Impact of Zhengzhou Subway System on Adjacent Migrant Neighborhoods

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By

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Abstract

Subway has advantages of large capacity, fast speed, punctuality, less pollution, low energy consumption and so on. It has become a chief means of public transportation and an important approach to solve the traffic problems in big cities. The purpose of this research is to investigate the impacts of the new subway lines (Line 1 and Line 2) in Zhengzhou on adjacent migrant neighborhoods. To study the impacts of Zhengzhou subway system, I conducted door-to-door surveys and interviews on household level in the two target communities (West Guanhutun and Yanzhuang). The major findings of this research reveal the negative impact of the subway system on migrant neighborhoods. The introduction of subway system in Zhengzhou provided more commute options, but since the two lines have not formed a mature subway network, the subway did not significantly shorten local residents' commute time. Meanwhile, though the emergence of subway system brought added value to surrounding properties, the rapid increase in rent aggravated migrants' living burden and further led to shifts in property use and local demographic composition. The vulnerability of migrant group is rooted in China's household registration system, and connected with local development policies. The findings of this research show the importance of taking minority group's voice into policy-making process and would be helpful for future development of metro system in the city.

Acknowledgement

To begin with, I would like to express my sincere gratitude to all the people who have helped me in the process of conducting and revising this research. Firstly, I would like to thank my advisor Professor Weiping Wu for her guidance and comments throughout the academic year. Her guidance not only helped me in this particular research, but more importantly, taught me the way of thinking professionally.

Besides my thesis advisor, I would also like to thank my thesis reader Professor Lance Freeman for his insightful suggestions on statistical analysis in this research and encouragement throughout the whole process.

Lastly, I would like to thank the cooperation and participation of all respondents of my surveys and interviews. Their responses supported this research, widened the research perspective, and gave me the opportunity to have a deep understanding of the migrant neighborhoods.

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1. Introduction

Construction of public infrastructures and facilities is crucial for a city's development. During the past decades, with China's significant economic growth, there has been a rapid increase in the amount of public transportation system, especially in major cities. The impact of the newly built metro system to the city has triggered public discussion. As Yifachel said, there is an "evident connection between regional planning and the dark side of minority" (Yiftache). While contributing to the city's development, we cannot overlook the dark side of the public infrastructures. Neglect of minority groups' needs in decision-making process could result in exclusionary planning and intensify to social conflicts.

This thesis is about the emergence of Zhengzhou subway system (Line1 & Line2), which has raised very high expectation from local people, and would focus on its impacts on migrant neighborhoods. Zhengzhou, located in the central part of China, is the provincial capital of Henan. It is the province's political and economic center. GDP of Zhengzhou in 2016 ranked the 18th among Chinese major cities. To complete the research, I have selected two study areas—the first one is North Huayuan Road Area (West Guanhutun) along subway Line 2; and the second one is Yanzhuang along subway Line 1. I am going to study the impacts of subway lines by comparing average rent, and commuting time to travel destinations, for example, work/school, before and after the opening of subway lines, and dig deeper into its influence on social economic features, including property use in the study areas. The research aims to answer the following questions:

- What is the impact of Zhengzhou subway system on the migrant neighborhoods along

metro lines?

- How does the influence of the emergence of Zhengzhou subway system on the migrant neighborhoods reflect the city's development policy, and what should the governments do?

- What can we learn from the construction of the city's metro system and what are the policy implications?

The two target areas are comparable in terms of scale, population size, building type, and locations (distance to the closest subway station). Both West Guanhutun and Yanzhuang communities have evolved from urban villages; in the demolition and redevelopment process, original free-standing house owners were compensated by several separate new apartments (based on the size of his/her original house). It is very common that an original home owner occupies only one or two apartments, and rents the rest out. Competition on the supply side lowers the rent in these communities, and therefore makes them become more attractive for migrants.

By interpreting changes in rent, commute time, and social economic conditions, the research aims to analyze the different impacts of subway system on migrant neighborhoods. The goal of the city's subway system is to shorten commute time, and make people's life easier. However, my research shows that the emergence of Zhengzhou metro system resulted in a rapid increase with less influence on commute time in the study areas. Due to the increase in rent, low-income migrant group is being excluded from the neighborhood and this worth

planner's consideration.

2. Literature Review

Scholars have done numerous research on the topics of migrant neighborhoods and impact of subway system. Their studies and findings provide theoretical foundations for this research that help clarify the definition of migrant neighborhood, analyze the positive and negative effects of subway system, and guide variable selection. The major findings are categorized and shown below.

2.1 Migrant Neighborhoods vs. Urban Villages

Data from Wang and Fan shows that China has experienced rapid urbanization, improving from less than 30% urban to nearly 50% (Wang and Fan, 2012). The pioneers in this transition have been the huge number of Chinese migrant workers, which are called "floating population" who have left their rural villages to seek work opportunities in the big cities (Connelly, Roberts, and Zheng, 2010, p2). The one-direction transition from rural to urban (Wu and Logan, 2015) has significantly increased population in urban areas, and facilitated the formation of migrant neighborhoods.

Migrant neighborhoods in China refer to low-cost, high-density, migrants clustered areas, often located in "Chengzhongcun" (urban villages) (Wu and Gaubatz, 2013, p103). Therefore, before digging deeper into the concept of migrant neighborhoods, it is necessary to understand the formation and development of urban villages in Chinese cities. Both urban villages and migrant neighborhoods are results of China's recent high-speed urbanization. (Liu, He, Wu, and Webster, 2010, p136). For urban development, farmland in "peri-urban

villages" is requisitioned through the land expropriation process, but the village's residential

areas are still owned by the indigenous villagers. (Hao et al, p2177-2197) Urban villages in

China can be divided into three categories — "mature urban villages", "expanding urban

villages", and "forming urban villages". "Mature urban villages" are the ones that have been

completely surrounded by urban lands; "expanding urban villages" are located on the cities'

edges and have not been fully surrounded; "forming urban villages" are located in the

planned urban areas (Zeng, p14).

The housing and settlement pattern of migrants are determined by not only personal needs but

also social context. The urban-rural divide, represented by Chinese Hukou system, largely

restricted migrants' access to affordable housing types, and to some extent, forced them to

live in poor, overcrowded urban villages. The housing reform in 1980s neglected migrants

housing demand. Due to the lack of urban Hukou, commercial housing is the only real

property sector open for migrants; however, they still not qualified to get bank mortgages to

finance new housing (Wu and Gaubatz, 2013, p102). As a result, most of migrants, who value

affordability and location more than living quality, are not homeowners but renting low-price

units in urban villages.

Due to the special dual-status of urban villages in urban-rural land management structure

(Kochan, 2015, p1), there are political and social tensions in the migrant neighborhoods. In Li

Zhang's book, while the central government seeing the power of migrant group as threats to

its control, local and district level governments who enjoyed economic benefits brought by

migrants, are more open to migrants. Besides conflicts among different layers of government, poor living condition with less regulation led to high crime rates in the migrant neighborhoods. As Zhang described, migrant group with lower social status, are more vulnerable and victims of such urban problems (Zhang, 2001, p137-159). Generally, migrants' housing conditions are poor and crowded; and it is very common that homeowners built additional structures or separate one single room into two illegally. The huge difference in migrant housing demand and affordable housing units contribute to the chaotic situation in the migrant neighborhoods (Wu and Gaubatz, 2013, p105).

