INTEGRATED TRANSPORT INFRASTRUCTURE AND CROSS-BORDER FACILITATION STUDY FOR THE TRANS-GTR TRANSPORT CORRIDORS

INDIVIDUAL COUNTRY REPORT

CHINA

GTI Greater Tumen Initiative

2013

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China individual country report is prepared as part of GTI "Integrated Transport Infrastructure and Cross-Border Facilitation Study for the Trans-GTR Transport Corridors" by Ms. Gao Meizhen, Transport Planning and Research Institute, People's Republic of China.

The Study has been carried out to assess general situation, bottlenecks and traffic potential of the transportation corridors in Northeast Asia and in the Greater Tumen Region in 2012 in accordance with the decisions GTI Consultative Commission and GTI Transport Board (2010-2011). The set of Study reports consists of five individual country reports: China, Mongolia, ROK, Russia and Japan; and Regional Summary report. The Study results and conclusions served as basis for development of joint agenda in transport cooperation by GTI.

CONTENTS

Abbreviations

AH	–	Asian Highway
BCP	–	Border Cross Point
DPRK	–	Democratic People's Republic of Korea
ECMT	–	European Conference of Minister of Transport
EU	–	European Union
FGT	–	Free Gauge Train
GDP	–	Gross Domestic Product
GTI	–	Greater Tumen Initiative
GTR	–	Greater Tumen Region
LCC	–	Life Cycle Cost
MDL	–	Military demarcation line
MOU	–	Memorandum of Understanding
NAFTA	–	North American Free Trade Area
NEA	–	Northeast Asia
PCU	–	Passenger Car Unit
PRC	–	People's Republic of China
RMB	–	Renminbi
ROK	–	Republic of Korea
RZhD	–	Russian Railways
SLB	–	Siberian Land Bridge
SOC	–	Social Overhead Capital
TEU	–	Twenty-foot Equivalent Unit
TAR	–	Trans-Asian Railway Network
TCR	–	Trans-China Railway
TKR	–	Trans-Korean Railway
TMR	–	Trans-Manchuria Railway
TMGR	–	Trans-Mongolia Railway
TSR	–	Trans-Siberian Railway
UNDP	–	United Nations Development Programme
UNESCAP	–	United Nations Economic and Social Commission for Asia and the Pacific
USD	–	U.S. Dollar

1 Background

This report was prepared by national consultant of People's Republic of China, and was written according to requirements of project specification of GTR transportation corridor: The Integrated Transport Infrastructure and Cross- Border Facilitation Study for the Trans-GTR Transport Corridor. This study is to develop a reliable, efficient and low-cost regional comprehensive transport network (GTR international transport corridor). Three provinces in Northeast China: Liaoning, Jilin, Heilongjiang province and Inner Mongolia Autonomous Region are part of research scope; object of GTR transport corridor also includes relevant area of ROK, Mongolia and Russia.

Main job of this report is to:

- Review Terms of Reference (TOR) requirements to ensure the consistency of our research;
- Get acquainted with the basic situation of transport infrastructure of Chinese section of GTR transport corridor;
- Analyze future passenger and freight flow and transport requirement of the transport corridor;
- Analyze main problems and solutions that restrict the influence of GTR transport corridor;
- Put forward suggestions for relevant content and specific action plan for national strategy.

Based on Concept Note and Interim Report, we have made some supplements and have updated data relevant to trade, highway traffic volume and marine traffic volume, enriched related content about convenient transportation coordination work between regional governments, improved the transport demand analysis and contents of forecasts of China in chapter 3, summarized related regional and national strategies about strengthening transport cooperation with northeast Asian countries, especially in infrastructure construction and convenient transportation, made a list of recent important projects and specific situation, and at last, put forward relevant policies, measures and suggestions for future action.

2 Macroeconomic Review

2.1 Overview

Three Northeast provinces, Liaoning, Jilin, Heilongjiang, and Inner Mongolia Autonomous region are the Chinese part of GTR. These provinces have frequent trade and cooperation with Northeast Asian countries. Transportation infrastructure plays a basic and imperative role for the development of the foreign trade.

Since the reform and opening up in 1978, China has seen a stable and rapid growth in its macro-economy (see Figure 2.1). The national gross domestic product (GDP) reached RMB 47.2 trillion in 2011. After the 2008 global financial crisis, China has gradually adjusted its economic policies, paying more attention to investment, consumption and trade. Therefore, macro-economy in China will keep growing steadily in the next decade.

