south away from the old moat approximately 900 meters. The length of parallel side with the old moat was approximately 3,000 meters. The expanded area was a trapezoid shape, and whole area was approximately 2.52 square kilometers. Key elements in this area were as follow;

- Moats of this area were Tha Kra Yang Canal and Bang Pee Canal in the north and the south respectively as well. The width of these moats was approximately 10-20 meters. However, nowadays some parts have been filled for establishing buildings and roads.

- Ridges served as the city wall that the width was approximately 10-15 meters, and the height was approximately 3-4 meters. Nowadays, there are some historical evidences of the wall at Ban Hin Songkong and in front of flats of the Special Warfare Center. However, some parts have been destroyed to construct the highway no. 3016 (ONEP and other institutes, 2005).

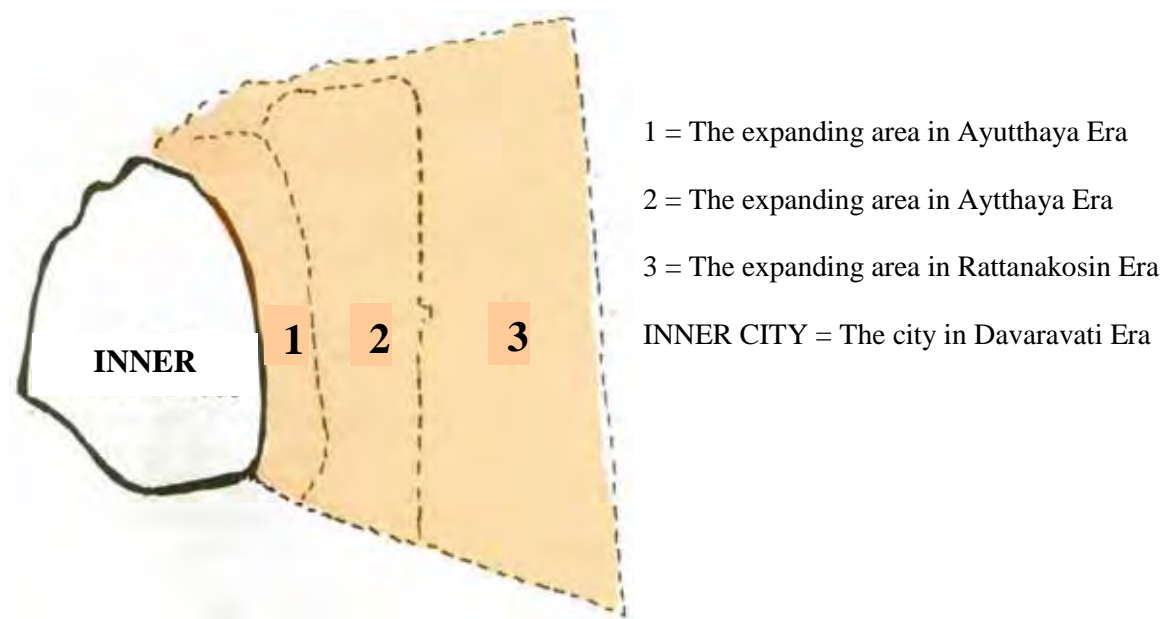


Fig.14 The map shows expanding urban area in various era (ONEP, 2005)

Background of King Narai's Palace

King Narai's Palace or Phra Narai Ratchanivet, the ancient palace of the Ayutthaya Dynasty is a good example of the significant historical architecture of the Lop Buri period. King Narai the Great had this palace constructed in 1666 to be his royal residence in Lop Buri. The palace faces the town and the Lop Buri River is behind it. The principle of the location of the palace in Ayutthaya Era believed that the palace was the center of the universe or the city. Although, in the past, the city center was a temple that Wat Phra Si Rattana Mahathat used to be the city center of Lop Buri before (Wallipodom, 1977). The palace is divided into the outer, middle and inner parts of the royal palace. The wall of the palace was made of brick and mortar with battlements along the ridge. These are overall 11 arched gates. The main entrance has a cruciform plan with a pointed arch at the doorway. The archway is decorated with a stucco sculpture in the triangular Krachang pattern developed from the lotus shape. There are rows of around 2,000 small pointed arch holes similar to lotus shapes for placing lamps on the gates and walls of the middle and inner parts. Later, King Rama IV had the palace renovated in 1856 to be the inner part of the royal palace and granted

its name as “Phra Narai Ratchaniwet”. The structures within the compound can be divided into two groups in accordance with the period of construction as follows:

1. Structures built during the reign of King Narai the Great include:

- Dusitsawan Thanya MahaPrasat Throne Hall, a combination of European and Thai style architecture, was a greeting hall for ambassadors. The front of the hall was decorated with glass from France and with gold in the corners. At the back, the high throne tower still stands. The top roof is possibly a type of mondop called “Mahaprasat”. Inside is a throne where King Narai the Great received ambassadors. The doors and windows are decorated with stucco in the Thai design.

- Chanthara Phisan Throne Hall, was a meeting hall for King Narai the Great and his Privy Councillor. The building is in the typical Thai style. In front of the building is a second projection is a second projecting portico used for receiving officials. King Rama IV restored the hall, and nowadays it is used for displays illustrating the glory of King Narai the Great.

- Suthasawan Throne Hall, a European style building, was the private residence of King Narai the Great. In the journal of the Frenchman, he writes “the roof is made of yellow glazed tiles, the pond on the right is close to the replicas of the mountain covered with green bushes and fragrant flowers. The four ponds are filled by the fountain. King Narai the Great passed away in this hall.

- Phra Chao Hao Hall, a building of Thai and European styles. Doors and windows were decorated in stucco with Thai designs. It was probably used as the royal chapel. The word “Hao” may refer to the old Buddha image once housed inside this building. In 1688, King Narai was dethroned by Somdet Phra Phetracha in this building.

- Reception hall for foreign envoys, a European style building with an arched doors and windows, is surrounded by a moat. The banquets in honor of foreign envoys like the French ambassador, Chevalire de Chaumont were hosted here by King Narai the Great in 1685. According to their journals, this pavilion was situated in a flower garden, with 20 fountains.

- Phra Khlang Supharat, European style with an arched doors and windows, connected buildings with streets between these buildings were presumably

warehouses for official goods and gifts and contained clothes, swords, wood, ivory, tin, and pepper.

- Water Tank, a rectangular structure made of a special thick brick wall by a French engineer and a special thick brick wall by a French engineer and an Italian priest, was used for water storage in the palace. The water came from Ang Sub Lek and flowed through terracotta pipes to the palace.

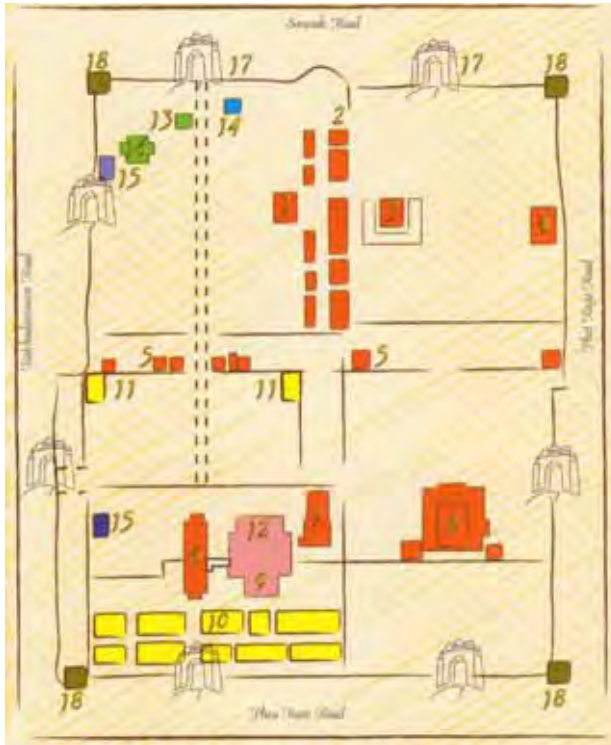
- Elephant stables, a European style building with an arched windows. The elephants of King Narai the Great and other noblemen were kept here and used for transportation, and sometimes for hunting. The elephant stables also housed for mahouts and royal elephant caretakers, who worked in shifts.

2. Structures built during the reign of King Rama IV include:

- Phiman Mongkut Pavilion, a European style building, was a private residence of King Rama IV. The front part has 2 stories and the back 3 stories. The roof is made of kabu, a Chinese ceramic, and the doors are semi-circular. On the second floor are the Chaiyasastrakorn Hall, the Aksornsastrakhom Hall, the Visuthivinitchai Hall, and the dining room. The bedroom is on the third floor, and the gable is decorated with King Rama IV's royal emblem "Phra Maha Pichai Crown" in stucco and the other is a design of the throne under for displaying archaeological objects and other items relating to King Rama IV. The Phiman Mongkut Pavillion compound was used as the city Hall, and became the Lop Buri Museum on October, 1924. It was officially Somdet Phra Narai National Museum in 1961.

- Phra Prathiap Buildings, European style building with semi circular doors, consisted of 10 buildings, some one story and some two stories. They were residences of the queens, consorts and other subordinated of King Rama IV. Tody Phra Prathiap is used for exhibits illustrating the life style of the local Thais, and for temporary exhibitions.

- Thim Dap or Royal Guards Residence, two European style buildings with semi circular doors, are on the north and the south corners of the wall, and were formerly the residence of the royal guards (TAT Lop Buri, 2008).



King Narai's Palace

1. The water tank
2. The twelve halls of treasure
3. Reception hall for foreign envoys
4. Phra Chao Hao Hall
5. Elephant stables
6. Chanthara Phisan Throne Hall
7. Dusitsawan Thanya MahaPrasat Throne Hall
8. Suthasawan Throne Hall
9. Phiman Mongkut Pavilion
10. Phra Prathiap Buildings
11. Thim Dap
12. Book-souvenir shop
13. Ticket booth
14. Softdrink
15. Toilet
16. Office
17. Entrance
18. Fortress

Fig.15 The map shows the lay out plan of King Narai's Palace (TAT)



Fig.16 The main entrance of King Narai's Palace
(Pic. From surveying)



Fig.17 The twelve halls of treasure
(Pic. From surveying)



Fig.18 The group of Phiman Mongkut pavilion and The Chanthara Phisan Throne Hall
(Pic. From surveying)



Fig.19 Thim Dap or Royal Guards Residence
(Pic. From surveying)

Development of Community Settlement

Apparently, Lop Buri is a city that has been developed continuously from the past. In many reigns, there are many evidences of community settlement, expansion of the city, urban restoration, and urban development. The study of the development of community settlement helps to understand the evolution of living in the old city of Lop Buri. The development of community settlement is divided into the various reigns as follows:

1. Davaravati Era: In this era, Lop Buri was an important port city of this region, because it was located in the eastern sea coast. In addition, Lop Buri was the center of exchange in commerce, and religious and cultural beliefs from various countries. The settlement in this era can be tracked from various archeological evidences. It is assumed that there are 2 characteristic of community settlements. The first was agricultural communities located outside the moat around Tha-le Chupson, Ban Hin Songkon, and Ban Tha Kra Yang. The second community was located within the inner city near the port. The main activities in this area were trading and commercial business. However, the agricultural products from the first area would be sent to the inner city for trading and exchanging.

2. Lop Buri Era: In this time, the city came under absolute sovereignty of the Khmers who made it one of their oldest provincial capitals. However, changes in this time was only to administrative power and the main activities of the city continued in

the inner city. There were some cultural heritage places constructed in this time. It is assumed that the density of community settlement was increased along the Lop Buri River, because this place was an important center of commerce and water routes. As the result, the later increasing communities had to be expanded to the eastern of the city.

3. Ayutthaya Era: The inner city area was still given precedence to be settlement area. There were many significance governmental institutions constructed in this area such as the palace, and residences for the envoys. Even though, in this time the expanded area into the east called “New Town” was established, but most people had still lived in the inner city that had more convenience.

4. Thon Buri Era: When King Tak Sin the Great defeated the cities of Luang Phrabang, and Vientiane in war, the captives from these area were taken into Siam (Thailand). These captives were permitted to settle in the northeast provinces including Lop Buri as well. This resulted in an expansion of ethnic groups in Lop buri.

5. Ratanakosin Era: In the reign of King Rama III, the content in the annals stated that most people still lived densely within the inner city along Lop Buri River. Later, in the reign of King Rama IV, the old city of Lop Buri was restored especially temples and King Narai’s Palace. Consequently, some people moved out from the confine of the river and moved into the center of the city around the palace. In the reign of King Rama V, the king made the administrative revolution as he thought the former administrative system had been used for almost 300 years since the Ayutthaya period and it was not suitable for the fast developing Siam at that time. Under this system, administrative boundaries were set for the town, sub- district, district, and the city. Two or more cities were combined to be a certain administrative area called ‘monthon’. The new administrative system called ‘Monthon Thaesapibal’ was also used in Lop Buri. The new developments were brought to Lop Buri in this reign such as constructing the railway from Bangkok to Chiang Mai that passed through the inner city area of Lop Buri. When the railway was finished, increasingly residences were built along the new land transportation network. Consequently, Chinese labourers who constructed the railway determined to live in Lop Buri as a Chinese community. Later, in the reign of King Rama VII, Marshall Plaek Pibulsongkram, the Prime Minister at that time, initiated the urban development policy that Lop Buri should be developed as

the military center. Consequently, the eastern areas of the old city of Lop Buri were improved to be residential areas, commercial areas, governmental institutions, and military areas. Narai Maharat Road and other roads were expanded and constructed for supporting the growth of the new city and linking to other regions. Most people who used to live within the inner city move to settle in the eastern of the railway. Later, this area was developed as an important commercial area (ONEP and other institutes, 2005).

Physical Conditions of the Study Area

The aim of this part is to explore physical conditions that are informative data for analyzing the significance of the setting of King Narai's Palace. Physical conditions can be used to indicate characteristic and development of the old city of Lop Buri and surrounding areas as setting of King Narai's Palace. This part is divided into 6 main issues as following below.

Geography

The old city of Lop Buri is located along Lop Buri River. The boundaries of the old city are Tor Canal in the east, Tha Kra-Yang Canal in the north, Bang Pee Canal in the south, and Lop Buri River in the west. The area slopes from Sam Yot Mountain Range located in the west of the old city. The urban area is located above sea level approximately 11-17 meters. Four kilometers in the northeast away from the city, the ground level is lower than the urban area that causes this area like a large pond. In the rainy season, rain water flows from the mountain range, and stands in this area like a large freshwater lake that is called Tha-le Chupson. In the reign of King Narai the Great, the fresh water from this lake used to feed into the urban area for consumption, and cultivation. However, nowadays the quantity of fresh water becomes rather lower, but some areas around this lake could be still used for agricultural cultivation. Next to the lake in the east side, there are some small mountain ranges such as Erawan Mountain and some canals flowing through such as Bang Khanmak Canal, and new irrigation canals. This area is also used for agricultural purposes. On the other hand, in

the west opposite side of the old city of Lop Buri, this area is a lowland area some 9-10 metres below sea level. In the flood season, the water from the Lop Buri River may overflow and flood into this area. In the northwest of the old city is a plain called Phrommat Plain. In the south and the southeast are also lowland that are used for agricultural cultivation supported by irrigation.

From the information of geography described above, the overall image of Lop Buri city can be indicated that the old city of Lop Buri is located in the central plain of Thailand. The geography of the old city and surrounding areas are various types such as plain, highland, hills, and mountain ranges. There is an important river, Lop Buri River, flows through the city in the west, and dug moat is located in the east. This aspects cause the old city of Lop Buri like an island (Silpakorn University, 1994).

Land Use

The structure of urban land use of Lop Buri city can be divided into 3 areas as a result of transportation networks and geographical aspects as follows:

1. The inner city or the old city of Lop Buri: In this area could be also divided into 2 areas by the railway as follows:

- The area in the west of the railway: This area has been used as residential and commercial areas and houses various places of cultural heritage value. The density of residential area is rather high in the old settlement in the south near the moat. The areas in the north and in the central of this part have been used as old commercial and service areas. The old commercial districts have been located in Vichayen Road, Surasong Kharm Road, Sorasak Road, Phraya Gamjat Road, Ku Meuang Road, and Na Phra Kan Road. Every day, there are many people from inner and outer city come to these commercial districts. Especially, Tha Khunnang Market and the municipal market are located in this area. The groups of cultural heritage places located in this area are as following: Wat Phra Si Rattana Maha That, King Narai's Palace, Wat Sao Thong Thong, Vichayen's House, Wat Peun, Phra Prang Sam Yot, Prang Khaek, Wat Ban Dai Hin, moats, and city walls.

- The area in the east of the railway: The land use in the north of this area is the location of Pibulwittayalai School. The areas under Narai Maharat Road to

the south are rather dense residential and commercial areas. The groups of cultural heritage places located in this area are as following: San Phra Kan, Wat Nakhon Ko Sa, moats, and city walls.