2.2 Impact of Subway System

As of early 2016, China has built over 3100 km urban subway lines in 27 cities (Li, 2016). The impact of subway system can be regarded as a two-edged sword. On the one hand, the construction of subway system could increase accessibility and shorten commute time (Bae, Jun, and Park, 2003, p88). Meanwhile, in regards to housing price, research showed that the value of property increases as distance to subway station decreases (National Cooperative Highway Research Program, 1996). Bajic found that improvements in accessibility and less commuting time were the factors of increase in housing prices (Bajic, 1983, p147-158). Besides housing price, subway system could also influence land use, employment and population profile (Bollinger and Ihlanfeldt, 1997, p179-204).

On the other hand, regarding China's rapid development in urban subway system, some scholars are concerned about its negative impacts, including decrease in affordability, safety

and environmental issues. Ho and Chui analyzed the effect of accessibility to subway lines on housing affordability, and found that accessibility significantly influenced on the affordability of private rental housing in Hongkong (Ho and Chui, 2002). Meanwhile, the analysis of Hangzhou Subway Line 1 accident, happened on November 15, 2008, indicated that during the construction process, safety was ignored and sacrificed due to economic benefits and time limit (Ma, Jong, Koppenjan, Xi, and Mu, 2012). The construction of subway system could also lead to environmental issues, including vibration on surround buildings (Dong and Zhu, 2004) and changes in underground soil condition (Mu, Cheng, Chohr, and Peng, 2014) (Fang, Zhang, and Wong, 2011).

2.3 Variable Selection

Through preliminary literature review, the majority of the previous studies were either about migrant neighborhoods or impact of subway lines, but lack of connections between these two research subjects. To study the impact of subway system on surrounding migrant neighborhoods, the research method should be based on the methodology of testing impact of subway system ((Bae, Jun, and Park, 2003, p89) and focus more on the features of migrant neighborhoods. Since migrants are excluded from housing distribution system and facing limitations in purchasing apartments in cities, renting has become the primary choice for them (Wu, 2002, p99). Therefore, the dependent variable should include indicators of rent, including rent price and rental behaviors. Moreover, regarding the fact that economic incentives are the major factors of migrants' settlement intention (Chen and Liu, 2016), economic indicators should also be considered.

3. Research Background

Zhengzhou is located in the east-central part of China and is the capital of Henan Province. As a prefectural level city, Zhengzhou serves as the province's political, economic, technological, and cultural center ("Illuminating China's Provinces, Municipalities & Autonomous Regions", 2017). The area of Zhengzhou contains 6 districts—Jingshui, Guancheng, Erqi, Zhongyuan, Huiji, and Shangjie; 5 sub-level cities—Xingyang, Gongyi, Dengfeng, Xinmi, and Xinzheng; and one county, Zhongmu (see Figure 3.1). Zhengzhou is under high-speed urbanization with more than 9 million residents, and about 6.5 million urban populations having local Hukou (Zhengzhou Statistical Bureau, 2016). The gap between the number of residents and urban residents shows that there are a large number of migrants working and living in the city.

Figure 3.1 Administrative Subdivision of Zhengzhou (from Wikipedia.org, edited by author)

Zhengzhou is also one of the country's important transportation hub as Longhai Railway Line

(from Lianyungang to Lanzhou) and Jingguang Railway Line (from Beijing to Guangzhou), the two major cross-country rail way lines, meet in Zhengzhou. With advantages in transportation, the city has attracted a large number of manufacturing enterprises. In 2012, Foxconn moved its 250,000-worker plant into the city. In March 2013, the central government officially approved development plan for Zhengozhou Airport Economic Zone (ZAEZ). ZAEZ has been growing very fast, become the world's largest smartphone producing site, and ranked the nation's second largest free-trade zone (Shepard, 2016). The introduction of these manufacturing enterprises has increased demand of labor force, more young people moved from rural areas to the city, and thus, further aggravated burden on migrant housing sector.

3.1 Formation and Redevelopment of Migrant Neighborhoods (Urban Villages) in Zhengzhou

As mentioned above, because of limited affordability and accessibility to most housing options, rental housing units in urban villages become migrants preferred option. Before the first redevelopment plan in 2003, there were over two hundred villages in the city. The self-build structures by the homeowners were provided for migrants who were new to the city. For migrants, life was easier and more convenient in the urban village not only because of their advantages in location, but also the low-cost merchandise and services within the neighborhoods. However, since most of the rental housing units were regulated by the homeowners, who only cares revenue from rents, the living conditions in the urban villages were much poorer than the city's average. Those migrant clustered urban villages had been regarded as the city's scars with dirty, dangerous, and uncertain image.

Besides negative image of urban villages in Zhengzhou, rapid development of Zhengzhou facilitated the redevelopment process of urban villages. Started from early 1990s, Zhengzhou has planned and built four new development zones, which are High Tech Industrial Zone, Zhengdong New Zone, Zhengzhou Economic and Technological Development Zone, and Zhengozhou Airport Economic Zone. While the city expended into the village, price of the village land increased significantly, huge potential of economic benefits attracted local governments and real estate developer to redevelop urban villages in Zhengzhou.

In 2003, Zhengzhou government announced the first official document, "Document No. 32", for redeveloping urban villages (see Table 3.1). West Shizhao Village was the first experimental redevelopment project and was the starting point of the city's 10-year urban village redevelopment process. Since then, "Document No.103" introduced "Zhengzhou Model" that emphasized the importance of the relationship among government, village residents and developers, and accelerated the redevelopment process. From 2011 to 2014, the city turned the market-lead urban village redevelopment process into government-lead that emphasized the importance of government's leading role in the redevelopment process; in 2014, the city's last 14 urban villages were listed on the redevelopment project and would be demolished by the end of 2016 (Henan100.com, 2014).

Year	Tittle of Policies	Significance
2003.09.30	"Regulations for Redeveloping Urban Villages in Zhengzhou" ("Document No.32")	Starting Point of Redevelopment of Urban Villages in Zhengzhou
2007.06.12	"Document No. 103"	Introduction of "Zhenghzou Model" in Redeveloping Urban Villages
End of 2011	"Measures of Regulating Urban Village Redevelopment"	From Market Lead to Government Lead-Turning point
2014	"List of Urban Village Redevelopment Projects"	Eliminating the Last 14 Villages in the City

Table 3.1 Redevelopment Policies for Urban Villages in Zhengzhou (created by author)

3.2 Transformation of Property Rights in the Redevelopment Process — "Post-Urban Village" Community

During the redevelopment process, local government is playing an important intermediate role between urban villages and developers. In China, after land reform, there are only two types of land ownerships—urban land is owned by the state and rural land is collectively owned by village members. Therefore, there is no absolute private property in China; rights being exchanged in the real estate market are actually time-limited use rights. Equipped with effective land and fiscal policies, and together with household registration reform the government facilities the urbanization process.

As mentioned above, since there are only state-ownership and collective ownership currently existing in China, land user can only obtain the use right, not the land or any resources in or below the land. This two-end leasehold system grants the government more control over land exchanging process. In urban areas, developers purchase land from local government, and transfer the use right to urban residents (including former village members).

After redevelopment, each village household was still living and owned several apartments in the community, most of them decided to rent the spare ones out. Therefore, due to the strong family connection and blood bond among village members, though the village was demolished and replaced by high-rise buildings, the new community are still "urban village" in people's mind. Meanwhile, leaders of villages still have big influence over the community. I define this type of community as "post-urban village" community.

