

Research on the Spatial Organization Pattern of Waterfront Development Based on "Hydrodynamics"

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Objectives

As unique resources of urban space, urban water and waterfront have gradually become important elements for leading the development of the city, shaping the image, creating the public core, and promoting the waterfront industry. The spatial organization pattern of waterfront development determines whether the city can effectively play the positive role of water elements. As the city shifts to high-quality development, the development concept of simply pursuing economic value has been abandoned, and the ecological and public nature of the waterfront has become the primary consideration for development and construction. This article aims to explore how to use water as the driving force to promote the development of the region, better "promote the city with water", and build an integrated urban waterfront environment.

Methods

1. Extend the Concept of Hydrodynamics

Hydrodynamics refers to the driving force of water on urban operation and development, as well as the interaction between water and cities. Its connotation is manifested as:

- (1) The impact of water bodies on urban development factors such as spatial structure, functional layout, and transportation system.
- (2) The development of cities has a negative impact on the water space, resulting in human intervention and transformation of the water space.

2. Identify the Characteristics of Waterfront Space

- (1) Ecological utility: It has ecological service function and is an important part of the urban ecosystem.
- (2) Public attribute: It is the core of urban public activity space. Only by opening up and gathering public service functions can we promote high-quality development in the region.
- (3) Image carrier: It is an important area for urban tourism development and a window for cities to showcase their charm to the outside world.

3. Analyzes Domestic and Foreign Practical Cases

Analyzing typical dynamic waterfront spaces at home and abroad, studying the spatial layout characteristics of their functions, and exploring the spatial organization mode of water city integration.

Results

Based on the case study and the relationship between water cities, we summarize three spatial development models: Water-ringed type, Water-along type, and Intersection type, each with different characteristics. Generally speaking, regardless of the type of waterfront space, its dominant functions, except for green space, are basically composed of three major types: commercial, residential and cultural. (Figure1-3)