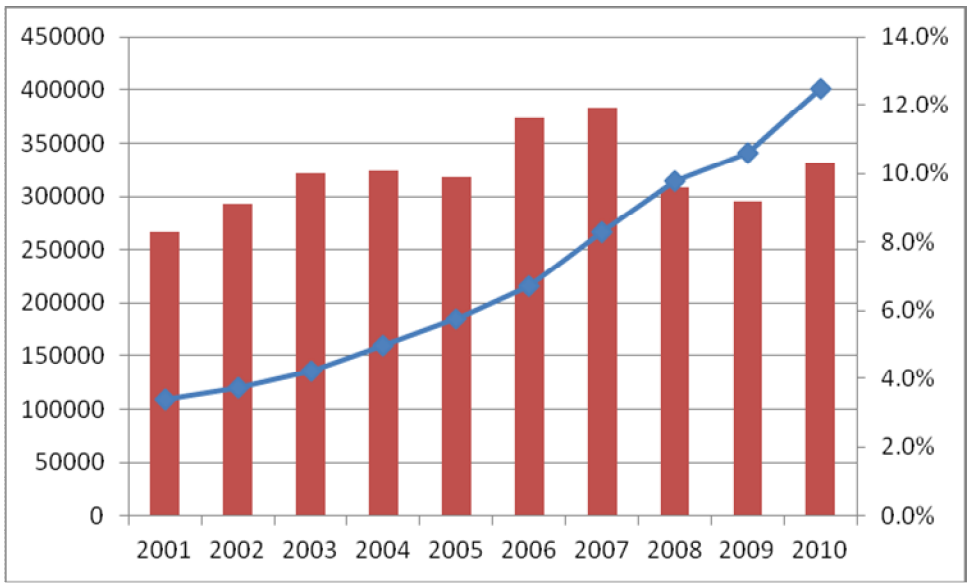

Figure 2.1 GDP growth in China in 2001-2010 (100 million RMB)
Source: China Statistical Yearbook 2011

Provinces in GTR (Heilongjiang, Jilin, Liaoning and Inner Mongolia) have a total area of 1.99 million km^2 and a population of 134 million (see Table 2.1), accounting for 20.74% and 10.01% of the national total respectively. Recently, this area has witnessed significant economic developments. In 2010, the total GDP in these provinces reached RMB 4,917 billion (USD 774 million), accounting for 12.3% of the total GDP in China. The annual growth rate of GDP has reached 12.1% in 2001-2005, 1.8% more than the national level. While in 2006-2010, the GDP kept rising at the annual growth rate of 14.3%, 3.3% more than the national level.

Table 2.1 Key indicators of GTR Chinese Provinces in 2010

Indicator	Unit	Provinces in GTR				
		Total	Liaoning	Jilin	Heilongjiang	Inner Mongolia
Area	10,000 km^2	199.1	14.8	18.7	47.3	118.3
Population	10,000 people	13,427	4,375	2,747	3,833	2,472
GDP	billion RMB	4,917	1,846	867	1,037	1,167
Trade volume	billion USD	127.7	81	12	26	8.7

Source: China Statistical Yearbook 2011.

Figure 2.2 illustrates the growth of per capita GDP in these provinces in 2001-2010. As can be seen in the line chart, the GDP per capita in Jilin, Liaoning and Inner Mongolia were above the national average and kept a rapid growth rate in 2000-2010. In Inner Mongolia, the level of GDP per capita soared from RMB 6,502 per capita in 2000 to RMB 47,347 per capita in 2010, almost a 7-fold increase. Jilin Province and Liaoning Province both showed a faster economic growth, while Heilongjiang had a relatively lower economic development in recent years. The following part will introduce the four provinces in details.

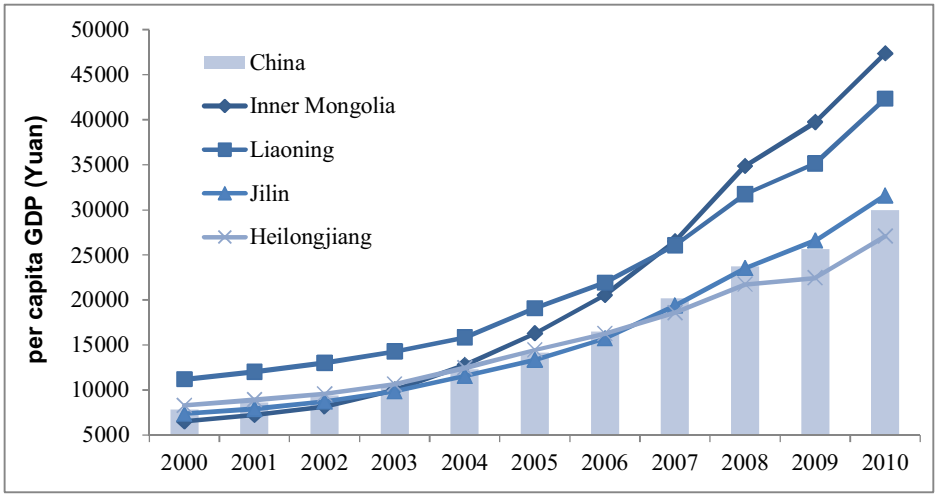

Figure 2.2 GDP per capita growth in GTR provinces 2001-2010 (RMB/capita)
Source: China Statistical Yearbook 2011