Fig.20 Sorasak Road in front of King Narai's Palace (Pic. From surveying)



Fig.21 Sorasak Road in front of King Narai's Palace (Pic. From surveying)



Fig.22 Sura Songkham Road to Prang Khaek (Pic. From surveying)



Fig.23 Vichayen Road to Phra Ram Road (Pic. From surveying)



Fig.24 Pra Ram Road in front of Wat Sao Thong Thong (Pic. From surveying)



Fig.25 Pra Ram Road behind King Narai's Palace (Pic. From surveying)



Fig.26 Buildings in Soi Wat Choeng Tha (Pic. From surveying)



Fig.27 Buildings in Wat Phrathat Raod (Pic. From surveying)



Fig.28 Buildings in Nasan Phakhan Road (Pic. From surveying)



Fig.29 Sura Songkham Road to Prang Khaek (Pic. From surveying)

2. The western area of irrigation canals (Except the old city area of Lopburi): There are some important business centers and commercial districts in this area, especially, around Si Suriyo Thai Circle, on the south along Narai Maharat Road, and Naresuan Road. The areas around Si Suriyo Thai Circle tend to be high potential growth of business and commerce. Nowadays, these areas are the location of financial institutions, bus terminal, theatre, and so forth. Therefore, there are activities in the night time more than the old city of Lop Buri. The northern of Narai Maharat Road is the location of the military area, Somdet Phra Narai Maharat Camp. The land uses of the southern of Narai Maharat Road are educational institutes, commercial areas, and medium density residential areas. Next to the south, there are some low density residential areas, and agricultural uses.



Fig.30 The new modern buildings on Narai Maharat Road
(Pic. From surveying)



Fig.31 The new modern buildings on Si Suriyo Thai Circle
(Pic. From surveying)



Fig.32 The new modern buildings on Ram Decho Road
(Pic. From surveying)



Fig.33 The new modern building on Narai Maharat Road
(Pic. From surveying)

3. The eastern area of irrigation canals: This area is an important land use. There are many governmental institutions located around Thep Satree Circle such as City Hall of Lop Buri, Lop Buri Police Station, Lop Buri Highway Police Station, Mueang Lop Buri District Office, Lop Buri Public Health Service Center, Lop Buri Stadium, post office, and so forth. The northern area along Narai Maharat Road is the military area, and the southern part is the commercial area expanded from the commercial area around Si Suriyo Thai Circle. On the highway no.1, Pahonyothin Road, nowadays, there are many commercial activities established along the road like linear development. The back areas of these linear commercial areas are still low density residential and agricultural areas.



Fig.34 The government institutions around Thap Satree Circle
(Pic. From surveying)



Fig.35 The new modern building on Narai Maharat Road
(Pic. From surveying)



Fig.36 Narai Maharat Road to Thap Satree Circle (Pic. From surveying)



Fig.37 The new modern building on Narai Maharat Road
(Pic. From surveying)

Architectural Characteristics

Buildings in Lop Buri city have been constructed and restored continually in many eras. Some were destroyed by humans and nature, and some still remain to present day. There are various architectural characteristics of buildings and other constructions influenced by art and development in each era in Lop Buri city. The architectural characteristics could be divided into 5 eras as follows:

1. Dvaravati Era: Most architecture in this time was connected with religion and urban settlement. Remaining archeological evidences can be seen in the moats and ridges constructed by piling up the soil. The width of moats is approximately 20-30 meters. The width of ridges is approximately 10-15 meters, and the height is

approximately 4-5 meters as ramparts. In addition, within the compound of Wat Nakhon Ko Sa, there is ancient remains of a grand chedi of the Dvaravati Era that is round shape and square base.

2. Lop Buri Era: The Khmer Mahayana Buddhism style was a major influence on the town's architecture and was later commonly referred to as "Lop Buri Style" (Silpakorn University, 1994). Remains of Khmer-Hindu architectural motifs found in the city include as following:

- Prang Khaek: It is the oldest monument of Lop Buri. it comprises 3 prangs, made of bricks with no adjoining corridors as Prang Sam Yot. Archaeologists estimate that it is dated around the 10th century. It is an ancient style of prang with the pointed arch entrance. During the reign of King Narai the Great, a wihan was constructed at the front and so was a water tank in the south of the site.

- San Phra Kan: It is an ancient Khmer sanctuary, constructed of laterite with a high base. Its lintel made of sandstone was engraved with the picture of reclining Vishnu, dated around the 11th century. The lintel is placed against the wall of the small wihan. Here, an octagonal stone inscription in ancient Mon language was also discovered. At its front is a shrine constructed in 1951 on the original foundation from the reign of King Narai the Great. Inside the wihan are enshrined 2 standing images of the God Vishnu made of stone.

- Phra Prang Sam Yot: The compound comprises 3 prangs linked to each other by a corridor. It reflects the Bayon style of Khmer art during the 12th-13th century. It was made of laterite and decorated with beautiful stucco reliefs. The colonettes were engraved into a hermit sitting with raised knees under the Ruean Kaeo shelter, which was typical of the Bayon style in the Khmer art. Moreover, there is a base inside the central prang. It was originally the location where a Buddha image was enshrined. The wooden ceiling was adorned with the painting of red asterisks. At the front on the east side, a wihan constructed during the reign of King Narai the Great where a stone Buddha image in meditation posture in perfect condition is enshrined is situated. It is the early Ayutthayan style of art, dated around the 14th century. Phra Prang Sam Yot might have originally been a Khmer sanctuary in the Mahayana Buddhism. Then, it was adjusted into a Hindu shrine with a linga base (Yoni)

appearing within the three prangs. In the reign of King Narai the Great, Phra Prang sam Yot was renovated as a Buddhist temple.

- Wat Phra Si Rattana Mahathat: It was constructed in a certain period with no precise evidence. It was built around the 18th-19th Buddhist century in the Lop Buri period according to the tradition to build a temple to house the holy relics of Lord Buddha in the middle of a major city. The temple has been renovated over the years by a number of kings. The most important site here is Phra Prang in its center. It has an extended visage and is decorated with has relief of Buddha images and the life of Lord Buddha on the gable, as well as designs of human faces and flora. A crooked balcony encircles two levels of the structure. It is believed to be the first Thai-style tall stupa. In front of the main tall stupa is the Wihan Luang , or main chapel. Sala Pluang Khruang is where kings changed attire before performing religious ceremonies (TAT, 2008).



Fig.38 Prang Khaek
(Pic. From surveying)



Fig.39 San Phra Kan
(Pic. From surveying)



Fig.40 Phra Prang Sam Yot
(Pic. From surveying)



Fig.41 Wat Phra Si Rattana Maharat
(Pic. From surveying)

3. Ayutthaya Era: Most prominent architecture was constructed in the reign of King Narai the Great. The architectural style in this time was influenced from European style that applied to various constructions such as door and window frames, pointed arch doors, and so forth. The new building technology had been used to construct high buildings. Urban planning and protecting system had been planned to develop urban areas systematically (Silpakorn University, 1994). Except King Narai's Palace, city walls, and city gates, there are various constructions of Ayutthaya Era as follows:

- Vichayen House or Royal Envoy Reception House: It was built in the reign of King Narai the Great as the residence of the first team of French envoys that came in 1685. Chevalier de Chaumont brought a letter from King Louis XIV to present to King Narai the Great. Later, a Greek named Constantin Phaulcon came to service in the royal court and was promoted to "Chao Phraya Vichayen". He was granted residence to the west of the royal envoy reception house. Most of the buildings have Renaissance-style architecture combined with Thai art of the time of King Narai the great. At the center are a bell tower and a Christian church laid out in the European style. There are doors and windows in the Thai style. To the east is the two-storey residence of envoys and clergymen with front steps and a half-circle doorway. To the west is the residence of Chao Phraya Vichayen.

- Wat San Paulo: It was located outside the old city of Lop Buri. it was a Jesuit church, constructed in the reign of King Narai the Great. At present, the remains are only a side of the wall and an observatory. There are big shady trees around the area. The word "San Paulo" might be eroded from the work "Saint Paul or Saint Paulo".

- Wat Tong Pu: It is an important ancient temple. In the past, it was a gathering place of the Thai army. Within Wat tong Pu are various ancient remains and objects such as the traditional Thai style ubosot with a delicate and curving base, a wihan presenting the architectural styles during the reign of King Narai the Great, with pointed arch windows and door openings. Besides, the chedi at this temple is similar to the one of Luangpho Saeng at Wat Mani Chonlakhon, but smaller in size.

- Wat Choeng Tha: It was originally called Wat Tha Kwian because it was a terminal for product-transport carts- Kwian – to the pier in front of the temple.

Inside the compound of the temple lie significant buildings which had been constructed from the end of the Ayutthaya to Ratanakosin periods. Objects which were registered as important national ancient remains are the ubosot, the main chedi, the 2 storey monk cells in a Chinese style, 3 face pavilion, the Wothan Thamma Sapha building, the bell tower and preaching hall. It is considered as a place reflecting valuable and beautiful fine arts of Lop Buri (TAT, 2008).



Fig.42 Vichayen House
(Pic. From surveying)



Fig.43 Wat San Paolo
(Pic. From surveying)



Fig.44 Wat Thong Pu
(Pic. From surveying)



Fig.45 Wat Choeng Tha
(Pic. From surveying)

4. Ratanakosin Era: The style of architecture in this era could be divided into 2 periods. The first period is the reign of King Rama IV. The style of building construction was similar to Ayutthaya style which was still influenced from European style. Some significant buildings constructed in this period are groups of building in the King Narai's Palace such as Phra Prathiap Buildings, Phiman Mongkut Pavilion,

and Thim Dap or Royal Guards Residence (Silpakorn University, 1994). In addition, an ancient temple was constructed in this period as well.

- Wat Mani Chonlakhon: The temple is divided into 2 parts due to a cut through road. An interesting ancient remain is the strange looking square and tall shape of the chedi, similar to those of the Chiang Saen (Lanna) style. However, it possesses 3 layers of 12 recessed corners with a pointed arch at each of the 4 sides of the entrance. Besides, within the compound of the temple stands a Bodhi tree, planted by King Rama V (TAT, 2008).

The second period of Ratanakosin Era is after the Siamese Revolution of 1932. As known, Marshall Plaek Pibulsongkram, the Prime Minister in that time, selected Lop Buri to be the central military city. The new style buildings had been constructed increasingly, and urban area was expanded simultaneously to the east to support the urban development. Buildings constructed in this period were modern style. The character of buildings was rectangular shape, and constructed from concrete. The curved wall, flatted slab roofs, and concrete awnings were designed as elements of the building (Silpakorn University, 1994).



Fig.46 Wat Mani Chonlakhon
(Pic. From surveying)



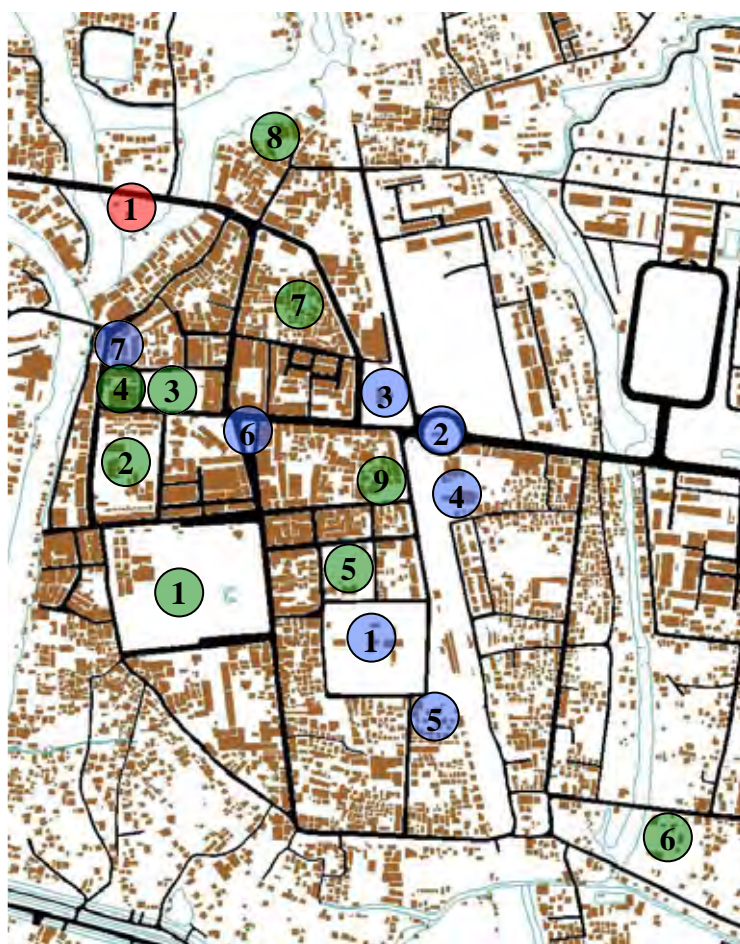
Fig.47 Wooden Row House on Sorasak Road
(Pic. From surveying)



Fig.48 Wooden Rent House on Sorasak Road (Pic. From surveying)



Fig.49 Wooden House on Sorasak Road (Pic. From surveying)



- Davaravati, Lop Buri Era:
 1. Wat Phra Si Rattana Mahathat
 2. San Phra Kan
 3. Phra Prang Lam Yot
 4. Prang Wat Nakhnon Go Sa
 5. Wat Ban Dai Hin
 6. Prang Khaek
 7. San Luk Son
- Ayutthaya Era:
 1. King Narai's Palace
 2. Wat Sao Thong Thong
 3. Vichayen House
 4. Wat Puen
 5. Wat Ra Cha
 6. Wat San Paolo
 7. Manorah Pond
 8. Tha Poh Fort
 9. Wat Indra
- Rattanakosin Era:
 1. Wat Mani Chonlakhon

Fig.50 The map shows the locations of high significant buildings

Group of Building and Open Spaces

Building groups and open space characteristics in Lop Buri City could be considered in 2 levels as follows:

1. Urban level: The characteristics of groups of buildings and open space are significant components of the city. These components had been created by the urban planning in the historic periods, and continual urban development. Normally, open spaces had been arisen from groups of ancient remains and other elements of the city. The significant characteristics are as follows:

- An open space in front of King Narai's Palace (in the east side of the Palace). From the historical evidences, this area appeared in many maps in the reign of King Narai the Great. The southern of this open space attached Wat Phra Si Rattana Mahathat. This open space liked open space plan of the palace in European countries. However, nowadays this open space has been developed to be groups of contemporary commercial buildings.

- An open space around Prang Khaek has been created from groups of ancient remains and new urban elements such as commercial buildings, and public buildings that located around.

- An open space in horizontal axis on Narai Maharat Road has been created from expanding urban area to the east by Marshall Plaek Pibulsongkram. This open space linked the significance urban spaces on Narai Maharat Road such as San Phra Kan, Si Suriyo Thai Circle, and Thep Satree thoroughly.

- Various open spaces that show the character of the old city of Lop Buri such as open spaces along moats, ridges, and city walls especially the elements within the old city of Lop Buri. In addition, open spaces on the axis or main roads within the old city of Lop Buri such as Vichayen Road, and Ratchadamnoen Road should be also considered as significant values of setting.

2. Architectural level or the group of buildings: Site plans of ancient buildings in Lop Buri City had been created interestingly. There was relation of function, lay out plan, and open spaces. The important group of buildings should be considered are as follows:

- The group of buildings within King Narai's Palace: From the rectangular boundary, the area within the Palace had been divided into various sizes of rectangles by grid system paths. The main axis of alleys was laid in the line of the east and the west. These alleys led to the important building such as Suthasawan Throne Hall, and Chanthara Phisan Throne hall at the end for enhancing majestic characteristics. Most buildings within the Palace faced to the east. Landscape designed was considered in the relationship between the group of buildings and open spaces. The landscape elements established in the open spaces such as the elephant stables, fountains are assumed to be influenced by Western traditions.

- The group of Chedis and Prangs within Wat Phra Si Rattana Mahathat: Most constructions had been faced to the east side. The main entrance and axis were laid in the line of the east and the west. Wihan Luang is a very grand wihan with a rectangular main entrance in a traditional Thai style. On the south of the Wihan Luang is a small-sized ubosot. On the west side of the Wihan Luang is the largest Phra Prang of Lop Buri. This grand Phra Prang that was the most important element in the site plan is located in the center of the site. There were 2 levels of square cloisters around the grand Phra Prang according to believes of Mahayana.

- The group of building within Vichayen House: The compound within this Royal Envoy Reception House comprises 3 sections: a grand two-storey building and long one-storey building with the arched entrance in the west. At the centre are situated significant buildings, such as bases of constructions assumed to have been a bell tower and a Christian church at the back. In the east lies a group of large two-storey buildings with a staircase in an arch shape at its front.

- The group of buildings within the old commercial area along the Lop Buri River: In the past, Lop Buri River was the main transportation route. Therefore, the junctions between roads in the old city and the river had been constructed as piers. In addition, in this commercial area, there were shop-houses located along the river. The characteristics of buildings were wooden 2 storey row houses. When the land transportation had been developed to this area, most new buildings had been faced onto the road. These characteristics could be found in Phra Ram Road and Ta Khunnang Market in the northwest of the old city of Lop Buri.

- The group of residential buildings along the moat: Most residential buildings in this area were wooden 2 storey houses faced to the moat that had been used the main transportation route in the past. There were not walls on the ground floor to prevent flood in the rainy season.

