

CONCLUSIONS AND RECOMMENDATIONS

I. Conclusions

1. Classification and evaluation of landscape diversity characteristics

- ***PB:** building with low-rise, row houses, local architecture
- ***IA:** buildings with mixed height, row houses, Western architecture
- ***IB:** buildings with mixed height, Western architecture
- ***IIIA:** buildings with low-rise, Western architecture
- ***IIIB:** buildings with low-rise, local architecture
- ***VA:** buildings with low-rise, row houses, Chinese architecture
- ***VB:** buildings with mixed height, row houses, Chinese architecture

2. Developing a system of criteria, methods, ways for landscape diversity design: combination criteria; connection criteria; adaptation criteria; safety criteria.

3. Developing design solutions for diverse landscape of seven street groups in old downtown of Ho Chi Minh City

- a. Establishing specific identification codes of the typical street landscape groups.
- b. Checking the level of response to the criteria of landscape diversity design.
- c. Selection of landscape diversity design way for each type of commercial and service streets in Ho Chi Minh city old downtown.

II. Recommendation

- 1. Maintenance and development the landscape features should be considered as a key task in the development of street space in Ho Chi Minh City.
- 2. There should be more researches to build a set of specific standards and regulations for the development of landscape architecture in Ho Chi Minh City
- 3. Raising awareness and promote the role and responsibilities of the community in urban centers about development landscape diversity of Ho Chi Minh City old downtown.

PREAMBLE

1. The necessity of the subject

Ho Chi Minh City is a city having many cultures, architectural styles and different lifestyles. This makes Ho Chi Minh City characterized of diverse urban, satisfying the diverse elements: space diversity, cultural diversity. According to the Saigon master plan of Coffyn, designed in the early 20th century, together with public spaces, the commercial areas of Ho Chi Minh City were also identified as the main points for the city development. Therefore, the commercial streets in its old downtown also displayed very obvious diversity.

Vietnamese people have adjusted the urban spaces planned by French people in order to match with their lifestyle for more than 100 years. Besides, many old commercial buildings have been demolished and replaced with new buildings, causing the disturbance of life and cultural values of the city, leaving many streets losing their original landscapes and become the same style. Their uncontrolled diverse development causes the cluttered, loss of order and unsafety.

From this above situation, the author has chosen the subject “Design for landscape diversity of commercial streets in the old downtown of Ho Chi Minh City” in order to find the oriented development for those streets on the basis of maintaining and developing their inherent diverse characteristics.

2. Subjects of the research

- The landscape of the commercial streets in old downtown of Ho Chi Minh city.

- The criteria and design solutions for landscape diversity of commercial streets in the old downtown of Ho Chi Minh city.

3. Purpose of the research

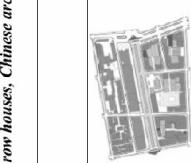
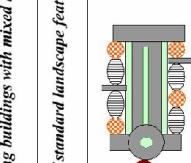
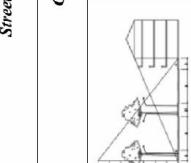
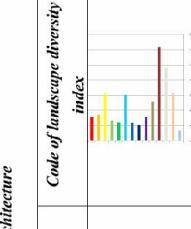
- To classify and evaluate the groups of commercial street landscape in the old downtown of Ho Chi Minh City
- To establish the criteria for landscape diversity of commercial streets in the old downtown of Ho Chi Minh City
- To propose the design solutions for landscape diversity of commercial streets in the old downtown of Ho Chi Minh City

4. Research Contents

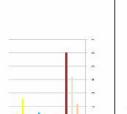
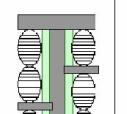
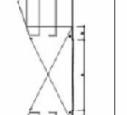
- The concept of landscape diversity and designs for landscape diversity.
- The theories and case studies of design for landscape diversity.
- The landscape characteristics of commercial streets in the old downtown of Ho Chi Minh City
- The scientific basis of design for landscape diversity
- To classify and evaluate the groups of commercial street landscape in the old downtown of Ho Chi Minh City
- To establish the criteria for landscape diversity of commercial streets in the old downtown of Ho Chi Minh City
- To propose the design solutions for landscape diversity of commercial streets in the old downtown of Ho Chi Minh City

5. Research Methodology: Methods of fieldwork; Historical Method; Methods of sociological surveys; Mapping Method; Statistical Methods; Analytical Methods; Integrated Method; Comparative method; Multi-criteria assessment Method.