3.3 Migrant Rental Housing Market in "Post-Urban Village" Communities

The high compensation to village members increased development cost for developers. To make profits, they have to build high-rise buildings to decrease unit cost of land. As a result, though the villages were redeveloped, the new "Post-Urban Village" Communities are still very crowded and lack of public spaces. Since each former village household owns several apartments and rents them out, the supply side of rental housing market in this type of community is highly competitive. While there are more available rental units in "Post-Urban Village" Communities, the rent there is relatively low. Also, some of the village members keep connection with previous migrant tenants. Sufficient available rental housing units, low

price, together with personal connections make the "Post-Urban Village" Communities popular for migrant group. Therefore, the locations of migrant neighborhoods were not significantly affected by the city's redevelopment towards urban villages.

3.4 New Subway System in Zhengzhou

Zhengzhou Metro is the rapid transit urban rail system serving Zhengzhou area, covering the city's 6 districts, 5 sub-level cities, and Zhongmu County. In February 2009, the National Development and Reform Commission (NDRC) approved the city's proposal for Subway Line 1 and Line 2. Henan Development and Reform Commission announced "Zhengzhou Urban Rail Transit Network Development Plan (2014-2020)". The second-phase Plan shows that before 2020, there will be 5 metro lines with a total distance of 167.55 km.

The west-east Line 1 with a total length of 41.4 km starts from Henan University of Technology and ends at New Campus of Henan Universityn (see Figure 3.2). The first phase of Line1 has 22 stations (from Xiliuhu to Zhengzhou Sports Center) and is 26-kilometer long. The first phase is completely underground and has been opened since December 13, 2013. The second phase of Line 1 opened in January this year, extending the first phase with ten stations (seven stations to the western end and three to the eastern end) and 15 km in length.
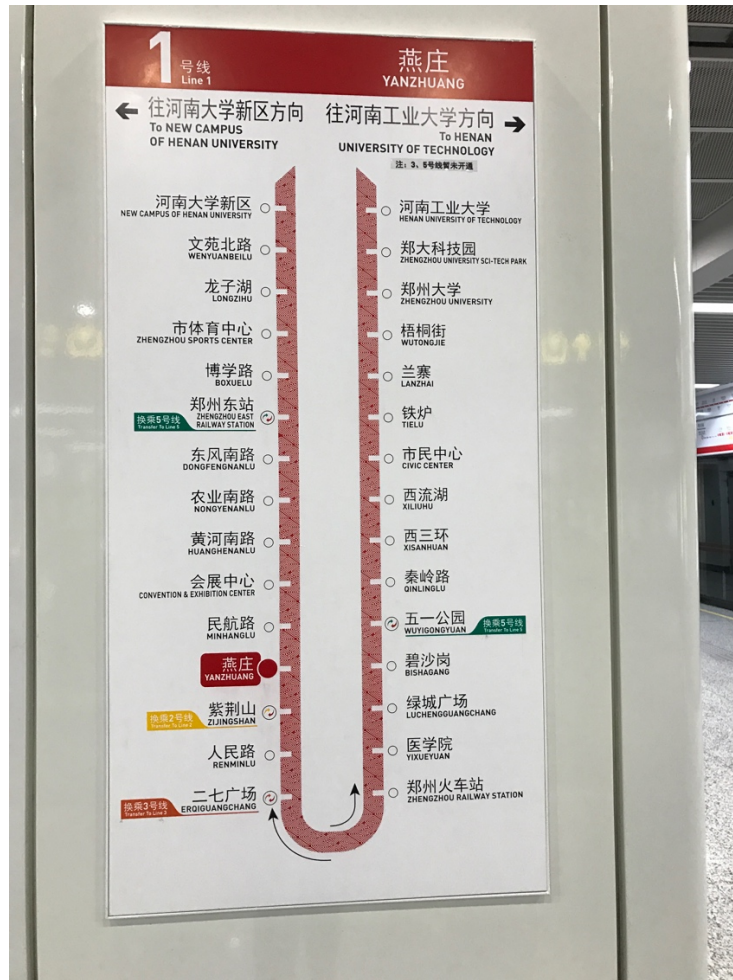
Figure 3.2 Line 1: Station Map (Photo taken by author at Yanzhuang Station)

Line 2, a north-south line with a total length of 27 km, starts form Huiji District and ends in Zhanmatun (see Figure 3.3). The first phase of Line 2 is 19 km with 16 station, 2 elevated and 14 underground, and was opened in August 2016. In January 2017, the completion of Chengqiao Line (southern extension of Line 2) added 15 stations and extended Line 2 to Xinzheng International Airport. The cross-shape Subway Line 1 and Line 2 meet at Zijinshan Station, which is currently the only transfer station.

Figure 3.3 Line 2: Station Map (photo taken by author at Guanghutun Station)

The demographic features of Zhengzhou and its recent development policies have attracted a large number of migrant workers into the city, and promoted the formation of "post-urban village" communities. The influence of the subway system cannot be separated with the city's background and development policies. Contextual background in Zhengzhou, including the city's development policies and advantages in location, evolution of migrant neighborhoods, and the emergence of subway system, would be helpful to understand the target migrant neighborhoods and narrow my focus to major conflicts.

4. Research Design

To study the impact of the emergence of subway system in Zhengzhou on migrant neighborhoods along metro lines, I adopted case study method by on-site visit, personal interviews, and a door-to-door survey in the two selected areas.

4.1 Methodology

Through preliminary background research and survey, I zoomed in my focus from general impact of subway system on migrant group to how it has affected rent price, commute behaviors, and demographic composition in the migrant neighborhoods. The entire research is based on both qualitative and descriptive quantitative analysis supported by surveys and interviews.

To determine the impact of the emergence of subway system on rent in the selected areas, I conducted longitudinal and cross-sectional comparison based on time line. The assumptions are: in one particular year (the years when Line 1 and Line 2 were completed), there was more rapid increase in rent in the selected areas comparing with the city and other migrant neighborhoods that are not along the metro lines; and in one neighborhood, the rent increased more in the year when subway line opened comparing with other years. The longitudinal and cross-sectional comparison would be helpful to control for the years when subway lines opened was a special year when the whole city's average rent increased significantly; or the rates of increase in rent in selected neighborhoods were originally higher than the city's average.

To analyze the subway lines' influence on commute time, I surveyed residents in the selected migrant neighborhoods for the average minutes saved in commute time after the emergence of subway line system. Since traffic condition varies every day, the quantitative number of minutes here should be conceptualized into qualitative responses, which indeed shows "to what extent the subway line has shortened the residents' commute time".

Meanwhile, I focused on the shifts in property use and demographic composition. I interviewed local residents about how they feel about the changes in demographic after completion of subway lines, and studied the property use in the target areas through site visits.

Besides survey and interviews of 70 residents in Yanzhuang and West Guanhutun, on-site observation also gave me chances to better understand and experience the impact of subway lines on the migrant community. I approached local rental agencies for more information from the supply side, and took the subways (both Line 1 and Line 2 from Yangzhuang Station and Guanhutun Station) during the rush hours. Photos and documented conversations would further support the findings of interview and survey.

4.2 Case Selection

In order to study the impact of the city's metro lines on migrant neighborhoods, I selected two migrant clustered areas along the subway lines, Yanzhuang and West Guanhutun, which

are comparable in community type, size, and location. As mentioned above, both Yanzhuang and West Guanhutun neighborhoods were redeveloped from "mature urban villages", which were completely enclosed by the city (Zeng, p14) into "post-urban village" with residential and commercial functions.

