

The Integration Development and Territorial Cohesion of Neighboring Cities :the Case Study of Jiuquan-Jiayuguan in China

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Abstract: City integration derived from the regional integration, urban agglomeration, has become a new regional phenomenon in China.This phenomenon has attracted wide attention. The paper examines the case of city integrate development between Jiuquan –Jiayuguan neighboring cities based on two spatial scales. Firstly,at the neighboring cities level,the paper studies the influence extent of facilities, complementarity extent of industries development and efficiency extent of institution system construction.secondly,at city linkages level, The authors study Changs in Intercity transport links and Changs in Intercity residents' daily behavior.Next,the paper analyzes the problems of city integration development and its influencing factors.On the basis of the above discussions, the paper believe that Jiu-Jia should build high-efficient cooperation mechanism, "complementary development"of land use function, "convenient" Intercity travel supply and jointly build complementary industry types and these four aspects help better promote the healthy development of the city integration in Jiu-Jia.

1.Introduction

Since the 1980s, with the continual development of global economy and internet progress, either regional economic integration or urban agglomeration has replaced single city, became main spatial regional unit for global competition and cooperation of countries and region, accelerated economic globalization and regional economic integration, increasingly become the most important character for current development of global economy. Regional economy integration is characterized as city agglomerations, city belt, as well as regional cooperation between cities, all of which regard the large city, and super city as center, and also behaved as trend conversion and expansion from urban space to regional space. City integration is developed from the huge context of economic globalization and regional economy integration, especially, as advanced products of development of industrialization, urbanization, and all the more so, it is making an “concordance” focusing on the common benefits between neighboring cities(Qunhua Zeng, etc,2013). The two central city areas of Jiu-Jia have a distance of 18 kilometers,both had long historical origin since ancient era. Jiayuguan is a new modernization city developing with the Jiuquan Iron and Steel Group in first five-year national key construction project, and was approved by the state council as municipality of province instead one part of Jiuquan. Both Jiuquan and Jiayuguan are transportation gateways, as known as a strategic town

in Hexi, a key in border. The two cities are linked with geography, joined by mountains and rivers, connected with human relation, and equipped with mutual basis of city integration. This paper aims to dig and trim the influences of City integration to these two cities, summarizes experience from them, and eventually provides beneficial references to city integration in the Jiu-Jia and other areas.

2 .City Integration Research Overview

2.1 Feature analysis

City integration contains two or more than two cities which have adjacent or closer built-up areas geographically, similar natural environmental conditions and social cultural background, developed rapid transportation network and communication network in a certain historical and realistic conditions. The cities, which have complementarity on the function and close connection on the industrial structure, become an urban aggregation with polycentric spatial structure and mutually independent in administration (Guodong Zhang, 2008). The practice of the city integration across the different regions has been varied. For instance, Tai-Yu city integration proposed “Ten integrations”, Chang-Zhu-Tan integration proposed “Five integrations”, Xi-Xian New Direct proposed “Eight integrations” etc., all have their own characteristics.

Table 1. The Main Practice in Different City Integration Objects

City Integration objects	Start Year	Composition city	Main approach
Chang-Zhu-Tan	1982	Changsha, Xiangtan, Zhuzhou	Transportation with ring、Electricity with net、Financial city、Information share、Environmental co-governance
Tai-Yu	2001	Taiyuan, Yuci	Planning jointly consider 、institutional isomorphism、market with the body、industrial with the chain、Common prosperity of science and technology、Transportation with ring、Facilities with layout、Information share、Environmental co-governance
Xi-Xian	2002	Xian、Xianyang	Planning jointly consider、Transportation with ring、Information share、Market with the body、Industry synchronization、Common prosperity of science and technology、Travel with line、Environmental co-governance
Guang-Fo	2002	Guangzhou、foshan	Construction of Guangzhou and Foshan cities cooperation framework agreement、urban planning、Transportation Infrastructure、Industry Collaboration、environmental protection the four special docking Agreement

2.2 Driving mechanism

As a special form of regional economic development stage, city integration has different generation mechanism in the areas with different developing levels, thus producing different development patterns. In this paper, a few city-integration cities in China are taken as objects, which have different generation mechanism in the areas with different developing levels, to analyze the difference on driving mechanisms under the different economic developing levels.

