RESEARCH ARTICLE OPEN ACCESS

Study on Experiences of Chengdu east railway Station for Land Development Strategy of Kabul north railway station

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ABSTRACT
"One Belt One Road", though appearing to be a political and economic policy, seems to have a positive and negative impact on other people's lives and the countries covered by the program, including Rapid development of cities and population density in the cities.
The factors that directly affect the development of cities and urban development will be the development of the economies of a region's inhabitants and population density in an area or city.
The launch of the "One Belt One Road" project is an opportunity for Afghanistan to find its place among the countries involved in this large and global program and to take advantage of its benefits for its progress and advancement.
In the past, the Silk Road was the only trade route between China and the countries in the west of China.This way had several paths, one of the paths was through Afghanistan. Afghanistan is a country in the neighborhood of China, and it was one of the major countries through which the Silk Road passed.
Kabul, the capital city of Afghanistan, with more than seven million population will be one of the cities in the country, for which One Belt One Road will have a direct impact on its development and growth.
The construction of the railway station will contribute to the development of this city (Kabul). But as we know, Afghanistan has no railways and does not have the experience of establishing a station, although in the last few years the construction of railways began in the country, which is also for the transfer of commercial products. Therefore, making use of Chinese experiences in the construction of railway stations in China would be quite useful in developing the city of Kabul and solving the challenges of this program.
In this research, we will look at the factors behind the city's growth and urban development. We will look at the challenges of this strategy and find out the solutions and suggest a way to limit and solve these challenges.
Keywords **-** Urban Development, Belt and Road, City Growth, Silk Road, Kabul, Afghanistan

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Date of Submission: 2--11-2019 Date Of Acceptance: 16-12-2019

I. INTRODUCTION

Local transport recently re-recognized even in the developed countries as an available resolution for the social issues in urbanization such as traffic congestion and safety, global warming by CO2 emissions, and the process of low birth rate and aging society [1].

Rail transportation was one of the public transport networks which were often used by the community. Railway emerged as a fast, convenient, safe, clean and low-cost alternative to other ways of transportation [2].

Railway transportation has made a comeback over the past few years. increased fuel efficiency as well as growing demand for bulk freight transportation and cover carbon footprint, has resulted in greater demand for the rail transportation industries [3].

In most countries, the development of the railway system has played an important role in the growth of the cities and the evolution of the urban system.

The impact of transportation improvement on urban development is perhaps one of the most important concerns in metropolitan cities and their transportation planning. It has long been known that transportation accessibility fundamentally influences urban form and/or development (especially urbanization, form location, household location, real estate development, land prices, density, etc.).

The railway station has become much more than just a place to get on and off trains, instead, they are now placing to work, do business, meet, shop and relax. Because of this shift in the role of stations, it is incredibly important for architects and planners to make sure their design facilitates this role as a hub with multiple functionalities.

When designing a station as a meeting place, planners and architects need to take the hub function into account from day one. *Mannela triggianese (architect and researcher)* believe; "The role of the design of a station building shifts from

designing a transportation hub without bearing to its surrounding to considering it as an integral part of the city and its district, the analysis of connections and passenger flows both inside and outside play a fundamental role" [4].

The prices of transportation planning, however, has until recently routinely ignored effects of major transportation improvement on urban form, and the consequent indirect effects that such induced development can have on the efficacy of alternative transportation investment strategies. One of them has been railway and central station, especially on the urban scale. So, this paper has presented a case on Experiences of Chengdu east railway Station for Land Development Strategy of Kabul north railway station. We will have a comparison of research including four factors:

1. Transportation planning and management.
2. Citizen engagement and collaboration.
3. Communications and collaborations between two stations and references of similar success cases.
4. Area planning and management strategy and the impact of the station on urban development in these two cities.

II. AFGHANISTAN`S RAILWAY SYSTEM

In the past few decades, the construction of railways in Afghanistan has been repeatedly raised by both the government and other countries, but it has been facing disagreements and obstacles for some reason because the first proposed plan for the construction of a railway was more than a century ago. However, due to political and economic reasons, the process of building and developing railway lines in Afghanistan has not been much advanced[5].

