From "Comprehensive Transportation Hub" to "City New Sitting Room"---Overall the design about Jinan East district comprehensive transportation hub

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Abstract: integrated transport hub or high-speed rail station often talked about, often known as the "city portal" and the title of "city window", so the comprehensive transportation hub or the high-speed rail station of a city is very important to a region or a provincial. At the same time, it reflects that the managers and users of a city only focus on the comprehensive transportation hub of transportation service function and ignore her cities attributes and functions. Jinan east district comprehensive transportation hub in the beginning of design is given a feature that it has to serve both the traffic and city. We are trying to build a new center for Jinan east new town, the window to welcome people, the city hall of hospitality.

1 Introduction
Jinan east station integrated passenger transport hub project is the supporting the project for Jinan east station (high-speed), mainly including the north and south station square underground space development, coach terminal, the starting station and the terminal station of the bus, BRT station, commercial and other facilities. Project is located in northeastern Shandong Jinan, Licheng district, Mr. Scheeren area, south of Beijing-Fuzhou highway, east of phoenix road, north of rural road, west of Fengming road. It total covers an area of about 123 mu.

Fig. 1 Jinan east district orientation diagram
2 Project background
There are 13 platforms and 27 rail lines in Jinan east station (high-speed). It is designed to the transportation capacity of 22.4 million people one year, and is the main station in the Jinan railway hub "Three Main, One Auxiliary" project, and will be the largest high-speed rail station in Shan Dong province.

The city of Jinan, where the project is located, is the south central of the Bohai sea area, and is one of the important connection of East China, North China and the Midwest China. The city’s geographical position is superior and traffic is developed. Jinan is the province's highway network center and highway hub cities, also is the largest railway hub of Jinan railway administration. At present, there are five railway lines of Jinghu, Jiaoji, Hanji, the Beijing-Shanghai high-speed railway and JiaoJi passenger dedicated line cross Jinan. There are some lines in the plan such as ShiJi and JiQing passenger dedicated line and Liaocheng, Texas, Taian, Binzhou inter-city railway hub. It will be built up city traffic layout of Jinan east railway station, Jinan railway station and west station. In addition, Jinan international airport - YaoQiang airport is one of China's comprehensive 4 E airport, located in about 15 kilometers northeast of the project.

3 Project positioning
3.1 The deputy city center in city with the station, the new living room in east new city of Jinan
According to the planning, Jinan east station area will undertake the main urban functions. It will be the distributing center of city and region, and be the accumulation of urban public activities and the third industry. It also will be a high-tech industry base and the city's new economic growth pole. This project should take advantage of unique geographical advantages, and play its inner lead the radiation effect of outreach, and perfect the urban functions, and improve service ability. In Jinan east station area, the people is no longer a passer-by, and they work, negotiation, live and travel here. We try to build it as the new window of eastern district of Jinan area to serve the guest.
Jinan is vigorously advances the strategy of bus priority, and strive to build a multi-level, intensive, convenient integration, and transfer to urban public transportation system. It takes rail transit as the backbone, and support the rapid linkage of city important functional areas and passenger transport hub, and strengthen the Jinan national integrated transport hub status, and strive to optimize the layout, and improve the network, and develop the multimodal transport. It will speed up the construction of "one hour life circle". It actively promotes the construction schedules of JiQing high-speed rail and ShiJi guest special projects, It helps to start the preparation work for ZhengJi passenger dedicated line as soon as possible. It optimizes the Jinan railway hub, and speed up the construction of the inter-city railway. Combining railway passenger dedicated line construction, it will establish economic circle inter-city rail transit system. As the core of comprehensive transportation hub area, Jinan east station will be the integrated body of railway stations, long-distance bus station and rail transit station and bus station/bus rapid transit (BRT).It is the modernization large-scale integrated transport hub with a variety of seamless transportation, and builds a new model of Jinan international transportation hub. In the future, as external oriented integrated transport hub of the city, it will be fast and efficient system of external road, and be convenient and smooth flow of large capacity public transportation system, and be people-oriented, and be seamless transfer environment. We will develop efficient, convenient and comfortable city new portal.

3.2 Jinan east new city transportation center

The space assembling area usually build in the railway station in Japan, the city's various important functions such as commercial, business and public service, are closely arranged around the station layout. The citizen's work and life are carried out in the station area. That attracts a large number of commercial development, and forms the station business.

4 Case reference

Fig.4 The east station south square area urban design intention figure
5 Project design concept

The rail track in Jinan east station are east-west, and the hub is divided into two parts of north and south, so there are the two squares. The south square of the hub faces toward the main urban area in the city in the future, and its main function is to meet the needs of the transport, at the same time, it should be committed to enhance the city’s overall level of urban public services, and highlight the city characteristics and cultural connotation of the area. Therefore, it will be a new window and the new portal and the city new living room in the southern area in Jinan and Shandong province. It plays the role of the gathered popularity and the appeal. The urban function will be extended to the southern axis; The north area of the hub is along with the eastern side adjacent to the White Springs Scenic Area, so the external condition create a quiet, excellent ecological resources of the space environment. The development of its future should be fully integrated with the feature landscape resources. We plan to make the area into a gathered place with high quality leisure and vacation tourism and cultural experience and personally entertainment leisure lifestyle. The area will be built as the city "back garden" of Jinan.