3.3.3.7. Typical street group VB: Streets having buildings with mixed height, row houses, Chinese architecture

SOLUTION OF LANDSCAPE DIVERSITY DESIGN		TYPICAL STREET GROUP VB <i>Streets having buildings with mixed height, row houses, Chinese architecture</i>	
Specific identification codes of landscape diversity	Code of standard landscape feature	Code of landscape diversity index	Safety criteria
	  	 Design type: no diverse building area, diverse the form of building type combination, mixed height, different building width, having subsidiary buildings in front of main building, diverse colour; Various commercial business types; Various traffic types; A lot of alleys and intersections.	- Commercial type (4.81) - Colour (6.16) - Tuổi thọ công trình (3.08) - Chiều ngang khu đất (3.01). - Traffic type (3.15)
Methods and design ways for diverse landscape design	Combination criteria - Maintenance existing status	Adaption criteria - Having public space - Suitability for social activity - Network with easy access and diversity	- Having regulation of all activities for each area.

3.3.3.6. Typical street group VA: Streets having buildings with low-rise, row houses, Chinese architecture

TYPICAL STREET GROUP VA Streets having buildings with low-rise, row houses, Chinese architecture	
SOLUTION OF LANDSCAPE DIVERSITY DESIGN	Code of standard landscape feature
Specific identification codes of landscape diversity	<p>Code of landscape diversity index</p>  <p>-Commercial type (4.21), Colour (6.02).</p> <p>Code of landscape diversity index</p>  <p>Design type: diverse building age, the form of row houses combination, having subsidiary buildings in front of main building, diverse colour; Various commercial business types; A lot of alleys and intersections.</p> <p>Code of standard landscape feature</p>  <p>Code of landscape diversity index</p>  <p>Design type: diverse building age, the form of row houses combination, having subsidiary buildings in front of main building, diverse colour; Various commercial business types; A lot of alleys and intersections.</p>
Methods and design ways for diverse landscape design	<p>Combination criteria</p> <ul style="list-style-type: none"> - Combination of material space factors which have different style - Combination of different building ownerships - Combine big and small commercial company <p>Connection criteria</p> <ul style="list-style-type: none"> -Having public space -Suitability for social activity <p>Adaption criteria</p> <ul style="list-style-type: none"> - Adaptation to natural environment <p>Safety criteria</p> <ul style="list-style-type: none"> - Having a strong and clearly boundary -Having regulation of all activities for each area.

6. Scope of the research: The typical commercial street in three old districts in Ho Chi Minh City, including District 1, District 3, District 5. Applying the scientific basis from two fields: landscape architecture and urban design.

CHAPTER 1: OVERVIEW

1.1. The concepts, terminology in relations to the subjects of research

1.1.1. The concept of diversity and design for diversity

1.1.1.1. The concept of diversity

* Definition

A diverse area is a place where gathers of many people with different of economic conditions, culture, race, gender, age, lifestyles ... The formation of many kinds of the building and many different composition of populations is an essential feature in the diversity area. ("Design for diversiry" Emily Talen, 2008).

* The meaning of diversity

- *Vitality of diverse areas:* The diversity brings economic development and ecological balance to the areas (creating sustainable development basis).