Transportation Network System

The transportation networks of the Lop Buri city have many routes to link to surrounding regions by land, by water, and by air. In the past, the water transportation was important routes especially Lop Buri River that could link to other provinces in the north and the south. However, nowadays, land transportation is the most important networks. Because of urban development, both roads and a railway could lead through the old city of Lop Buri and link to other places conveniently.

1. Road network system: Road networks in the old city of Lop Buri are rather mixed in various types according to pattern development of community settlement. The study found as follows:

- Within the old city of Lop Buri, the road network system is unequal grid type. As the result, each lot is unequal squares, and the length of roads is also unequal. Most of road networks within the old city are the same network in Ayutthaya Era and Ratanakosin Era. The important main roads are Sorasak Road, Phra Ram Road, Phetracha Road, Vichayen Road, and Ratchadamnoen Road. Generally, the condition of road in the old city of Lop buri is rather narrow and unequal through the route, because characteristics of the old city was not developed to support motor vehicles. There are many alleys and paths divided from main roads into various lot sizes. However, some lots have no roads or lane that motor vehicle could go into, but there are only footpath as the entrance to communities inside.

- Within expanded urban areas, around Si Suriyo Thai Circle and Thep Satree Circle, both road network systems are the ring system pattern. There is highway no.311 called Narai Maharat Road used to link the old city to the east linearly through Si Suriyo Thai Circle and Thep Satree Circle respectively. In addition, the highway no.311 can link to Sing Buri in the western of the old city. In the east of Thep Satree Circle, there is the highway no.1 or Pahonyothin Road to Saraburi Province.

Therefore, the highway no. 311 is an important road in Lop Buri City that has been used to link three centers of Lop Buri City such as the old city of Lop Buri, the commercial area around Si Suriyo Thai Circle, and the government center around Thep Sathree Circle. Furthermore, this highway is a linkage to adjacent provinces.

2. Water transport system: In the past time, the water transport was an important system of Lop Buri City. As the result, most people lived near the river. Lop Buri River was the main route to go to Ayutthaya and Bangkok. There were the Green Boat and Red Boat services along the river from Tha Tian, Bangkok, through Ayutthaya and on to Lop Buri. However, the service was stopped permanently in 1965, because of the growth of land transport infrastructure such as roads, and the railroad (ONEP and other institutes, 2005).

3. Railroad system: The railroad had been constructed in the reign of King Rama V. The King wanted to construct the railroad from Bangkok to Chiang Mai in the northern of Thailand. The railroad had been planned to pass the old city of Lop Buri. As the result, Lop Buri City has been developed increasingly. Nowadays, it is still an important mode for passengers to travel to other provinces.

4. Air transport system: This mode is only used for the military purpose.

5. Public transport system: The urban transport services in Lop Buri City have 3 important modes as follows:

- Bus: This mode does not service only the urban area but also links to other districts or provinces around Lop Buri City.
- Mini Bus or double seating rows bus, “Rod Song Thaew” in Thai, this mode services Lop Buri City for short distance trips. There are many routes to support trips in the city servicing important places and districts such as markets, schools, bus terminals, the railway station, the government center, tourist attractions, commercial areas, residential areas, and so forth.
- Taxi, and Tricycle: These modes are available for passengers who want to hire to their destination. These modes have no the permanent route. Most of them often wait to service in the node of the city such as markets, the bus terminal, the railway station, tourist attractions, and other public areas.
- Motorcycle: Nowadays, this mode has become a vital form of public transport in the urban area. One of the advantages of this mode is flexibility that

can go to the narrow places thoroughly. These modes have no permanent route as well. Most of them often wait to service in the node of the city like taxis and tricycles.

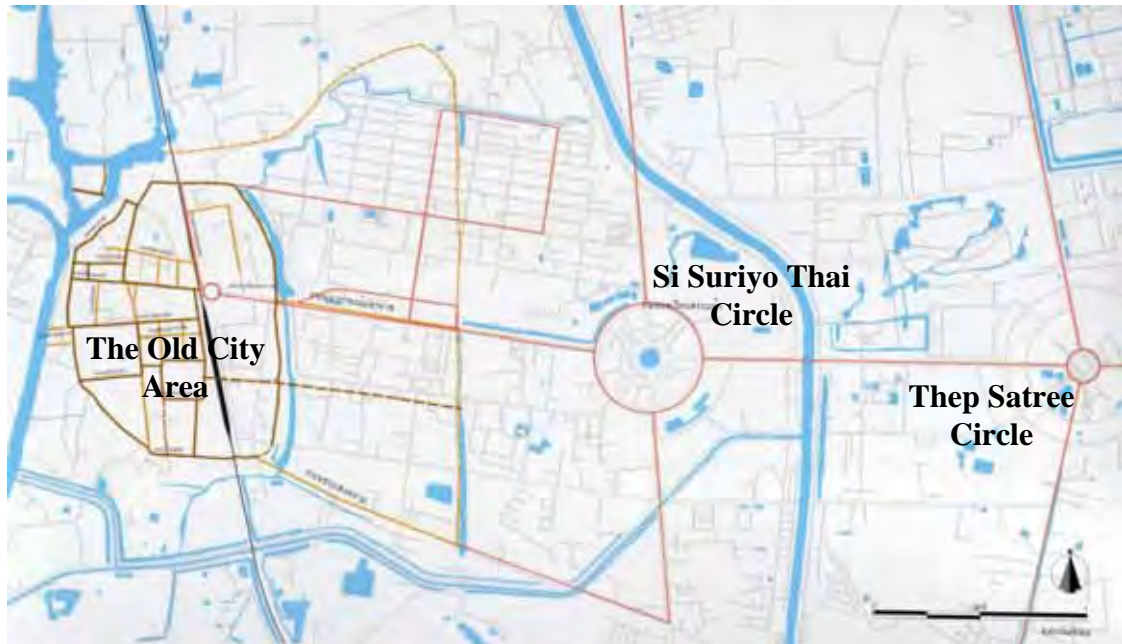


Fig.51 The map shows the road network in Lop Buri City (ONEP, 2005)

Features of Urban Landscape

The structure of the urban landscape of Lop Buri City is comprised of a number of major elements. The suitable geography has aided the development of community settlement in many periods. Generally, the old city of Lop Buri was located on the plain, but the highland in the boundary of the city was the location of the important buildings such as the palace and fortresses. As the result, most cultural heritage places had been constructed in the middle part of the city. The highest area in the city was in the north that Ta Pho Fortress was built to observe movement clearly both in the inner city and outer city that were lower areas. One of advantages of this feature was to guard against invasion. In the south of the old city of Lop Buri next to the moat, this area was the old settlement from the past. There were many communities settled around here. The low land along the Lop Buri River was an important settlement area. The growth of communities related with the water transportation network in the past. Later, the land transportation had been developed causing the

community settlement change. The new communities and commercial buildings were located along the land transportation network such as roads and railroad, and expanded into the city center around cultural heritage places. The railroad passed through the old city was the significant path that divided Lop Buri City into 2 characteristics. The first characteristic is the old city located in the west side of the railroad. This area comprises of many ancient remains and archeological evidences. There are residential and commercial areas located with those cultural heritage places. The second characteristic is the expanded urban area located in the east side of the railroad. The features of this area are rather different from the old city of Lop Buri. Most buildings located here are military forts, government buildings, schools, hospitals, large commercial buildings, residential buildings, and so forth. These features express this area as a new urban development area. However, there are still large agricultural areas around Lop Buri City.

Social and Economic Situations of the Study Area

The aim of this part is to explore the socio-economic situations in Lop Buri City. On an urban scale conservation involves not only cultural and historic value but also their inherent economic and social implications. The city is the product of several historical periods and of specific social, cultural, anthropological, geographical and economic relationships. These data could indicate the livelihood and the growth of development in this area. This part is divided into 5 main issues as following below:

Population Characteristics and Trend

Population characteristics in Lop Buri City are rather different from other cities. Interestingly, Lop Buri City is a location of 3 military forts. As a result, most population in this city is soldiers' family who live in the military areas. Moreover, this population enhances the growth of local economy. Other characteristics are local population who live in the urban areas. Some of this group live in high dense residential areas in the western of the old city. However, some residential areas have

been located in the boundary of ancient remains that increasingly represent the trespassing problems.

According to information from Lop Buri Office of Public Works and Town & Country Planning, in 2008, in the boundary of Lop Buri comprehensive plan, it has a population of 135,984. However, in Lop Buri Municipality, it has a population of 25,736 as 18.56%.

Density of population in the boundary of Lop Buri comprehensive plan is approximately 1,744 person/square kilometer, and density of population in Lop Buri Municipality is approximately 3,260 person/square kilometer. Population growth rate between 2004-2007 is 3.8% per year. The population forecast in the boundary of Lop Buri comprehensive plan next to 20 years, in 2024, is approximately 160,445 with population growth rate 1.7 % per year.

Economic Factors

The area of the old city of Lop Buri is located in Mueang District. In the past, this area was the commercial center of Lop Buri, since it has been developed continually in many periods. Initially, Lop Buri River was the main water transportation route. Many communities had been settled along this river, and had been developed as local commercial areas. Lang Market and Ta Khunnang Market had been located here on the east bank of the river. Nowadays, these markets still service local communities within the old city of Lop Buri. Later, construction of the railroad brought the rapid economic growth into the city. Chinese labours who constructed the railroad have settled in the old city of Lop Buri, when the railroad construction was completed. Most of them make a living by commerce. Many people came to Lop Buri for working and living more. In 1940, Marshall Plaek Pibulsongkram, the Prime Minister in that time, selected Lop Buri to be the central military city. The new Lop Buri was constructed as a military city on the east side of the railroad covering a wide territory. There were many military forts located in Lop Buri City. Many soldiers and their families came to live in Lop Buri City more. As the result, this group of people supported the growth of the local economy. The new commercial area had been developed around Si Suriyo Thai Circle and expanded to the government center around

the Thep Satree Circle in the east. However, the commercial areas in the old city of Lop Buri still service the local communities within the old city (Silpakorn University, 1994).

At present, the general characteristics of economy in Lop Buri City are commercial services and retail shops that service local communities. Most are small businesses managed by local people. In the old city of Lop Buri, there are many markets such as Lang Market, Ta Khunnang Market, Lop Buri Municipality's Market, and Bon Mueang Market. Moreover, some medium size economies have been located within the old city of Lop Buri as well such as hotels, banks, restaurants, office buildings, and so forth for service local people, and tourists. On the other hand, most large economies such as department stores, garages, apartments, large hotels, large office buildings, and so forth had been located outside the old city of Lop Buri next to Thep Satree in the east.

Public Services

Lop Buri is an important city in administration, military affairs, and commerce in central region of Thailand. The city has been developed continually from the past. Therefore, infrastructure systems and various facilities are established throughout the city area as follows:

1. Water supply: Provincial Waterworks Authority, Lop buri Branch has responsibility to supply fresh water to whole old city area of Lop Buri and expanded urban areas in the east. At present, service of water supply system has been supplied in Lop Buri city thoroughly.

2. Electricity supply: Provincial Electricity Authority, Lop buri Branch has responsibility to supply electric current to whole old city area of Lop Buri and expanded urban areas in the east. At present, service of electricity system has been supplied in Lop Buri city thoroughly.

3. Telephone system: TOT Public Company Limited, Lop buri Branch has responsibility to supply telephone system in Lop Buri City. At present, service of telephone system has been supplied in Lop Buri city thoroughly. Furthermore, mobile and internet service has been developed for local communities thoroughly as well.

4. Educational institution: Lop Buri City has all level of education. There are kindergartens, primary schools, secondary school, and universities located in the old city of Lop Buri and expanded areas.

5. Public health: Lop Buri Provincial Public Health Office is the center to manage service in Lop Buri province. In Lop Buri City, there are many public hospitals, private hospitals, and health stations located in Lop Buri City.

6. Security: In Lop Buri City, the main institute that has responsibility to control and prevent danger and natural disaster are Lop Buri Disaster Prevention and Mitigation Office, Lop Buri Provincial Police, Lop Buri Tourist Police, and Lop Buri Fire Police (Lop Buri Office of Public Works and Town & Country Planning, 2008).

Tourism

Tourism is a major income source in Lop Buri Province. In Lop Buri City, there are many tourist attractions. Most tourist attractions are historic attraction that are considered as essential to the identity of Lop Buri as follows:

1. King Narai's Palace or Phra Narai Ratchaniwet
2. Wat Phra Si Rattana Mahathat
3. Wat Sao Thong Thong
4. Vichayen House or Royal Envoy Reception House
5. The City Pillar Shrine or Lukson Shrine
6. Prang Khaek
7. Phra Prang Sam Yot
8. San Phra Kan
9. Wat Nakhon Kosa
10. Wat San Paolo
11. Wat Mani Chonlakhon
12. Wat Tong Pu
13. Wat Kawitsararam Tatchaworawihan
14. Wat Choeng Tha
15. Wat Prommat
16. Wat Ban Dai Hin

- 17. Chai Gate
- 18. Surasongkhram Fort
- 19. Phaniat Gate
- 20. Phra thi Nang Yen
- 21. King Narai the Great Monument

Moreover, there are natural and cultural tourist attractions in Lop Buri City as follows:

- 22. Sa Kaeo Zoo
- 23. Marl Village

To support tourism activities in Lop Buri City, Accommodations, restaurants, and transportation service has been established to service Thais and foreigner tourists sufficiently.

Land Ownership

In the old city of Lop Buri and surrounding areas, most land has been occupied by government sectors and private owners. The detail of land ownership in Lop Buri City can be indicated as follows:

1. The area of the old city and along Lop Buri River: In the old city of Lop Buri, there are many groups of buildings with cultural heritage value and significance and considerable and extensive archaeological remains. The land ownership of these remains areas is in the hands of The Treasury Department. These ancient remains are Manorah Pond, Vichayen House, Phra Prang Sam Yot, Prang Khaek, King Narai's Palace, and Wat Phra Si Rattana Mahathat that must be conserved according to Act of The Fineart Department. In addition, The Treasury Department manages some areas of their ownership that are not ancient remains areas for rent to make incomes and utilities. For the temple area, the ownership of various temples areas is belong to Department of Religious Affairs. In addition, State Railway of Thailand has land ownership along the railroad in the old city of Lop Buri as well. These land ownerships of government sectors are 2/3 of all the old city area of Lop Buri. Most areas of private owners are located densely in the north and the south of the old city of Lop Buri.

2. The expanded urban area in the east: In this area, Narai Maharat Road is the main axis that links three centers as the old city, Si Suriyo Thai Circle, and Thep Satree Circle together. Along the road between the old city and Si Suriyo Thai Circle, the north of the road is military area, Somdet Phra Narai Maharat Fort, and the south of the road is belong to Lop Buri Primary Education Office and private owners. The area around Si Suriyo Thai Circle is commercial area. There are some lots of The Treasury Department for rent. Along the road between both circles, most areas are belong to various government sectors. The area around Thep Satree Circle had been planned to be government center. Therefore, most areas belong to various government sectors as well.

The Comprehensive Planning of the Study Area

The aim of this part is to review the land use plan that is enforced covering both the old city area and expanded area. Nowadays, The Department of Public Works and Town & Country Planning has delegated to local administrations the urban planning process in their urban areas. Lop Buri city has the comprehensive plan as well. The Ministerial Regulation of Lop Buri comprehensive plan enforced in the present time is the second improvement plan. The land use plan is one of components of the comprehensive.

Introduction of the Comprehensive Plan

Lop Buri comprehensive plan was undertaken for the first time in 1984 covering 53.64 square kilometers of 14 sub-districts in Lop Buri province. In that plan, land use was divided into 10 categories and enforced from 17 August 1992 to 16 August 1997. Later, the comprehensive plan had been improved and added more areas to 74 square kilometers. The first improvement plan had been enforced from 6 November 2003 to 5 November 2008. Normally, in Thailand, when the comprehensive plan has been initiated, this plan will have 5 years for enforcement. The comprehensive plan has to be improved for the new enforcement. However, it may take a long time, because there are many procedures in the process of comprehensive

plan improvement. As the result, Act of urban planning 1975 permits to extend the enforcement 2 times, extending 1 year each time. Nowadays, the comprehensive plan enforced in Lop Buri is the second extending of the first improvement plan and will be expired in November 2010 (Lop Buri Office of Public Works and Town & Country Planning, 2008).

Objectives and Policies of the Comprehensive Plan

The objective of this comprehensive planning is to be a framework for development and to sustain urban and rural areas in aspects of land use, transportation, infrastructure and facilities, and environment relating with The National Economic and Social Development Plan and historic urban conservation ((Lop Buri Office of Public Works and Town & Country Planning, 2003).