Table 2. The Main Driving Mechanism in Different City Integration Objects

City Integration Objects	Driving Mechanism
Shen-Fu	Increasingly closer economic and social space links, Aspects of government and inter-city cooperative enterprise governance methods..
He-Huai	Economies of scale and competition effects, diversion effect, the welfare effect
Guang-Fo	The driving force of government and impetus of market mechanism
Tai-Yu	Economic strength is the real foundation of the city integration; the industrial structure is the basis for the city integration; development and competition is the source of the city integration

2.3 The Relationship Between City Integration and Regional Integration

City integration and regional integration are not equal entirely, the key to discriminate is that whether the involved areas belongs to the same region. When the involved area of city integration is same with the regional integration's, city integration and regional integration can be equal. When the involved area of city integration is less than or is assigned to the involved area of regional integration, city integration is a crucial stage in the process of regional integration, city integration area is equivalent to a "growth pole" in the involved area of regional integration. The development and construction of "growth pole" contributes to regional development and promotes the construction of regional integration with clear priorities and gradual process.

3. Development Review of Jiu-Jia City Integration

City integration is a development particular form among regional cities and its essence is a process of close cooperation between the regional cities. City integration experiences city integration consensus, co-construction between cities, city integration alliance, city merge each other, city integration realization from the initial phases to the mature phase of development. So far, The development of city integration is at the stage of co-construction. Co-construction is the elementary stage of city integration, and the guidance of co-construction also has a critical impact on health

promotion of city integration.

3.1 City Integration Consensus

Jiu-Jia cities have enormous potentiality in economic cooperation and strong complementarity in cooperative development. Jiayuguan has an enormous steel smelting strength and a higher urbanization rate, while Jiuquan possesses rich mineral resources, complete industrial categories and prosperous service industry. Numbers of the consumption in Jiuquan need to drive by Jiayuguan, and that Jiuquan need Jiayuguan to provide consumer sentiment. The population of permanent residents in city in Jiuquan is 245,000, and rural population is 245,000. Jiayuguan, with 219,900 city permanent population and 15,600 rural population, provides large developing space to peasants' urbanization in Jiuquan. A sentence has been circulated in Jiu-Jia is that seeing the city in Jiayuguan, shopping in Jiuquan, buying a house in Jiayuguan, working in Jiuquan. Jiu-Jia connect closely in the region, landscape and the culture. With the rapid development of economy and the speeding up of urbanization, the Geopolitical contact between Jiu-Jia cities have been more closer, and city integration development has been an irresistible trend.

3.2 Co-construction between Jiu-Jia cities

Through the current situation of urban land in 2000, 2004, 2006 and 2009, it can be seen that Jiu-Jia city integration had been in gestation period and had relatively slow development before 2009. After 2009, the development strategy of Jiu-Jia regional integration was proposed by the Gansu province, and a series of development policies were introduced to accelerate the development of Jiu-Jia regional integration. The trend of spatial extension approaching to each other in Jiu-Jia began to accelerate. Industry park in the West of Jiuquan started a large scale construction from 2009 and Jiu-Jia cities expressway was opened to traffic in 2012. Mingzhu Park and Taolai River Park in Taolai River New District completed first and then residential communities, administrative office, schools and other communal facilities followed up.

4 .The effectiveness analysis of Jiu-Jia city integrate

Urban space development effectiveness study allows us to go from the bottom-up perspective seriously examine the problems and the reasons of the urban development process, in turn, to better guide our planning. In this part, the author will use a combination of qualitative and quantitative manner, starting from different periods of development of the Jiu-Jia city integration to analyze the actual effectiveness, the concrete can be from the city integration development's influence on the whole Jiu-Jia area (the neighboring cities level) and the influence on the inter-city link (city linkages level) to analysis the two scale.

4.1 The Neighboring Cities Level

4.1.1 Changes in the Industry System of the Neighboring Cities

Currently Jiuquan takes new energy equipment manufacturing, agricultural processing, chemical industry, commercial logistics industry as the mainstay industries. The gross output value of the four mainstay industries in 2009 were 69.4%, 5.8%, 2.5% and 16.1%. While Jiayuguan's steel industry appears to be the dominant industry with the steel industry accounting for more than 90% of overall industrial output value. The city industrial integrate development between Jiuquan and Jiayuguan is then based on industry structure differences, differences in the proportion of light industry and heavy industry and the industrial categories differences. The industry system development in Jiu-Jia is mainly based on the traditional manufacturing upgrades and fostering strategic emerging industries, thus promoting the coordinating development of three major industries and enhancing regional industrial competitiveness.