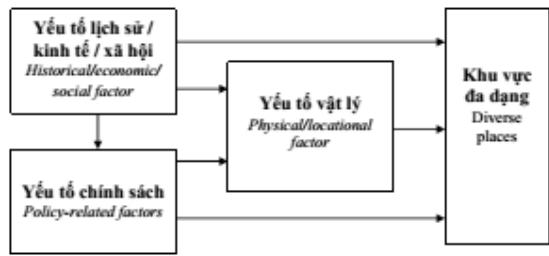
- *Social justice:* The diversity ensures the better access to resources for all social groups

* Diversified development trend

From the late 20th century, there was the movement to support the ideal for diversity, from residential component diversity, living space diversity to diversity of social institutions. One of the pioneers of this ideal is Jane Jacobs (1916-2006), the famous American researcher. Following Jane Jacob, there have been plenty of researches and

designing about the ideal of diversity, forming a strong trend across the world with the famous authors such as Emily Talen (USA), Ian Bentley (England) ... In the East, the socio-cultural characteristics of some countries like Japan or Hong Kong have been more favorable to this ideal, so they could help to blend the diversity in life naturally and inevitably as aism. There were some well-known researchers in this field such as Yoshinobu Ashihara (Japan), William SWLim (Singapore).

* The factors that form the diversity



1.1.1.2. Concept of diversity design

Diversity design is a design used for the buildings or spaces that have the physical diversity elements. Physical factor is one of three key elements of a diverse area (*Physical factors, Historical/economic/social factors and Policy factors*). These factors have discernment and linked by a chain of interactions.

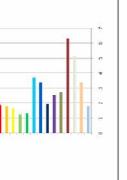
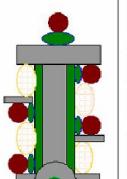
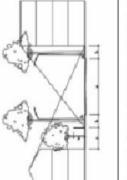
1.1.2. The concept of landscape diversity and landscape diversity design of commercial streets

Landscape diversity design of commercial streets: the activities aimed at maintaining and developing the diversity of the physical elements which constitute the landscape diversity.

3.3.3.5. Typical street group IIIB: Streets having buildings with low-rise, local architecture

TYPICAL STREET GROUP IIIB <i>Streets having buildings with low-rise, local architecture</i>	
Code of standard landscape feature	Code of landscape diversity index
Specific identification codes of landscape diversity	<ul style="list-style-type: none"> - Commercial type (5.13) - Colour (6.32) - Chiều ngang khu đất (3.68) - Khoảng lùi (3.08) - Traffic type (2.76)
Combination criteria	Adaption criteria
Methods and design ways for diverse landscape design	<ul style="list-style-type: none"> - Having a strong and clearly boundary - Activation "dead" areas - Manual supervision and technical monitor

3.3.3.4. Typical street group IIIA: Streets having buildings with low-rise, Western architecture

TYPICAL STREET GROUP IIIA Streets having buildings with low-rise, Western architecture											
Specific identification codes of landscape diversity	<p>Code of standard landscape feature</p>    <p>Diverse tree; Having water surface; Having open space; Having Square; Design type: diverse building function, diverse building age, diverse the form of building type combination, diverse building type, mixed height, different height, different building width, having subsidiary buildings in front of main building, diverse front yard, diverse fence, diverse parking lot, diverse building facade, diverse colour; Various commercial business types; Various traffic types; Pavement width: 4-6m; - A lot of alleys and intersections.</p>										
Methods and design ways for diverse landscape design	<p>Code of landscape diversity index</p>  <p>- Commercial type (4.45) - Colour (4.94) - Chiều ngang khu đất (4.55) - Khoảng lùi (3.37). - Traffic type (3.35)</p> <p>Adaption criteria</p> <table border="1"> <tr> <td>Connection criteria</td> <td>Adaption criteria</td> </tr> <tr> <td>- Suitability for social activity</td> <td>- Maintenance existing status</td> </tr> </table> <p>Safety criteria</p> <table border="1"> <tr> <td>Combination criteria</td> <td>Adaption criteria</td> </tr> <tr> <td>- Maintenance existing status</td> <td>- Activation "dead" areas</td> </tr> <tr> <td>- Methods and design ways for diverse landscape design</td> <td>- Manual supervision and technical monitor</td> </tr> </table>	Connection criteria	Adaption criteria	- Suitability for social activity	- Maintenance existing status	Combination criteria	Adaption criteria	- Maintenance existing status	- Activation "dead" areas	- Methods and design ways for diverse landscape design	- Manual supervision and technical monitor
Connection criteria	Adaption criteria										
- Suitability for social activity	- Maintenance existing status										
Combination criteria	Adaption criteria										
- Maintenance existing status	- Activation "dead" areas										
- Methods and design ways for diverse landscape design	- Manual supervision and technical monitor										