The policies of this comprehensive plan for managing land use efficiently, supporting for expanded communities in the future, and enhancing economic development and transportation networks have important substances as follows:

1. To enhance and develop urban communities as the administration center of Lop Buri province;
2. To enhance and conserve art and culture, environment that has art value, architectural value, historic value, and archeological value as identity of Lop Buri Province;
3. To enhance and develop tourism industry;
4. To develop social service and standard of infrastructure and facilities;
5. To enhance and develop agricultural industry;
6. To conserve natural resources and environment

Categories of the Land Use

The Ministerial Regulation of Lop Buri comprehensive plan divided land use in land use plan into 11 categories. Each category has definitions and purposes as follows:

1. Land no. 1.1-1.17 have been stipulated with yellow as low density residential area;
2. Land no. 2.1-2.17 have been stipulated with orange as medium density residential area;
3. Land no. 3.1-3.7 have been stipulated with red as high density residential area and commercial area;
4. Land no. 4 has been stipulated with purple as industrial area and warehouse;
5. Land no. 5.1-5.16 have been stipulated with green as agricultural and rural area;
6. Land no. 6.1-6.14 have been stipulated with light green as recreation area and environmental preservation;
7. Land no. 7.1-7.35 have been stipulated with olive green as education institution;
8. Land no. 8.1-8.9 have been stipulated with light brown as conservation area for enhancing identity of Thai art and culture;
9. Land no. 9.1-9.52 have been stipulated with light gray as religious institution;
10. Land no. 10.1-10.26 have been stipulated with blue as governmental institution, infrastructure and facilities;
11. Land no. 11.1-11.3 have been stipulated with pink as transportation area (Lop Buri Office of Public Works and Town & Country Planning, 2003).

The case study for this study, King Narai's Palace and its setting, is located in the light brown area in the old city of Lop Buri.

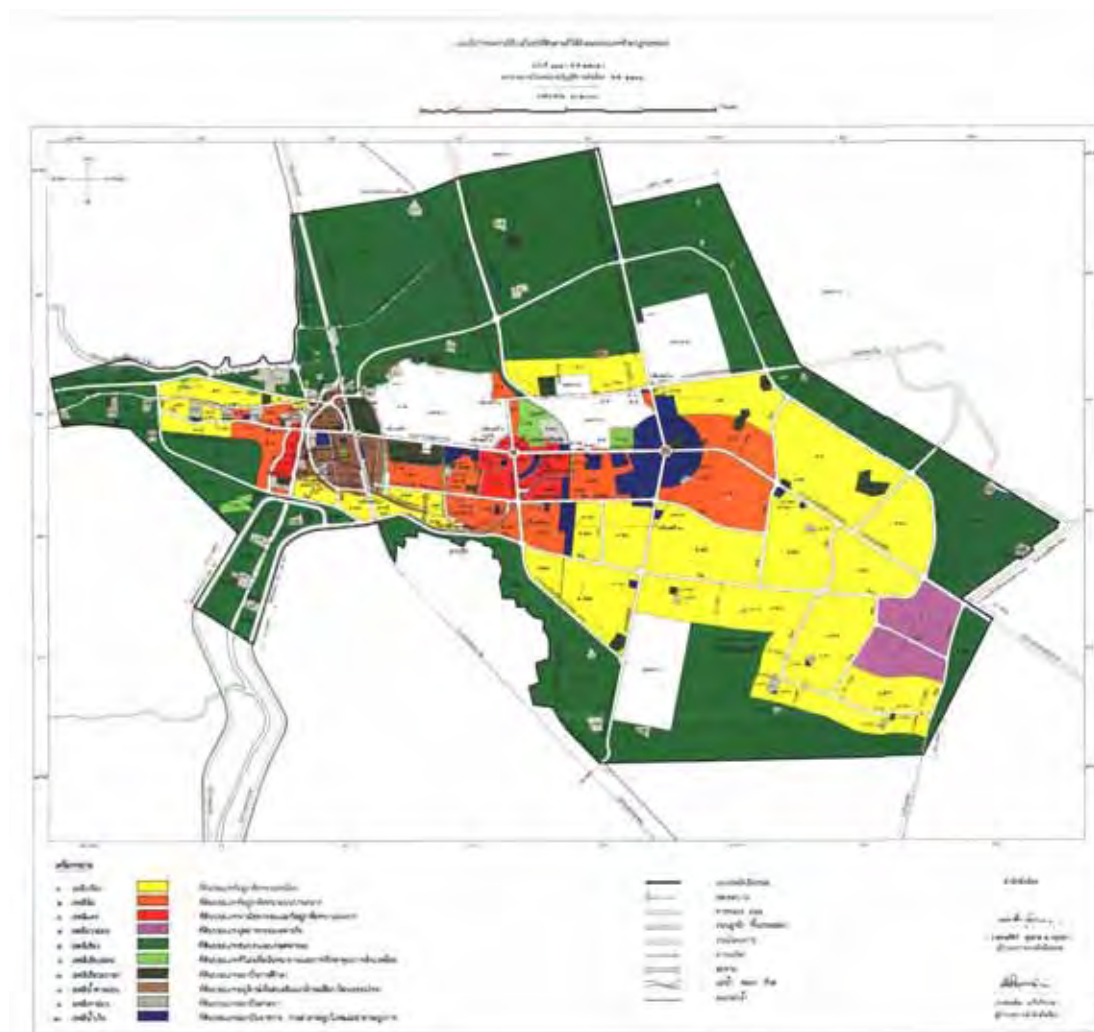


Fig.52 The map shows the current land use plan
(The Department of Public Works and Town & Country Planning, 2003)

The Current Land Use

Lop Buri City is a historic community settled continually from the past. The ancient remains are significant evidences shown characteristics of urban development. Nowadays, commercial and residential areas are located densely in the old city of Lop Buri, Lop Buri Municipality areas, and along the highway no.1 or Phahonyothin Road. Each category of land use has been located in the boundary of urban planning that is as follows:

1. Residential area: There are approximately 2.87 square kilometers as 15.55% of whole planned area. Most have been located along the highway no.1 or Phahonyothin Road, and along road networks in the Lop Buri Municipality.

2. Commercial area: There are approximately 0.32 square kilometers as 1.76% of whole planned area. Most have been located densely around Si Suriyo Thai Circle. In addition, these areas are located scatteringly in the old city of Lop Buri and in residential areas.

3. Institution area: This area could be divided into 3 categories as follows:

- Educational institution: There are approximately 0.13 square kilometers as 0.70% of whole planned area. Most have been located scatteringly in the boundary of urban planning.

- Religious institution: There are approximately 0.84 square kilometers as 1.10% of whole planned area. Most have been located scatteringly in the boundary of urban planning.

- Governmental institution, infrastructure, and facilities: There are approximately 2.07 square kilometers as 2.55% of whole planned area. Most have been located in Lop Buri Municipality, along the highway no. 205, and around Thep Satee Circle.

4. Agricultural and rural area: There are approximately 13.51 square kilometers as 73.25% of whole planned area. Most have been located around urban areas (Lop Buri Office of Public Works and Town & Country Planning, 2008).

Trend and Direction of Expanding Communities

The trend of the growth of urban area is expanding along the main axis of Lop Buri City especially on the highway no. 1 or Phahonyothin Road in the east. Most building established here are commercial buildings and residential areas. Other roads that have expanding communities are the highway no. 311, and the highway no. 1 in the north.

Problems and Limitations

It is important in addressing the urban conservation process to understand problems and limitations within a city like Lop Buri City from various perspectives. Linked to this is the importance of tracking threats, problems, and limitations in the historic urban area. Effective planning is a tool for solving these critical aspects. From the review, and survey, problems and limitations can be divided into various aspects as follows:

Land Use Problems

These problems have been arisen from enforcing of The Ministerial Regulation of Lop Buri comprehensive plan and existing of land use in Lop Buri City. These problems could be explained as follows:

1. Some urban areas in the old city of Lop Buri have been developed as commercial and business center. There are a lot of people who come here for shopping, working, and living and new residential, commercial, and business buildings have been constructed over time. Therefore, the new land uses and activities could be threats to cultural heritage places located in this area leading to overcrowded communities and unhealthy conditions. The old city of Lop Buri has been confronting the problems of slums that trespass into cultural heritage areas. Furthermore, the land transportation networks such as roads with penetration of historic urban areas, and a railroad with passing through historic urban areas could generate atmospheric pollution and destructive vibration.

2. The area in the east of the old town of Lop Buri, on the north side of Narai Maharat Road is military land use. A wide area of Somdet Phra Narai Maharat Fort is located between the old city of Lop Buri and Si Suriyo Thai Circle, the new commercial center. As a very wide area and located in the center of Lop Buri, this fort is an obstacle for expanding of the urban area.

3. The old city of Lop Buri, Si Suriyo Thai Circle, and Thap Satree Circle are urban centers of Lop Buri City, and there are various activities located in these areas such as residential areas, commercial areas, governmental institutions, and military

areas. These areas have been linked by Narai Maharat Road. As the result, there is high density of traffic along this road and in these urban centers.

4. Most developed areas in Lop Buri City are on higher. If the growth of urban area continues expansion will have to locate unavoidably in the lowland around those developed areas. As the result, cost of construction and flood prevention may be high.

Architectural Problems

These problems have been arisen from human behaviours and general natural disasters both intentionally and accidentally. These problems could be explained as follows:

1. The ancient remains and cultural heritage places have been decayed as a result of effects of climate and the natural environment, and these remains have been damaged over time. Most ancient remains were located in outdoor spaces that have been affected from heat, humidity, rain, wind, ground subsidence, and air pollution. As the result, most constructions made from bricks, mortar, and wood have decayed over time.

2. The ancient remains have suffered human trespass. These circumstances are major problems of dilapidation that could be divided as follows:

- Digging and finding some treasures around ancient remains are reasons of the damage.

- Lacking knowledge of, or understanding, principles of conservation is a major problem of cultural heritage degradation. It has led to destruction of significant historic remains and evidence of the past.

- The new constructions have been constructed irresponsibly around ancient remains and other cultural heritage places. As the result, these buildings block the view of the significant constructions. Moreover, the problem of trespass from surrounded slum is a major concern causing cultural heritage degradation as well.

3. The ancient remains and cultural heritage places have been destroyed by government sectors. These circumstances are also major problems of dilapidation that could be divided as follows:

- To permit private sectors to rent the land lots carelessly in the historic urban area could be the reasons of rising unsuitable activities, new appropriate buildings, and high density communities.

- Constructing the infrastructure systems and facilities improvidently could destroy the value of ancient remains and cultural heritage places such as effects of destructive vibration from motor vehicles and train, constructing roads, laying the pipe network, and so forth.

Open Space Problems

These problems have been arisen from human impact and behaviour. These problems could be explained as follows:

1. Some open spaces have been trespassed by people such as the areas along moats and city walls of the old city of Lop Buri or ancient remains open spaces as Manorah Pond, Tha Poh Fort, and Wat choeng Tha.
2. Lack of open spaces for recreation and sport activities in the old city of Lop Buri is one of the reasons of the low living standard of people.
3. Urban open spaces as a river, canals, roads, and a railroad have not been managed properly. Since some open spaces are dirty and untidy.

Transportation Problems

The problems of transportation have arisen from its networks and the traffic volume. These problems could be explained as follows:

1. The road in Lop Buri is still not a complete network, since there are a lot of large military areas and large institution areas located in the Lop Buri. The large land lots could be obstacle to link the road network properly.
2. The main road in Lop Buri City is Narai Maharat Road that links 3 important centers within Lop Buri City together. Most roads in Lop Buri City have been linked to this main road. Moreover, this road is the main route that can link to Sing Buri in the west and Sara Buri in the east. Therefore, the traffic volume in this road is rather high especially between San Phra kan and Si Suriyo Thai Circle.

3. Within the old city of Lop Buri, around the community center or commercial area especially markets, there are not enough the off-street parking for service merchants and buyers. As the result, there are many vehicles parked on the road surface. Especially, in the morning and evening, this circumstance causes the traffic jam in the urban center area.

4. The land transportation system is one of reasons of dilapidation of ancient remains. Since increasing use of private motor transport could make destructive vibration that affects the ancient remains and other cultural heritage places especially large vehicles, and trains.

Land Ownership Problems

The main problem of land owner ship is issuance of land title deeds for private sectors by the public sector. Since, nowadays, there are needs for open space to develop and expand urban area. Therefore, some land title deeds issued by public sector have been overlapped with the land of state property. As the result, there are the problems of trespassing surrounding the ancient remains and other cultural heritage areas.

Chapter 5

Analysis of Delineation of the Buffer Zone of the Study Area

According to the reviews in Chapter 2, cultural heritage places derive their significance and distinctive character from their perceived social and spiritual, historic, artistic, aesthetic, natural, scientific, or other cultural values. They derive their significance and distinctive character from their meaningful relationships with their physical, visual, spiritual and other cultural context and settings as well. Lack of controlling activities and uses effectively in their setting poses threats to the significance of cultural heritage places and historic urban areas. Therefore, providing adequate care and management of the setting could help to protect the significance of cultural heritage places. A well-maintained historic urban area has many advantages for its citizens. It is intimate and human in scale and often rich in diverse activities. It can be extremely convenient for residential use, special public function, appropriately scaled services, shopping, and tourism. The reviews indicate the similar suggestions from various international conservation organizations, UNESCO, ICOMOS, ICCROM, IUCN, and WHC, that the concept of the buffer zone can be a very important management tool in protecting cultural heritage places. A buffer zone not only protects the values and significance of cultural heritage places, it also protects their settings, views, land use, and other aspects.

This study focuses on the concept of the buffer zone as a tool for protecting cultural heritage places in the historic urban area. The goals of this study are to suggest the criteria for appropriate delineation of the buffer zone and the guidelines to control and manage setting within the buffer zone of the cultural heritage place in the historic urban area. This chapter analyzes all of information of Lop Buri City and the process of historic

urban conservation to suggest criteria of the buffer zone delineation for King Narai's Palace as a cultural heritage place in the historic urban area. Four main parts of analyses are as follows:

1. Comparison of case studies of buffer zone implementation
2. Delineation of the buffer zone in the historic urban area
3. Management guideline within the buffer zone in the historic urban area
4. Opinions on a buffer zone in the historic urban area

Comparison of Case Studies of Buffer Zone Implementation

According to case studies reviewed in the Chapter 2, There are many buffer zone implementation approaches used in many continents such USA, Europe, Asia, and Australia. Some of them have no buffer zone regulation for protecting cultural heritage places directly. However, other regulations or laws must be used to enforce instead. In this part, various case studies are analyzed by analytic induction with comparative approach to find all aspects of buffer zone implementation from case studies.

From 12 case studies analysis, there are many different and similar aspects of buffer zone implementation that can be summarized into 8 aspects as follows:

1. The buffer zone is a protective measure that should be the law.
2. The delineation of the buffer zone can be applied to other spatial planning approaches.
3. To assess the significance of cultural heritages is necessary to delineate the proper buffer zone boundary widely enough to cover their significance.
4. To assess internal and external threats of cultural heritages is also necessary to delineate the proper buffer zone boundary to prevent the risks from deterioration, degradation, and devalue of cultural heritages.
5. To assess the values of views and vistas between cultural heritages and their surrounding setting.
6. The enforcement level of the buffer zone should not be only one level to protect the significance of cultural heritages.

7. To control physical and socio-economic conditions within the buffer zone is necessary to protect the cultural value and enhance the quality of life of local communities.

8. As the manner of protection of World Heritage sites, the buffer zone should be applied to heritage of national significance as well.

The conclusion of differences and similarities of the buffer zone implementation of each country can be expressed in the following comparative Table 1:

Table 1 The comparison of the buffer zone implementation of case studies

Aspects of the buffer zone implementation	Case Studies											
	Jpn	Swe	Cro	Net	Pol	Ger	Bul	Spn	Fin	Aus	US	Isr
1. Should be the law	●	●	●					●		●		●
2. To apply to Other spatial planning approach	●	●	●	●	●	●	●	●	●	●	●	●
3. To assess the cultural significance	●	●	●	●	●	●	●	●	●	●	●	●
4. To assess all of threats				●	●	●			●	●		
5. To assess the value of views						●				●	●	●
6. The level of the buffer zone enforcement	●	●										
7. To control all of conditions	●	●	●	●	●	●	●	●	●	●	●	●
8. To apply to other cultural heritages							●				●	

Jpn = Japan, Swe = Sweden, Cro = Croatia, Net = Netherlands, Pol = Poland,

Ger = Germany, Bul = Bulgaria, Spn = Spain, Fin = Finland, Aus = Australia,

US = United States, Isr = Israel, ● = Proceed in those case studies

From the Table 1, the compared aspects of the buffer zone implementation in various case studies can be concluded into 3 issues as legal aspect, delineation of the buffer zone boundary, and factors controlled.

Legal Aspects of the Buffer Zone of Case Studies

Most case studies from other countries have laws or regulations that is used to enforce the buffer zone directly. Conservation laws have measures to fulfill the role of the buffer zone. As in Sweden, Croatia, Spain, and USA the conservation laws such as Cultural Monuments Act, Law on the Protection and Preservation of Cultural Goods, Law 16/1985 regarding the Spanish Historical Heritage, and Conservation District are tools used for buffer zones to protect cultural heritage places. These laws are based on the monument conservation and territory management.

For the country that has no buffer zone regulation, laws or regulations that have been often used instead are building or spatial laws. Planning Act and Building Act of each country are the spatial laws that have been used extensively. These laws can control the activities and development that threaten cultural heritage places and their setting. Normally, these laws have been used by local administrations or provincial authorities. As in Netherlands, and Finland, spatial planning also stipulates regulations concerning the designated use of land and outlines activities which are subject to a permit. In this way provincial authorities can prevent developments at places with important cultural values.

