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**LHASA URBAN MORPHOLOGY EVOLUTION
AND CONSTRUCTION PATTERNS ANALYSIS**

Abstract: *With the rapid development of Lhasa, a huge collision has emerged between the traditional urban form and the modern urban form. This article takes the temple areas, independently constructed settlements, modern apartments and modern service-centers as case studies, compares the textures, the lanes, the architectural prototypes and the living styles of these case studies from the comparative view of spontaneous construction mode and planning & construction mode. Finally, it explores Lhasa's urban form characteristics and evolution patterns so as to provide the theoretical support and the reference to the study on individualized and localized urban forms in Lhasa.*

Keywords: *spontaneous construction, planning & construction, urban form typology, Tibetan culture, Lhasa city.*

Introduction

Urban morphology not only reflects the urban elements under the geospatial scope, but also records the development of the city. The feature of its constitution and changing is the result of contradictions inside and outside. Diverse bases of productivity, economy, society, natural environment, humanity, and so on, have this city burgeon with different characteristics of times. Except for the urban planning, most cities develop following their own society, economics, natural environment and technology. (Qi, 2011) As the result of urbanization, urban morphology keeps changing and developing under the social economy development and meets the demands pertaining to people and developing society. The process of government-allocating land transfer is executed on the basis of planning & construction, different kinds of planning regulations and completed by developers. While, the process of spontaneous construction is through private farmland transaction, according to former land scale and relevant data management, and whose architectural style and form are completed by private construction group as the residents intended. Thus, the spontaneous construction follows a natural law, and whose development demonstrates the evolution in different times. Lhasa, the capital city of Tibet Autonomous Region, is located on a 3650-meter-high plateau, possessing an average sunlit time over 3000 hours. As the centuried Tibetan Buddhism predominates in local politics, economics, culture and region, Lhasa is featured in Tibetan traditional culture and particular urban morphology. While modern urbanization changed urban form, complicated component elements, brought in more population, striking the formal urban morphology. Based on the typical example, Lhasa, the article will analyze the form, factors in forming, merits and demerits through morphological typology, and put forward the importance of duration and regionalism in the urban construction.

Evolution of urban morphology in Lhasa

Lhasa, meant “Holy Land” or “Buddhist land” in Tibetan, with the superior geographic location, has been the traditional plateau city the southeast frontier of China for more than 1300 years. Cultivated from Tibetan Buddhism, the traditional Tibetan culture influenced the spatial form and functional organization. (Fan, 2016)

Generally, the traditional urban morphology of Lhasa uses regional buildings as the node and connects functional areas through circumanbulations, whose functional component elements are simple.

While, the modern urban morphology of Lhasa, in comparison with the former one, adds modern functional component elements, uses landmarks as the node, expands the scale of public buildings and cultural buildings, perfects urban infrastructures, enriches the space forms and varieties, preserves the pattern of Potala Place, extends axes (including the InterContinental Hotels & Resorts on the west-east axis and Princess Wencheng Theatre on the north-south axis) and enhances city loop traffic enriching the diversity of landscape and making a more effective traffic system. All of the methods present the unique characteristic in modernizing Lhasa.

