A Preliminary Study of Slow Traffic System to Activate the Vitality of Historic Districts——Take Wuhan Tanhualin Historic District as an example

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Abstract. Human activity is a prerequisite for a neighborhood to be full of vitality. As the embodiment of the image of the city, the historical districts need to rely on human behavior. Slow traffic can promote people's communication to a certain extent, so the slow traffic system has a certain significance in activating the vitality of historic districts. This article summarizes the Tan Hualin historic district by investigating the current situation of residents' traffic in Tan Hualin. Combining with the existing examples and based on the slow traffic system, this paper proposes measures to improve the existing problems in the Tanhualin Historic District in Wuhan, and explores how the slow traffic system can stimulate the vitality of the historic district.

1. Introduction
Tan Hualin is located in the northeast corner of Wuchang District, Wuhan. It is the last place to stay with the ancient charms and traditions. It is about 1.2 kilometers in length. It gathers natural culture, ancient city culture, religious culture, architectural culture, education culture, and medical culture. It can be regarded as the epitome of a period of history. There are more than 52 modern historical buildings in the entire Tan Hualin historical and cultural district, which is more than a century old, and it is therefore called a "living" Wuhan modern history book. However, the current traffic characteristics of its historic districts mainly include the following points.

1.1. The road facilities are single and weak.
The streets of Tan Hualin are north-south, with the block extending from Crab Cape Mountain in the north, Hubei Academy of Fine Arts in the east, Desheng Bridge in the west, and Liangdao Street in the south. However, Tan Hualin’s internal and external arterial roads cannot be directly connected. Because of the preservation of Renji Hospital and some religious buildings in the east, only narrow passages are left, but the narrow roads are overloaded during peak traffic. The road conditions are very poor, the traffic is mixed, and the traffic capacity is very small. Motor vehicles are difficult to pass on this street.

1.2. The traffic order is disordered.
Roads with limited width are difficult to pass through the traffic flow demand here. Motor lanes dominate non-motorized lanes, especially in the historic district of Tanhualin, and there is a lack of effective traffic management in this area. Although traffic management is arranged here, it still had little effect. People and vehicles are mixed, traffic order is chaotic, and road traffic efficiency is very low. The roads around the block have insufficient bus lines, and lack of sufficient parking stations, and even
the waiting crowd occupies the road. Therefore, the narrow crowd distribution space makes it easy to form a traffic bottleneck at the bus station, which not only poses a hidden danger to safety, but also makes The image of the city has been affected.

1.3. Lack of parking facilities.
There is a lack of car parking spaces in the Tanhualin Historic District. Public parking spaces are mainly concentrated on the outer avenues of the historic district, which is the entrance of the Tanhualin Main Street. However, because there are not enough obvious parking spaces, Therefore, the traffic conditions here are also very congested, and there is a phenomenon of illegal parking.

1.4. The demand for slow traffic does not match the supply of facilities, and the distribution of road rights is unreasonable.
Slow travel space is seriously insufficient. In addition, the space is not fully utilized, pedestrians, motor vehicles, and non-motor vehicles are difficult to effectively isolate, and the concept of space is vague. Pedestrians often walk in motorized lanes, which is poor in safety. Motor vehicles and non-motor vehicles often occupy sidewalks. Pedestrian space is occupied by parking, operation, and municipal facilities extremely seriously. Due to historical reasons, the residential area within Tan Hualin is seriously inadequate with parking rations. Vehicles can only be parked on the road or on a slow road.

2. Case Analysis of Historic District Renovation——Taking Wuhan Slow Demonstration Area as an Example
After understanding the current situation of the Tanhualin Historic District, it is indeed found that the transportation system does affect the healthy development of the historic district. In order to better and effectively put forward some feasible suggestions, reference and analysis of the reconstruction case of Wuhan slow-moving demonstration area.