Delineation of the Buffer Zone Boundary of Case Studies

The delineation can be divided into 2 issues as follows:

1. Assessment of the buffer zone boundary: There are many definitions of the buffer zone in the laws. However, these are described broadly. When it has been implemented, sometimes ambiguity can arise where the extent has not been decided or how large the area is. This is the main problem for this study to find the proper boundary.

All of case studies require the cultural significance assessment to understand the value of cultural heritages and their setting. Some case studies such as Netherlands, Poland, Germany, and so forth give precedence to preventing threats which cause of degradation or destruction of the value of cultural heritages and their setting. Furthermore, some case studies preserve views and vistas between the cultural heritages and their setting within the buffer zone to avoid any diminution of cultural heritages when viewed from surrounding settings. As the result, the assessment of cultural significance, threats, and value of scenic vistas of cultural heritages and their setting should be done before establishing the proper buffer zone boundary. The proper boundary has to be wide enough to protect the whole significance of cultural heritages and their setting.

2. The level of the buffer zone: Some case studies stated the level of buffer zone for protecting cultural heritage places. According to the case of Kyoto, there are two levels of buffer zones to protect historic and natural features of their setting. One is a set of zones which protect the immediate vicinity of each site, and the other is a single wider zone covering all of areas and their immediate buffer zone in one area. The protection in the first zone is stricter than the large zone. Similarly, in Croatia, the historic area could be divided into 2 parts as a core zone including the cultural significance and a buffer zone including the protective measures.

Control in the Buffer zone of Case Studies

Control in the buffer zone in many countries focuses on physical conditions and socio-economic conditions to provide appropriate criteria for protecting stated values of cultural heritage places. The physical conditions that have been considered to set the boundary of a buffer zone appeared in case studies are land use, view and vista, historic buildings and areas, the design of buildings, including such factors as building height and site coverage area. Others focus on general urban design issues such as height, scale, building placement, setback, materials, or landscape features. The socio-economic conditions are quality of life, public assemblies, cultural and historical value, community facilities, population, and economic development. Any change should be permitted from

administrative authorities. Croatia raised the system of the protective measures of the buffer zone in order to protect basic elements and characteristics of building clusters, intervention respecting to historical structure, and adopting methods of conservation, reconstruction, interpolation, recomposition and integration.

Delineation of the Buffer Zone in the Historic Urban Area

The concept of the buffer zone may be considered an essential requirement in the establishment of effective protection of cultural heritage places. The presence of precise boundaries is crucial for the efficient protective functioning of buffer zones. Boundaries should be drawn to ensure the full expression of the significance and the integrity and/or authenticity of those cultural heritage places. However, the criteria for delineation of the buffer zone boundary are not provided clearly even in the World Heritage Operational Guidelines. Nevertheless, there are numbers of factors in relation to wise use of buffer zones suggested by many international conservation organizations. These related aspects could be applied as the numbers of linked framing considerations for delineation of a buffer zone. There are many aspects related with delineation of the buffer zone boundary that are recommended by conservation organizations as ICOMOS, ICCROM, IUCN, WHC, and Recommendations from the World Heritage Committee as follows:

According to ICOMOS position paper (ICOMOS, 2008), the proposed check-list of aspects in relation to define the boundary of the buffer zone is as follows:

1. the value of heritage property,
2. the potential threats to a site from inside and outside,
3. the issues of setting as essential part of the authenticity of the property and visual integrity.

According to the ICCROM position paper (ICCROM, 2008), various factors as it particular reference to World Heritage sites are suggested as important:

1. the limits to protect views, settings, land use, and other aspects, but may also positively encourage developments,
2. the statement of the OUV of heritage property and its setting,

3. field of view or view shed analysis as the visual impacts,
4. historic urban landscape,
5. cultural impact assessments that concern the threats.

According to IUCN position paper (IUCN, 2008), the boundary of a buffer zone can protect the value of the property that various factors could include:

1. threats from outside the boundary of the property,
2. linkages to facilitate cultural and spiritual, social and economic benefits for communities.

According to WHC position paper (WHC, 2008), the proposed factors in relation to define the boundary of the buffer zone are as follows:

1. threats from outside the boundary of the property,
2. providing an additional layer of protection,
3. an area of land around the core,
4. the cadastral parcel on which the property is located,
5. the territory of the municipality in which the property is situated.

Finally according to recommendations of the World Heritage Committee from International Expert Meeting on World Heritage and Buffer Zones, recommendations related with delineation of a buffer zone are as follows:

1. providing additional protection for the OUV and integrity of a property,
2. analysis of the characteristics and the OUV of the property and integrity define the external issues.

The findings from this comparison have indicated that there are some factors related with delineation of a buffer zone. These factors are the main information for analyzing the boundary of a buffer zone to protect the OUV of cultural heritage places in the urban area. Therefore, these factors could be possibly concluded as the model for delineating the boundary of a buffer zone for non-World Heritage sites. Three steps are involved:

1. To assess the cultural significance of both the cultural heritage place and its setting: The establishment of cultural significance and the preparation of statement of cultural significance are essential prerequisites including a summary of the determination

that the property has specific cultural values. In this part, the concept of cultural significance in the Burra Charter can help in estimating the value of places. The places that are likely to be of significance are those which help an understanding of the past or enrich the present, and which will be of value to future generations. There are 4 values in the context of cultural significance as aesthetic, historic, scientific and social value;

2. To assess the authenticity and integrity of the cultural heritage place and its setting: It would be useful to clarify implications and modalities of use of the integrity concept for cultural heritage and to integrate this understanding within any effort to improve application and use of the buffer zone concept. Authenticity and integrity are effectively synonymous in conservation usage although there can be a slight nuance in general use with authenticity suggesting genuineness and integrity implying honesty (Kerr, 2000). The Operational Guidelines for the Implementation of the World Heritage Convention usefully enlarge on the meaning of authenticity and integrity (paragraphs 79-95);

3. To assess the threats: These threats may be very detrimental to the conservation of heritage properties. The proper boundary of the buffer zone can play an important part in ensuring this protection.

According to summarized aspects from case studies of buffer zone implementation and recommended aspects of conservation organizations, all significant aspects can be synthesized as criteria for buffer zone delineation in the historic urban area. The similar aspects in case studies and recommendations of conservation organizations could be recognized as required criteria for delineation of the buffer zone boundary, and other aspects could be recognized as recommended criteria. These significant criteria can be divided into 2 groups as follows:

Required criteria for delineation of the buffer zone boundary:

1. The buffer zone implementation should be enforced as the legal tool.
2. The buffer zone implementation could be applied into other spatial planning approach or conservation laws.
3. The cultural significance assessment is necessary to delineate the proper buffer zone boundary widely enough to cover their significance.

4. Internal and external threats of cultural heritages assessment are necessary to delineate the proper buffer zone boundary to protect value of cultural heritages and their setting.

Recommended criteria for delineation of the buffer zone boundary:

1. The level of protection of the buffer zone should be divided into various levels.
2. The authenticity and integrity assessment is necessary to delineate the proper buffer zone boundary widely enough to cover the significance of cultural heritages and their setting.
3. Values of views and vistas assessment between cultural heritages and their surrounding setting.
4. The buffer zone concept should be applied to other heritages of national significance.

According to these tasks could be examined in the case study, King Narai' Palace and its setting, to delineate the buffer zone boundary to protect the significance of both.

Assessment of Cultural Significance

In this part, the assessment of cultural significance can be divided into 2 issues. The first is the assessment of cultural significance of King Narai's Palace, and the second is the assessment of cultural significance of its setting. These assessments can indicate the aspects of place in aesthetic, historic, scientific and social value of both, and can conclude the statement of significance to help identify the fabric of cultural significance. The boundary of the buffer zone should have been ensured to protect the all of cultural significance.

1. Assessment of cultural significance of King Narai's Palace: From the review, background information, and surveyed, the cultural significance of King Narai's Palace has been assessed as follows:

- Aesthetic value: The characteristics of the site plan and buildings within the palace were influenced from Western style. The palace was built on a plan of rectangle on the bank of river. The wall of the palace was made of brick and mortar with

battlements along the ridge. The palace is divided into 3 zones; the Outer Palace includes a reservoir, a treasury, a guest reception hall, Phra Chao Hao building, and a royal elephant hall, the Middle Palace consists of Chantharaphisan Throne Hall, Dusit Sawan Thanya Maha Prasat Throne Hall, the Phiman Mongkut Throne Hall group, and Thim Dap, and the Inner Palace where Suttha Sawan Throne Hall and Phra Prathiap Building are located. Most buildings show a combination of Western and Thai Style architecture. The decoration of the doorways, windows, and buildings is a mixture of Thai and Western architecture. Except, The Chanthara Phisan Throne Hall was constructed in the typical Thai style. Most buildings were constructed from brick and mortar, and wooden structure on the roof. There are very large garden that foliage was so dense that gave the shade and cool air even in the mid-day. In addition, there are some evidence of ponds and fountains around the reception hall for foreign envoys, and Suthasawan Throne Hall as the private residence of King Narai the Great. In the reign of King Rama IV Phiman Mongkut Pavilion, Phra Prathiap Buildings and Thim Dap were constructed when the king came to renovate Lop Buri. These buildings were constructed in Western style. Especially, Phiman Mongkut Pavilion, the roof was made of kabu, a Chinese ceramic, and the gable was decorated with King Rama IV's royal emblem "Phra Maha Pichai Crown" in stucco and the other is a design of the throne under for displaying archaeological objects and other items relating to Kin Rama IV.

- Historic value: The historic value of King Narai's Palace can be assessed into 2 periods. The first is in the reign of King Narai the Great. During that period, King Narai the Great realized that Ayutthaya was not quite safe from the blockade and fire of the enemies in wartime. Therefore, the king had Lop Buri re-constructed as the second capital city due to its strategic suitability. The king had this palace constructed in 1666 to be his royal residence, office, envoy reception, and hunting in Lop Buri. The architectural style in this period was influenced from Western style, and there was a banquet hall constructed in the Palace. These characteristics are one evidence that Siam has long established trade with many countries including powers from the west especially France. In the reign of King Rama IV, with the similar reasons as King Narai the Great did in the past, the king made a decision of restoring the palace again. The western power

expansion had ambition to possess the countries in the Asia region. The king adopted a diplomatic strategy in dealing with the colonial expansion. The king decided to restore Lop Buri as the second capital for military defense. Phiman Mongkut Pavilion was constructed in 1862 as the king's private residence when he came to renovate Lop Buri.

- **Scientific value:** In the outer palace, there a water tank was constructed of brick with a specially-thick wall at its edge. Underground lies baked-clay pipes to distribute water from Thale Chup Son and Sap Lek Reservoir to the buildings and halls. The technology of fountain was constructed around the palace. The water distribution system was the work of the French and Italians. This is evidence shows that the water supply system was invented by using the advantage from the condition of topography of Lop Buri, because Thale Chup Son and Sap Lek Reservoir were in the highland, the pipes were lies on the slop into the city. Because of relation with western countries, the new construction techniques derived from those countries. Fortresses and city walls were constructed from similar brick palaces in Europe. As the result, most buildings in the palace were employed the construction technique to use brick for stability instead.

- **Social value:** The palace once served as the second capital of Siam in the reign of King Narai the Great. The king used this palace as an administrative center during his regular annual stay in Lop Buri. The palace was divided into 3 parts as outer, middle, and inner part for hierarchy of the king's palace. The palace was located in the middle of the old city of Lop Buri that was belief from the Ayutthaya Era. This belief was inherited to the Rattanakosin Era, when Bangkok was established as the current capital. In the reign of King Rama IV, the palace was used as provincial government office. Later, in the reign of King Rama V, it turned into national museum towards the end of his reign.

The statement of cultural significance of King Narai's Palace: The King Narai's Palace is associated with the Thai monarchy of Ayutthaya and Rattanakosin period. The palace was constructed by the reason of politics and administration to protect the territory from colonial expansion. The location of the palace followed the historical belief in the Ayutthaya Era. The characteristics, decoration, site plan and landscape reflected the historical background that was influence by foreign influence. The palace is ancient remain that has utility for educational and social activities. Although, some components in

the palace are ruins, but these significant evidences are indicated as the cultural heritage of identity and civilization of Lop Buri.

2. Assessment of cultural significance of the setting of King Narai's Palace: The setting of King Narai's Palace can be divided for consideration broadly into 2 areas. The first is the setting within the old city of Lop Buri, and the second is the setting outside the old city of Lop Buri especially the expanded area in the east. From the review, background information, and surveyed, the cultural significance has been assessed as follows:

- Aesthetic value: Lop Buri is a historic city that has been developed since Davaravati Era. Therefore, the various ancient remains located in the old city of Lop Buri provide significance evidence of art and architectural characteristics in various eras. The remaining relics in Dvaravati era are moats and round shaped city walls as particularity in this era. Prang Khaek and Phra Pran Sam Yot were ancient remains in Lop Buri Era that the characteristics were influenced from the Khmer. Wat Phra Si Rattana Mahathat is one of architecture in Lop Buri Era that was built according to the tradition to build a temple to house the holy relics of Lord Buddha in the middle of a major city. The remarkable building is Phra Prang. It has an extended visage and is decorated with *bas relief* of Buddha images and the life of Lord Buddha on the gable, as well as designs of human faces and flora. In Rattanakosin Era, the western style influenced architectural characteristics distinctly especially in the reign of King Narai the Great. Vichayen House, Wat San Paolo, and King Narai's palace are good examples of the aesthetic mix of Thais and Western styles. On the other hand, in the expanded urban area in the east and outside of the old city, the modern buildings were constructed after the Siamese Revolution of 1932. Most buildings were government institutions, and commercial buildings. Narai Maharat Road was constructed as the main axis for Lop Buri City through the significance circles as Si Suriyo Thai Circle and Thep Satree Circle. This road is the formal main approach to imposing sense to Lop Buri City

- Historic value: The various ancient remains in the old city of Lop Buri are part of the historic significance background. Lop Buri is a historic city that has developed continually from Davaravati Era. The historical evidences that indicated Lop Buri as the community settlement is the ruins of moats and city walls. Later, Lop Buri had

been under the control of the Mons and Khmers, and the significance evidences are the ruins of Prang Khaek, and Phra Prang Sam Yot. Thais possessed more power in this land in the 14th century. In the first period of Ayutthaya period, Lop Buri was the Mueang Luk Luang - the prince's town. The importance of Lop Buri increased in the reign of King Narai the Great (1656-1688). Since the invasion of the Dutch who traded with the Thais, King Narai realized that Ayutthaya was not quite safe from the potential enemies. Therefore, Lop Buri was reconstructed as the second capital. In this period, the boundary of Lop Buri was expanded to the east as agriculture area called "new town". However, the community had been still settled in the old city of Lop Buri as present time. After the reign of King Narai the Great, the significance of Lop Buri decreased. In the reign of King Rama IV, the king moved to Lop Buri again as the same reason of King Narai the Great. The colonial expansion was the threat of Siam and other countries in this region. Lop Buri was rather safer than Ayutthaya as the administrative center. In the reign of King Rama V the growth of Lop Buri was increased by the northern railway construction from Bangkok to Chiang Mai that passed through the old city of Lop Buri. The change once more of Lop Buri was in the period of Marchall Plaek Pibulsongkram. Because of WWII, the new Lop Buri was constructed as a military city on the east side of the rail road in the expanded urban area. Therefore, there are many ancient remains, cultural heritage places, and significant buildings located around the King Narai's Palace that should be conserved as well.

- Scientific value: Around the old city of Lop Buri was the moat for indicating the boundary of the city and protecting the enemies. The moat was dug when the urban area was expanded for other purpose. This procedure was also used in the late era as Rattanakosin. Bangkok has the moats around the city as well. In the reign of King Narai the Great, the water supply system was laid through the setting in the old city of Lop Buri and the expanded urban area. Sra Khaew around Si Suriyo Thai is the water reservoir to feed the water into the city area. The source of fresh water supply was Sap Lek Reservoir and Thale Chup Son that located away in the northeast of the old city of Lop Buri.

- Social value: Initially, The settlement of community in the Lop Buri

was located along the Lop Buri River as it was the important transportation route. The commercial area was also located along the river in the north. In the middle of the old city was the location of the palace and the temple followed the belief of the establishing city. There are significance evidences that indicate the relationship between Ayutthaya and the western country in the reign of the King Narai's such as the Vichayen House or the Royal Envoy Reception House, ancient remains in King Narai's Palace, and Wat San Paolo. In the reign of King Taksin the Great, the king defeated the cities of Luang Phrabang, and Vientiane in war, the captives were taken into Siam, and permitted to settle in the northeast provinces including Lop Buri as well. In the reign of King Rama V, Chinese labourers who constructed the rail road settled within the old city of Lop Buri after finishing the rail road construction. This resulted in an expansion of ethnic groups in Lop Buri. In the period of Marchall Plaek Pibulsongkram, Lop Buri was changed into military city. Many soldiers and their families moved into the city. As a result, one of the reasons for growth of the economy in Lop Buri is due to the increase of these populations. The government institutions and educational institutes were constructed more in the new urban area.