1.2. Overview of landscape diversity design for commercial streets in urban centers

In some Asian cities, the landscape diversity has been formed naturally and maintained effectively. In European and US cities, there was a reconsideration on the theory of modern urban architecture and encouraging the trend to shift from planning method "template" to planning model "diversity, adaptation" (The Death and Life of Great American Cities - Jane Jacobs, 1961). The theoretical and practical lessons learned from the success of landscape diversity design in developed cities such as Tokyo, Hong Kong have created the platform of the comprehensive development solution for the urban landscape design in Asia, including Ho Chi Minh city. The methods measure diversity indices have led to the expectations on establishing a scientific design method for the development of landscape diversity on commercial streets of Ho Chi Minh city.

1.3. Overview of the characteristics and classification the groups of commercial street landscape in the old downtown of Ho Chi Minh City

1.3.1. History

Experiencing the development periods: the period before 1858; 1859 -1955; 1956 – 1975; 1975 to the present.

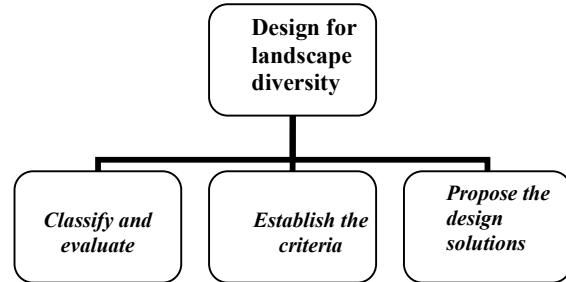
1.3.2. Landscape features of commercial street landscape in the old downtown of Ho Chi Minh City

In the old center of District 3 (including Districts 1,3,5) have the typical streets with the characteristics represented for each district, and the most common ones in urban areas of Vietnam

*PB: building with low-rise, row houses, local architecture

- ***I A:** buildings with mixed height, row houses, Western architecture
- ***I B:** buildings with mixed height, Western architecture
- ***III A:** buildings with low-rise, Western architecture
- ***III B:** buildings with low-rise, local architecture
- ***V A:** buildings with low-rise, row houses, Chinese architecture
- ***V B:** buildings with mixed height, row houses, Chinese architecture

1.4. The thesis subject



CHAPTER 2: THE THEORY BASIS OF THE THESIS

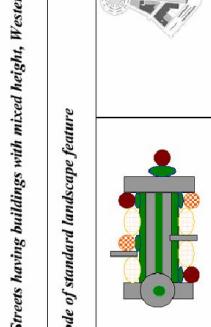
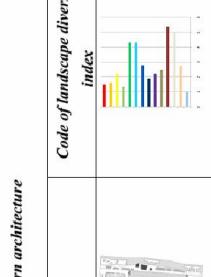
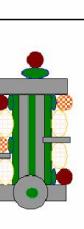
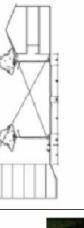
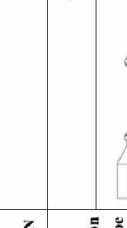
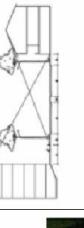
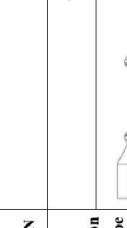
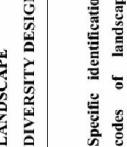
2.1 The rationale applied in diverse landscape design

2.1.1. The theory basis to classify, evaluate the characteristics of landscape diversity

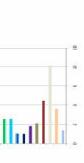
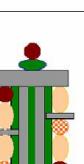
2.1.1.1. Classifying the landscape characteristics according to the block spatial elements

There are five factors that shape the landscape space, including: *Terrain, Trees, Water Surface, Available Space, Architecture*. The thesis uses five factors as the basis for determining the block spatial elements of the commercial streets. Besides, the streets represent the difference through other elements: Function; Structure; Architecture; Feature.