The first line of the country was built a century ago in 1912. In the 1920s, the country purchased three locomotives and deployed them at the 7 km line from Kabul to Dar Al-Aman Palace Fig1. This electric line was later abandoned and did not expand for political reasons. In the twentieth century, proposals were made to connect the Russian Trans-Caspian railway to India through Sarakhs, Herat, and Kandahar. Moreover, around 1928, proposals were made to connect Jalalabad to Kabul, which should eventually be connected to Peshawar (a city in Pakistan), and few more routes to Kandahar and Herat should be added later on. But due to different political developments and changes of governments in the country, none of the said plans had come into action [5].

Figure 1(Kabul Dar Al-Aman place line 1920)

The new Afghan railways were established in September 2012. The aim of this railway is to manage the development and operation of existing and future Afghan railways to improve economic growth, support regional development and promote the development of Afghan passengers. It also seeks to ensure the reliable and efficient flow of resources, goods, and people across Afghanistan through development. Sustainable and coherent policies and regional and international partnerships, see Fig 2 [5].

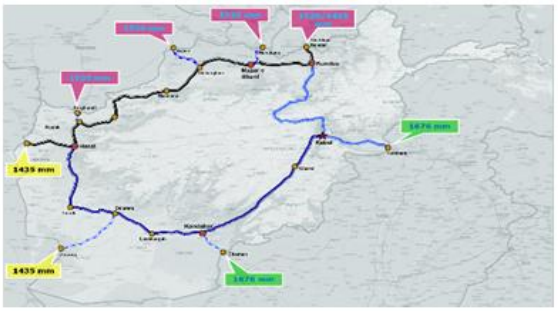


Figure 1(AFG National Railway Plan)

In recent years, with increased stability in the country, Afghanistan is seeking to establish coherent railroads for domestic and international traffic. Currently, the total length of the railway lines built in Afghanistan is about 135 kilometers, one part of which is operating in Balkh at a limited level, but another part in Herat requires action to be used. However, in recent years, Afghanistan is trying to build its national rail network and join the international rail network [6].

III. TRANSPORTATION PLANNING AND MANAGEMENT

Chengdu East Railway Station is located in Changhua District of Chengdu. It is an important transportation hub in the west [7], similar to Kabul north railway station, which will be constructed in the 11th district in the north of Kabul, the capital of Afghanistan. The purpose of this station would be to

connect Kabul with the north, east, south, and west of the country. It is 9.5 km from Kabul international airport in the south, 9.5 km from Kabul north bus station in the north, 34.4 km from Kabul east bus station in the east of the city and 12 km from Kabul west bus station in the west.

Figure 2(Chengdu East Railway Station Area)

Chengdu east railway station is 10km from the North Railway Station and 18 km from the airport. This station connects many domestic trunk lines. It is divided into two parts: the arrival of the yard and the inter-city yard. The station is divided into the east square, the east side, the west side, and the west square. The subway line 2 and the subway line 7, were added into the station. City bus station, and long-distance passenger station, there is a public vehicle parking lot and taxi station under the east and west squares. It is a convenient integrated transportation system hub Fig 4 [7].

The Chengdu East Railway Station looks and functions much like an airport than a train station, with ``200,000 passenger peridia`` (Wu Yong, director of the Chengdu Railway Bureau) and is built in 68 hectares area. With respect to passenger capacity and area, Kabul North railway station only has 10-hectares area and has a maximum 10,000 passengers per day, which is a very small number. We can manage passenger traffic and roads around the station with buses and taxies easily. With four direct bus lines to connect station to four cities' main bus station in the north, south, east, and west and one bus line to Kabul international airport and taxi agency to provide good facility and convenience for passengers. But we also can provide bikes, electric cars and horse carts for short distances. It will be very convenient and also helpful for decreasing air pollution and sound pollution in the city, especially around the station

IV. CITIZEN ENGAGEMENT AND COLLABORATION

4.1 Chengdu East and Kabul North Stations Urban Development Strategy

The residential area around the Chengdu East Railway Station is a large proportion. Due to the proximity to the Tazishan Park and the surrounding greenery, the Central Park Belt is planned. When residents are idle, most of them walk to various leisure places. However, in the current planning, the block size is large, not suitable for walking, failed to create a spatial scale suitable for walking [8].