Yanzhuang is located along Zhengzhou Metro Line 1, the Yanzuang station was name by the village's name. After redevelopment in 2007, the new community was renamed as Manhattan Plaza. It was the largest redevelopment project at that time with 5,979 residential units and size of 800,000 square meters (Fang.com, 2007). West Guanhutun is located along Zhengzhou Metro Line 2, near the Guanhutun Station named by the village (see Figure 4.1). In 2010, the village was redeveloped into the 480,000-square-meter Guomao360 Plaza (Xintian360 Plaza.com, 2012).
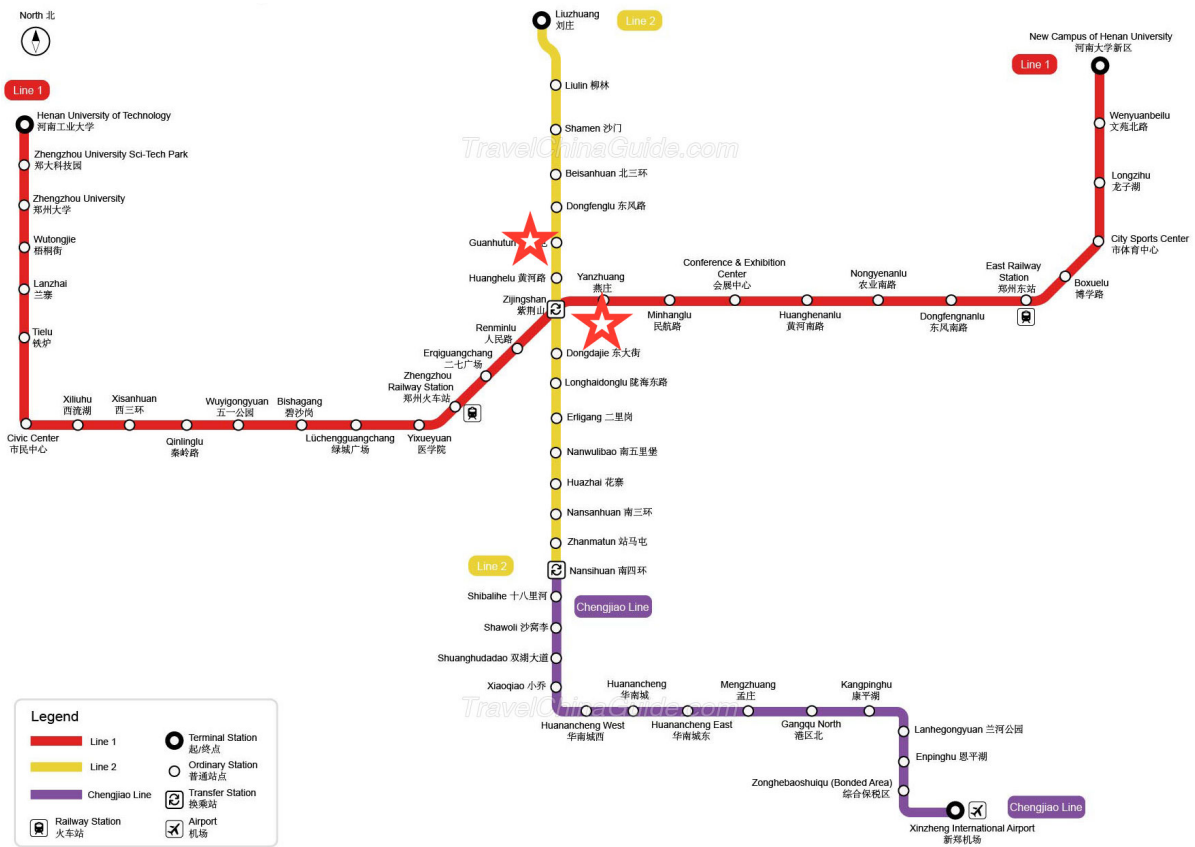
Figure 4.1 Zhengzhou Subway Map and Locations of Study Neighborhoods

In both Yanzhuang (Manhattan Plaza) and West Guanhutun (Guomao 360 Plaza), the

buildings are very tall and a large number of units were owned by former village members as

relocating housing (see Figure 4.2 & 4.3). Though the communities are very crowded, low

rent due to competition on the supply side in these areas attracts migrant renters.

Figure 4.2 Manhattan Plaza (Photo taken by author)

In addition to comparable size, type, and location, since each of the selected neighborhoods

has been redeveloped over 5 years, the housing markets in these areas are more stable and

mature. A stable rental housing market would be helpful to control external influences and

focus on the impact of the emergence of the city's subway system.

Figure 4.3 Guomao 360 Plaza (photo taken by author)

4.3 Data Collection

Due to the lack of officially published rent data at the community level, for this research, I

collected first-hand data through on-site survey and interview. Meanwhile, I used secondary

data of the city's average rent hike and other from websites of the city's department of

housing management, local news, and rental agencies as references to study the findings of

my survey and interview.

The door-to-door individual survey and interview is based on following rules of sample

selection: 1. Even spatial distribution—certain number (5 – 10) of samples in each building

of the communities; 2. Systematic selection of apartment number in each building (every

10th). 3. Survey Timing—some of the residents may not be able to reach because of the time

of survey. Especially, migrant workers return to their hometowns during the Chinese Spring

Festival period. Therefore, surveys within in one building cannot be done all at once. (Ideally, 1/3 in the morning, 1/3 in the afternoon, 1/3 in the evening and during different seasons.)

In each selected neighborhood, I surveyed 50 residents (interview questions were on the survey questioners and orally responded). To avoid side effects of survey time and season, I visited each of the sites three times (2017.01.03 – 2017.01.08, 2017.02.28 – 2017.03.01, 2017.03.15 – 2017. 03.19), and during the different times of the days. For the first visit, I conduct preliminary background research and survey to verify research questions and editing survey questionnaire; during the second and third, I approached local residents for surveys and interview(survey questionnaire is attached in the Appendix). After deleting incomplete ones, I collected 35 records for each community.

4.4 Sample Profile

The total of 70 survey respondents are from the two study neighborhoods, Yanzhuang and West Guanhutun. The survey questionnaire includes demographic questions of if the respondents are migrants, apartment owners or tenants, and their age. As shown in Table 4.1 and Figure 4.3, half (35) of the 70 residents in these two neighborhoods are migrants. In Yanzhuang, 16 out of 35 are migrant residents; in West Guanhtutun, the number of migrants is 19. Meanwhile, in both neighborhoods, the percentage of renters is higher than the percentage of apartment owners. In in Yanzhuang, 6 of 35 residents are apartment owners, and the rest are renters; in West Guanhutun, there are 8 apartment owners and 27 renters. Lastly, most sample residents in these two study areas are younger than sixty years old. In

Yanzhuang and West Guanhutun, there are 30 and 33 respondents who are younger than sixty.