The statement of cultural significance of setting of King Narai's Palace: Lop Buri is a historic, archeological, and culturally significant city. The various evidences indicated the continued development of the city evidently from Davaravati, Lop Buri, Ayutthaya, Thon Buri, and Rattanakosin Era through to the present day. Lop Buri is associated with King Narai the Great as the second capital of Siam and was renovated in the reign of King Rama IV as the second administrative city. In the period of WWII, Lop Buri was restored as the military city with the reason of stability. Lop Buri had been often involved in the sovereignty of the country. Lop Buri is the city of conglomerate between the valuable cultural heritage places and new development. Therefore it should be managed and conserved.

Assessment of Authenticity and Integrity

The aim of this part is to assess the condition of authenticity and integrity of King

Narai's Palace and its setting. The authenticity could be assessed by a variety of attributes that was suggested in The Nara Document on Authenticity (1994), and the integrity could be assessed including all elements necessary to express its OUV.

1. The authenticity and the integrity of King Narai's Palace:

- The authenticity: In the reign of King Narai the Great and King Rama IV, the palace was the second place of the king for official administrating, hosting, and living. However, at present, the use of the palace has been changed to a museum and a tourist attraction. The authenticity of King Narai's Palace can be assessed by some attributes of the Nara Document. The authenticity of King Narai's Palace is in the location and its setting, although, the use and some material has been changed. The location of the palace and its layout indicates the belief of establishing the city in the past. Most buildings constructed in the reign of King Rama IV have been restored in the good condition. It indicates the authenticity of form, design and spirit of the art in that era such as Phiman Mongkut Pavilion, Phra Pratiep Building, Thim Dap, and restored the Chanthara Phisan Throne Hall.

- Integrity: Although some buildings in the boundary of the palace have collapsed, the integrity of setting and location of King Narai's palace can be expressed through the ancient remains and restored buildings. Whole components in the 3 divided parts of King Narai's Palace can indicate the function and use in each compound. Most buildings in the reign of King Narai the Great are ruins that have no integrity of building construction. On the other hand, the integrity of buildings could be seen in the buildings in the reign of King Rama IV.

2. The authenticity and the integrity of setting of King Narai's Palace:

- Authenticity: Lop Buri is a historic city that has been developing all the time. The significant authenticity is the function and use of the city. The various activities located in the city such as cultural heritage places, residential areas, commercial areas, transportation routes, government institutes, and so forth emphasise on the diversity and specificity of the setting. The authenticity of form, design and location of ancient remains in the city affect to the spirit and feeling of sense of place. In the expanded area in the east

of Lop Buri, the new buildings also express the authenticity of form, design, material, and techniques of construction in the modern style. Furthermore, the transportation networks especially roads in the old city of Lop Buri were developed from the tracks in the past. These shown the authenticity of road networks in the urban area.

- The integrity: The role of LoP Buri City is still the living historic city as in the past. The various activities can be carried on as the social diversity. The co-existence of cultural heritage places and other new buildings should be controlled to prevent threats that impair the integrity of the setting. In the physical condition, the boundary of the old city of Lop Buri is still clear as in the Ayutthaya Era, but the moats and ridges of the expanded area were demolished to construct buildings and roads.

Assessment of Threats

Evidently, the traditional and functional whole of historic city is often threatened. The assessment of threats can identify the conditions in various aspects that impair the significance value of the cultural heritage place and its setting. These threats could be summarized from problems and limitations in Chapter 4.

1. Threats to King Narai's Palace:

- The buildings have decayed as a result of effects of climate and the natural environment, and these remains have been damaged over time by heat, humidity, rain, wind, ground subsidence, and air pollution.

- Increasing of tourism activities could be stimulation of decay of cultural heritage places. Since King Narai's Palace is the most attractive place in Lop Buri City, there are a lot of tourists come in this place. Lack of interpretation and management of the concerned authorities and public awareness of tourists may be a reason of the decay. Tourists can walk through, climb on the ruins, sit on the places, and so forth. If they do not be careful with their behaviors, it could be the reason of threats.

- Increasing use motor vehicles around the palace can generate atmospheric pollution and destructive vibration especially, tourists' bus and trucks.

- The new constructions such as high-rise buildings, signs, wires, electricity post, and so forth have been constructed irresponsibly around the palace. As the result, these constructions block the view of the significant constructions.



Fig.53 Constructions block the view of the significant places (Pic. From survey)



Fig.54 Constructions block the view of the significant places (Pic. From survey)

2. Threats to setting of King Narai's Palace:

- The new land uses and activities could lead to overcrowded communities and unhealthy conditions.
- Most ancient remains in setting were located in outdoor spaces that have been affected from climate and the natural environment such as heat, humidity, rain, wind, ground subsidence, and air pollution. As the result, most constructions made from bricks, mortar, and wood have decayed over time.
- The new constructions have been constructed irresponsibly. Moreover, the problem of trespass from surrounded slum is a major concern causing cultural heritage degradation as well.
- Constructing the infrastructure systems and facilities could improvidently destroy the value of ancient remains and cultural heritage places.
- Lack of open spaces for recreation and sport activities in the old city of Lop Buri is one of the reasons of the low living standard of people.

- Since increasing use of private motor transport could make destructive vibration especially large vehicles, and trains.

From the analysis, the significance of King Narai's Palace and its setting are indicated through assessment of cultural heritage, authenticity, and integrity. The historical evidences, background and current information expresses the development of Lop Buri precisely. King Narai's Palace, the case study, is a significant cultural heritage place of Thailand involved with crises of the country many time. There is established historic value, cultural value, art value, and educational value. It is an identity of nation that must be conserved. The setting around King Narai's Palace relates with King Narai's Palace closely in historical aspects, traditional aspects, cultural aspects, and social aspects. The old city area in Lop Buri is significant evidence in the community settlement over time. Around King Narai's Palace, there are many cultural heritage places, ancient remains, and the old local communities located within the old city of Lop Buri. These places should be conserved together with King Narai's Palace. In the condition of the old city that ancient remains is located with the old community, these characteristics can not be separated from each other. The process of urban conservation should be managed in overall aspects. Furthermore, assessment of threats can indicate risks that threaten the significance of the cultural heritage place and its setting. These threats should be managed and resolved. The boundary of a buffer zone should be delineated covering these high significance and threats simultaneously to protect the OUV of King Narai's Palace and setting as historic urban landscape around it.

Management Guidelines within the Buffer Zone in the Historic Urban Area

The effectiveness of a buffer zone is not only related to proper delineation of boundary of the buffer zone but also management within such buffer zone. The boundary that is large enough might not be sufficient to protect the cultural heritage place. The line on the map and the accompanying regulations can make it very clear to all interested parties. According to the review in the Chapter 2, the first factor that helps the buffer zone

to be used effectively is the legal aspect. ICOMOS, ICCROM, IUCN, WHC, and UNESCO affirm that many buffer zones are not or insufficiently protected by national or local legislation. For that reason, a protective status for buffer zones is not possible. The status of buffer zone should be managed as a legal instrument.

This part aims to find the proper management guidelines within a buffer zone. The recommended factors for managing within the buffer zone in the historic urban area could be expressed considerably to control and enhance the proper conditions between cultural heritage places and their surrounding settings. The recommended managing factors can be divided into 2 issues as physical conditions, and socio-economic conditions.

Recommended Managing Factors for Physical Conditions

The setting around King Narai's Palace consists of various ancient remains, cultural heritage places, commercial buildings, residential buildings, government institutions, schools, open spaces, and so forth. This circumstance indicates the diversity of physical environment of the old city of Lop Buri. According to review in Chapter 2, managing factors are considered in the concept of buffer zone, case studies, setting, cultural landscape, historic urban landscape. In this part, recommended managing factors for physical conditions can be divided into 5 factors: design, location, size, environment, and infrastructure. The first three factors are recommendation to control buildings, and communities or new development in the setting. The last two factors are recommendation to control urban environment. These factors are elaborated as follows:

1. Recommended managing factors for design: These factors use to control the new buildings that would be constructed in the setting around King Narai' Palace, and old buildings that would be renovated, reconstructed, rehabilitated, and restored. The attributes that should be controlled are:

- Style, form, and character
- Pattern, and façade
- Use and function

- Exterior & interior alteration
- Permanent installation
- Decoration
- Material
- Texture
- Colour
- Permission for new structures & interventions
- Demolish & move

2. Recommended managing factors for location: These factors can be used to control the new buildings that would be constructed in the setting around King Narai' Palace, and should consider adjacent areas. The attributes that should be controlled are:

- Position
- Siting
- Set back

3. Recommended managing factors for size: These factors can be used to control the new buildings that would be constructed in the setting around King Narai' Palace. The attributes that should be controlled are:

- Height
- Density
- Scale and proportion
- Volume of building
- Bulk
- Site coverage area

4. Recommended managing factors for environment: These factors can be used to control the physical environment, and urban landscape in the setting around King Narai's Palace. The attributes that should be controlled are:

- Open Space, square, and green area
- Recreation area
- Main visual axes

- Plantation
- Roofscape
- Natural resources
- Harmonious urban landscape
- Open view / scenic vista

5. Recommended managing factors for infrastructure system: These factors can be used to control the infrastructure system that would be constructed in the setting around King Narai' Palace. The attributes that should be controlled are:

- Electricity pole
- Telephone, electricity cables
- Advertising sign, and other signs
- Road, lane, and path
- Street furniture
- Lighting
- Traffic Volume
- Parking
- Service for site visitors

Furthermore, in the old city of Lop Buri, there are many significant buildings located in the setting around King Narai's Palace. These buildings are vacant and declined, and need to be preserved. There are many tools of conservation for protecting in safety or preserving the existing state of a heritage resource from destruction or change including consolidation, restoration, reconstruction, rehabilitation, replication, relocation, and urban renewal.

Recommended Managing Factors for Socio-Economic Conditions

Socio-economic conditions are one of factors that indicate quality of life in historic urban area. Nowadays, urban conservation focuses on cohabitation between communities and cultural heritage places as living heritage. The role of buffer zone can encourage

positive measures which enhance the value and provide benefits for local communities. It should also provide an important mechanism to share the benefits of cultural heritage places with local communities and stakeholders and enhance sustainable use. Recommended managing factors for socio-economic conditions can be divided into 2 factors as socio-economic, and assistance. These factors are elaborated as follows:

1. Recommended managing factors for socio-economic benefits: These factors can be used to control and enhance local communities to get benefit from the buffer zone. The attributes that should be controlled are:

- Stakeholders
- Education and interpretation
- Traditional living pattern
- Demographic growth
- Local economy
- Private Properties
- Development rights
- Tourism

2. Recommended managing factors for assistance: These factors can be used to enhance local communities who live in the buffer zone to get benefit from their right. The attributes that should be controlled are:

- Fund
- Grant
- Subsidies
- Loan
- Tax concession
- Compensation

A buffer zone should enhance economic activities in the historic urban area, and may also positively encourage developments that would be beneficial to the site and community.

Opinions on a Buffer Zone in the Historic Urban Area

This part indicates the data from questionnaires. The sample size is 350 units consisting of people who live in the setting around the King Narai's Palace and in the boundaries of urban planning delineated by the Department of Public Works and Town & Country Planning (DPT). The main point of the questionnaire is to ask about the significance of King Narai's Palace and its setting, and the necessity of the buffer zone to protect the cultural heritage place in the historic urban area. This process of listening to local people is one of reading into the historic urban landscape as a basis for future planning and design. The opinions of sampling unit can be indicated as follows:

Opinions on Cultural Significance and Conservation

In this part, the opinions of local people on the significance of King Narai's Palace and its setting are indicated as follows:

1. The level of cultural significance of King Narai's Palace: Most sampling units (96 %) agree that King Narai's Palace has high level of cultural significance.

Table 2 Opinions on the level of cultural significance of King Narai's Palace

Opinion	Rank				
	High Freq.(%)	Medium Freq.(%)	Low Freq.(%)	Not Sure Freq.(%)	Total Freq.(%)
The level of cultural significance of King Narai's Palace	337 (96.0)	11 (3.1)	0 (0)	2 (0.9)	350(100)

2. The level of cultural significance of ancient remains around King Narai's Palace:

Most sampling units (95.1%) agree that ancient remains around King Karai's Palace have high level of cultural significance.

Table 3 Opinions on the level of cultural significance of ancient remains around King Narai's Palace

Opinion	Rank				
	High Freq.(%)	Medium Freq.(%)	Low Freq.(%)	Not Sure Freq.(%)	Total Freq.(%)
The level of cultural significance of ancient remains around King Narai's Palace	333 (95.2)	14 (4.0)	0 (0)	3 (0.8)	350(100)

3. The level of cultural significance of setting around King Narai's Palace:

Most sampling units (67.0%) agree that setting around King Karai's Palace has high level of cultural significance.

Table 4 Opinions on the level of cultural significance of setting around King Narai's Palace

Opinion	Rank				
	High Freq.(%)	Medium Freq.(%)	Low Freq.(%)	Not Sure Freq.(%)	Total Freq.(%)
The level of cultural significance of setting around King Narai's Palace	234 (67.0)	92 (26.4)	15 (4.0)	9 (2.6)	350(100)

4. The necessity for conservation of whole area within the old city of Lop Buri:

Most sampling units (85.5%) agree that it has necessity of conservation of whole area within the old city of Lop Buri

Table 5 Opinions on the necessity of conservation of whole area within the old city of Lop Buri

Opinion	Rank			
	Necessity Freq.(%)	Not Necessity Freq.(%)	Not Sure Freq.(%)	Total Freq.(%)
The necessity of conservation of whole area within the old city of Lop Buri	299 (85.5)	25 (7.1)	26 (7.4)	350(100)

5. The level of conservation of whole area within the old city of Lop Buri:

Most sampling units (77.1%) agree that it is high level of conservation of whole area within the old city of Lop Buri

Table 6 Opinions on the level of conservation of whole area within the old city of Lop Buri

Opinion	Rank				
	High Freq.(%)	Medium Freq.(%)	Low Freq.(%)	Not Sure Freq.(%)	Total Freq.(%)
The level of conservation of conservation of whole area within the old city of Lop Buri	270 (77.1)	57 (16.3)	8 (2.3)	15 (4.3)	350(100)

6. The level of understanding in historic urban conservation:

Most sampling units (44.0%) and (42.8%) understand historic urban conservation in the high level and medium level respectively.

Table 7 Opinions on the level of understanding in historic urban conservation

Opinion	Rank				
	High Freq.(%)	Medium Freq.(%)	Low Freq.(%)	Not Sure Freq.(%)	Total Freq.(%)
The level of understanding in historic urban conservation	154 (44.0)	150 (42.8)	30 (8.6)	16 (4.6)	350(100)

7. Factors promote the effective historic urban conservation:

Most sampling units (44.3%), (42.8%), (42.5%), (42.0%), and (39.7%) think that Enhancing community participation, population density control, appropriate land use, keeping view and vista of cultural heritage places, and building height control are factors helping to promote the effective historic urban conservation respectively.

Table 8 Opinions on factors promote the effective historic urban conservation

Factors	Freq.(%)
1. Population density control	150 (42.8)
2. Appropriate land use	149 (42.5)
3. Building height control	139 (39.7)
4. Form and material control	125 (35.7)
5. Traffic volume control	98 (28.0)
6. Appropriate infrastructure system	67 (19.1)
7. Sign control	85 (24.2)
8. Open space and green space planning	87 (24.8)
9. Keeping view and vista of cultural heritage places	147 (42.0)
10.Supporting knowledge and understanding in conservation to stakeholders	111 (31.7)
11. Enhancing community participation	155 (44.3)
12. Implementation of conservation plan	114 (32.5)

8. Receiving the information of historic urban conservation in Lop Buri:

Most sampling units (62%) have never received the information of historic urban conservation in Lop Buri.

Table 9 Opinions on receiving the information of historic urban conservation in Lop Buri

Opinion	Rank		
	Yes Freq.(%)	No Freq.(%)	Total Freq.(%)
Receiving the information of historic urban conservation in Lop Buri	217 (62.0)	133 (38.0)	350(100)

9. Participation in historic urban conservation in Lop Buri:

Most sampling units (69.1%) have never participated in historic urban conservation in Lop Buri.

Table 10 Opinions on participation in historic urban conservation in Lop Buri

Opinion	Rank		
	Yes Freq.(%)	No Freq.(%)	Total Freq.(%)
Participation in historic urban conservation in Lop Buri	107 (30.6)	242 (69.1)	350(100)

10. The level of cultural significance of setting outside the old city of Lop Buri:

Most sampling units (52.9 %) and (35.7) agree that setting outside the old city of Lop Buri has high level of cultural significance and medium level respectively.

Table 11 Opinions on the level of cultural significance of setting outside the old city of Lop Buri

Opinion	Rank				
	High Freq.(%)	Medium Freq.(%)	Low Freq.(%)	Not Sure Freq.(%)	Total Freq.(%)
The level of cultural significance of setting outside the old city of Lop Buri	185 (52.9)	125 (35.7)	27 (7.7)	13 (3.7)	350(100)

11. The necessity for conservation of whole area outside the old city of Lop Buri:

Most sampling units (74.3%) agree that it has necessity of conservation of whole area outside the old city of Lop Buri.