3.3.3.3. Typical street group IB: Streets having buildings with mixed height, Western architecture

TYPICAL STREET GROUP IB <i>Streets having buildings with mixed height, Western architecture</i>	
SOLUTION OF LANDSCAPE DIVERSITY DESIGN	Code of standard landscape feature  Code of landscape diversity index 
Specific identification codes of landscape diversity	  
Combination criteria	Adaption criteria  Connection criteria  Safety criteria 
Methods and design ways for diverse landscape design	 Adaption criteria  Connection criteria  Safety criteria 

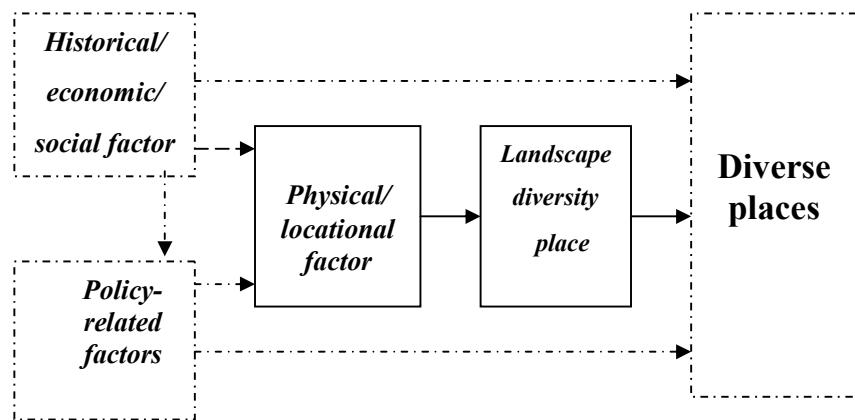
3.3.3.2. Typical street group IA: Streets having buildings with mixed height, row houses, Western architecture

TYPICAL STREET GROUP IA <i>Streets having buildings with mixed height, row houses, Western architecture</i>													
SOLUTION OF LANDSCAPE DIVERSITY DESIGN	Code of standard landscape feature												
Specific identification codes of landscape diversity	<p>Code of landscape diversity index</p>    <ul style="list-style-type: none"> - Many kind of trees. - Having water surface. - A lot of opened space. - Having square. - Design type: diverse building function, diverse building age. The form of row houses combination, diverse building type, mixed height, different building width, having subsidiary buildings in front of main building; Diverse parking lot; Diverse building facade; Diverse colour. - Various commercial business types; Various traffic types. - Pavement width: 5-7.5m. - A lot of alleys and intersections. 												
Methods and design ways for diverse landscape design	<p>Code of landscape diversity index</p> <table border="1"> <thead> <tr> <th>Combination criteria</th> <th>Connection criteria</th> <th>Adoption criteria</th> <th>Safety criteria</th> </tr> </thead> <tbody> <tr> <td>- Maintenance existing status</td> <td>- Maintenance existing status</td> <td>- Maintenance existing status</td> <td>- Maintenance existing status</td> </tr> <tr> <td>- Maintenance existing status</td> <td>- Maintenance existing status</td> <td>- Maintenance existing status</td> <td>- Maintenance existing status</td> </tr> </tbody> </table>	Combination criteria	Connection criteria	Adoption criteria	Safety criteria	- Maintenance existing status							
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- Maintenance existing status	- Maintenance existing status	- Maintenance existing status	- Maintenance existing status										

2.1.1.2. To assess landscape diversity

* The frame of diverse elements

The frames of diverse elements including the physical elements constituting the landscape: Block spatial elements; Activity spatial elements.



* The diversity index of the landscape

The thesis uses Simpson's formula to measure the diversity index of the landscape. According to this method, the higher diversity index, the more diversity landscape exists in that area and its elements are almost of the same quality.

$$A = \frac{N(N - 1)}{\sum i n_i(n_i - 1)}$$

2.1.1.3. The rubrick to emotionally evaluate landscape

The perception of the street landscape includes: beauty - ugly, light - dark, traditional - modern ... (visual), hot - cool (touching), noisy - quiet (hearing) ... This research applies common assessment Japanese

methodology, and is based on the five-levelled scale (Godankai Hyōka).