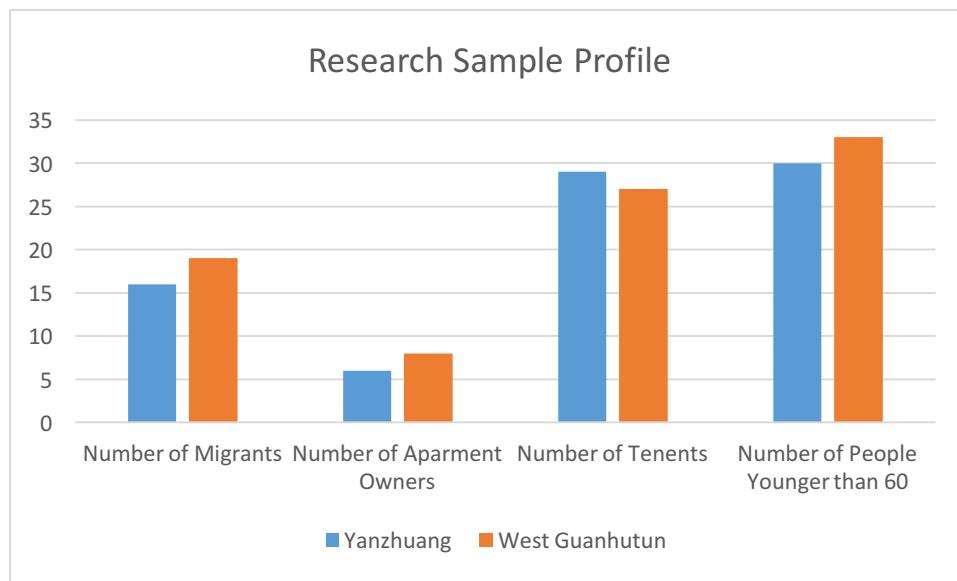| Sample Profile			
	Yanzhuang	West Guanhutun	Total
Number of Migrants	16	19	35
Number of Aparment Owners	6	8	14
Number of Tenents	29	27	56
Number of People Younger than 60	30	33	63

Table 4.1 Research Sample Profile

Figure 4.3 Demographic Features of the Sample

4.5 Research Limitations

Small sample size—Due to the limitations on time and man power, the sample size of the survey may not be big enough to represent the overall tendency in the selected areas.

Accuracy of information—Lack of officially published data on selected areas; secondary data from news and rental agencies may not be reliable.

Disruptive factors—timing of the survey, other infrastructures built at the same time, difference in policies on district level, etc.

5. Major Findings and Analysis

The major findings of this research can be divided into three sections—the impact of subway system on rent, commute time, and property use and demographic composition in the two study neighborhoods. In section 5.1, I will analyze the influence of subway system on rent increase rate in Yanzhuang and West Guanhutun by comparing the rent in selected areas with the city's average. In section 5.2, I will focus on the impact of the emergence of subway lines on local residents' commute time in this two neighborhoods to study if the current two subway lines have made people's daily travels easier. Lastly, section 5.3 will dig deeper into changes in property use and demographic composition.

5.1 Impact of Subway System on Rent in Yanzhuag and West Guanhutun

In Yanzhuang, 19 (54%) of the surveyed 35 residents' rent increased more than 20% from 2013 to 2014. Meanwhile, 12 (34%) of them said their rent increased 15% to 20%. Only 2 people's rent increased less than 10% during that year. In West Guanhutun, there are 29 residents whose rent increased more than 15% from 2016 to 2017 and counts for more 84% of the total respondents. At the same time, there is only 2 people said their rent increased less than 10% during that year (Figure 5.1 & 5.2).
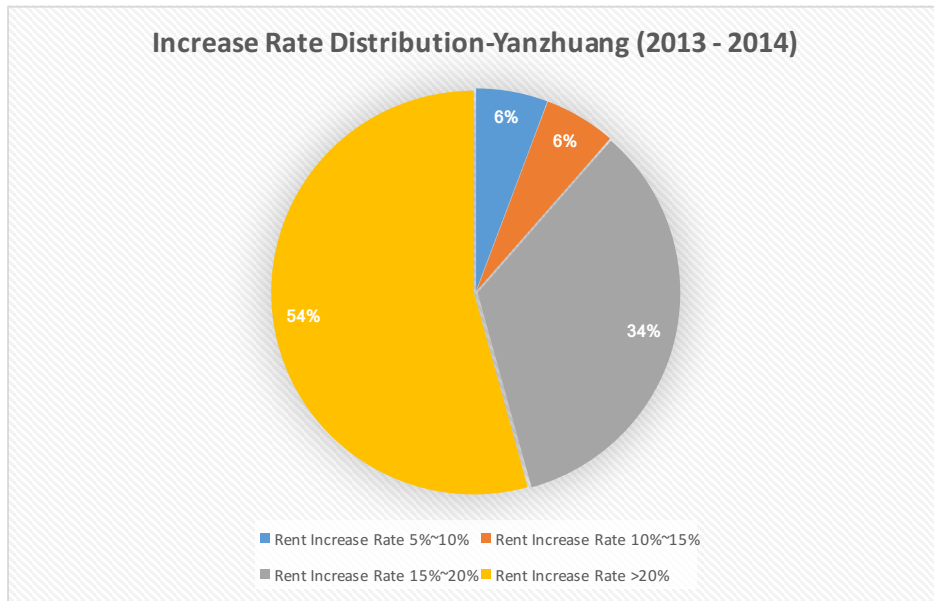
Figure 5.1 Distribution of Increase Rate in Rent – Yanzhuang (created by author)
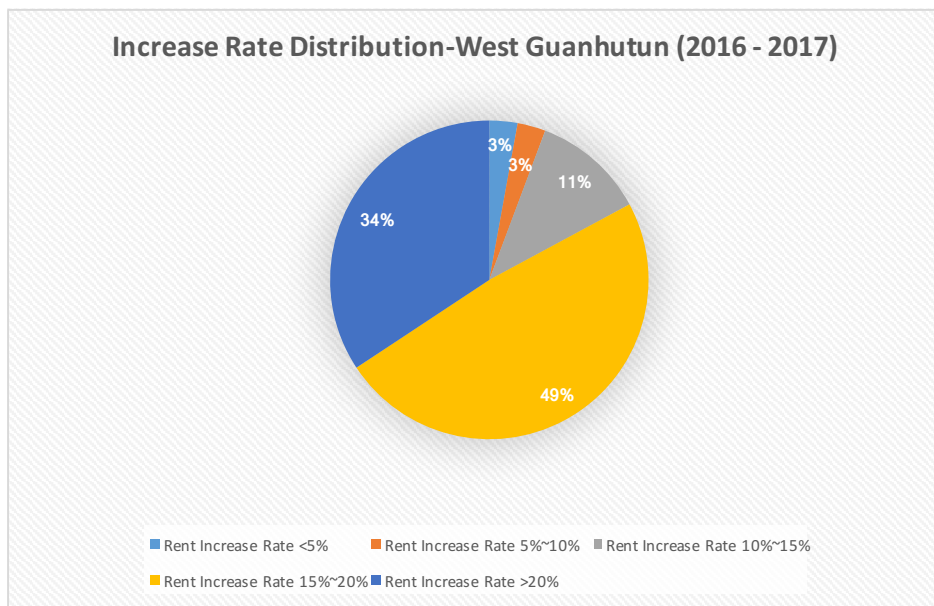

Figure 5.2 Distribution of Increase Rate in Rent – West Guanhutun (created by author)

Comparing the average rent increase rate in the selected areas (among 70 respondents) with the city's average during years, from 2013-2014, as shown in Table 5.1, the average rent increase rate in Yangzhuang was 20%, which was much higher than the city's average of 15% from Zhengzhou Department of Housing Management. In West Guanhutun, after the opening

of Line 2, the average rent increase rate was 18% and higher than the city's average increase of 10% during the same period. I notified that the general rent increase rate (in both the city and selected neighborhoods) from 2013 to 2014 was higher than the rate from 2016 – 2017. The significant difference was a result of the "List of Urban Village Redevelopment Projects" policy in early 2014; ten urban villages, including Zaozhuang, Dapu, were demolished during that period. The sudden decrease in the number of urban villages intensified competition on the demand side, and led to rapid city-wide increase in rent.