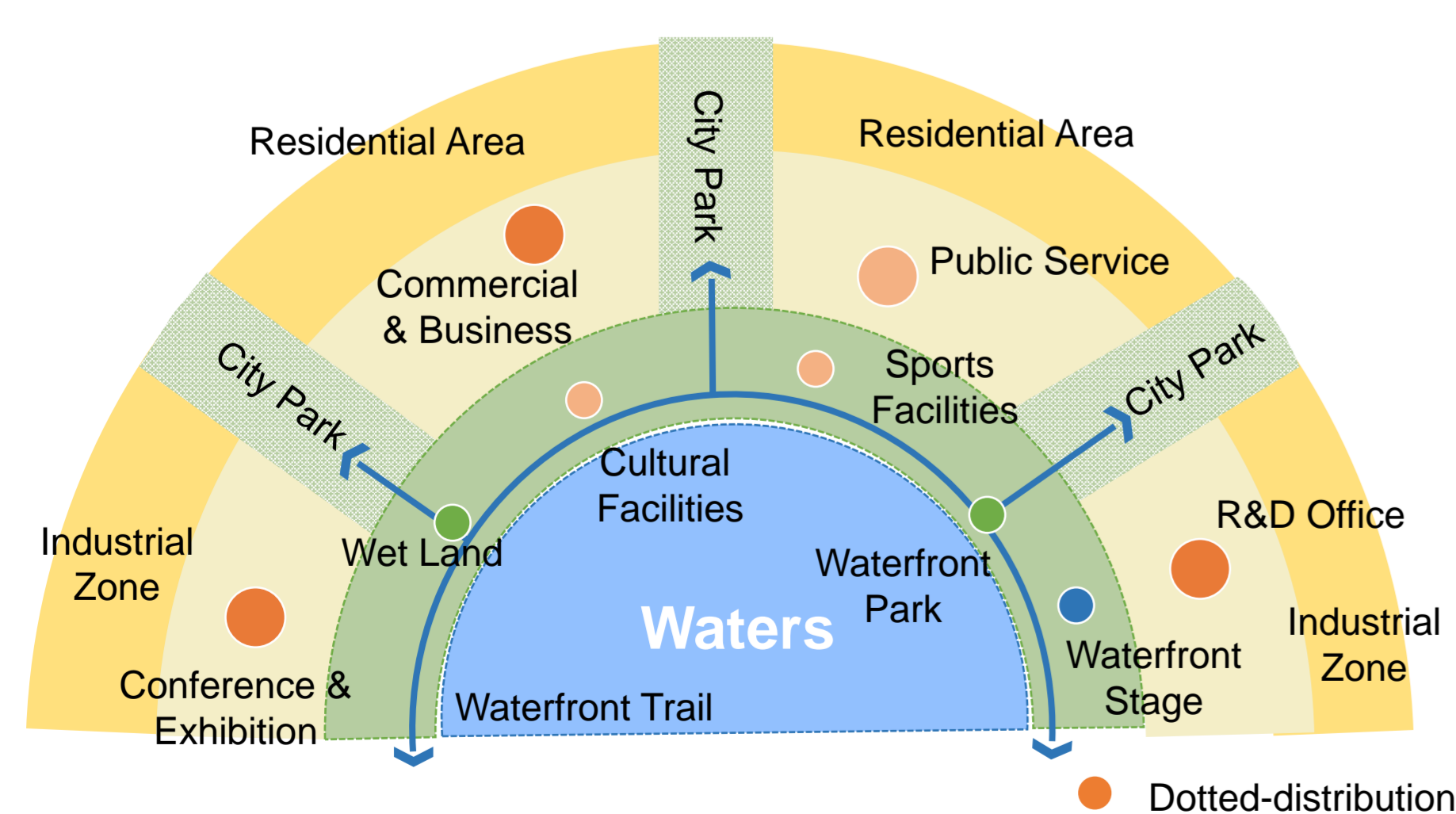


Figure 1 The organizational model of water-ringed type space

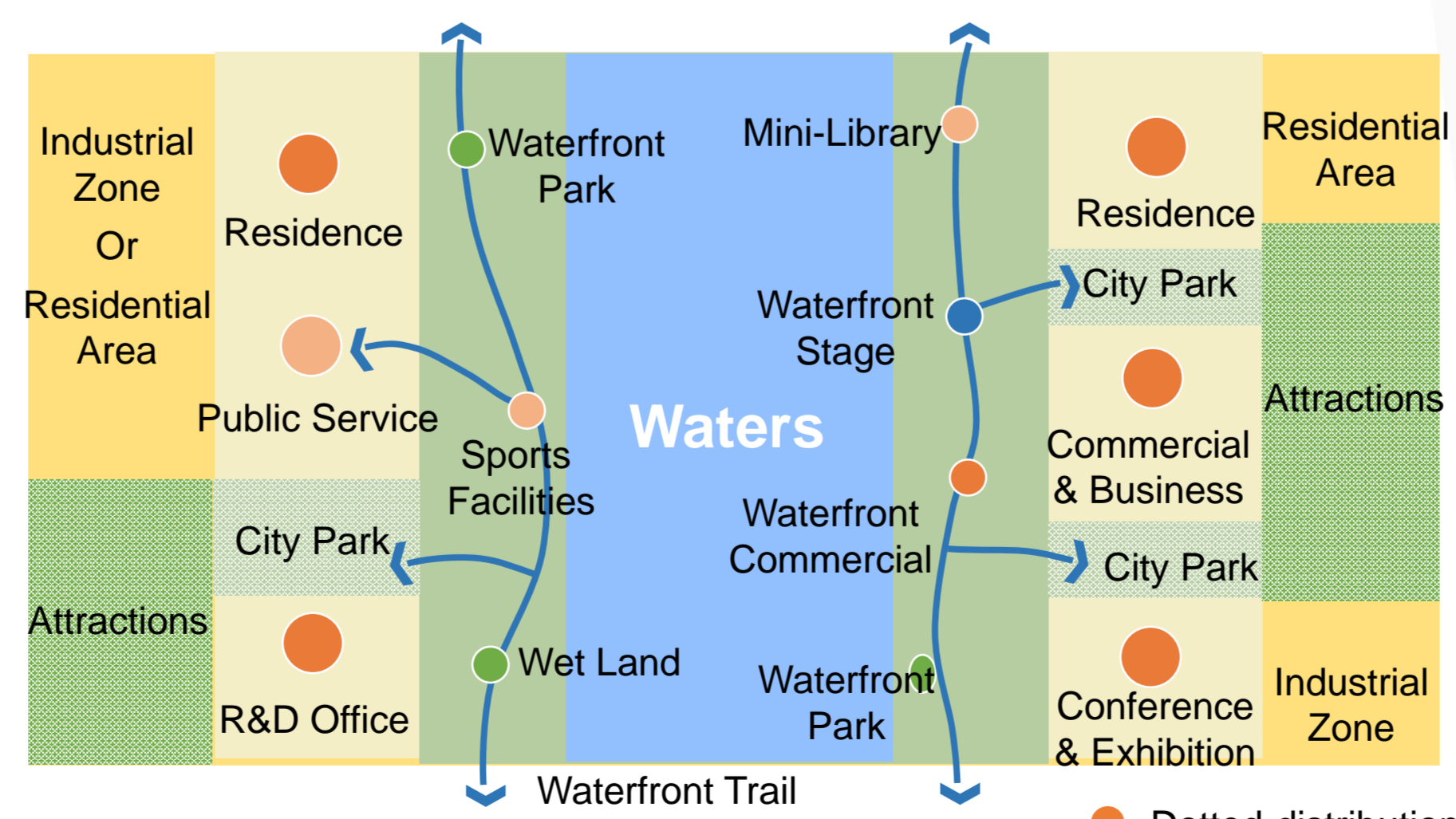