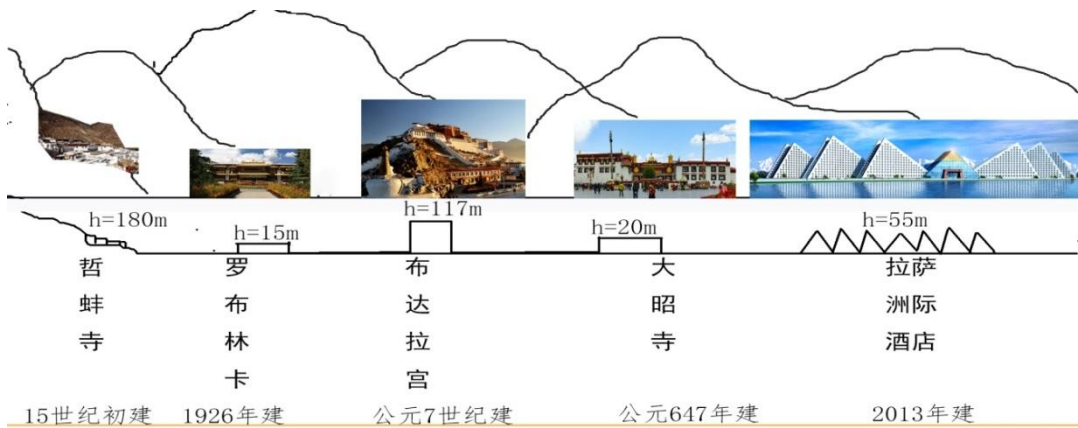
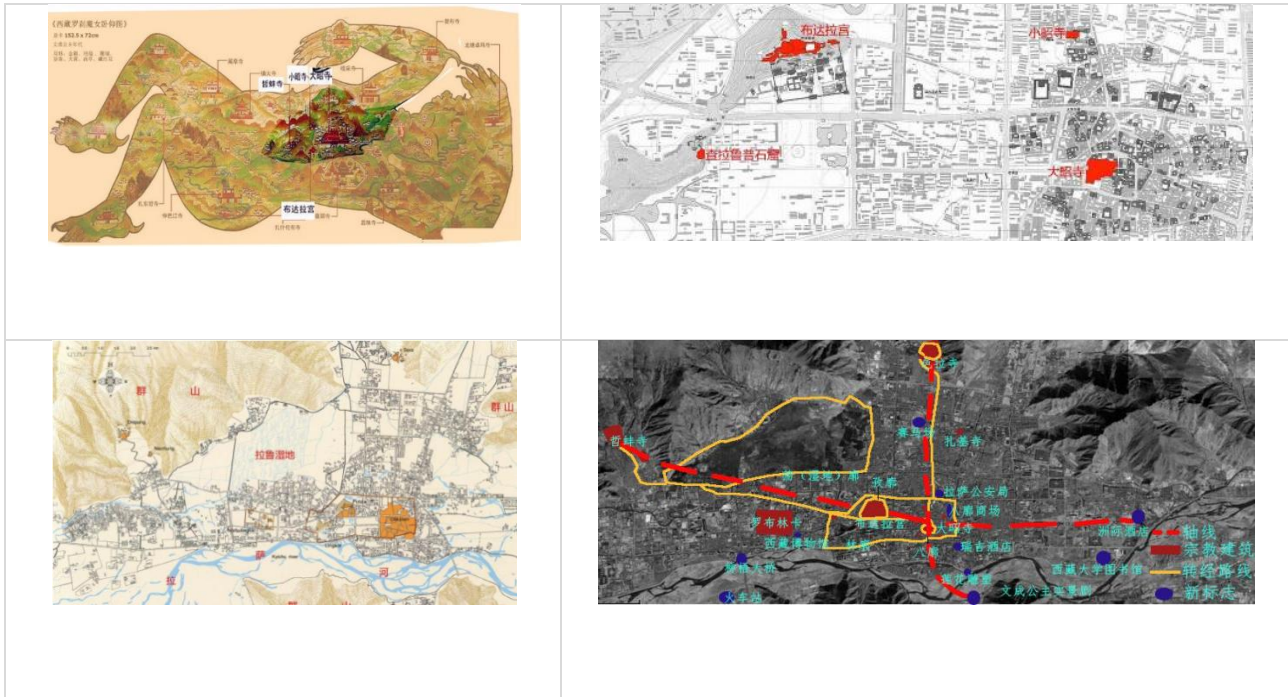


Figure 1. The Abstract Drawing of Nowadays Lhasa Skyline. (Pu, 2018)

Analysis on the typical case studies







1. Urban Form through Spontaneous Construction

The spontaneous construction mentioned in this research is an early urban form measure spontaneously developed by local residents in the form of courtyards on the divided private lands. The illogical layout is naturally developed following the finger-like roads and is now deemed as the traditional dwelling form. In the constant traditional residential area, the continuity of space

and time makes every single moment of local people's daily life disinter through the details in the space construction. The spatial pattern of Lhasa's traditional urban areas wholly reflects the process of how the local shape their space in a marvelous way. (Tian Kai, 2014) There are two main types of spontaneous constructions modes in Lhasa, one is the regional areas influenced by Tibetan Buddhism culture, and the other is the communities autonomously constructed by citizens. As for the urban planning led by the government, the typical cases are Chengguan Garden and Tibet Convention and Exhibition Center.

Morphological Characteristics of Jokhang Temple Area

Jokhang temple area, where the oldest settlements existing in Lhasa (Knud Larsen and Amund Sinding-Larsen, 2005), is surrounded by temples, including aristocrat compound and a few small temples soon after Jokhang Temple has been built, and ordinary courtyard and public buildings gradually built around them, reflect a social hierarchy. The early architectural form ‘courtyards’ transformed into ‘slabs’. The layout evaluated from irregular to regular harmony. Building density from inside to outside changed at a range of 45%-60%. The building height in the center area is two-floor and became five-floor in outskirts area. The plot rate is more than 3. Most ratios between height and width are 3:1, except Barkhor which is 2:3. The naturally developed road network looks like a spider net which is totally different from common “chessboard” in mainland ancient cities. (Wang, 2014) The three architecture styles incarnate a certain space order, strict hierarchy and urban morphology characteristics, which are: temple building (with Jingding, white, red and yellow colors and thick walls, etc), aristocratic residence (with red walls constructed by 1.5 meter-high bricks and white walls featured in hand-grasp surface) and common compound (with rough stone walls and side walls). (Wang, 2014) Without a unified plan in early time, there are a lot of problems at present. For example, government is trying to improve and update infrastructure construction and mitigate the high pressure of population in central areas and has paid more attention to the sustainable urban development.