Period	City's Average Increase	Selected Area's Average Increase
After Line 1 (2013~2014)	15%	20%
After Line 2 (2016~2017)	10%	18%

Table 5.1 City's Average Rent Increase Rate vs. Selected Area's Average Rent Increase Rate (created by author, data source: Zhengzhou Department of Housing Management listed on Sina.com)

Besides the city's average, I selected six additional comparable migrant neighborhoods, which are not close to the current subway lines, and compared rent increase rates in those communities. Due to time limit and shortage of manpower, I was not able to conduct survey in each of the neighborhoods. Instead, I approached 21 Centaury rental agency located on Xiangsheng Street in Zhenghzhou for listed rent information. Though the supply side rent would be higher than actual rents (room in price left for bargaining process), and thus, resulted in higher growth rate, the rent hikes in these comparable migrant neighborhoods were still lower than the two target areas' in the according years (see Figure 5.3 & 5.4).
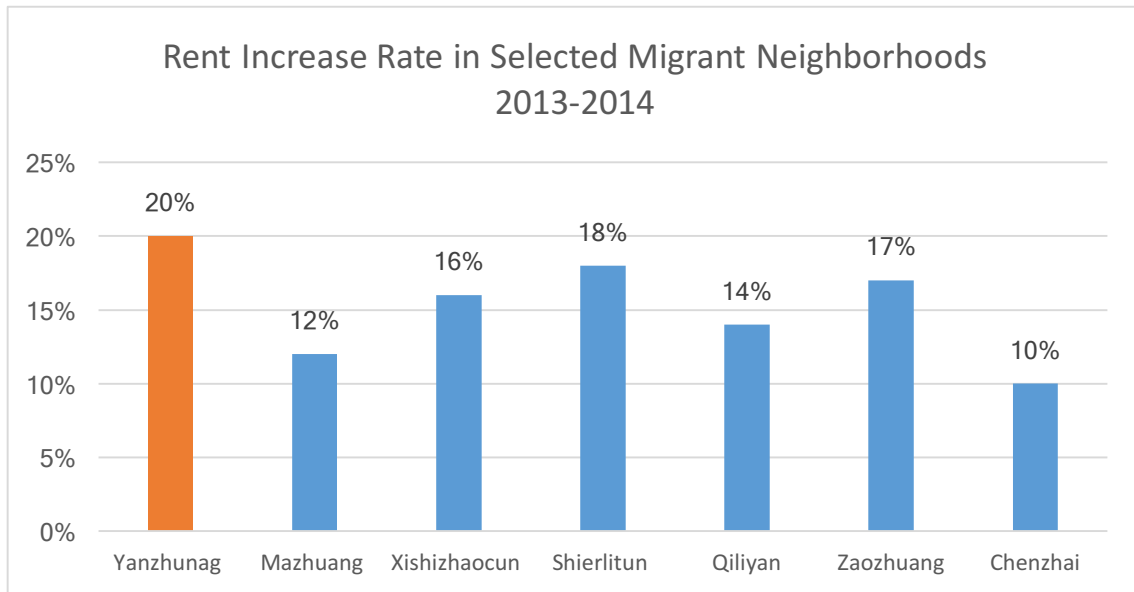
Figure 5.3 Rent Increase Rate in Selected Migrant Neighborhoods 2013 - 2014 (created by
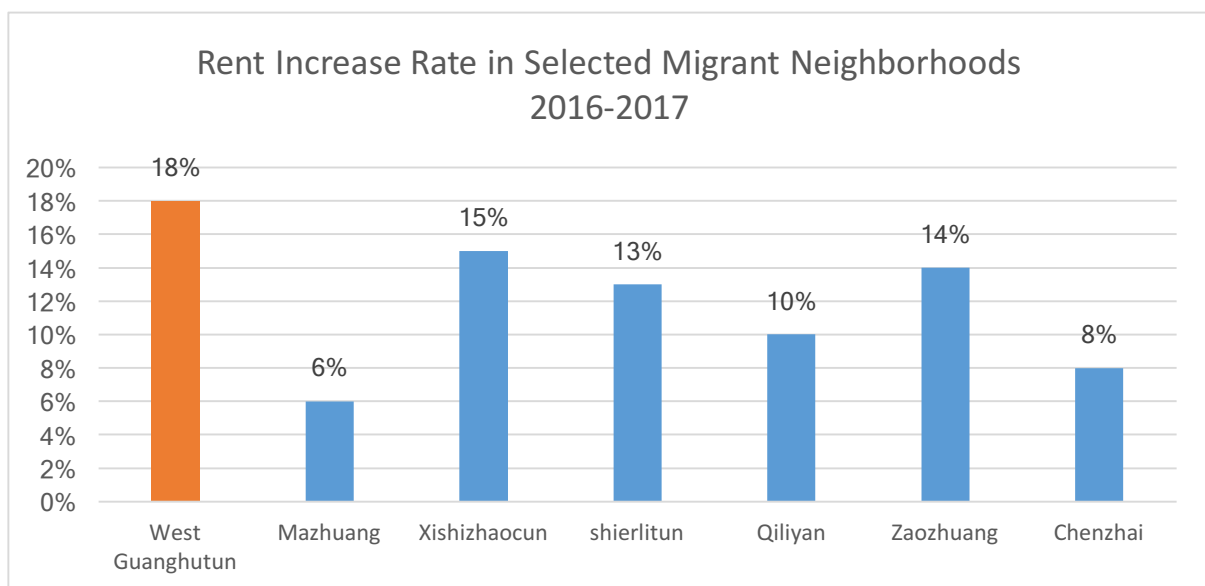
author)

Figure 5.4 Rent Increase Rate in Selected Migrant Neighborhoods 2016 - 2017 (created by

author)

The longitudinal comparison based on time line was more difficult than comparing the two

years' rents since it required more data of the past years. Through the preliminary survey, I

found that most of the respondents could not remember exact changes in rent for each past year. I modified the quantitative question into a qualitative one, asking have then if they have experienced more rapid increase in rent from 2013 to 2014(for Yanzhuang) and from 2016 to 2017 (for West Guanhutun) comparing with other years. Interview responses indicates that in both communities, most of the interviewees (33 of 35 in Yanzhuang, 34 of 35 in West Guanhutun) have experienced more rapid increase in rent in the opening year of the subway lines.

From the analysis above, we can see that comparing the same neighborhoods' rent increase in the opening years of subway lines with other years, most of the residents has experienced more rapid increase. Meanwhile, larger increase in the selected areas where are closer to the subway lines shows the impact of the emergence of subway lines on migrant neighborhoods.

5.2 Impact of the Subway System on Commute Time in Surrounding Migrant Neighborhoods
The introduction of subway system to the city provided local residents more commute options. However, does the emergence of Metro Line 1 and Line 2 shorten residents' commute time in the surrounding migrant neighborhoods? In Yangzhuang, the average time saved per trip after the emergence of subway line is around 4 minutes. Surprisingly, only half of the respondents' commute time decreased; and one fifth of the respondents' commute time was even increased by taking subway. Situation in West Guanhutun is worse, while the average commute time decreased by 6 minutes, less than half of the respondents' commute time was shortened, and 8 respondents' commute time was longer than before (see Figure 5.5

& 5.6).