Figure 2 The organizational model of water-along type space

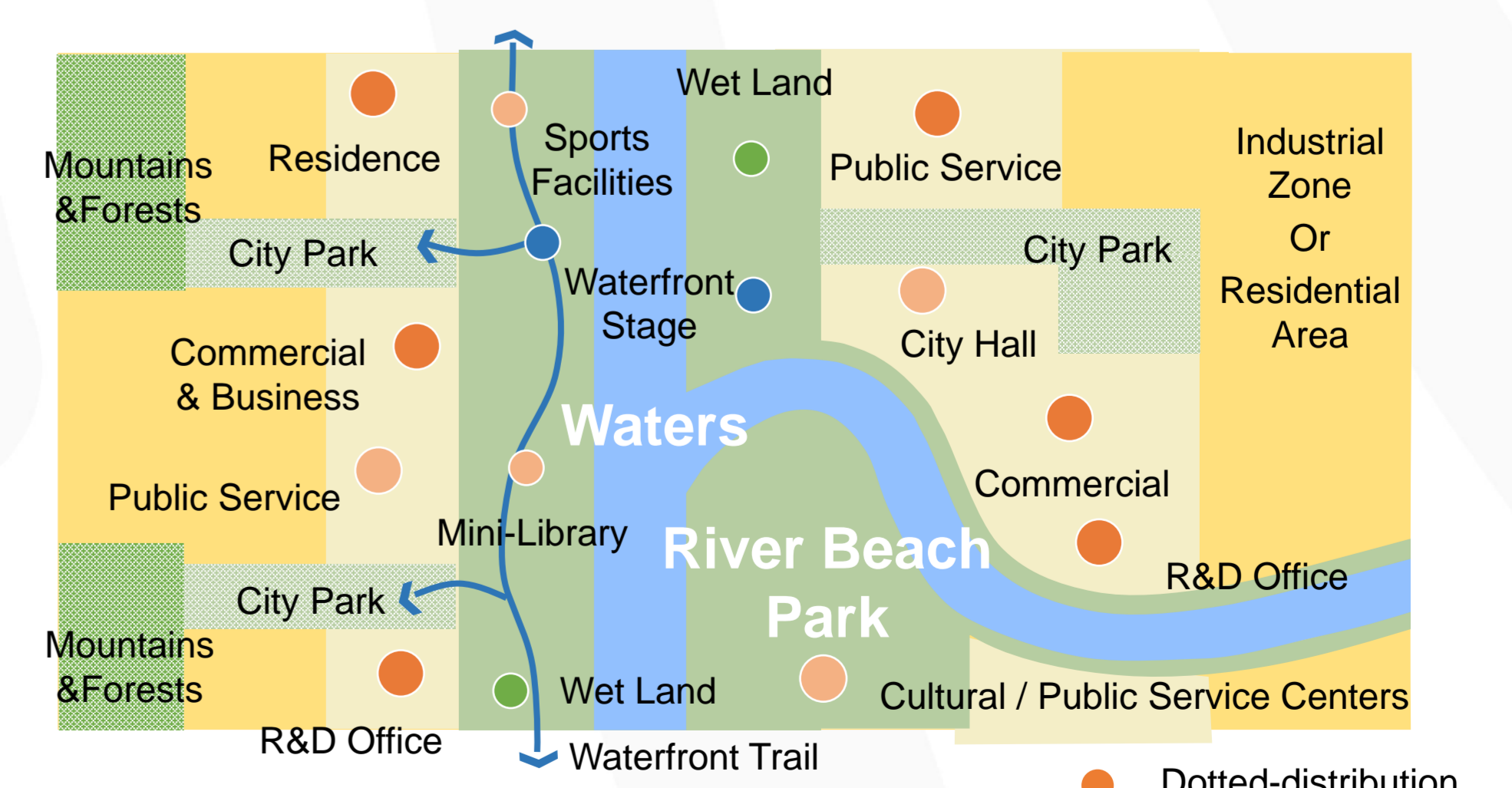
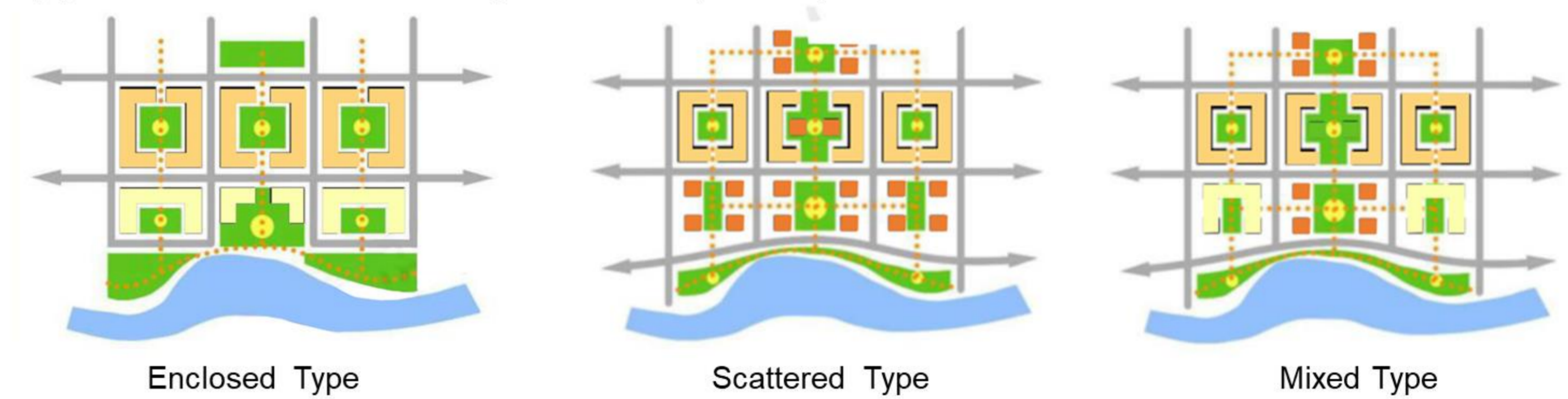