2.1.2. The theory basis to create criteria, method for designing the landscape diversity

2.1.2.1. The theory basis to create design criteria

From the theoretical basis: *The conditions of landscape diversity of Jane Jacobs; Criteria for adaptive landscape diversity of Ian Bentley; The design criteria diversity landscape of Emily Talen*, the thesis proposed four criteria for designing landscape diversity: *Combination criteria; Connection criteria; Adaptation criteria; Safety Criteria.*

2.1.2.2. The theory basis to create design method

Because of the physical elements constituting the street landscape includes two main factors: the block spatial element and the operation spatial element, therefore the design method for each group is followed these two factors.

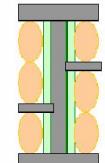
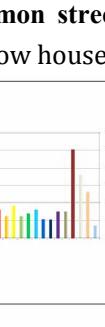
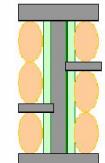
2.1.2.3. The theory basis to create design steps

- Based on the criteria and methods for diversity landscape design.
- Simulation on the characteristics of the streets having highest diversity landscape in old downtown of Ho Chi Minh City.
- Consistent with the characteristics of all street groups.
- Based on some design methods supporting the diversity urban.
- Based on the design experience for urban in the world.

2.1.3. The theory basis of design solutions for diverse streets in old downtown of Ho Chi Minh City

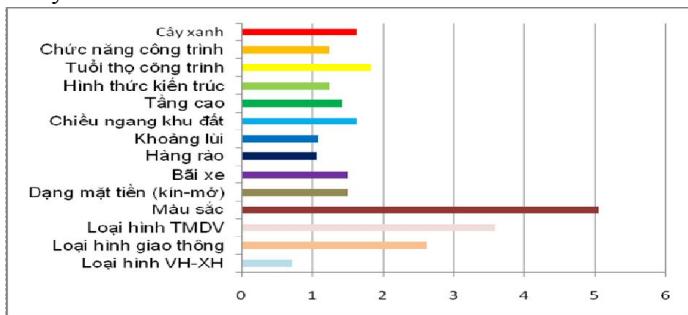
First of all, the diverse area needs to have a specific code to identify the diversity landscape characteristic and clarify into groups.

3.3.3.1. Common street group (PB): Streets having building with low-rise, row houses, local architecture

SOLUTION OF LANDSCAPE DIVERSITY DESIGN		COMMON STREET GROUP Streets having building with low-rise, row houses, local architecture		
Specific identification codes of landscape diversity	Code of standard landscape feature	Code of landscape diversity index		Safety criteria
		Combination criteria	Connection criteria	
	 	 - Design type: The form of row houses combination; Having subsidiary buildings in front of main building; Diverse parking lot; Diverse colour. - Various commercial business types; Various traffic types. - A lot of alleys and intersections.	 	- Commercial type (3.59) - Colour (5.05) - Traffic type (2.62)

3.3.1.2. Code of landscape diversity index

The results show that the features of commercial type bring the highest landscape diversity value. The features of color type is rating number 2. Building age is rating number 3. In addition, features such as height, width area, front yard, type of traffic are also high diversity value. Therefore, the streets with these properties achieved higher diversity values need to use them in setting Code of landscape diversity index.



3.3.2. Checking the level of response to the criteria of landscape diversity design in each commercial street group of Ho Chi Minh old downtown .

Based on the framework of criteria and methods of landscape diversity design, checking table for each commercial street group was established.

3.3.3. Selection of landscape diversity design way for each type of commercial and service streets in HCM old downtown.

After that, each group is matched with the diversity criteria and design methods in order to test the suitability and adaptation to diversity of each group.

Finally, proposing the appropriate methods for landscape diversity design to make the complements of criteria, methods to enhance diversity landscape design.