Buses and taxis are seamlessly connected at the East Station, and you can get to the bus stop and taxi waiting for an area very close to the subway station. Most of the residents can change to the next destination by changing to the bus [8].

Most of the sites close to the East Station are public facilities, including functions such as hotels, businesses, offices, etc. see Fig 4.

Figure 3(Chengdu East Railway Station Urban Development Area)

In the range of 0-100 meters, it is a concentrated space for the integration of above-ground and underground space. The current integration of the above-ground and underground is more significant, and the planning is more reasonable. However, the underground passage of East Square to the car transfer station is straight, and the rest area should be appropriately increased [9].

In the range of 100-500 meters, the surrounding development intensity is medium, next to the East Station, there are two parts of the concentrated commercial area, including restaurants, shopping malls, hotels, etc. is the core business near the East Station. The East-West Square of the East Station vertically corresponds to the underground taxi platform and the bus stop [9].

In the range of 500-800 meters, the commercial land used for the station is greatly reduced, and the surrounding land is mostly occupied by land, see Fig 5 [9].

Figure 4(Chengdu East Railway Station Area Development)

The location of lands around railway stations vary greatly depending on the distance from the station[10] et al. ``Sphere theory`` based on TOD Mode, proposed ``three spheres`` structural model based on the previous example of development surrounding area of the railway station for Kabul North Railway Station area[10].

The first sphere is the core area which is 0.5-0.8km from the station, covering an area of 1-1.5km². the area with the strongest direct association with the railway station where industries are serving stations directly and some other related businesses are concentrated. This area includes station yard, the main body of the hub, square accessory occupancy, bus station, urban transit station and other comprehensive means of transportation and service industries like large-scale business, hotels, business office, finance, exhibition, and entertainment industry, see Fig 6.

Figure 5(Sphere Theory Model 0.5-0.8km)

The second sphere extends and supplements the various function of the first sphere which is 0.8-1.5km, from the station with an area of 3-5km2. the major industries aggregated in the area are cultural industry high-technology industry and land for the logistics industry and another business office. The functional orientation of the area shifts from passenger to residents. Various functions of the city have also transformed from "outward" to "inward-oriented" the development intensity of this area is relatively high, see Fig 7.

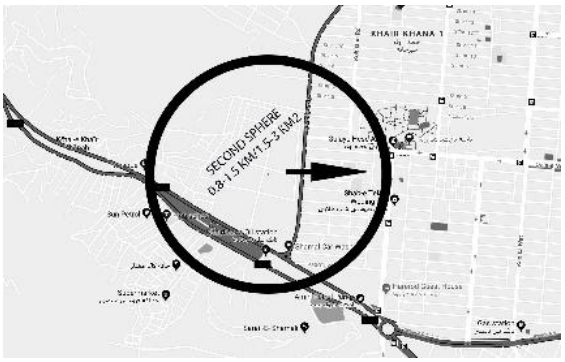


Figure 6(Sphere Theory Model0.8-1.5km)

The third sphere is the periphery area, the function of which is somewhat related to the operation of the railway station, but the dependence is not that high. The association between this area and station is more weakened, which is why the development intensity depends on the land property and development goal which is determined by a number of functions like the goal of urban development in the vicinity of that area, see Fig 8.

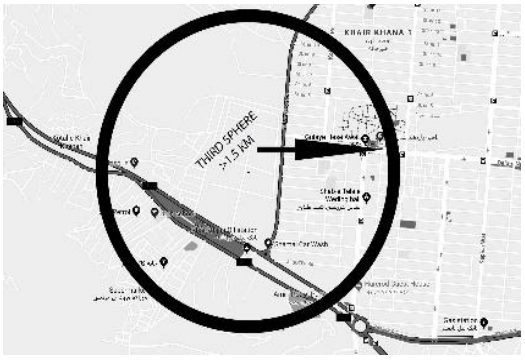


Figure 7(Sphere Theory Model >1.5km)

