SHAPING VIBRANT URBAN PLACES IN CHINESE INNER-CITY STATION AREAS

A Case Study of Beijing West Station Area

XIALU WANG
Delft University of Technology, The Netherlands
x.wang-1@tudelft.nl

Abstract. Cities in China are embarked on ambitions plans to create renewed inner-city station areas, particularly evident after a series of redevelopment projects; these projects mainly focus on the development of transport infrastructures, rather than turning station areas into vibrant urban spaces. Therefore, a general lack of citizen’s daily activities have turned these areas into urban ‘enclaves’, which are merely transport nodes with interior spaces only used by travellers, rather enclosed and segregated from their surroundings. Through the study of the spatial characters of Beijing West station area, a typical project model in Chinese urban context, this paper aims to clearly reveal the spatial failures of Chinese problematic. Conclusions are three recommendations for future redevelopments to improve urban vitality of inner-city station areas in China.

Keywords. Inner-city station areas; spatial performance; urban vitality; station area redevelopment in China.

1. Introduction

Since the opening-up, China’s urban population increased rapidly with the urbanization process. By 2014, 142 mainland cities have a population that surpasses 1 million, and several megacities such as Beijing, Shanghai and Guangzhou have each urban population of over 10 million. To meet traffic demands within and between big cities, the national high speed rail (HSR) network and local rail network scattered across urban cores in China in the recent decade. By the end of 2013, a 13,000Km HSR network linking main cities in mainland China and a total length of 2380 km of urban rail lines in 15 cities have been built. Furthermore, plans call for extending and upgrad-
ing existing national HSR to 25,000 km and local rail systems in 12 other Chinese cities.

In line with these transport infrastructure development, 22 top inner-city stations (in terms of passenger flows in 2011) have been included in the HSR network since 2008, and 13 of them have experienced station area redevelopment. The construction emphases have been put on extending complex transport hub and station square, as well as renovating surrounding (underground) road network.

However, these projects paid little attention to integrate station areas with their urban surroundings and to support local urban life with functional setting and spatial connection. Although taking strategic locations in city centres, China’s inner-city station areas are isolated from typical urban life: the close and static operation turns multi-modal transport hubs into transfer machines; transit station squares are fenced and only serve to ferry passengers to and from railways; the station blocks are demarcated from the surrounding city by heavily trafficked roads on all sides; local citizens seldom carry out daily activities in station vicinities, and the station areas are spatial collections of functions with little relation with each other.

Beijing West station area, among all the Chinese inner-city station areas, is perhaps the most striking example of this urban problematic. It is the busiest railway station in China in terms of passenger flow and takes a central place within the Beijing city. In addition, the station area actively adopted new ideas in its redevelopment in 2013 and being taken as models for other projects in China. If the isolated problem is apparent in Beijing West, it would be more serious in other Chinese big cities. Therefore, Beijing West can be regarded as a critical case that is the most representative to illustrate the isolation urban phenomenon.

The urban significance of inner-city station areas as urban life hubs has been realized and practiced in the developed countries for decades. To tackle with integrated urban mobility and diverse functional requirements, station areas should facilitate departure, arrival and transfer of large number of passengers, as well as living, meeting, working and leisure of local people. Some leading projects such as the redevelopment of the Rotterdam Central station area and the Tokyo Station area have implemented different strategies to make seamless connections between transport hubs and their urban surroundings (Trip, 2007; Zacharias, et al., 2011).

As the first step in tackling the isolation urban phenomenon in China, this paper aims at clearly revealing the spatial failures of Beijing West and proposing possible solutions to improve urban vitality there. After this introduction as Section 1, Section 2 develops a theoretical framework to explain the importance of creating vibrant station vicinities, and influential spatial fac-
tors of such an environment based on relevant literatures on urban vitality and station area redevelopment. Then in section 3, a case study of Beijing West station areas is examined to reveal the influential spatial factors involved under four categories, namely functional integration, spatial integration, visual/mental integration, and spatial configuration support. This is followed by conclusions and recommendations in section 4.

