

# Research on Transitional Shared Space Architecture Design

## -Taking the Planning & Design of Kazakhstan Fishermen's Supply Station Center as an Example

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**Abstract**—In recent years, the state has been increasingly strengthening the development of urbanization. The influx of population from less developed areas into cities with high economic development level has caused large density of population, relatively small per capita land area, unbalanced population income level, large differences in educational level and serious polarization in big cities. Therefore, how to coordinate these people who are full of complexity and difference in one space, how to meet each individual's needs in a limited space, and how to maximize space function and form a shared space that can be transitioned at any time according to the functional requirements and the crowd, is the problem that big cities need to consider in the space utilization level at present.

**Keywords**—transitional; shared; regional culture; the gap between the rich and the poor; function set

### I. INTRODUCTION

With the acceleration of urbanization in China in recent years and the improvement of social requirements for current cultural development and social civilization, the people's quality of life has been gradually improved. Therefore, people have begun to pay attention to the quality of outside space while paying attention to the private material living conditions.

In the face of the diversified and complex urban development, the urban population is increasingly dense and the economic level is polarized, which are a series of consequences brought by the urban expansion which is nearly out of control [1-3]. However, economic growth has promoted people's yearning for a better life and enhanced their demand for a better quality of life, which are contradictory to the negative phenomena arising from the current urbanization development.

The transitional shared space is now a strategy to alleviate a series of negative phenomena brought by the urbanization. The environmental activities in which people live are complex and diverse [4-6]. And many places have space that needs to be given full play through transition to cater to special interests and preferences and create a variety of possibilities without affecting other users of traditional open spaces. This approach allows us to have a new understanding of spatial inclusion and continuity.

### II. CONCEPT AND COGNITION

#### A. Definition of transitional shared space

"Transit" refers to something that changes from one stage to another by some means. Transitional space is the neutral model of spaces with different attributes, and it is a key point of functional transformation between spaces.

The transitional shared space is a relative existence. It is not only a transition within the spatial category, but also a transition that covers functions and functions in space, and transition between the crowd and so on [7-8].

Transitional space and transitional shared space are different. Transitional space pays more attention to the "grey space" between two or more space carriers, while the transitional shared space described in this paper focuses on the change of some properties in space due to the change of some external factors.

### III. VALUE AND STRATEGY OF TRANSITIONAL SHARED SPACE

In a literal sense, the transitional shared space reflects the functions of transition and connection in public space, which plays a good connection and communication between architectural space and outdoor public space in the city. From the perspective of development, since the transitional space pays attention to the evolution of the surrounding environment, the transitional shared space provides a beneficial foreshadowing for the architectural discovery in the urban space development, which is also one of the important methods to set off the urban characteristics.

In a sense, transitional shared space is a concept with the combination of virtuality and reality. It is not only the transition between the physical space and space, since people's emotion and will must be taken into account during the transition. Therefore, the transitional shared space has the value that promotes people's basic needs and psychological culture to a better level.

### A. Strategy of transitional shared space

- Time transition: the time transition of transitional shared space refers to the architectural function change of an architectural space in the same place caused by the change of time, thus making the public architecture can better adapt to the changes of the climate and the users in different time periods, providing more suitable services for the users.
- Space transition: the space transition of transitional shared space refers to the transition between spaces within the architectural space or the transition between the architectural space and the external environment. Each architectural space cannot exist alone, so there is always a correlation between spaces. The existence of transitional space increases the connectivity between buildings, which can enhance the unity of the overall space.
- Group function transition: the group function transition of transitional shared space refers to the transitional part of the functional transformation between buildings with different functions that gather in the same space in the building group. In order to meet the needs of citizens at present for the diversity of outdoor space, urban public spaces are generally multifunctional, and the public space multifunction includes single building multifunction and multiple building function set [9-10]. The transition between group functions will consider more about the needs of the users and rationally distribute and connect building groups according to the needs, making the public space more humane, improving the user experience.

### B. Overview of the Planning & Design of Kazakhstan Fishermen's Supply Station Center

#### 1) Reason for the Planning & Design of Kazakhstan Fishermen's Supply Station Center

The topic site is Nur-Sultan, the capital of Kazakhstan. Nur-Sultan is located in the semi-desert grassland in the north central part of Kazakhstan. The Ishim River runs through the southern part of the city, and it is of the typical temperate continental climate. The seasonal temperature difference of Nur-Sultan is big and the winter is long.

The gap between the rich and the poor on the left bank and the right bank is very large, the urban development rate is seriously unbalanced, and the lifestyles of residents on the left bank and the right bank are also far apart. The stage model of the city is in line with the research.