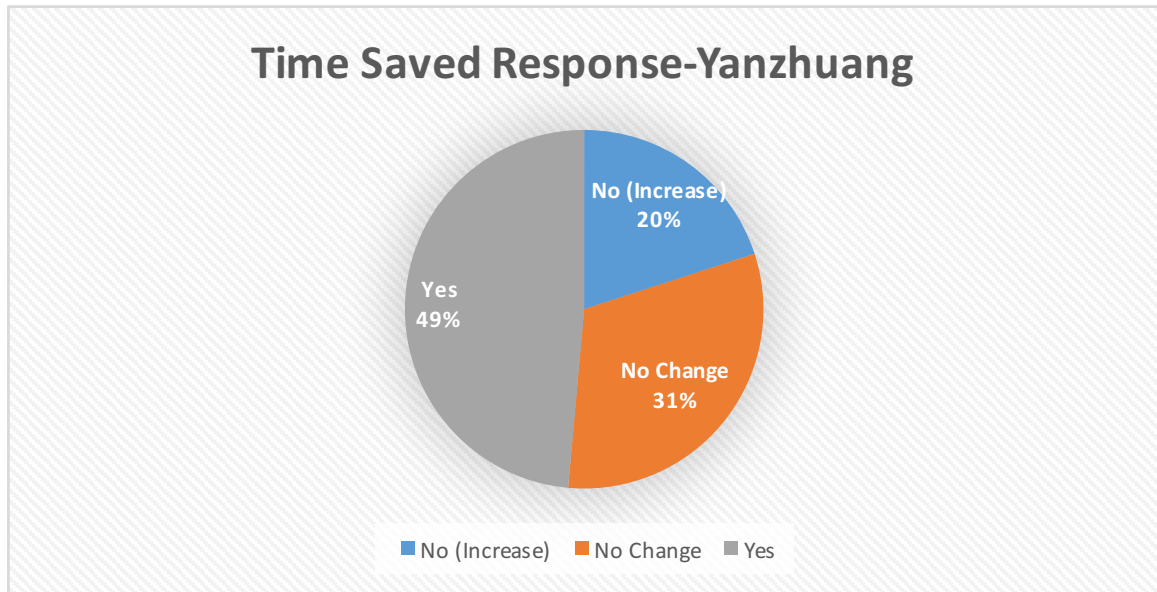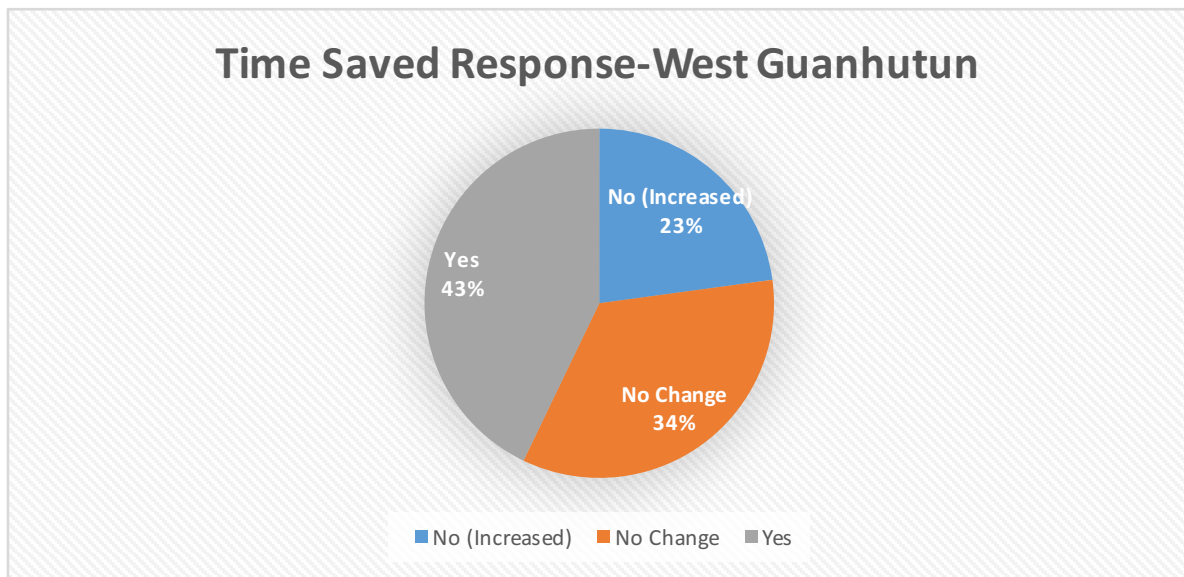Figure 5.5 Impact of Subway on Commute Time - Yanzhuang

Figure 5.6 Impact of Subway on Commute Time – West Guanhutun

During the survey process, one female respondent in West Guanhutun who was from Luohe, a prefectural-level city in Henan Province and now working in the Zhongyuan District in Zhengzhou complained that

"After the Line 2 opened, the city's BRT routes has been changed and the original station

near the neighborhood was canceled. Now I have to take subway to work and transfer in Zijinshan Station. The transfer station is very busy and crowded during rush hours and hard to get on the subway. Also, there is a 10-minute-walk distance from my working place to the nearest subway station."

To prove what she said and find out why the emergence of subway system did not significantly shorten residents' commute time in these neighborhoods, I took the subway from the Yanzhou Station to the Guanhutun Station during the rush hours on a weekday. At Yanzhuang Station, I could not get on the first train because there were too many people. When I transferred in Zijinshan Station, I waited for three trains and the entire trip was about 45 minutes. I checked Baidu Map when I was on the subway, and estimated the travel time with bus was about 35 minutes.

Figure 5.7 & 5.8 Rush Hours of Subway Lines (photo taken by author)

Reponses from survey and my personal experience show that while the introduction of subway system broadened people's commute options, the route changes of other public transportations and immature subway network did not significantly decrease residents

average commute time in the neighborhoods.

5.3 The Emergence of Subway System Shifted Property Use and Demographic Composition in Study Migrant Neighborhoods

I met a young migrant couple in West Guanhutun packing staff in the hallway and preparing to move. They told me that the original lease would be expired at the end of that month and due to the emergence of Line 2, the apartment owner increased the monthly nrent from 2200 yuan to 2800 yuan.

> "The rent has increased too much and we would not be able to afford it. This apartment will be leased to a small e-commerce firm as their office."

They also told me that they still had not found new satisfied accommodation yet, rental housing would still be their first and only choice, they would have to stay in local relative's place for a while and was considering migrant neighborhoods that is far from the city's central area and subway lines.

Through my observation, in both neighborhoods, nearly one fourth of the apartment units have been changed into commercial use for offices, restaurants, coffee shops, beauty salon, and etc. (as shown in Figure 5.9) In West Guanhutun, I counted the number of non-residential units at Building 4 Unit 3. There were 216 apartments in that building unit, and 39 of them were for non-residential use. Comparing with individual migrant, business owners can afford higher rent and squeeze migrants out of the neighborhoods. Meanwhile, the new commercial units make the neighborhood more crowded and harder to be regulated since the number of

temporal visitors increased. The introduction of temporal visitors also shifted the

neighborhoods demographic composition.

Figure 5.9 Non-residential Units at West Guanhutun (photo taken by author)

Data and responses from my survey indicates that rent was significantly increased in the

selected neighborhoods due to the emergence of subway system. However, surprisingly,

while the subway system broadened local residents commute options, it did not significantly

shorten residents' commute time in the selected area, and some of them even spend more time

on daily travel. Rapid increase in rent also shifted property use and demographic composition.