Level	First sphere	Second sphere	Third sphere
Distance from station (km)	0.5-0.8	0.8-1.5	>1.5
Effect	Transportation service area	Promote the region directly	Catalyze the region indirectly
Vitality	Very strong	Strong	Marginal effect
Influence on spatial arrangement	Direct control	Direct impact	No direct association
Impact behaviors	Road land layout, function land price	Function, population, real estate	Urban function
Boundary definition	A clear boundary between adjacent blocks	Weakened boundaries in the surrounding neighborhood	Not direct reflection on land function, with blare boundary
Highly associated function	Carting, hotel, business, office, information industry, tourism centre	Business office, information, residence	Urban function

Table 1(Features of each sphere)

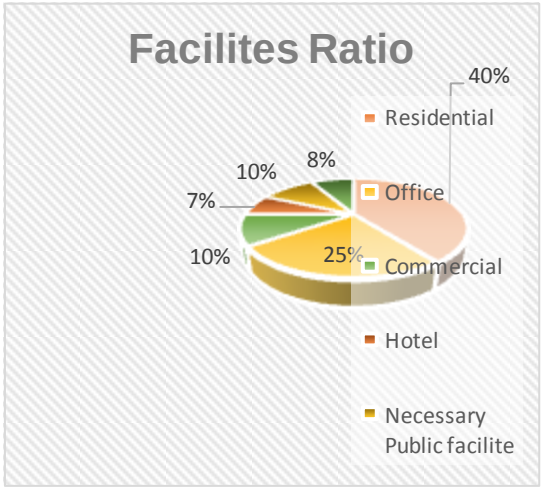


Figure 8(KBL North Railway Station Urban Development Site Plan base on Sphere Theory)

4.2 Relevant Successful cases for Reference

4.2.1 Shin-Yokohama Station in Japan build the center of the city

Shi-Yokohama station lies in Shinoharacho, Kohoku Ward Yokohama, Kanagawa Prefecture, Japan. Within the metropolitan circle of Tokyo and in the north of Yokohama, it is a railway station jointly operated by JR East JR Central and Yokohama City transportation bureau. The station is 11 minutes from the center of the city Prefecture, 26 minutes from Tokyo and 20 minutes from Honda Airport. Passengers can take the Shinkansen to Tokyo, Nagoya, Kyoto, Osaka, and Fukuoka and there are also buses to Honda Airport.

As the Southwest gateway of the Tokyo metropolitan circle, Shin-Yokohama caters to the demand for spatial expansion of Yokohama in the overall planning of Yokohama the area of the railway terminal is defined as the center of the city, forming "dual-core" development mode together with old Yokohama. The two are interdepended and complementing each other. With the area in front of the station the core area, it has developed into the gateway of the metropolis with comprehensive function. Commercial-office buildings and commercial complexes are distributed in the surrounding areas of the station and along the main road in front of the station. Within a 300-meter radius of the comprehensive junction is the core area of the growth of a new urban function, and approximately 500-2000-meter area of land between the station and the route can be used for the development of high-density urban development. The various functional area can be ranked in order of their dependence on transportation junction: circulation business, commerce, residence, and recreation; the residential area is relatively far from the station and the supporting facilities of public culture are distributed between the business district and residential area. At present, the surrounding area of the station has formed complete urban functional facilities including recreation, sports, conference, hotel, residence, cultural, business and convention, and exhibition Fig 10.

Figure 9 (Shin-Yokohama Urban Development Area)

4.2.2 Lille In France: forging European commercial center

Textile as its major industry before slipping into recession in the 80s, soon become the transportation hub of TVG because of its unique geographic location and a Eurostar traversing through its territory. The modern Lille station is equipped with the subway, streetcar and large parking lot with more than 6,000 parking spaces. Successfully grasping the golden opportunity. Lille benefits greatly from the function of high-speed railway in driving the economy and thrives on the people flow, material flow and information flow brought by high-speed railway and soon develop into one of the business centers of Europe.

Within a 500-meter radius of "Eura Lille" Station, there is a dense cluster of commercial and office facilities, as the center. The project of "Eura Lille" includes almost all urban functions and mobilizes the development of business, leisure entertainment and hotel industry around the area, with special emphasis on the third industry. It also plays a major role in gathering a stream of people to the area.