2. Framework

The potential of station areas as vibrant urban places has been widely discussed in literature. Researchers share the idea that station areas have the potential to attract physical human interaction with improved mobility. In the node-place model, station areas are defined as both multimodal transfer nodes and places where a diverse conglomeration of functions and activities accumulate over time (Bertolini and Dijst, 2003). In his book that introduces the planning concept Transit Oriented Development (TOD), Dunphy (2004) proposes station areas should facilitate the development of different transport means, high density urban fabric and a variety of facilities within walking distance. Therefore, this potential is increasingly evident in inner-city station areas, as their locations are surrounded by densely developed urban functions and transport facilities.

A group of researchers pointed out spatial conditions which facilitate physical human interactions in station areas via practice review. De Jong (2009) criticized the spatial failure of station area around Lille Europe and pointed out several stagnant situations happen there, such as placing monofunctional blocks adjacent to one another. He concluded that spatial properties, which go against characteristics of “primary mixed use” proposed by Jacobs, are spatial causes of the failure. Deike Peter (2009) summed up several valuable lessons of the Berlin Hbf project and emphasized the lack of potential users and complementary functions from station vicinity turned the whole area to “glass palace in the desert”. During the redevelopment of Tokyo station area, a underground pedestrian system and a Gran Roof facility connect the core station building with its surrounding buildings, creating an indoor walkable city which support place-based activity and consumption under a limited land resource urban context (Zacharias, et al., 2011). In another Asian city like Hong Kong, atria spaces correlate the station interiors and urban spaces. Endless stream of pedestrians between skywalk systems, atria space, and railway stations have enhanced rippling effects of station complexes considerably (Xue, et al., 2012).

Lessons from specific cases provide several urban conditions benefit urban vitality in station areas, such as legible local street network, high density
with mixed functions, and seamless walking environment around station areas. However, none of these authors set up a comprehensive framework to investigate spatial factors creating vibrant station areas.

Another group of researchers tried to explore measurable spatial parameters to explain and evaluate to what extent station areas can perform as vibrant urban spaces. Brouwer (2010) employed Montgomery’s (1998) framework on sense of place to evaluate spatial performance of pedestrian link between 16 Dutch inner-city railway stations and city centres. In general, she proposed liveliness, human scale, legibility and safety& Comfort as spatial criteria. Followed Inoek’s work, Angkotta (2013) studied liveability of railway station environment and developed twelve measurable parameters under four categories, namely liveliness, safety, connection with city centre and the connectivity of station within rail network. Last but not least, Scheltema (2012) explicitly explained design interventions to improve the bikeability from residential area to railway station in the Netherland. Based on Gehl’s (2010) twelve quality criteria for successful pedestrian landscape, a set of conditions for successful public space for cyclists arisen within a pyramid framework contain four levels, namely safety, directness, comfort and attractiveness.

Some common strategies are identified from above research to create vibrant station area: ① Functional integration, which means provide diverse functions, cannot be found in the vicinities of the project area to attract outsiders. ② Spatial integration, which means create safe and convenient spatial connectors, such as squares, building over railway or roads, overpass and underpass, from all parts to all others within the station itself and its immediate surroundings to overcome spatial barrier generated by infrastructure. ③ Visual and mental integration, which aims to improve the sense of orientation and observability of station area via visual continuation of spaces and transparency of separations.

However, these studies only take station area as normal urban public space and overlook its particularity as transport hub: ① Transport infrastructure inevitably take overwhelming space in station areas and makes transport the primary challenge to tackle with. Therefore, the introduction of retail and catering facilities are subsidiary portion of transport nodes, without restricting the efficiency of the transport network itself. ② Scale transfer zone deserve more concern than those in normal urban areas, since they not only link large scale transport infrastructure and ordinary buildings, but also link different mobility modes, such as from high speed railway to local bus and subway etc. ③ Large scale spatial elements in station areas, such as visual axes, open landscape squares, may hinder functional and spatial integration mentioned above if designed without considering human scale carefully.
As an organic part of urban context, the influence from a broader urban fabric on station area vitality should be involved.

To tackle with above research gap, a framework to investigate spatial factors contribute to urban vitality within inner-city station areas is developed. This tool allows, on one hand, to systematize different strategies that are often developed individually, on the other hand, to provide an overall assessment of urban vitality in station areas.