Chart 1. Morphological Characteristics of Jokhang Temple Area. (Pu, 2018)		
Attribute: Influenced by Tibetan Buddhism		
Location: Lhasa Old Downtown		
Texture	Building Prototype	Lane
	<ol style="list-style-type: none"> Temples  Traditional courtyards  Common courtyards  	 

Morphological Characteristics of Garmargonan Community.

In ancient time, there was a Tibetan Buddhist Gammah temple named "Garmargonsan" in this area, which no longer exists now. (Dawa, 2016) And in 1980s people began to build

houses on farmland. With the development of Lhasa city suburbs, the small village turned into a downtown. And the spontaneous construction formed a free urban texture and a dense, messy and complex social form. The only three intensive public green areas are surrounded by varieties of dwellings. The "spider web" of urban texture consists of high building density (50%), mixed building styles, filthy environment, impassable roads and random layouts along streets, like the old downtown, which is extremely compact and messy, showing a typical spontaneous construction space in two-thirds of Lhasa.

Chart 2. Morphological Characteristics of Garmargonan Community. (Pu, 2018)






Attribute: Spontaneous Construction		
Location: Eastern Lhasa (about 1000m away from the old downtown)		
Texture	Building Prototype	Lanes
	<p>1.Traditional Dwellings</p>  <p>2.Modern Dwellings</p> 	 

2. Urban Form under Planning & Construction

With future eyes, scientific reasoning and expert decision-making, planning & construction is to comprehensively deploy the future urban development, the reasonable layout, the integrated projects and so on, to consider the urban structures - economic structure, social structure and space structure, to put people first, and to meet the traffic demand, through creating the urban morphology under the blueprint of urban development. (Qiu, 2008) As Giovannoni's theory "palimpsest" pointed out that urban form is a stage in the process of endless transformation, and the form itself can self-protect and form its own trajectory. Thus, although the urban form under planning & construction has innovated and developed a lot, it still inherits a certain degree of traditional texture. In the modern urban morphology of Lhasa, it is not only the urban form, but also the traditional characteristics of buildings and decorations that meet the needs of modern informative life. We observed the autonomously constructed urban places from residential areas and public spaces in these two aspects.

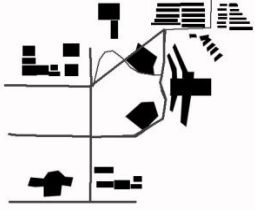





Chengguan Garden

Chengguan Garden as a typical early urban planning residential area in Lhasa, with relatively complete facilities, successively developed A, B, C, D, E, F groups in enclosed or linear texture, and most of whose residential are middle-income or high-income. The early developed Group A is, as the survey showed, an idea residential place, for taking advantages of its 2-floor Tibetan exclusive courtyard, open layout, sufficient sunshine distance (height-to-width ratio 1:1) and 1.1 plot rates. Compared to A, Group C was built in the period when house prices raise rapidly, land became lacking, and the new policy limited building exclusive courtyards, resulting in the middle-level and high-level residential buildings (8 floors in average), 2:1 sunshine distance ratio, 3.2 plot ratio, the harmonious traditional architectural elements on facades and the north-south linear texture, revealing a trend of the compact and economic layout.

Chart 3 Morphological Characteristics of Chengguan Garden. (Pu, 2018)		
Attribute: Modern residential area		
Location: North Suburb of Lhasa		
Texture	Building Prototype	Lanes
	<ol style="list-style-type: none"> 1. Tibetan Courtyard  2. Tibetan Apartment  	 

Tibet Convention and Exhibition Center

Started in 2012, the large-scale center consists of 17-floor InterContinental Hotel and open squares, perfectly engaging with surrounding mountains, providing public spaces and creating a fine landscape, representing the large-scale public buildings in modernizing Lhasa.

Chart 4 Morphological Characteristics of Tibet Convention and Exhibition Center. (Pu, 2018)		
Attribute: Modern Public Buildings		
Location: Eastern Lhasa		
Texture	Building Prototype	Lanes
	<p>InterContinental Hotel</p>  <p>Tibet Convention and Exhibition Center</p>  <p>Mass Art Gallery</p> 	 

Conclusion

This study analyzes the typical morphological characteristics of Lhasa city by case study, and it aims to explore pros and cons in spatial form between the spontaneous construction and planning & construction in the urbanization process in Lhasa. As the article illustrated above, though being accompanied with various spatial forms, harmonious neighborhood and detached residential prototype, the spontaneous construction still brought about a lot of problems such as disorder space forms, poor environment, impassable roads, hidden danger of fire, insufficient infrastructure and so on, and is slowly dismantled in nowadays urban development. While, the planning & construction, though whose spatial form and neighborhood relationship are less satisfying, features in fine infrastructure, aesthetic landscape and superior privacy and is highly

praised. Since both of spontaneous construction and planning & construction play initial role in integral morphological characteristics in Lhasa, the regional features need the guidance of planning & construction, the "spider web" needs to be enhanced to meet the needs of modern daily life, and Lhasa's local morphological elements need to be fully considered to inherit the historical trace of tradition and foster a unique spatial characteristic of custom and regionalism.

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