#### 2) Meaning of the Planning & Design of Kazakhstan Fishermen's Supply Station Center

The topic is the "Research on Transitional Shared Space Architecture Design", which aims to explore a shared space that conforms to the local religious culture of Kazakhstan under the complicated and unbalanced background of Nur-Sultan, while paying attention to the changes of various factors such as region and season, and the transition of space function and people needs. The three expressions of "time transition", "space transition", and "group function transition" are

proposed as the keywords of the project and are integrated to carry out theoretical research. Then the conclusion obtained is applied in practice to redesign and reconstruct the place of practice to achieve the harmonious development of economy and culture on the left and right banks of Nur-Sultan through respecting the actual conditions of local regional culture, reasonably using the existing local materials and resources, and learning and drawing lessons from the national history and national symbols of Kazakhstan.

### C. Basic strategic principle of the planning & design of Kazakhstan Fishermen's Supply Station Center

#### 1) Application strategy of architectural transitional function set

##### a) Seasonal architectural function transition

The research mainly investigates the differences between the lifestyles and living needs of Nur-Sultan people in summer and winter through the analysis and study of the extreme seasons of summer and winter in Nur-Sultan to ensure that there will be no deviation in the arrangement of architectural functions.

##### b) User transition

The main research object of the topic is fishermen in Nur-Sultan, whose general economic conditions are not very good. The design is not only to improve the living and employment environment of the fishermen, but also to drive the economic development of the surrounding areas and enhance the communication between the left bank and the right bank. And the users can transit from fishermen to surrounding residents and then to the rich areas on the left bank.

##### c) Geographical environment transition

The main employment environment of fishermen is on the river, while their residence is definitely on the land. The design connects the river and the land, aiming to provide a better transition space for the land and the river.

#### 2) Architectural form

- The early Kazakhstan was a nomadic nation, so the portable yurt which is easy to disassemble was designed for the convenience, being the crystallization of the wisdom of the Kazakhs.
- In modern Kazakhstan, due to the rapid development of oil, the economy develops rapidly, and buildings of various forms rise straight from the ground. However, these architectural forms lack consideration of the surrounding residents and local traditional culture.
- Most of the Kazakhs believe in Islam. Therefore, the unique style of Islamic architecture in Kazakhstan is extracted to integrate with the modern architectural forms.

#### IV. SPECIFIC ANALYSIS OF THE PLANNING & DESIGN OF KAZAKHSTAN FISHERMEN'S SUPPLY STATION CENTER

##### A. Project background

Geographic factors: N51 °, E71 °

Climate attribute: temperate continental climate

Climate feature: The sunshine time is general, the summer is hot and dry, and the winter is long with little snow; and the snow period is as long as 130 - 140 days, and the winter is 5 - 5.5 months, with the average snow of 30cm. There are sandstorms.

Temperature profile: Both the daily temperature range and the annual temperature range are large. The ice period is long and the frost-free period is about 120 days. The annual average temperature is about 1.8°C.

Rainfall: The annual precipitation is 300mm, of which 30% occurs in spring, 66% in autumn and winter, the precipitation in July is the largest (about 45mm) and that in December is the smallest (about 15mm).

Planning area: ≈6500m<sup>2</sup>.

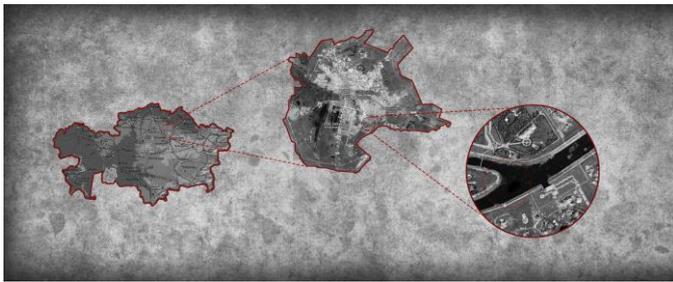


Fig. 1 Site selection of Kazakhstan Fishermen's Supply Station Center

##### B. Design concept

The keywords of the design are "function set, block, circular divergence, and variability". The restrictions of local hydrological climate, geographical environment and fishermen's work habits are considered, and local traditional culture and building material resources are fully used and combined with the living distribution characteristics of Kazakhs to form a more practical design.

##### C. Design analysis

The source of the theme of the topic comes from a news of Kazakhstan. A group of ice fishermen wrapped themselves in plastic bags to fish on the Ishim River at -40°C. Due to their bad economy, they can only use plastic bags to keep themselves warm.