While the business owners and local renters came into Yanzhuang and West Guanhutun, the

neighborhoods have become more mix-used. The introduction of these new residents and

temporal visitors altered local demographic composition. In other words, the emergence of

Zhengzhou subway system has made the migrant neighborhoods less "migrant".

6. Reflections and Implications

The research on the impact of newly built Zhengzhou subway system on surrounding migrant neighborhoods illustrates that while the average rent increased rapidly, the subway lines did not make local residents travels much easier or significantly shorten commute time. From analysis above, in exchange of more than 5% additional rent increase rate comparing with the city level, average commute time only shortened less than 10 minutes for residents in the selected migrant neighborhoods. Meanwhile, the increase in rent heaviered migrants living burden and forced them to move out. Changes in property use and demographic composition reflect the urgent needs of effective regulation, and therefore, worth consideration.

6.1 Impact of the Emergence of Subway System Cannot Be Isolated from the City's Background

From the history of migrant neighborhoods in Zhengzhou, the formation of the migrants clustered areas was a combined result of the city's development policies and nature of local urban villages. Therefore, the study on the impact of Zhengzhou subway system should be based on context of the whole city and cannot neglect other social economic factors' influence on the migrant community.

The impacts of the emergence of subway system and the city's policies on the migrant neighborhoods are in the same direction and affected each other. On the one hand, the city's redevelopment policies towards urban villages shortened the number of rental housing units for migrants; the development policies that introduced more manufacturing companies and

attracted more migrants increased competition on the demand side. On the other hand, subway system as part of the city's development plan, influenced not only the surrounding migrant neighborhoods, but the entire city. However, migrant groups were more vulnerable to the changes. The emergence of subway system did not weaken, but further amplified the impact of the city's policies.

The impact of subway system on commute behaviors should also be based on the city's public transportation system. Since there are only two metro lines in Zhengzhou, and has not been a mature network, comparing with the city's entire transportation system, the introduction of subway system widened people's options but its benefits and convenience have not been significant for most people, including residents in the migrant neighborhoods along the metro lines.

6.2 Short-term Impact vs. Long-term Impact

It has been less than 5 years since the opening of the first subway Line 1 in Zhengzhou, this research studies the impact of its emergence. However, it is hard to define whether the current impact on rent increase rate, commute time, and demographic composition is long-term or short-term.

Empirical studies in Tianjin with well-developed subway network shows that with the development of the subway network, the neighborhoods distance to the nearest station, whether it is located in the city's central area, and the age of subway lines will become the

key factors determines the extent of subway system's impact (Sun, Wang, Li, p9). It seems that in the long-term, with completion of more metro lines, the impact of subway lines in the migrant communities tends to be closer to the city's average.

6.3 Policy Recommendations

The root of the vulnerability of migrants to social economic changes in China is the country's household registration system. However, eliminating the urban-rural barrier is over local government's scope, since they do not have enough control over national wide labor force and social resources. It is the central government's responsibility to play a leading role in improving household registration system in China (Chan, 2013.)

Without much control over state-level household registration system while facing tensions in the migrant neighborhoods due to the emergence of subway system, Zhengzhou local government should narrow its focus into the major conflictual migrant neighborhoods, aim to not only regulate but improve affordability in these areas to increase migrant living standard and avoid social exclusion. Firstly, local government should consider a rental aid plan for migrants together with the subway development that overcomes expected rapid increase in rent price. Secondly, the emergence of subway system has made surrounding migrant neighborhoods more mix-used in function and thus, requires stronger and more detailed regulations.

Figure 6.1 & 6.2 Unregulated Trash Collections the Migrant Neighborhoods

(photo taken by author)

7. Conclusion

With China's rapid economic growth in the past decades, development of infrastructures and public facilities has significantly altered people's daily life. This research narrows its scope into the migrant neighborhoods in Zhengzhou (West Guanhutun and Yanzhuang), and analyzes the influence of the city's new subway system on these communities. While providing more travel options and contributing to the city's public transportation system, Zhengzhou subway has led to significant increase in rent, heaviered burden on migrants, and caused shifts in property use and demographic composition in the migrant neighborhoods. The impact of subway system on migrant neighborhoods is a reflection of China's household registration system and local redevelopment policy. Resolving tensions and issues in the migrant neighborhoods require efforts from both the central and local government, and participation of vulnerable groups in the policy-making process.

The major findings of the research show that the emergence of Zhengzhou subway system has impact on the selected migrant neighborhoods' rent increase rate, property use and demographic composition, but less effects on shortening commuting time. Firstly, Yanzhuang and West Guanhutun migrant neighborhoods, which are closer to the subway lines, became more popular on the rental housing market. As a result, the rent increased significantly during the year when the subway line opened in both communities. The rapid rate hike in rent increased local residents' living burden.

Secondly, while the growth rate of rent increased dramatically, the subway system has not

largely shortened residents' commute time in these two study areas. In both communities, the average time saved after the opening of subway lines is less than 6 minutes. And there were also negative voices on the subway lines complaining that the original BRT routes has been changed due to the subway system, and made their daily travel less convenient. Zhengzhou subway Line 1 and Line 2 has not formed a mature metro system yet. Though the introduction of the city's subway system widened people's traveling options, it has not effectively shortened their commute time.

Thirdly, the subway system has led to shifts in property use and demographic composition in Yanzhuang and West Guanhutun migrant neighborhoods. From my site visit and interview, I found that because of the study neighborhoods' advantage in location, the emergence of subway system attracted more business owners and local renters and made them more popular in local rental housing market. The competition on demand side not only caused increase in rent, but introduced more business and local renter who could afford higher rent into the neighborhoods. Meanwhile, business owners, local renters, together with temporal visitors altered the demographic composition in there two neighborhoods.

The vulnerability of migrants is rooted in the nation's household registration system, which limits migrants access and right to affordable housing options. Reform of current household registration system needs efforts from the central government with the highest administrative hierarchy. In addition to the national wide household registration system, the impact of subway system on the study migrant neighborhoods is deeply connected with local

development policies. The formation of migrant neighborhoods and supply of rental housing units were results of the city's redevelopment policy; and the subway lines are part of the city's entire public transportation system. Therefore, it is also local governments responsibility to take migrants benefits into careful consideration and improve participation of minority groups in the policy-making process.

Appendix

- **Survey Questionnaire**

Household Survey – The Impacts of the Emergence of Zhengzhou Subway System on the Migrant Neighborhoods along Metro Lines

Date:

Location: Yanzhuang / West Guanhutun

Age:

Apartment owner / tenant (select one)

Hometown:

Number of owned units _____ (apartment owners only)

1. How long have you been living in this community? _____

2. Travel frequency _____ (per week)

3. Current frequency of using subway lines per week _____

4. Average commute time to travel destinations (for example, school, work etc.) _____ minutes before the opening of subway line

5. Average commute time to travel destinations (for example, school, work etc.) _____ minutes after the opening of subway line

6. Time saved per trip after the completion of subway system _____ minutes

7. How many rooms in your apartment?

8. Rent _____ (CNY) before the opening of subway line

9. Rent _____ (CNY) after the opening of subway line

10. To what extent has the subway line changed your daily life _____ (select from 1 to 5)

11. Have you felt significant increase in rent (more than before and after) during the year when the subway line open?

12. How do you think about the changes in the neighborhood's average income level after the opening of subway lines? Improved___ Don't Know___ Not Improved___

13. Do you think the overall percentage of migrants in your neighborhood has decreased

since the emergence of subway system? Why?

14. Any other comments on the city's subway system

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