2.2. The practical basis applied in landscape diversity design

2.2.1. Landscape diversity design in Chicago

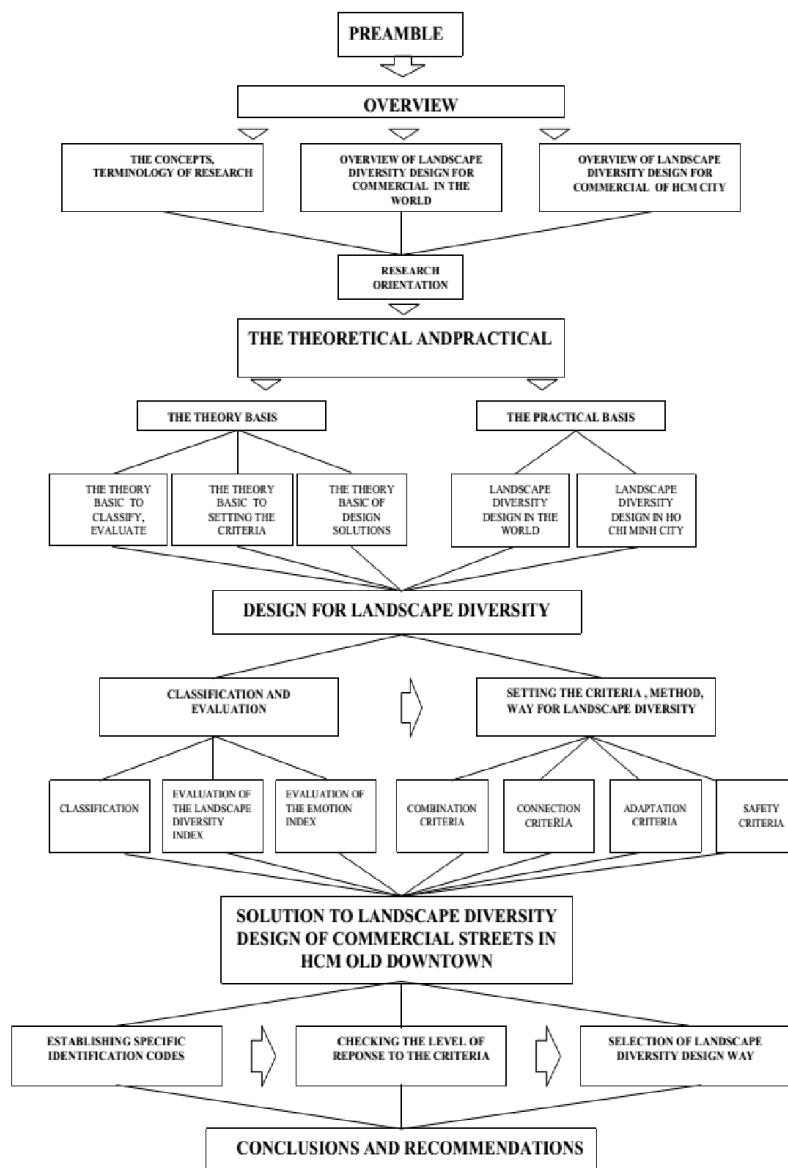
Including: Awareness of the value of diversity in the community, to reduce the pressure to develop new projects, social connection, the role of the social unions

2.2.2. Landscape diversity design in Tokyo

Including: Street landscape continuously changes over time; the street landscape have formed different areas with different characters, coexistence rather than elimination.

2.2.3. Landscape diversity design in Hong Kong

Including: Flexible and opened plan for landscape diversity with friendly design, high building and the surprising design.



features are not used in setting specific Code of standard landscape features.

Name of Street Group	Street Group	TYPICAL STREET GROUP			Street Groups of District 5 (V1-V2, V4-V5)
		Street Groups of District 1 (I1-I6, I7-I9, I10)	Street Groups of District 3 (III4, III7, III8, III9)	Street Groups of District 5 (V1-V2, V4-V5)	
Phan Bao Thanh	Ia (I-4, I-5, I-8)	Streets having mixed buildings with mixed height, row houses, Western architecture	Streets having mixed buildings with low-rise, row houses, Chinese architecture	Streets having mixed buildings with low-rise, row houses, Chinese architecture	
Chieu mang	Ib (I-2, I-3, I-5)	Streets having mixed buildings with mixed height, row houses, Western architecture	Streets having mixed buildings with low-rise, row houses, Chinese architecture	Streets having mixed buildings with low-rise, row houses, Chinese architecture	
Landscape Characteristic					
Thien mai					
Sang sua					
Cao cap					
Hien dai					
Co moi					
Landscape Emotion					
Gia					
Sang sua					
Cao cap					
Hien dai					
Co moi					
Landscape Diversity Index					
Tree	Building age	Architectural Style	Commercial type	Width	Front Yard
Parking	Building function	Colour			Fence
	Front Façade				Culture - Social type