Fig. 2 Photos of Kazakhstan fishermen in winter\*

##### 1) Architectural form and analysis

The design is based on the four keywords of "function set, block, circular divergence, and variability", and it is hoped that the architectural form can present the characteristics of the nomadic group of Kazakhstan, while integrating the dispersed blocks into several units with different sizes. Transitional corridors are set up at the land and river of different altitudes, connecting the dispersed units, and primary and secondary shared platforms with level difference are built at the site.

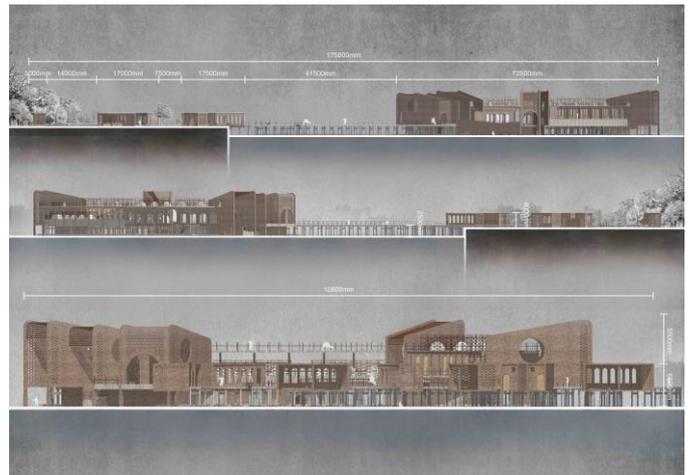


Fig. 3 Elevation drawing\*

The supply station mainly consists of three blocks, each of which is circular, radiating outward from the center. Two accessory bodies are located at the banks, while the center is generally on the glacier.

The building is mainly divided into three functional areas, with two accessory bodies mainly carrying functions such as public toilets and rental carts. Two sightseeing corridors are derived from the two accessory bodies, forming an intersection

and a large public platform outward, covering functions such as church, accommodation, food and beverage, temporary place for inflatable tents, public trading platform, drying fish, fish farming, wharf, information exchange, public landscape, and entertainment.



Fig. 4 Plane planning drawing

2) *Space function and plane layout analysis*



Fig. 5 Section view

The land part of the supply station adopts the load-bearing wall structure, and the building on the glaciers adopts the concrete bearing column structure. The circular platform is made of anti-corrosion wood materials to achieve the high and low irregular shape, increasing the viewing range and perspective of users. The main materials of the individual building distributed on the platform are red bricks, aiming to give users a warm feeling with crimson, which are also very eye-catching.

Temporary tents are placed in places such as the accommodation area and the roof of the restaurant, which uses the structure of yurt for reference, and is easy to disassemble, aiming to provide temporary break places for poor fishermen. The open spaces after the disassembly can be used for entertainment or drying fish.

Considering the local architectural language, the architectural decoration symbols use elements such as the roundness and arch of the Islamic mosque for reference.

3) *Space functional transition analysis*

According to the “variability” analysis of the architecture, it can be concluded that the transitional functions of the supply station are: i. Seasonal transition: in summer, the supply station is a public landscape platform for people to play, while in winter, it is the supply center of the fishermen; ii. User transition: the main users during the ice period are fishermen, while that of the non-ice period are passing fishing boats, tourists and surrounding residents; iii. Geographical transition: the supply station connects the land and the river, forming a direct transition from the two geographical environments.

4) *Innovative value, deficiency, and prospect of the design*

The concept of transitional shared space is still in the development stage. In the face of the large gap between the rich and the poor, the large population density, and the small per capita land area during the development of urbanization, the society should pay more attention to the complicated diversity in the city, carry out concrete analysis of concrete problems, and should not apply the single architectural model to cities under the development.

V. CONCLUSION

Buildings designed in this way are often only form and not practical, which will affect the development of the construction industry in China’s urbanization. The architectural design shall take into account local resources and give full play to the advantages of the unique local resources, and integrate the environment, people and culture, and shall respect the local historical culture and architectural development, and explore the application of functional transition in shared space.

How can the common progress between people and the city and the development of urbanization be achieved? It not only needs to absorb the quintessence, retain the part that is positive, beneficial to the peaceful coexistence between people and between people and architecture in the original city, but also needs to discard the dregs, change the changeless stereotyped architectural design, and put an end to the hierarchy in the space division. It is hoped that one day an increasing attention will be paid to the planning and design of the transitional

shared space, and each shared space can have its own unique form language, and have more inclusive and practical functions in addition to meeting people's needs for beauty in the current society.

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