The specific development strategy of the city industrial integration in Jiu-Jia is mainly focus on building clustered industrial parks including Jiuquan western industrial park, Jiuquan southern industrial park, Jiayuguan eastern industrial park, Jiayuguan northern industrial park and Jiuquan steel group. Through analyzing the area of site's space changes of 7 categories of industries of the year of 2000, 2004, 2009, 2012 and 2014 (Figure 1), this paper finds that each industrial park gradually forms its backbone industry over time. Jiayuguan northern industrial park forms metallurgy and new materials and building materials as the leading 2 types. The land size of metallurgy and new materials increases from 83ha in 2004 to 592.4ha in 2014 that reflecting a rather fast pace. In Jiuquan western industrial park, the agricultural products processing industry and the chemical industry based on biopharmaceuticals become its two leading industries. Wind and solar power generation equipment manufacturing have grown rapidly in Jiuquan western industrial park, which also become the emerging industries of Jiu-Jia in about 2012. Commerce and Trade Service Industry lay in the industrial parks in Jiuquan western industrial park and Jiayuguan northern industrial park. Jiayuguan eastern industrial park started later than others, which leading industry is metallurgy fine and new materials. The leading industry of northern part of Jiayuguan is new materials and building materials. The leading industry of western part of Jiuquan is the equipment manufacturing and new energy. The leading industry of southern part of Jiuquan is agriculture and sideline products processing and chemical industry. In a word, these three main industrial parks have their characteristic industry. From the view of the whole region of Jiu-Jia, there is a long way to go. The industrial types of these three main industrial parks are similar. So there is a keen competition among the three industrial parks. Jiugang group, as the upstream firm, does not have enough drive effect to the stainless steel, alloy materials, R&D, circular economy, producer service industry of the three industrial parks. This is a long way to go for the complementary of industry in Jiu-Jia.