Table 12 Opinions on the necessity of conservation of whole area outside the old city of Lop Buri

Opinion	Rank			
	Necessity Freq.(%)	Not Necessity Freq.(%)	Not Sure Freq.(%)	Total Freq.(%)
The necessity of conservation of whole area outside the old city of Lop Buri	260 (74.3)	57 (16.3)	33 (9.4)	350(100)

12. The level of conservation of whole area outside the old city of Lop Buri:

Most sampling units (60.8%) agree that it is high level of conservation of whole area outside the old city of Lop Buri

Table 13 Opinions on the level of conservation of whole area outside the old city of Lop Buri

Opinion	Rank				
	High Freq.(%)	Medium Freq.(%)	Low Freq.(%)	Not Sure Freq.(%)	Total Freq.(%)
The level of conservation of conservation of whole area outside the old city of Lop Buri	213 (60.8)	102 (29.1)	16 (4.5)	24 (6.6)	350(100)

Opinions on Lop Buri Comprehensive Plan

In this part, the opinions of local people on Lop Buri comprehensive plan are indicated as follows:

1. The level of understanding in Lop Buri comprehensive plan:

Most sampling units (43.2%) and (34.5%) understand historic urban conservation in the medium level and low level respectively.

Table 14 Opinions on the level of understanding in Lop Buri comprehensive plan

Opinion	Rank				
	High Freq.(%)	Medium Freq.(%)	Low Freq.(%)	Not Sure Freq.(%)	Total Freq.(%)
The level of understanding in Lop Buri comprehensive plan	42 (12.1)	151 (43.2)	121 (34.5)	36 (10.2)	350(100)

2. The level of necessity of urban planning on historic urban conservation:

Most sampling units (50.8%) agree that it has necessity of urban planning on historic urban conservation.

Table 15 Opinions on the level of necessity of urban planning on historic urban conservation

Opinion	Rank				
	High Freq.(%)	Medium Freq.(%)	Low Freq.(%)	Not Sure Freq.(%)	Total Freq.(%)
The level of necessity of urban planning on historic urban conservation	178 (50.8)	93 (26.5)	20 (5.8)	59 (16.9)	350(100)

3. The level of necessity of buffer zone for historic urban conservation:

Most sampling units (60.8%) agree that it has necessity of buffer zone for historic urban conservation.

Table 16 Opinions on the level of necessity of buffer zone for historic urban conservation

Opinion	Rank				
	High Freq.(%)	Medium Freq.(%)	Low Freq.(%)	Not Sure Freq.(%)	Total Freq.(%)
The level of necessity of buffer zone for historic urban conservation	213 (60.8)	103 (29.4)	14 (4.0)	20 (5.8)	350(100)

The findings in this part indicated that most sampling units have the moderate consciousness of historic urban conservation. In their opinions, the cultural heritage place and its setting should be conserved. The buffer zone and urban planning process are considered as the tools for protect the OUV of the cultural heritage place in the historic urban area. However, the level of participation on historic urban conservation and understanding about urban planning process, most sampling units are rather medium and low level.

Chapter 6

Implementation

Obviously, a buffer zone is an effective tool for protecting the significant value of the cultural heritage place, if it has been established circumspectly. All of information background as physical, cultural, socio-economic aspects has to be considered before establishing. The lack of a buffer zone inhibits the ability of the authority to protect their cultural heritage place from unwelcome development pressures planned for adjacent territories which might have a negative effect on cultural significance. In some case, buffer zone boundaries are defined, but the conditions within the zone are not specified or made clear, and appear unsupported by local legislation of any kind. Often, there are not the necessary regulations and policies to make them useful (ICCROM, 2008). Therefore, the implementation should be ensured that a buffer zone is set in relation to physical, social, cultural, and economic contexts reflecting all sources of the heritage value of a place (ICOMOS, 2008). A buffer zone has to both improve protection the cultural heritage place and its setting, and the quality of life of the community. From information analysis process in previous chapter, the important issue that should be considered seriously is legal aspect of the buffer zone. According to the review and case studies, the effective buffer zone should be or supported by laws or regulations.

According to ICCROM, IUCN, WHC position paper 2008, and recommendations from International Expert Meeting in Quebec 2008, the concept of buffer zone should be integrated with planning process as one of the protection layers established through national legislation concerning heritage safeguarding. Spatial planning is one of protection laws established to control and enhance uses and activities in the planned area. According

to reviewed case studies, in many countries such as Sweden, Netherlands, Bulgaria, Spain, Finland, and USA the implementation of the buffer zone has been integrated with the spatial planning. A buffer zone need to fulfill the function of protection as well as to contribute to an integrated approach to land use management (IUCN, 2008).

Urban land use planning can be the process that is integrated with delineation of the buffer zone. Since, urban land use planning is the key to guiding urban development. It identifies areas that are to be devoted to various types, densities, and intensities of use categories. It also identifies the principles and standards that should be applied in the development or conservation (Roberts, 1988). Importantly, the land use plan and land use regulations, the outputs of urban land use planning, are laws that could be integrated with delineation and management guidelines of the buffer zone to protect the significant value of the cultural heritage place in the historic urban area effectively.

The aim of this chapter is to suggest the buffer zone implementation by integrating with the urban land use planning. The contents of this chapter can be divided into 4 parts as follows:

1. The relation of delineation of the buffer zone and urban land use planning
2. Delineation of the buffer zone in urban land use planning
3. Management guidelines in urban land use planning
4. The buffer zone for King Narai's Palace

The Relation of Delineation of the Buffer Zone and Urban Land Use Planning

The aim of this part is to compare the process of delineation of the buffer zone boundary and urban land use planning process to find the relation of these processes. According to the review in chapter II, the overall image of process of urban land use planning consists of procedures that can be concluded as follows:

1. Problem identification
2. Formulating goals and objectives
3. Data collection
4. Data analysis

5. Data synthesis
6. Alternative plans development
7. Plan selection
8. Implementation
9. Monitoring and assessment

On the other hand, the process of delineation of boundary of buffer zone can be concluded as follows:

1. Data collection- the background information
2. Data analysis- the cultural significance, authenticity and integrity, and threats
3. Suggestion of boundary of the buffer zone

As stated above, the process of delineation of boundary of the buffer zone is similar with the process of urban land use planning. The steps of delineation of the buffer zone as data collection, data analysis, and suggestion the proper boundary can compare with the similar steps of urban planning process as data collection, data analysis, data synthesis, and the plan selection. Therefore, the process of delineation of boundary of buffer zone can be possibly integrated with the process of urban land use planning, because they have the same methodology. Generally, if an area is historic urban area, the goals and objectives of planning should be formulated to preserve the significance of that area. Normally, the process of data collection in urban land use planning needs to collect all aspects of data in the planning area. Therefore, the data relate with aesthetic, historic, scientific, social, authenticity, integrity, and threats that are important data for assessment of delineation of boundary of the buffer zone need to collect as well. This similarity can conclude that the process of delineation of boundary of the buffer zone is a part of the process of urban land use planning as shown in Fig.55

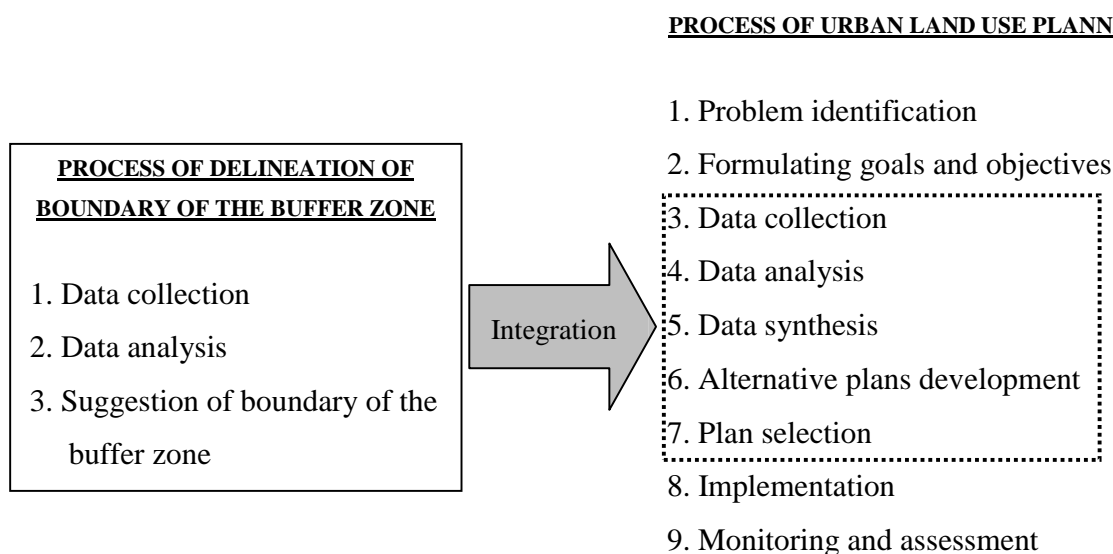


Fig.55 The relation of process of delineation of boundary of the buffer zone and process of urban land use planning

Furthermore, in the land use planning process of Thailand, the opinions of local communities are important information for planning. According to The Town and Country Planning Act 1975, the public hearing is a required legal step in the process of urban planning. Therefore, the delineation of the buffer zone in the land use plan would be considered by local communities in the step of the plan selection.

Delineation of Buffer Zone in Urban Land Use Planning

The boundary of buffer zone should have clearly defined in relation to the significance of the cultural heritage place that the buffer zone is delineated to protect. From the review and data analysis in previous chapter, the required and recommended criteria for delineation of the buffer zone to protect the significance of the cultural heritage place in historic urban area can be suggested orderly as follows:

1. Obvious goals and objectives of delineation of the buffer zone: The statements should be expressed in a form that what is protected? Where is protected? Why is it protected? How is it protected?

2. Complete background information: All aspects of background information as historical data, cultural data, traditional data, physical data, socio-economic data, threats, problems and limitations should be collected completely for assessment and understand the side.

3. Understanding the significance of the cultural heritage place and its setting: From the review, and background information, the cultural significance of place should be assessed circumspectly to recognize the significant value of the cultural heritage place and its setting and their relation.

4. Understanding the authenticity and integrity of the cultural heritage place and its setting: From background information and the field surveyed, the authenticity and integrity should be assessed evidently to recognize the intactness of cultural heritage place and its setting.

5. Awareness of threats, problems, and limitations: From background information and the field surveyed, the threats, problems, and limitations of the cultural heritage place and its setting should be assessed carefully to realize the risks resulting of deterioration, degradation, and devalue of the cultural heritage place and its setting.

6. Delineation the coverage boundary: The boundary of the buffer zone should be delineated widely enough to cover the cultural significance, the authenticity and the integrity of the cultural heritage place and its setting. The boundary of the buffer zone should cover the threats or other risks in the setting to prevent destructive effects as well.

7. Levels of protection of the buffer zone: The level of protection of the buffer zone should be divided into various levels. It is not necessary to use the one standard to protect whole area. The adjacent areas around the cultural heritage place should have higher restriction than far away areas. These levels should be considered with the cultural significance, the authenticity and the integrity, and threats of the cultural heritage place and its setting.

8. Generating the continuous landscape: Although, the boundary lines of the buffer zone are clearly delineated on roads, canals, rivers, and other linear components, the different development between 2 sides of the boundary line might be effect to urban physical environment. The buffer zone that the boundary line on one edge to a cultural

heritage places and on the other to a high rise development should adapt an intermediate height in order to bridge between the two areas for generating the continuous landscape. Therefore, the main purpose of the buffer zones is to create the appropriate atmosphere to match the cultural heritage places.

9. Enforcement as the legal tool: The effective buffer zone has to be the law. The concept of buffer zone should be integrated with legislation such as urban land use planning, urban conservation planning, urban management plan, and so forth.

These criteria lead to the proper boundary of buffer zone that could protect the significant value of cultural heritage place and its setting in the historic urban area. Consequently, the size of the boundary of the buffer zone should be rendered in the land use plan following criteria above with the different colour from other land uses. This method can identify the boundary of the buffer zone clearly in the land use plan.

For Thailand, The Department of Public Works and Town & Country Planning stipulates boundaries of the cultural heritage place and historic urban areas in the land use plan as well, but has never used the buffer zone for protecting the cultural heritage place before. Only the light brown colour is used to represent cultural heritage places or conservation areas in the land use plan. As the result, one standard of the light brown has been used to control and protect both the cultural heritage place and its setting. Therefore, the implementation of buffer zone into the land use plan should consider 3 issues as follows:

1. Type of land use plan: In Thailand, according to The Town and Country Planning Act 1975, there are 2 types of plan that used to enforce, the first is the Comprehensive Plan defined as the guidance for urban development in various elements such as land use, transportation, infrastructure networks and facilities, and so forth to achieve the town and country planning objectives. The second plan is the specific plan defined as detailed plan and projects for development and conservation of specific area to benefit the town and country planning. However, in Thailand the specific plan has never used to enforce before, because there is difficult in the process of planning. According to report of Meeting of Experts in the Citizen Participation Development in Urban Planning for healthy Environment 2009 by Thai Health Promotion Foundation

(ThaiHealth), the situation of the specific plan was stated that there was the effort to use the specific plan to enforce in Mataput Municipality, Rayong Province for 10 years ago, but it was not success in practice. The problems of the specific planning related with the background information especially land lots owner ship. Importantly, most processes of specific urban planning need to expropriate some area in the planning area, so this procedure has to enforce with the Act. As the result, procedure of promulgation is complicated. As a result, at present, there is no case study of the specific plan in Thailand. Normally, both the comprehensive plan and the specific plan consist of maps and texts to control the area that is planned. Land use map is one of components in these plans. According to limitation of the specific plan stated above, initially, the delineation of the buffer zone should be integrated with land use plan of the comprehensive plan as a framework of historic urban conservation.

2. The enforcement levels of the buffer zone: According to review and data analysis in previous chapter, the level enforcement of the buffer zone should not be only one level to protect the significance of the cultural heritage place. Since, in fact, there are a lot of physical, social, cultural, and economic diversities in the historic urban area. Two enforcement levels of the buffer zone are suggested here like the buffer zone used in Japan. The first level should cover thoroughly the area of the cultural heritage place and its setting that is adjacent around the place. This level should cover all of area that has cultural significance and affected threats to the cultural heritage place as assessment from criteria. The second level should cover the outside area around the first level as the transition from the cultural heritage place in the first level to its surroundings. In the second level, the control and restriction might be less than the first level.

3. The new represented colour: As stated above, initially, the conservation area is represented with the light brown colour in the land use plan of Thailand. However, this light brown can still use for representing only the cultural heritage area and adjacent significant areas as a core zone as well. But the buffer zone should be also represented clearly with a new colour. According to recommendations from interviewing experts in The Department of Public Works and Town & Country Planning, the new colour in land use plan can be established for more controlling, if the objectives and reasons of the new

colour defined clearly. This new colour definition, objective, and reason will be sent to Office of the Council of State of Thailand for considering. This new colour would be available, when Office of the Council of State of Thailand approved.

In conclusion, in the land use plan, the buffer zone of the cultural heritage place and its setting has two levels of protection. The first level consists of the area of cultural heritage place and adjacent significant areas that could be represented with the former light brown colour of The Department of Public Works and Town & Country Planning. The second level is the protection areas around the first level that could be represented with a new colour. However, it may be concluded that buffer zones should not be regarded as universally desirable in all contexts, and the consequences of their application at all levels carefully studied before adoption (ICOMOS, 2008).

Management Guidelines in Urban Land Use Planning

In the land use planning process, not only the land use plan that used to control the activities and another aspects in the urban area but also the regulations. The land use regulation is a tool for controlling and permitting the uses and activities in each area in the land use plan as well. The land use regulation should make fairness in the communities, and balance in the land use control between permission and prohibition. Normally, in Thailand, the land use regulation in each type of land use, following the standard of The Department of Public Works and Town & Country Planning, states mainly the permitted uses, prohibited uses, percentage of establishing uses that are not permitted and prohibited uses, density control by floor area ratio (FAR), building coverage area (BCR), or open space ratio (OSR), height control, and set back control. Since, the land use plan and the land use regulation in the comprehensive planning is a framework of development in the urban area.

From the analysis in Chapter 5, factors that are considered in the recommended managing factors for physical condition and socio-economic condition as design, location, size, environment, infrastructure, socio-economic benefits, and assistance consist of various significant attributes that should be controlled. Therefore, all those factors that

should be controlled may not be stated in the land use regulation completely as attributes in the design factor such as colour, material, decoration, texture, and so forth, and in the other factors. However, it is possible to use another laws to enforce the conditions in the buffer zone. According to report of Meeting of Experts in the Citizen Participation Development in Urban Planning for healthy Environment 2009 by Thai Health Promotion Foundation (ThaiHealth), normally, the local authority in Thailand such as the municipalities, sub-district administrative organizations, and so forth can promulgate municipal laws or local ordinances to control or manage in their territories. Therefore, these local authorities should establish the local laws to control other aspects for enforcing together with the land use plans and land use regulations. The contents of those laws might be building ordinance to control design and site of constructions, or the infrastructure management to control telephone or electricity cables, electricity poles, signs, lighting, and so forth. Furthermore, it might use fiscal laws from other organization as The Revenue Department, Department of Lands to assist communities to develop or improve their place such as subsidies, tax concession, funds, grant, and so forth. This is the measures that enhancing all recommended managing factors for physical condition and socio-economic condition can be enforced in the legal aspect.