Figure 3 The organizational model of intersection type space

(1) Commercial waterfront space development pattern



(2) Residential waterfront space development pattern



(3) Cultural waterfront space development pattern

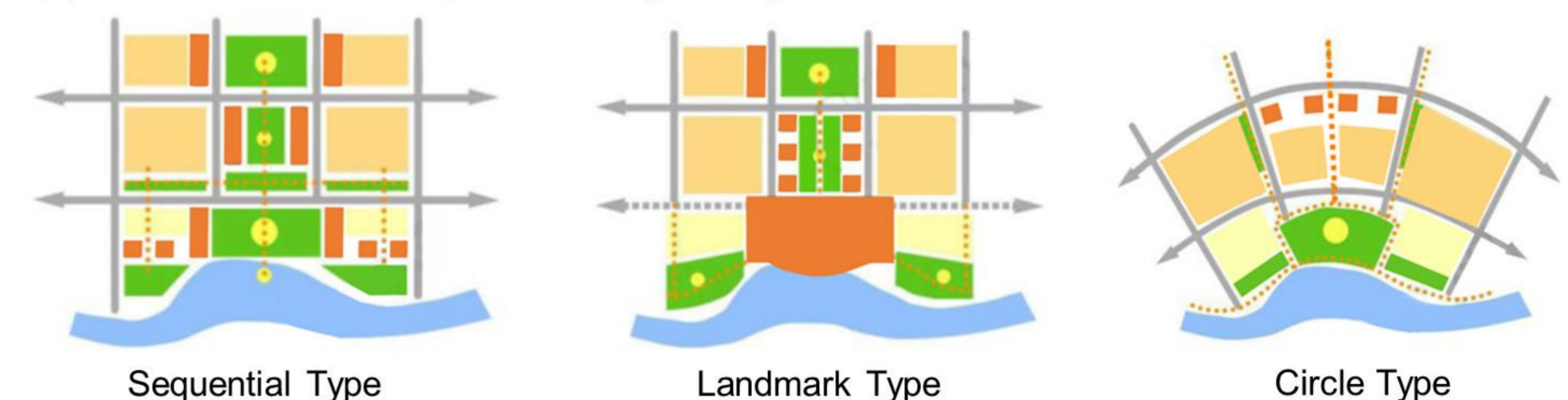


Figure legends



Figure 4 Three types of waterfront space form control

Conclusions

Various types of elements affect the vitality and openness of the waterfront space, so we summarize the language of the waterfront space organization pattern of the three dominant function types from the elements of land use function, road traffic, building clusters, and public space, to better stimulate the spatial vitality of the waterfront. (Figure 4)