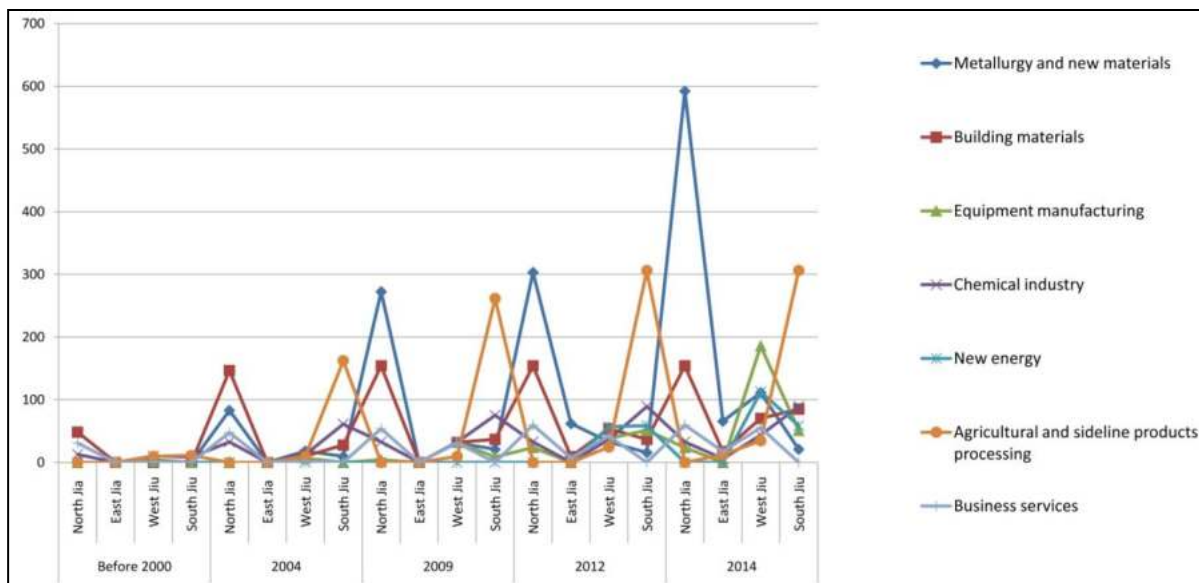


Figure 1. Industry Development Status of Each Industrial Park

4.1.2 Changes in the urban space of the Neighboring Cities

Urban form is one of the external manifestation of association degree of the city elements, and a different urban form can have different effects on the regional urban transport links, organizational structure, land layout and so on. From the point view of the boundary of urban built-up area, Jiayuguan and Jiuquan are all single central cities before the year of 2009, and then Jiayuguan urban area gradually evolved into more structured form of group layout form, while built-up area of Jiuquan city is showing a form which is similar to "7".

By comparing the status of urban land use of the central city of jiuqia among the year 2004, 2006 and 2009(Figure 2-5), we can see that Jiayuguan and Jiuquan developed mainly to the south before 2009. After 2009, the two cities accelerated the face-to-face development, and Jiayuguan developed mainly to the east, while Jiuquan to the west. with the continuous development of urban space between the two cities, the spatial distance between the two cities is shrinking continually. Currently, the shortest linear distance of the construction land edge of the two cities is less than 10 kilometers, and the shortest distance between the two cities reduces at the speed of 1-2 km per year, then the two cities will naturally blend in the next 5 to 10 years. Hence, the overall urban form will change greatly.

Through land-use structure changes of the two cities in recent years, there exists differentiation which is mainly manifested in the aspects as the followings: the increasing proportion of Jiayuguan road traffic, public service facilities and municipal infrastructure and decreasing trend of the industrial warehouse proportion; On the contrary, in Jiuquan, industrial warehouse proportion increased rapidly, which shows that Jiayuguan is already transforming from late industrialization to service industry, while Jiuquan is experiencing a period of fast development of industrialization.

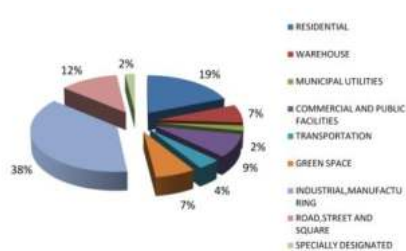


Figure 2. Jiayuguan land use structure in 2007

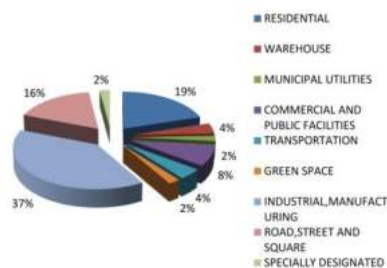


Figure 3. Jiayuguan land use structure in 2011

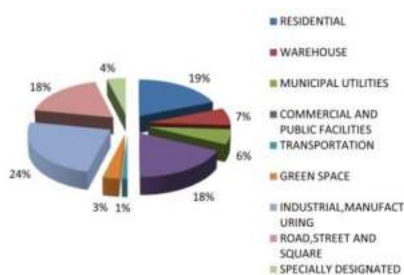


Figure 4. Jiuquan land use structure in 2004

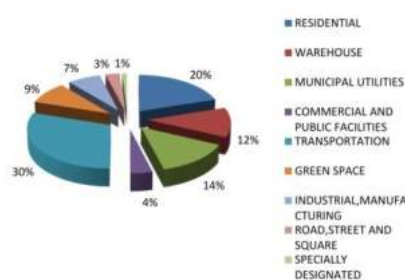


Figure 5. Jiuquan land use structure in 2011

4.2 The city linkages level

4.2.1 Changes in Intercity transport links

On contact channel construction, 2000 years ago, in addition to the rail way, G312 Jiu-Jia section is the only contact channel between two cities; In 2006, the second contact channels Qing Jia highway officially opened to traffic, Jiu-jia fast track was opened in 2012 with a line design speed of 80km/h and two-way eight-lane. The line is open free to the public, has become the most convenient way between the two cities. In 2014 years, Jia yuguan Mingzhu Road and west industrial park Guangda road of jiuquan communicated with each other, the third contact channel was built so far. 2005 years ago, public transport links between the two cities is only interoperability Shuttle every 30 minutes. In 2005, the two cities intercity bus line started operations. The bus company of Each city provided half vehicles, Initially, Jiuquan and Jiayuguan only have 11 and 9 little buses, 2009 onwards, the two cities gradually replaced them to the large. To 2014, there are 18 large vehicles in Jiuquan and 15 in Jiayuguan. 2005-2014 years, Jiayuguan issued annual passenger volume increased to 1.5 million from less than 300,000 and jiuquan from less than 400,000 to 1.9 million. The constantly opening up of the contact channel and continuously improvement of the ability to inter-city bus service reduce the contact barriers between the two cities, promoted the further development of the City integration.