However, the strict controls in a buffer zone may contribute to isolation of a cultural heritage from its long existing social, cultural and economic context, and may contribute to unplanned and unnecessary museification of the cultural heritage place that isolating it from its surrounding (ICOMOS, 2008).

Furthermore, the recommendation from the ThaiHealth meeting 2009 stated that the land use planning process should support knowledge and understanding to local communities for creating good conscious to the urban land use planning process. When local communities recognize the significance of urban land use planning, this will facilitate participation from the local communities. As the result, the land use plan and the land use regulation should be derived from needs of local communities actually. Related with the opinion of the sampling unit communities in the Chapter 5, the first factor that promotes the effective historic urban conservation is enhancing community participation.

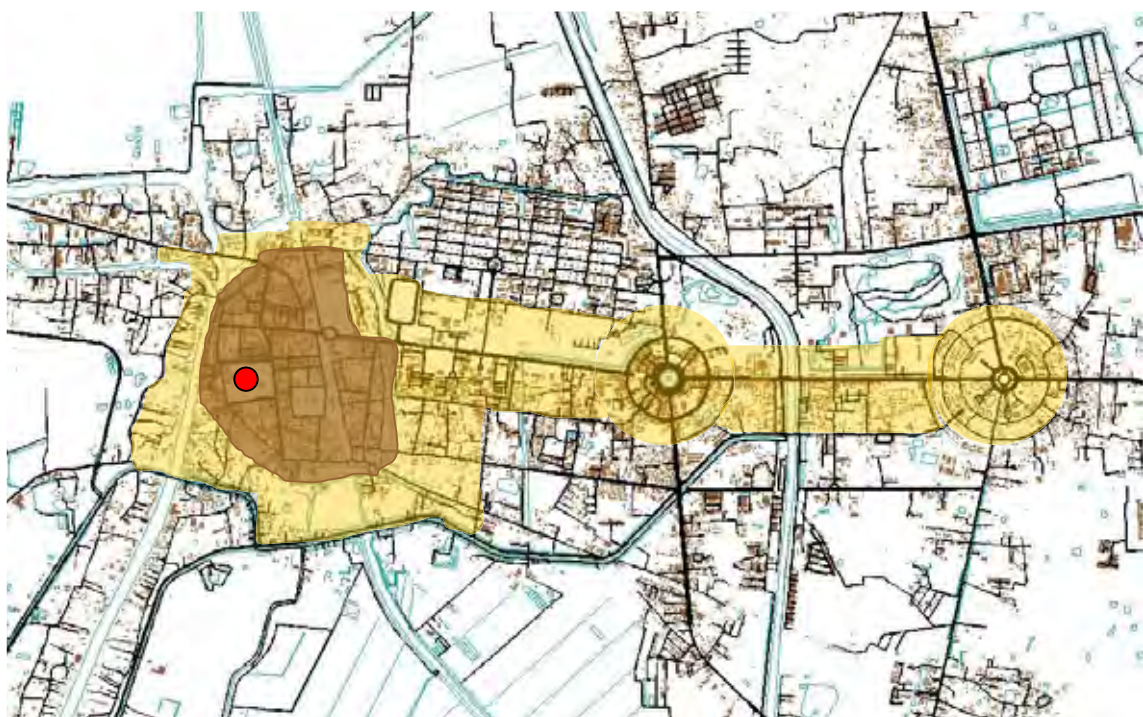
The Buffer Zone of King Narai's Palace

This part aims to implement the criteria of delineation of the buffer zone to protect the cultural heritage place in historic urban area as King Narai's Palace in the old city of Lop Buri. According to the criteria of delineation of the buffer zone that suggested in the previous section, the buffer zone can be established for King Narai's Palace to protect the cultural significance of the Palace and its setting. The buffer zone should cover all cultural significance, authenticity and integrity, and threats that were assessed in the Chapter 5. As the recommended criteria, the buffer zone boundary for protecting the significance of King Narai's Palace and its setting should have two levels enforcement.

The first level of buffer zone which protects the cultural heritage place and adjacent significant areas as the core zone. The boundary of the first level of the buffer zone covers the whole area of King Narai's Palace, the surrounded cultural heritage places within the old city of Lop Buri as Prang Khaek, Phra Prang Sam Yot, Wat Phra Si Rattana Mahathat, Vichayen House, San Phra Kan, Wat Sao Thong Thong, Wat choeng Tha that located densely in the middle of the old city of Lop Buri. In the first level of the buffer zone, cultural significance assessment, and threats assessment are required to recognize the coverage area of buffer zone to protect the value of cultural heritages and prevent internal and external threats such as destructive vibration from vehicles and trains, and the new building constructions. The authenticity and integrity of the whole area of the old city of Lop Buri should be also protected. All of recommended managing factors for physical condition and socio-economic condition for new development need to be controlled strictly.

Continually, the boundary of the second level covers the whole area of the old city of Lop Buri that had the evidences of moats, ridges, city walls, city gates, as boundary of the old city since Davarivati Era, Wat Mani Chonlakhon in the north. There are the old commercial areas and residential areas in the north and south of the old city that should be controlled as well. The boundary of the second level should expand from the line of moats in every side to protect the significance value of the old city area and as the transition to the new city area around it. Most boundary lines of buffer zones should be set on the

natural and artificial edge as a river, canals, streets, moats, and so forth. The main axis, Narai Maharat Road is the main road to the old city of Lop Buri, and through the significance circles as Si Suriyo Thai Circle and Thep Satree Circle. This road is the formal main approach to imposing sense to Lop Buri City. Recommended managing factors for this buffer zone might be less strict than the first level buffer zone. The suggested buffer zone of King Narai's Palace is shown in Fig.56



- The first level of the buffer zone
- The second level of the buffer zone
- King Narai's Palace

Fig.56 The suggested buffer zone of King Narai's Palace

This suggested boundary of buffer zone of King Narai's Palace can be an important tool for managing and protecting the significant value of the Palace and its setting. The cultural heritage conservation in the historic urban area by delineation of the

buffer zone is necessary to ensure that it has a logical and clear boundary, and that regulations and management guidelines have been developed which provide for all of the necessary protection of the significant value of the cultural heritage place.

Chapter 7

Conclusions and Further Studies

Conclusions

King Narai's Palace is a historical significant group of buildings in the historic urban area. The setting around it consists of many ancient remains, cultural heritage places, even simple buildings, residential areas, commercial areas and open spaces. To conserve King Narai's Palace should understand the setting in an inclusive way. The setting is defined as adjacent and extended environment that given its contribution to helping establish and define significance and distinctive character. The concept of buffer zone is an important tool for managing and protecting the cultural significance of the cultural heritage place and its setting.

The goals of this study were to suggest the criteria of delineation of buffer zone for the cultural heritage place in the historic urban area and to suggest management guidelines within the buffer zone. The objectives of this study were to review case studies of implementation of buffer zone from other countries finding the strength and weakness from each case. The process of land use planning was reviewed to integrate with the concept of buffer zone. Importantly, the background information in every aspect is very important data base for analyzing of this study with the opinion of local communities and related organizations.

The review of critical concepts recognized that the effective buffer zone should be a legal tool. In some countries, there are laws or regulations for enforcing the implementation of buffer zone directly. On the other hand, the related laws or regulations

especially conservation laws or spatial planning were used to enforce instead in some countries that they had no the buffer zone regulation. Like, in Thailand, there is no the law of buffer zone to protect the significance of the cultural heritage place. Therefore, the spatial law that used to enforce extensively is urban land use planning. The concept of buffer zone could be integrated with this process.

With regard to the theoretical framework derived from the review, the research methodology focused on background information that is important resource for qualitative research approach. The background information collected from review, field survey, in-depth interview, and questionnaire. All aspects of information were collected as background and history, physical conditions, socio-economic conditions, comprehensive planning, and problems and limitations of the study area. As qualitative data analysis, case studies of buffer zone implementation in various documents were analyzed by the analytic induction. A sample of 350 respondents from local communities was used to analyze their opinions about significant value of King Narai's Palace and its setting, and buffer zone concept by the quantitative method.

The result of analysis from case studies, and review had been synthesized to criteria of delineation of the buffer zone, management guidelines as recommended managing factors within the buffer zone, the opinion of local communities on the significance of Kings Narai's Palace and its setting. The criteria of delineation of buffer zone for the cultural heritage place in the historic urban area can be summarized as follows:

1. Obvious goals and objectives of delineation of the buffer zone;
2. Complete background information;
3. Understanding the significance of the cultural heritage place and its setting;
4. Understanding the authenticity and integrity of the cultural heritage place and its setting;
5. Awareness of threats, problems, and limitations;
6. Delineation the coverage boundary;
7. Levels of protection of the buffer zone;
8. Generating the continuous landscape;

9. Enforcement as the legal tool.

From these criteria, the process of assessment of cultural significance, authenticity and integrity, and threats can be integrated with the process of data analysis in urban land use planning process. The boundary of the buffer zone can be stipulated in the land use plan that is one of component of comprehensive plan. The study suggested two enforcement levels of buffer zone to protect a lot of physical, social, cultural, and economic diversities in the historic urban area. The first level covers thoroughly the area of the cultural heritage place and its setting that is adjacent around the place to protect cultural significance and affected threats. The second level covers the outside area around the first level as the transition. In the second level, the control and restriction might be less than the first level. As the result, the boundary of the buffer zone in the land use plan has to increase a new colour for clear identification. Initially, the light brown colour was used to represent the conservation area, there fore this colour was used to represent the first level of the buffer zone. The new colour that approved by Office of the Council of State of Thailand can be used for the second level of the buffer zone. The management guidelines that are suggested as recommended managing factors to control uses, activities, and conditions within the buffer zone in the land use plan are two conditions as follows:

1. Recommended managing factors for physical condition: These factors consist of various attributes that should be controlled as follows: Design, location, size, environment, and infrastructure system.

2. Recommended managing factors for socio-economic condition: These factors consist of various attributes that should be controlled as follows: Socio-economic benefits, and assistance.

These recommended managing factors can be integrated with the land use regulation. Some recommended managing factors that can not be integrated the local authority or municipality can promulgate their ordinances or laws to control those attributes instead.

In conclusion, the implementation to King Narai's Palace, the buffer zone can be stipulated around the palace with required and recommended criteria. The first level of buffer zone covers the whole area of King Narai's Palace and adjacent significant areas in

the old city of Lop Buri as the core zone. The second level of buffer zone covers the outside area of the old city of Lop Buri around the first level area, and expands away from around the moats line of the old city, and along the Narai Maharaj Road through the significance circles as Si Suriyothai Circle and Thep Sathirathai Circle.

This study can define the criteria for delineation the buffer zone for cultural heritage place in the historic urban area, and management guidelines for control the condition within the buffer zone. Furthermore, these processes can be implemented by integration with the urban land use planning process as the possible way to conserve historic urban area with spatial planning process.

Further Studies

This study aims to find the criteria of delineation of buffer zone in the historic urban area that useful for urban conservation. This section identifies briefly further studies that might usefully be concentrated:

1. The result of this study is only the list of criteria for delineation the buffer zone for controlling the unsuitable use or threats around the cultural heritage place. In practice when the buffer zone would be used in the land use plan, in the future, it should be monitored and evaluated the result from the buffer zone enforcement. The criteria are suitable for urban conservation, or it has to amend.

2. These criteria are for delineation of buffer zone in historic urban area. But the cultural heritage may be located in the natural environment, suburb, or mix environment. These criteria might be not unsuitable for those contexts. It might be necessary to find the new suitable criteria for conservation in each area.

3. This study is integrated with urban land use planning process as the spatial planning of The Department of Public Works and Town & Country Planning. However, there are other organizations that have the spatial laws in their authority such as Office of Natural Resources and Environmental Policy and Planning, and National Housing Authority.

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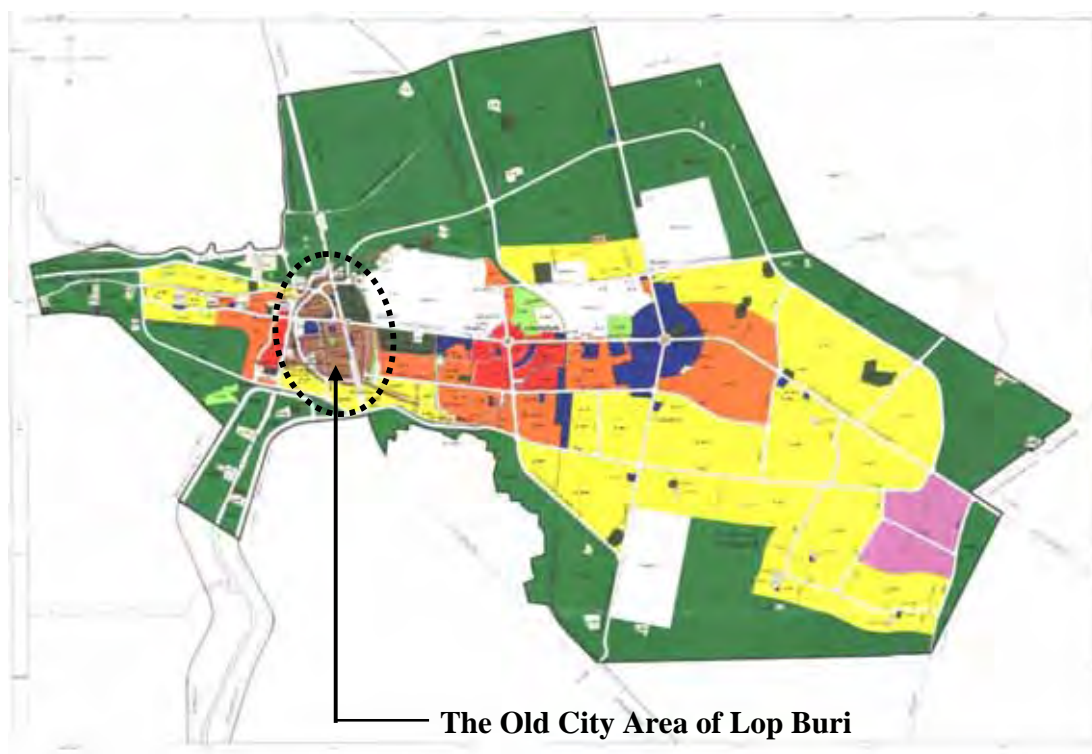
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Appendix

The Questionnaire for Communities in the Setting Around King Narai's Palace:

This questionnaire is made for the dissertation of the Doctoral Degree in Philosophy (Architectural Heritage Management and Tourism) at Silpakorn University, Thailand. The title is Review of Conservation Guidelines in Relation to Land Use Planning Aspects of Buffer Zone Affective Urban Heritage Places, Case Study: The Setting of King Narai's Palace, Lob Buri Province.



: The map of land use plan of Lop Buri city (DPT, 2549)

A. Opinions on cultural Significance and Conservation

1. Which level of cultural significance, do you think King Narai's Palace has?

☐ High ☐ Medium ☐ Low ☐ Not Sure

2. Which level of cultural significance, do you think ancient remains around King

Narai's Palace such as Prang Khaek, Wat Phra Si Rattanahat, and so forth have?

☐ High ☐ Medium ☐ Low ☐ Not Sure

3. Which level of cultural significance, do you think setting around King Narai's Palace

such as street, open space, and so forth have?

☐ High ☐ Medium ☐ Low ☐ Not Sure

4. Nowadays, most ancient remains have been conserved, does whole area within

the old city of Lop Buri has necessity for conserving?

☐ Necessity ☐ Not Necessity ☐ Not Sure

Which level of conservation does it should be?

☐ High ☐ Medium ☐ Low ☐ Not Sure

5. Which level of understanding about historic urban conservation do you have?

☐ High ☐ Medium ☐ Low ☐ Not Sure

6. Which factors do you think that can promote the effective historic urban conservation of the Old City of Lop Buri? (You can choose more than one)

.....Population Density Control

.....Appropriate Land Use

.....Building Height Control

.....Form and Material Control

.....Traffic Volume Control

.....Appropriate Infrastructure System

.....Sign Control

.....Open Space and Green Space Planning

.....Keeping View and vista of Cultural Heritage places

.....Supporting Knowledge and Understanding in Conservation to Stakeholders

.....Enhancing Community ParticipationImplementation of Conservation Plan

7. Have you received the information about historic urban conservation in Lop Buri?

☐ Yes ☐ No

8. Have you participated in historic urban conservation in Lop Buri?

☐ Yes ☐ No

9. Which level of cultural significance, do you think the setting outside the old city of Lop Buri has?

☐ High ☐ Medium ☐ Low ☐ Not Sure

10. Does the setting outside the old city of Lop Buri has necessity for conserving?

☐ Necessity ☐ Not Necessity ☐ Not Sure

Which level of conservation does it should be?

☐ High ☐ Medium ☐ Low ☐ Not Sure

B. Opinions on Lop Buri Comprehensive Plan

11. Which level of understanding about comprehensive planning do you have?

☐ High ☐ Medium ☐ Low ☐ Not Sure

12. Which level do you think the urban land use has necessity for historic urban conservation?

☐ High

☐ Medium

☐ Low

☐ Not Sure

13. Which level do you think the buffer zone has necessity for historic urban conservation?

☐ High

☐ Medium

☐ Low

☐ Not Sure

Biography

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