The framework is based on four main strategies, gathered by previous summary. They are:

- Functional integration
- Spatial integration
- Visual/Mental integration
- Spatial configuration support

Then, each strategy has been specified within three implementing scales, within station building, within station immediate vicinities (500m radius), or within station areas (1000m radius).

The following figure (Figure 1) sums up spatial conditions involved in the framework.

Figure 1. Relations between spatial conditions for vibrant station area
3. The case of Beijing West station area

Beijing west station is playing a critical role as transport hub, and the station area takes strategic location in the inner-city of Beijing. Trains depart from Beijing West reach almost 90% provincial capitals and municipalities in mainland China. The station is also the starting point of Beijing-Guangzhong high-speed railway and Beijing-Jiulong conventional line. Local subway line 9 and some sixty bus lines go through Beijing West and another underground rail is being constructed and heads to Beijing railway station, another inner-city station in Beijing. The station area locates within the 3rd ring road of Beijing, which is the most densely built urban area of the capital city, and the station building itself is also a landmark building (Figure 2).

![Figure 2. Location of Beijing West Station](image)

3.1. FUNCTIONAL INTEGRATION

Like many inner-city station areas in China, transport related infrastructures domain the immediate vicinity of Beijing West station. The station building is closed transport hub with limited retail services, and station squares lack facilities to support urban life.

The circulation design of Beijing West station adopts an airport-style approach to manage the massive volume of predicted passenger flow, which means that the interior space of the railway part is only admission by train tickets and not open to the public (Figure 3). In addition, only limited com-
commercial facilities are centralized located to meet basic needs of passengers according to related design code (Ministry of Construction, 2007). The majority of passenger use interior spaces are station concourse, escalators to upper waiting room, capacious upper waiting areas, and wide underground corridors head to station exits. Mainly offering queuing spaces for boarding and leaving, the station does not accommodate any functions that are not related to railway transport.

On the other hand, as the most important public spaces adjacent to station building, station squares fail to support citizens’ physical interaction. The north square of Beijing West is fenced and always occupied by passengers with luggage, and has turned out to be extension of static passenger container; the south square, on the other hand, is desolate and empty. Without street furniture and bicycle parking facilities with good accessibility, both squares reject city users’ coming by fences and regulations, although cycling is still
playing an important role in transport mode split of Beijing (Gray et al., 2011; Xiong et al., 2010).

3.2. SPATIAL INTEGRATION

Limited spatial linkages within Beijing West station area lack a sense of place. Compared to scarce cycling routes, walking routes perform better as boarding/exit passageways. However, their usage is still limited by the priority to motorized traffic.

Pedestrian routes within research scope consist of indoor linkages between different transport modes for passenger use and outdoor routes head to surrounding fabric. Most indoor boarding/exit passageways belong to tickets admission zone. The underground pedestrian hall of Beijing West is an 85m wide and 217m long interchange space offers a convenient short cut linking two sides of the station, however, without any non-transport facilities. The outdoor paths to nearby public spaces are not legible due to a general lack of clear signage and large scale spatial barriers along the routes. Although without confliction points with car traffic, the walking routes from the station site to its next blocks inevitably include a walking experience through a 90m long overpass on the north or large parking areas on the south.

On the other hand, cycling routes within station areas are in short supply. Biking is ignored as a transport means in the station area. To give spatial priority to automobile, cycling lanes are detoured round the station site. This planning thinking breaks the entire cycling system in the city, but also leads to the result that bicycles cannot gain admittance to station squares.

3.3. VISUAL INTEGRATION

Both railway and local authorities paid much attention to visual effect of Beijing West without considering urban experience and accessibility of the area to citizens. Large scale visual elements lack human scale also hinder functional and spatial integration in turn.

The Beijing West station building is designed on an enormous scale. The station locates on a 510,000 m² site, and has a floor area of 170,000 m². The door shape building with a height of 90m visualizes the “City Gateway” image of the capital. In line with this, the station area is characterized by axes of geometric against the complex in the north and symmetric green corridors without access.