4.2.2 Changes in Intercity residents' daily behavior

In order to know the effect of city integration promoting to residents' daily behavior, this study adopted the method of questionnaire and interview carried on the thorough research to the residents in two cities. In addition to the research of the current situation of the people daily inter-city behavior, also please residents recalled their daily behavior of inter-city memories for nearly a decade and complete the questionnaire, to gain a certain amount of historical data to reveal people daily behavior changes at a period of time. Research site selection to cover the major area of the two cities, two cities each randomly distributed 150 questionnaires, of which 134 valid questionnaires recovered Jiayuguan, Jiuquan 137.

(1) Changes in Travel frequency and travel time

Through the questionnaire analysis showed that more than 35 percent of residents in the two cities daily more frequent travel between the two cities, the main frequency to 1-3 times a month (Figure 6), more frequent contacts between the two places in the crowd, about 18% who before 2005 started travel between the two cities, but by 2010 this figure is small change, about 68% of people suddenly start more frequently from 2010 to the other cities (Figure 7).

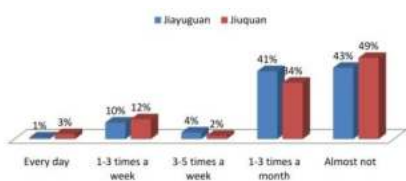


Figure 6. the frequency of Daily to Other City

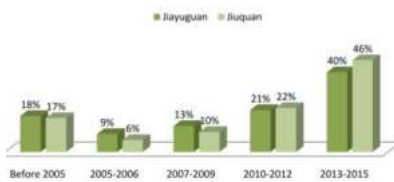


Figure 7. Time to Other City

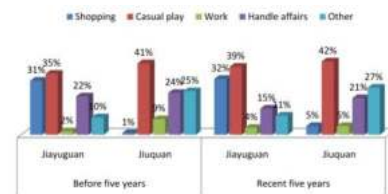


Figure 8. Purpose To Other City

(2) Changes in the purposes of traveling and travel destination

In the past five years, Jiayuguan residents traveled to Jiuquan mainly for recreation and shopping purposes. Before 2010, Jiayuguan residents traveled to Jiuquan for the same purposes yet in a slightly lower ratio. The destinations of their traveling were concentrated to Gulou Business District. Fukang Shopping Center and Jiuquan Municipal Square had attracted more and more Jiayuguan residents to areas surrounding Jiuquan People's Administration, which caused the changes in their choice of destinations. Major part of Jiayuguan residents who travel to Jiuquan for work reasons traveled to Jiuquan City to do business, yet in the past five years more people went to the Industrial Zone in Jiuquan's western suburbs.

In the past ten years, Jiuquan residents traveled to Jiayuguan also mainly for recreation and shopping purposes. However, before 2010 only a few Jiuquan residents traveled to Jiayuguan for recreational reasons, and travel destinations were concentrated to Guancheng Scenic Area and several large parks (Figure 8). In the last couple of years by the newly opened Taolaihe park attracted more Jiuquan

residents. When it comes to Jiuquan residents who travel to Jiayuguan for work reasons, more people worked at Jiayuguan, Jiuquan Iron & Steel Group before 2010, while in the recent five years, with Jiuquan's local employment pressure been eased thanks to the newly built Industrial Zone in Jiuquan's western suburbs, less Jiuquan residents came to work in Jiayuguan.

(3) Changes in people's way to travel

Before 2010, up to 70% of the citizens from both cities chose to travel to each other's city using intercity public transportation, and only about 18% chose to travel with private cars. In the recent 5 years residents from the two cities who drive private cars to each other's city doubled, while the number of people who used intercity public transportation dropped to around 54%. Not so many people chose to travel with electric vehicles or other transportation methods.