3.3. Solution to diversity landscape design of commercial streets in Ho Chi Minh old downtown.

3.3.1. Setting specific identification codes of the typical street landscape groups

Specific identification codes of the typical street landscape groups are not only help to maintain the characteristics of inherent landscape diversity, but also help to improve the diversity of street landscape. So we need to select the characteristic landscape on the two requirements as below.

3.3.1.1. Code of standard landscape features

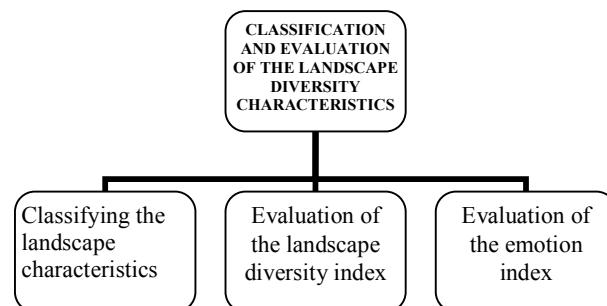
As the results of classification, evaluation characteristic landscape diversity, the features of the street groups show a lot of diverse variables which are measured by various indicators such as: trees, building functions, building age, building architecture, building height; building width, front yard, fence, parking area, building front facade (closed-opened), color, commercial type, traffic type, culture type, social type... Therefore, the street groups have the above-mentioned characteristics which get high diversity values need to use them in setting specific Code of standard landscape features.

Other features such as the water surface, opened- spaces, squares, the form of combined building, subsidiary building, pavement width, alley, intersection...can not be measured diversity level, but these properties are also supportive landscape diversity. Therefore, it is possible to use them in setting specific Code of standard landscape features

According to my finding, there is no clear relationship between the width of the road, building density, coefficient of land usage and landscape diversity in the commercial streets. Therefore, these

CHAPTER 3: FINDINGS

3.1. Classification and evaluation results of the typical commercial streets in old downtown of Ho Chi Minh City



3.1.1. Classification results according to physical factors constituting landscape: Classification into 7 street groups

* **PB (Popular):** Streets having building with low-rise, row houses, local architecture

* **IA:** Streets having buildings with mixed height, row houses, Western architecture

* **IB:** Streets having buildings with mixed height, Western architecture

* **IIIA:** Streets having buildings with low-rise, Western architecture

* **IIB:** Streets having buildings with low-rise, local architecture

* **VA:** Streets having buildings with low-rise, row houses, Chinese architecture

* **VB:** Streets having buildings with mixed height, row houses, Chinese architecture

3.1.2. Evaluation results about the characteristic of landscape diversity

Reviewed characteristic landscape diversity through two surveys results, including the diversity of the physical elements constituting the landscape, the diverse index calculation results of typical commercial streets in old downtown of Ho Chi Minh City.

3.1.3. Evaluation results about the landscape emotion

* The main factors affecting the assessment of landscape emotion:

- Likes: Depending on factors: Beautiful, Bright, Open, Modern.
- Attractive: Depending on factors: Beautiful, Open, Bright, Comfortable, Luxury, Ancient, Modern.
- Wish to come: Depending factors: Beautiful, Open, Bright.

Thus, the key influence elements are as follows (from highest to lowest level):

Beautiful > Openness > Bright, Comfortable > Luxury, Traditional, Young > Modern.

There is a large difference in assessment of landscape emotion about the landscape of 30 streets. The streets having high landscape diversity are more attractive than others. The favorite extent is less change with age (young - old) or trendy (modern-traditional), but more depending on the elements of open, bright, comfortable.

3.2. Building criteria, methods and design ways for diverse landscape design of commercial treets in Ho Chi Minh old downtown.