2.1. Current status of traffic in the demonstration area
The following problems existed in the demonstration area before; the density of the road traffic network is high, but there is still room for improvement; the slow traffic does not match the supply of facilities, and the pedestrian space is extremely occupied by parking, operation, and municipal facilities; correspondingly; [1]The supporting facilities are not perfect, the safety and comfort of each intersection are poor, the density of public space is low, and the activity on the street is insufficient. In summary, the fundamental problem of this block is the contradiction between the city's rapid development of motorized traffic and existing road traffic and pedestrian traffic.

2.2. Transformation-optimization of slow-moving system
2.2.1. Encrypt the slow network
First, follow the original road traffic context and restore the pedestrian roads that were occupied by rapid construction in the process of urban development by adding slow roads and other methods.

2.2.2. Walk system structure
Set up a reasonable pedestrian system structure to connect the fashion living area, creative office area, quiet living area, historical exhibition area, commercial activity area, business tourism area and other six slow-moving areas with each characteristic. [2] At the same time, establish different types of streets, such as friendly streets that encourage pedestrian activities or guarantee streets that ensure basic slow traffic demand and provide necessary commuting conditions.

2.2.3. Bicycle system structure
In the vicinity of important traffic nodes and entrances and exits, and on some road sections with bicycle passages, reasonable arrangements for shared bicycle parking points.
2.2.4. Street comprehensive traffic attributes

Through the analysis of the system structure of transportation modes such as motor vehicles, non-motor vehicles, and pedestrians, combined with the analysis of the traffic flow of various transportation modes, the comprehensive traffic attributes in the street can be judged reasonably, and the road surface can be scientifically arranged according to the dominant function. Only paying attention to slow traffic is not enough, only the combination of motor vehicles and slow traffic can truly achieve slow traffic.

2.2.5. Characteristic area improvement

According to the characteristics of the street itself, the detailed design is in line with the street scale.

3. Thoughts on how the slow traffic system can stimulate the vitality of historic districts

Based on the above analysis and study of Tan Hualin's research results and case studies, the author listed the following points on how to stimulate the vitality of Tan Hualin's historic district based on the slow traffic system based on the problems faced by the current situation of Tan Hualin.

3.1. In response to the chaotic organization of Tan Hualin traffic flow lines, the overall road network was adjusted and planned

The perfect slow traffic system can well guide people to complete the tour of the entire block, which is conducive to the publicity of the historical block, thereby continuously supplying vitality to the historical building. Road planning should not destroy the overall style of the entire historic district, improve the modernization of municipal road facilities and maintain the historical and cultural style of the historic district, and follow the existing spatial context and spatial scale. When planning the road network of the historic district, by optimizing the overall road network structure, a protective road network is formed. The periphery of the block can be surrounded by main urban roads, and the main urban traffic is controlled outside the block; the interior is composed of secondary main roads and is responsible for the main traffic flow in the area, as well as traffic flow for tourism and office use. Then use the slow traffic system as the main pedestrian route in the area to sort out the traffic flow organization. Considering the characteristics of the comprehensive base, lighting, ventilation, and solar radiation, this building adopts a rectangular shape. [3] The body is as compact as possible while reducing the external surface area. Due to the existence of ancient trees in the base, comprehensive consideration of heating and ventilation decided to make the building enclose the ancient trees to form an atrium, and the building was partially designed with three floors. The building as a whole faces the southwest direction, introducing the lake and water into the building, and a small part of the building is embedded in the southwest slope. The main entrance and garage are designed on the west side near the road.

![Figure 1. The organization of the slow traffic system in the block.](image-url)

3.2. Road and node association

From the perspective of urban design, these historical buildings are scattered in the very specific environment of Tan Hualin, but only a few "cultural buildings" are protected, and the rest are gradually abandoned or gradually abandoned during the replacement of homeowners. Lost its original features during the illegal additions of residents, leading to the "decline" of the overall historical atmosphere of the block. In addition, several historical buildings with good preservation conditions have scattered...
atmosphere and insufficient cohesion, failing to highlight the overall "historical atmosphere" of the block.