5. Reflections on the Jiu-Jia city Integration Development

5.1 A high-efficient cooperation mechanism led by local governments can guarantee a smooth process of city integration development

In light of Gansu Province's regional development goals of "Cities in the center of Gansu (Lanzhou, Baiyin) should lead common development for surrounding cities in Gansu's both wings; All cities should develop as groups according to overall planning", Jiuquan and Jiayuguan are important cities in Gansu's western wing. In the year of 2010, the Gansu People's Government drew up the Jiu-Jia Regional Economic Integration Development Plan, aiming to guide the embodiment integration development of the two cities under an overall plan. Yet until now, the intergration development has stayed on an initial stage. Both Local enterprises and the public have strong demand for an intergration development. Local enterprises wish, with the help of an intergration development of Jiu-Jia, to have the free flow of production factors promoted, the combined effect enhanced and the upstream and downstream industry chain extended. While the public wish to see increase in employment opportunities employment and improvement in their quality of life. Higher level governments have not been very active during the process of intergration development, which has been relatively slow on the whole and have encountered many problems. Under the process of intergration development, Jiayuguan seems to be more active while Jiuquan seems to hang back. The frequent vicious competition between operating companies for intercity public transportation has seriously affected residents from the two cities to travel freely. The serious of problems root in the lack of an efficient cooperation mechanism led by both governments. Without sufficient information exchanges and collaboration, intergration development has not been organized disorderly like a heap of loose sand. Local governments should after balancing the views of all interested parties take initiative to establish a high-efficient cooperation mechanism and draw up an overall intergration development strategy.

In this respect, the cooperation mechanism of Yangtze River Delta Urban Economic Coordination Conference can be a good reference(Xiaolong Luo, Jianfa Shen, 2007). The Economic Coordination Conference holds mayoral meeting and working meeting every two years, at which academic elites and members of higher level governments are invited. Topics at these meetings includes discussion around

strategic objectives, interactive policy and ideas for development, as well as a variety of other topics. In addition, under the coordination mechanism between major cities, special leading groups for integration development work, leading groups should also be set up, in order to build a multi-level platform for negotiation, communication, information exchanges and cooperation, thus to jointly promote the sound and rapid development of both cities.

5.2 "Complementary development" of land using can be a channel enhancing friendship in daily intercity contacts

The American Geographer Ullman in the mid-1950s proposed that complementarity is an important condition for the occurrence of spatial interaction, i.e. if the material provided by a region meets the need of another, there is a basis of spatial interaction. The greater the complementarity, the larger is the amount of mutual interaction between these two places. After analysis on Jiuquan and Jiayuguan residents’ daily interaction, we have found out that the main reason for Jiayuguan residents go to Jiuquan is shopping, while the main reason for Jiuquan residents to go to Jiayuguan is recreation and sight-seeing. In order to find the the main driving forces that triggers these interaction, we have done a related analysis between the land-using of business, leisure & entertainment, sports centers and exhibition in different periods, and the residents daily travels under the corresponding period (Table 3).Analysis showed that complementary land-using under the integration development can play an important roll in guiding the daily interaction of residents. The beautiful environment of Jiayuguan and the concentrated and bustling shopping centers in Jiuquan can form a kind of complementary land using, which stimulate the frequent daily exchanges between the residents of both cities. On the other hand, the frequent daily interactions between the residents of both cities in turn accelerated the integration development.

Table 3. The Relationship Between the Behavior and Urban Development

Year	Building of Large- and Medium-sized Retail Business		Land used for Large- and Medium-sized Leisure & Entertainment Projects, Sports Center and Exhibition		Changes in interactions	
	Jiayuguan	Jiuquan	Jiayuguan	Jiuquan	Jiayuguan to Jiuquan	Jiuquan to Jiayuguan
Before year 2005	Dispersed along Xinhua Road	Concentrated around Gulou area	3parks, 1 big theatre, 2 stadi, 1museums, 1 public square	3 parks, 1museum	Not many people, For shopping purposes maily , Concentrated to areas near Gulou business center	Not many people, for sight-seeing purposes maily Concentrated to large parks