In contrast with above image, it is not easy for city users to easily identify their surroundings. The majority of buildings surrounding Beijing West station are newly-built large scale modern architectures, located on blocks whose sizes are larger than 20,000 m² (160m*160m) along the trunk roads.
The closer to main streets and station building, the larger building scales are. Limited small scale blocks are sandwiched by middle and large ones deep inside super block structure (Figure 4).

Figure 4. Block scale, visual effect and pedestrians’ movement in Beijing West station area

3.3. SPATIAL CONFIGURATION SUPPORT

As mentioned at the beginning of the case study, Beijing West station locates within city core and is surrounded by dense public transport network and people attractors (Figure 5). However, urban life suffers from local inwardly oriented street network and fragmented slow traffic routes.
Two important places near Beijing West station are The China Millennium Monument, a commemorative building to welcome the Year 2000, and the Lotus Pond Garden, an inner-city green of Beijing. The former is the northern endpoint of the axes ending at the main entrance of the station, and the latter locates next to the southern square. Public transport network within station vicinity offer convenient links between the main parts of the area.

The street network around Beijing West station is a grid with a hierarchic setting. Most arterial roads are wide and straight, sometimes meeting at right-angle intersections with viaduct. In each block, internal streets are cul-de-sacs. The inwardly oriented street pattern focuses on provides fluent vehicle transportation and avoids through-traffic through internal blocks. Moreover, the maintenance of slow traffic routes along with arterial roads is better than that of internal streets. Facilities for pedestrians and cyclists are only available in separate points and are not well connected.

4. Conclusions and suggestions

Since the late 2000s, the redevelopment of inner-city station areas in China had been implemented at an unprecedented speed. Strategic locations and excellent transport connections give these areas the potential of becoming lucrative development sites. However, the current practice has given rise to a series of problems. This paper stresses the spatial failure of Beijing West station area in facilitating citizen’s activities and creating vibrant urban spaces.
Four main arguments arise from spatial analysis and field research:

Firstly, the functional arrangement within station vicinities is questionable. The airport-style approach turns station building and its surrounding area into “transport machine” by complicating passenger flows and partially emphasis on management and security. In reality, inner-city stations are merely transport nodes with interior spaces only used by travellers without functions and places available to support urban life. Not only the station buildings are closed to non-passengers, the enormous open station squares are largely disconnected from typical urban life. In addition, to benefit from rising lease values of commercial estate, surrounding blocks display a spatial property of mono-functional blocks adjacent to each other, which is another shortcoming of existing redevelopment.

Secondly, slow traffic linkages between public attractions and station building are overlooked. Many controlled vertical and horizontal movements inside station building result in a lengthy route and lack of seamlessness. The outdoor walking routes head to other places suffer from large scale spatial barriers and a general lack of pedestrian-scale signage. Cycling routes are nearly ignored in station areas, since biking flow is regarded as impediment to effective motorized transportation.

Thirdly, visual effect takes precedence over functional layout in station area planning. The pursuit of “gateway” image brings excess huge scale elements without practical function into station area. These elements have broken up spatial linkages between station and its vicinities.

Last but not least, although Beijing West is close to significant public attractors and supported by dense public transport, the local inwardly oriented street pattern and fragmented slow traffic environment as a whole still need improvement.

Three recommendations follow the issues discussed in this paper.

Firstly, urban planners and local governments need to have a long view of the future role of inner-city station areas as significant urban places. Although the current practice mainly focus on transport infrastructure and real estate development, the situation in the future after the station area turning to public activity hub for citizens needs to be foreseen and considered, especially after high-speed railway and mass transit system increase the frequency of citizens’ travelling to station areas. Therefore, in parallel with keeping the efficiency of the transport network itself, there is a need for a functional and spatial integrated station space and circulation.

Secondly, in the future, the design and planning of Chinese inner-city station areas should emphasize the role of slow traffic environment in creating urban vitality in station areas. Seamless pedestrian/cycling routes and other
facilities support urban life would improve the “gateway” image from the users’ perspective on top of the visual effect.

Thirdly, small scale street network could contribute to creating better scale transfer zone between large scale infrastructure and normal urban fabric. It could be significant for future redevelopments to keep historical small scale street network or break down super blocks moderately. In this way, the station areas can be more accessible for citizens and provide more possibilities for local people to carry out daily activities.

References