Then, considering the five elements of urban design in the city image, these historical buildings can be designed as nodes. The planning takes historical buildings as the main feature and functional nodes to create a vibrant area and highlight the cultural characteristics of the historical buildings. Pay attention to the supplement of traditional elements in the renovation of surrounding buildings, so that the new and old architectural styles do not conflict, and the harmonious symbiosis of new and old elements is achieved. Then connect the scattered historical buildings with multiple streamlines to form a historical and cultural sightseeing block. The organized circulation makes the location of historical buildings more clear, and the slow traffic system helps people discover and understand historical buildings.

Figure 2. Schematic diagram of route design for visiting historical buildings.

3.3. Street elevation design
For roads of different levels, different road section designs are needed to continue the characteristic image of the city. The function of the main road in the city is to allow vehicles to pass to meet the needs of urban traffic, but the space design on the side road should be pleasant, especially the Tanhualin area has a strong literary and historical atmosphere, and it should provide a loose and comfortable walking space. Entrance to the neighborhood needs to be provided. These nodes need to pay attention to the coordination of the landscape and guide the integration of historical culture and modern style. [4] The road section can be combined with the building to advance and retreat, forming a vivid and pleasant spatial vision. The rich street facade allows the open and friendly street environment to attract more people to enter and inject vitality into the neighborhood.

Figure 3. Schematic diagram of street elevation design of block.

3.4. Pedestrian system planning
It is the setting of the slow traffic system. The slow traffic system is conducive to people's communication and enhances the overall vitality of the block, so that residents and tourists can have a safe and comfortable feeling of Tanhualin block, which is conducive to the sustainable development of blocks and buildings. [5] In order to strengthen the connection and penetration between the slow-moving system and the Tan Hualin Historic District, the tourist flow line and the residents flow line are separated, and they should not interfere with each other as far as possible under the condition of proper integration. Refined processing of slow nodes between the main block and various historical buildings. In order to further enhance the continuity and safety of slow traffic, motor vehicles are prohibited from entering the Tanhualin area, and the current motorized roads in Tanhualin are transformed into bicycles Dedicated roads provide tourists for rest and play.
3.5. Taking Tan Hualin as an example to think about the transformation of other historical districts

Many historical blocks, as the origin of the city, are platforms for the concentrated display of urban culture. In recent years, the whole country has gained an important understanding of blocks with historical and cultural value. As an important part of the city, the renovation of historical blocks should never be drastic transformations, but should be based on in-depth investigation of the current traffic problems and the actual needs of residents, through scientific and reasonable street function research and judgment, and put forward a proposal that adapts to the characteristics of the district. Renovation suggestions include adding a specific slow-moving traffic system to increase collisions and communication between people, thereby attracting more people to visit, so as to achieve the effect of enhancing the vitality of the historic district and making it sustainable.

4. Conclusion

The exploration of slow traffic system and historic district is essentially to build an organic system constructed by space and traffic. We hope that the future historical districts will have a spatial appearance that grows vigorously instead of bloated and spreads, and at the same time have sustainable development. At the same time, it is possible to leave leisure time to residents, hoping that the future historic district will have a slow traffic system for the elderly to stroll around and children to play freely, an urban space that is built for everyone, not just rapid development, and constantly updated. It is expected that the future city will not have a binary system composed of an “independent space system” covered by an “independent transportation system”, but to match the different characteristics of different land use spaces with different but adapted traffic environments.

Therefore, we still have a long way to go in how to deal with the relationship among the protection, utilization and transformation of historic districts, how to build a slow traffic system, and how to effectively divert the traffic flow inside and outside the historic districts. Therefore, it can promote the city to make a small step forward on the road of more powerful, flexible and sustainable development, which is the significance of the research on the relationship between traffic and city.

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