Around year 2009	+1 shopping center	+ 3 shopping centers	+ 1 park	+ 1 public square, 1 museum	Number of people grow slowly, for shopping purposes mainly , Concentrated to areas near Gulou business center while more people visit the newly built Leisure & Entertainment Projects and Sports Center	Number of people grow slowly, for sight-seeing purposes mainly Concentrated to large parks
Around year 2012	Not much changed	Not much changed	+ 1 park	Not much changed	Number of people grow fast, for shopping purposes mainly , Concentrated to areas near Gulou business center while more people visit the newly built Leisure & Entertainment Projects and Sports Center	Number of people grow fast, For sight-seeing purposes mainly Concentrated to large parks. Many visit the two newly built parks.
Around year 2014	Not much changed	Not much changed	+ 1 park, + 1 large-scale amusement park	+ 1 museum	Number of people grow rapidly, for shopping purposes mainly , Concentrated to areas near Gulou business center while more people visit the newly built Leisure & Entertainment Projects and Sports Center	Number of people grow rapidly, Concentrated to the 3 recent newly built parks.

5.3 Convenient transportation as a solid foundation for city integration development

Spatial Interaction is a precondition for integration development while the flows of people and things are its basic manifestations. Convenient transportation is an important means to accelerate flows of key factors between regions, and a solid foundation for integration development. If two cities are built into a

half-to-one hour living circle, where residents can have a daily life and commute like in one city (Yingkui Zhao, Jianjun Zhang, et al., 2010). Highway system connecting Suzhou District in Jiuquan and Jiayuguan has grown from one road to the current three roads. Residents from both cities are given special free access to the Jiuquan- Jiayuguan Highway Channel. The construction of the Jiuquan- Jiayuguan Highway Channel has fastened interaction between city residents, promoted cultural integration between the two cities, and at the same time led the development of the whole Integration Development area as well as the internal development of each city separately. Public transportation between the two cities can provide convenience in travel for the residents and reduce their difficulty in finding a car. Thus it plays a vital role in promoting integration development. Coordination system should be built for public transportation operation between the two cities to guarantee an efficient and convenient intercity travel. On the basis of accelerating highway channel construction between the two cities, intercity public transportation should be given high priority in the city integration development process.

5.4 To jointly build complementary industry types is the key in complementary development

To jointly build demonstration areas, high-level model areas, management innovation zones and area of most dynamic growth can lead and coordinate the development of the whole region. Industry is an important pillar of regional development, jointly built industry types must not only drive their own development, but also to the greatest degree of optimize the industrial chain in the entire intercity region, thus the former vicious competition between similar industries can be transformed into complementary collaboration so as to enhance the overall competitiveness of the whole integration development area. The new region of Jiuquan-Jiayuguan is a united constructed zone, which includes two major industrial parks: the Industrial Park in Eastern Jiayuguan, and the Industrial Park in Western Suburbs of Jiuquan. The latter has two characteristics of industrial types: new energy equipment manufacturing and automobile sales, and business services, especially sales of regional agricultural products. These two major industrial types not only lead the growth of the Industrial Park in Western Suburbs of Jiuquan itself, but also play an important complementary role in optimizing the industry structure of the whole Jiu-Jia integration development area. The Industrial Park in Eastern Jiayuguan is still in an initial stage of large-scale construction. Judging from the current enterprises its main features are metallurgy and new materials, which is similar to Jiayuguan, Jiuquan Iron & Steel Group and the Industrial Park in Western Suburbs of Jiuquan. With the opportunity of Jiu-Jia integration development, The Industrial Park in Eastern Jiayuguan should be coordinated into having complementary industrial types from the other industrial parks thus optimize the industrial chain in the whole region.

6 .Conclusion

City integration as a new phenomenon of regional development, which plays a vital role in driving the overall development of the region and promoting the new urbanization. On the basis of the development of the domestic city integration reviewed research, taking jiuquan-jiayuguan development as an example, at the neighboring cities level, from the whole industrial system variation, urban space

development variation and at the urban linkages level, from the Intercity transport links variation, Intercity residents' daily behavior variation, the authors analysis development effectiveness of city integration from these two different spatial scales. Ultimately the paper believe that Jiu-Jia should build high-efficient cooperation mechanism, "complementary development" of land use function, "convenient" Intercity travel supply and jointly build complementary industry types and these four aspects help better promote the healthy development of the city integration in Jiu-Jia.

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