The sphere: 500-meter radius, mostly upscale commercial offices; second sphere:1.5km radius mostly concentrated commercial offices and supporting facilities and recreational facilities and municipal facilities: third sphere: 3km radius, mainly housing development and living facilities. After its completion, Lille has attracted a larger number of young people from surrounding cities to work and live here; moreover, the trading volume and price of real estate in the cities along TGV will increase substantially with the construction of the station, Fig 11.

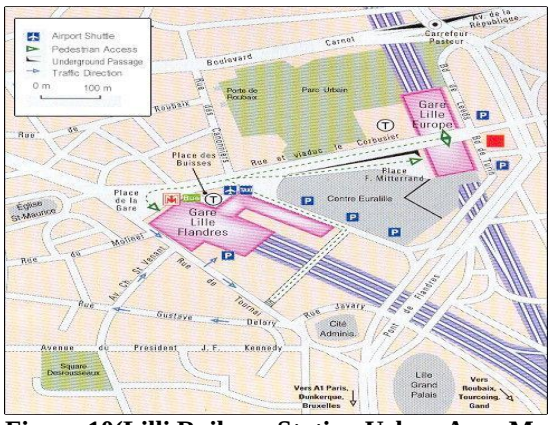
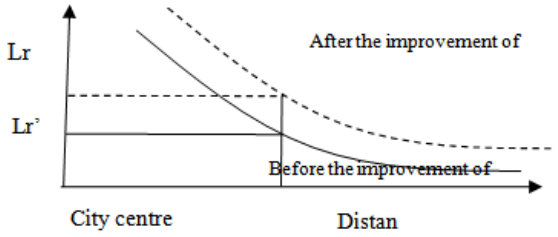


Figure 10(Lilli Railway Station Urban Area Map)

V. RELATIONSHIP BETWEEN CONSTRUCTION OF RAILWAY STATION AND LAND DEVELOPMENT AROUND THE STATION

5.1 The relationship between station and land price

The land closer to the center of the city have higher land price due to lower transportation cost He. Ning et al. believed that was a certain degree of substitutability between land price and transportation facility. As a result, two impotent theories come into being: The Bit Rent Theory and the location theory. The improvement of transportation means the increase of traveling speed and the reduction of transportation fee; for example, rail transit improves the traveling speed of residents, decrease traveling time and reduce opportunity cost. The land rent is in an inverse proportion of the distance from the center of the city; besides the sum of the land rent and transportation cost is constant. The vanishing point of land rent represents the boundary of the city; when the transportation facility is improved the transport cost will be reduced, the land price will be improved corresponding and the vanishing point of land rent will move far away from city center. The phenomenon shows that the improvement of transportation technology and the facility will result in the outward movement and expansion of urban construction. Cities can rely on intercity railway a rapid means of transportation with large carrying capacity between cities, to from corridor spatial layout in which the surrounding areas of the station will be the polarized spots receiving priority in the development[11].



Curve 1*(Curve of Land Rent after the Development of Traffic Facilities)*

5.2 Railway Station Promoting Land Development

The difference in the means of transportation is closely related to land use. The construction of a railway station can improve the complementation of the economic development in the region and give full play to the central cities` radiation function and complementation with surrounding cities. It is also conducive to regional integration. With large carrying capacity and frequent running with a short-time-interval like a bus, the railway provides highly efficient and convenient services, timely transporting passenger flow, improving the accessibility of area

along the railway and upgrading urban structure [11].

VI. PLANNING MANAGEMENT AND IMPLEMENTATION STRATEGY

6.1 Mode of Operation

The development model should combine inter-city construction and property development. The development mode with government leadership and market participation will be the major mode of operation for inter-city railway in the future; for example, we can establish joint venture company (combining state-owned capital and private capital) to take full charge of the promotion, international cooperation land control, operation and management of the project and some relatively independent development in the planning such as the construction of infrastructure and public service facilities. The rest can be left to the market to allow market behavior to conduct the development and construction of the secondary market [11].