In the process of planning, design and construction of east Jinan district comprehensive transportation hub, a pattern of External Traffic is formed that the railway passenger transportation, road passenger transport (tourism, passenger transport, passenger bus and taxi passenger transport), rail transit and other transportation ways are seamlessly connected. It becomes a "compact, three-dimensional, convenient transfer" space system; In accordance with the principles of the bus field integration, facilities layout humanization, shuttle bus high-end hub cities, construction of information integration, and the portal city, it will implement the idea that several types of passenger transportation ways are the planning coordinated, the construction synchronous, the improvement of the identification, the bus rapid, the function complete, and the transfer convenient. The Jinan east district comprehensive transportation hub will be the deputy city center with a set of railway passenger transportation, city bus, taxi passenger transportation, rail transit and other transportation way.
6 Hub space organization plan
The space is the soul and the fundamental of a building. If the space design is proper and the space organization is reasonable, it would help the construction function to get the full release. In terms of Jinan east district comprehensive transportation hub, according to the different main service function, we divided the space into two categories, the one is traffic functional space, the another is urban functional space.

6.1 Traffic functional space
"Traffic functional space" as the name implies, is the space that serves for passenger flow in and out of the hub and the traffic facilities. Traffic function space as the core space in the hub, has the distinct characteristics of space structure and sequence. There are two key factors about the space layout. The first is to follow the high-speed railway passenger flow characteristics of "the upper into and out of the bottom" features and hysteresis of passenger flow in and out of the stop time. This will organize orderly all kinds of function space and create a comfortable and convenient environment for in and out of the station passenger flow; The second is to deal with "External Traffic and Internal Traffic" relationship, the so-called "external traffic" refers to the city's external transport related to the transfer of traffic. For this project, "External Traffic" refers to the railway and long-distance passenger transport; The so-called "internal traffic" is the transportation system with the service for the inner city. General idea of dealing with the "External Traffic" and "Internal Traffic":

A) "External Traffic" demand is the first object of hub services, and is the key that the hub design needs to grasp;
B) Determine the demand for "External Traffic" firstly, then identify "Internal Traffic" requirements; C) "Internal Traffic" is a priority for the "External Traffic" service;

The traffic space layout of Jinan east station hub area is based on the intensive and economical use of land and make full use of underground space resources; taking "Stereoscopic development, Convenient transfer" as the principle, by the High Speed Rail outbound propylaea for spindle, we design all kinds of transportation space respectively in the left and right sides of the organizations of transport and in the north and south ends of the three-dimensional intensive space. According to the principle of "The bigger, The closer", the large traffic facilities, such as the rail transit, the bus station and the BRT station, will be arranged nearby. It is helpful for shortening the distance and saving the time of transfer. The small traffic facilities, such as Coach station, will be separated out properly. The transfer time of various kinds of transportation facilities is controlled within three minutes.
6.2 Urban functional space

The so-called "urban functional space" is the hub space that provides city functions and services for citizens. Although the space providing the services is located in the hub area, also is the land of the hub. But the space is more about the function of the service city than the hub itself.

However, the domestic construction hubs are mainly focused on the transport function of the hub and avoid the function of the hub city. Hubs are embedded in cities like lonely islands, and "islands" are connected to the cities with huge squares. They have neither the echo nor the space continuation. This kind of situation causes that it is crowded in the hub internal and there are very few people in the outdoor of square. There are a huge waste of limited space resources for cities and a great damage to the urban texture space for cities. We think that in "HSR + METRO" era at present a large number of passenger flow no longer rush to the hub station square, and the passenger come and go of the hub through large amount of rail transit and the elevated system on the ground directly. Therefore, it is better to give the big station space to the city than stick the traditional design model. It is better to turn the huge square into a modest public plazas and introduce the urban service function and make full use of this treasure land by the city. The traffic organization ability is changed into urban development space, and the area of the hub is made into city standing deputy city center and the new engine of urban development. The ability to transform its strong traffic capacity into the development of the zone. Let the city area of the hub grow into the city's center of integration. A new engine of urban development.

Jinan east district comprehensive transportation hub at the beginning of the design is given the double attribute to serve the traffic and the city. The planning and design fully respects the new urbanism concept of "transit oriented development". The transportation hub is closely integrated with Jinan urban function and urban characteristics and the unique natural resources. It forms a new pattern of "the city has the station, the station has the city". We are trying to build a new center, a window of the city to greet visitors, a hall of hospitality in Jinan east new town.

7 Summary

In recent years, the city of Jinan has implement a new strategy of urban development, and the development of "two districts of a city" pattern has been opened. The urban construction in the eastern region is fast which is the development point of Jinan city. Based on Jinan east district comprehensive transportation hub, at the same time Shi Ji guest and Jiqing, marina, tay intercity lines such as the construction come into use, the new phase of rapid development is on the way. In the future, the region will be led by transportation hubs and dominated by modern service industry and strategic emerging industries. The region will be the new living room of the city with complete service facilities and industrial new heights and the deputy city center and new urban areas.

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