6.2 Development strategy

6.2.1 The timing of housing demolition and relocation and development

(1) Consider on the whole and implement step by step:
The construction of the intercity railway is a long process, which starts from housing demolition and relocation, investment promotion, to development and construction and finally putting into use. The whole process may last for three or five years at least, sometimes ten or even more years. Therefore, we need to take the larger view into account, and consider the whole plan and implement it step by step. Departments concerned should work together and cooperate with each other, take an active part in the construction of public government service platform and form the mechanism in which specialized company is responsible for operation and development under the guidance of the government [12]. We should make one overall planning and develop step by step on a long-term basis [11].

(2) Take good control and make a reservation and choose ideal time for development:

If the timing is premature for development in the near future, we should better take good control and make reservation, rather than haste for success at the cost of development quality and standards because we should have confidence that, with the improvement of economic situation and facilities like rail transit, the development prospect is rosy in the future; however, once we have conducted development with low quality, it would be very difficult to make amendments in the future[11].

(3) Actively improve development conditions and introduce scientific operation mechanism:

According to relevant domestic and foreign experiences, the improvement of infrastructure and other conditions in the surrounding area of intercity railway stations can effectively promote the value of land in the planned area and is very good for attracting strong developers. Consequently, the government should vigorously improve the development conditions within the planned area, including opening BRT (Bus Rapid Transit) routes and building rail transits, etc., so as to improve the convenience of transportation within the area and create a good investment environment. The author suggests that scientific operation mechanism shall be introduced and governments of different areas shall gather together to make decisions, clearly distinguish the relationship of rights, responsibilities, and interests among various parts in the development process of the station area and leave the concrete implementation to the company in charge of the development. In addition to the above, it is necessary to consider a number of other issues to provide prosperity for the residents of the area [11].

- Defects of the road line system resulting in the formation of narrow street lines.
- Development of slums and squatter settlements.
- Haphazard location of industries.
- Heavy traffic during the work hours of the day.
- Inadequate open spaces for parks and playgrounds resulting in unhealthy living conditions.
- Noisy atmosphere of the area.
- Uncontrolled development of the area.
- Unhealthy living condition.

We should establish a specialized development panel with major leaders from the municipal government, introduce professionals to take full charge of the planning, development, construction and investment attraction of the project, cooperate and coordinate among various parties and jointly promote the implementation of the project.

(4) Strictly control the quality of development and modify the content of development without delay:

The area around the intercity railway station is the gateway of the city to the outside. The quality of development within the area will directly influence the image of the city; therefore, the author suggests that the quality of development should be controlled effectively while improving the development conditions in the planned area. In particular, the key areas should be developed by developers with good resources and strength, so as to ensure the quality of development. Appropriate plan positioning and overall design should be made to guarantee the high standard and good quality of the development project; the focus should be the

control of the road network and the area of gateway image [11].

6.3 Implementation of the proposed satiation area Planning Schemes

We should strengthen planning control and conduct land use control and project approval in strict accordance with the requirements in the planning; a detailed land supply plan should be formulated in advance; as for the project resulting in a long time idle land due to failure to develop in accordance with the project schedule, the lands should be recovered according to rules [11].

The development and construction of the planning is a long process, therefore, in case of changes in the external environment or the existing planning schemes' failure to adapt to the external environment, we need to adjust and correct the content of development in good time according to the changes of external environment, so as to guarantee the ultimate success of the development and construction. Planning schemes need legal force for fixing up the value of the property arbitrarily according to some fixed procedure, power to acquire slums and demolish them with a view to improving the area, power to acquire land, power compel proper use of land and buildings, power to finance the urban planning project and power to prevent the fragmentation of land beyond creation limit [11].

VII. CONCLUSION

Due to the experience of Chengdu east railway station and the area around the station, the land use in the area around the Kabul north station should develop with help of Chengdu east station area urban area development experience and with the Guidance of "TOD`s" core idea of development. Meanwhile, the government and people should take full account of social benefits and economic benefits. The government should conduct optimization management in the area and apply a market mechanism for the scientific operation to improve prosperity and development in the area, and people must support and push the government to run the project.

ACKNOWLEDGMENTS

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