Heilongjiang Province

Heilongjiang is part of Northeast China, the traditional base of industry for the People's Republic of China. Heilongjiang has a total area of 473,000 square kilometers and a total population of 38.3 million. Industry is focused upon coal, petroleum, lumber, machinery, and food. Due to its location, Heilongjiang is also an important gateway for trade with Russia. In 2000-2003 Manchuria has suffered from stagnation. As a result, the government has started the Revitalize Northeast China campaign in 2003 to deal with this problem, using privatization as the preferred method of economic reform. Since then, its GDP has been rising steadily since 2003, growing 37% from 2003-2007. Furthermore, the incremental value of the private economy grew by 20.1 percent in 2006 reaching RMB 234 billion, and accounting for 37.6 percent of the GDP. In 2011, Heilongjiang's nominal GDP was RMB 1,250 billion (USD 198.5 billion), an annual growth rate of 12.2%. Its per capita GDP was RMB 21,640 (USD 3,168).

Jilin Province

Jilin lies in the central part of northeastern China, bordering Russia and DPRK in the east and southeast respectively. Jilin has a total area of 190,000 square kilometers and a total population of 27.3 million. Its capital is Changchun, which lies 113 kilometers west of Jilin city. Jilin province is rich in natural mineral deposits with 136 different types of minerals, of which 70 have already been extracted. Jilin has abundance of traditional Chinese medicine resources, with approximately 27,000 kinds of wild plants and 9,000 kinds of medicinal herbs. Also the province is rich in large reserves of oil, gas, coal, iron mine, nickel, molybdenum, talc, graphite, gypsum, cement rock, gold and silver; its reserves of oil shale are the largest in the country.

In 2011, the nominal GDP of Jilin province totaled RMB 1,053.1 billion (USD 167.1 billion). Its GDP has been rising at a double-digit rate since 2003, growing 51 percent from 2003 to 2007. Per capita nominal GDP increased to RMB 26,289 (USD 3,848) in 2009. Meanwhile, the incremental value and profit of large enterprises witnessed an increase of 19 percent and 30 percent respectively, compared with 2005 figures. Industry in Jilin is concentrated on automobiles, train carriages, and iron alloy. Jilin is one of the most important commodity grain bases in China and ranked sixth nationwide in timber production.

Inner Mongolia

The great stretch of Inner Mongolia means that parts of it belong to Northeast China and Northwest China as well. Most of its international border is with Mongolia, while a small portion is with Russia. Inner Mongolia has abundance of resources especially coal, cashmere, natural gas, rare earth elements, and has more deposits of naturally occurring niobium, zirconium and beryllium than any other province-level region in China. Inner Mongolia is also an important coal production base, with more than a quarter of the world's coal reserves located in the province.

Industry in Inner Mongolia has grown up mainly around coal, power generation, forestry-related industries, and related industries. The nominal GDP of Inner Mongolia in 2010 was RMB 1.16 trillion (USD 172.1 billion), a growth of 16.9% from 2008, with an average annual increase of 20% from the period 2003-2007. Its per capita GDP reached RMB 37,287 (USD 5,460) in 2009.

Liaoning Province

Liaoning has the largest economy of Northeast China. Its nominal GDP for 2011 was RMB 2.20 trillion (ca. USD 348 billion) making it the 7th largest in China. Its per capita GDP was RMB 41,782 (USD 6,172). Among the three provinces of Northeast China, Liaoning is the largest in terms of GDP. According to preliminary statistics, Liaoning maintained its GDP growth rate of 13.1 percent in 2009 and held its position as the province with the highest economic growth.

Leading industries include petrochemicals, metallurgy, electronics telecommunications, and machinery. On a national level, Liaoning is a major producer of pig iron, steel and metal-cutting machine tools, all of whose production rank among the top three in the nation. Liaoning is one of the most important raw materials production bases in China. Industries such as mining, quarrying, smelting and pressing of ferrous metals, petroleum and natural gas extraction, are all of great significance. Also the cities of Dalian, Dandong and Yingkou have been developed as major ports and economic gateways to all of northeast China.

2.2 Foreign trade in GTR

Foreign trade of the PRC maintains stable and rapid increase, according with its dramatic growth of national economy in recent years. Excluding the decline in 2009, the growth rate of foreign trade is around 20% (Figure 2.3).

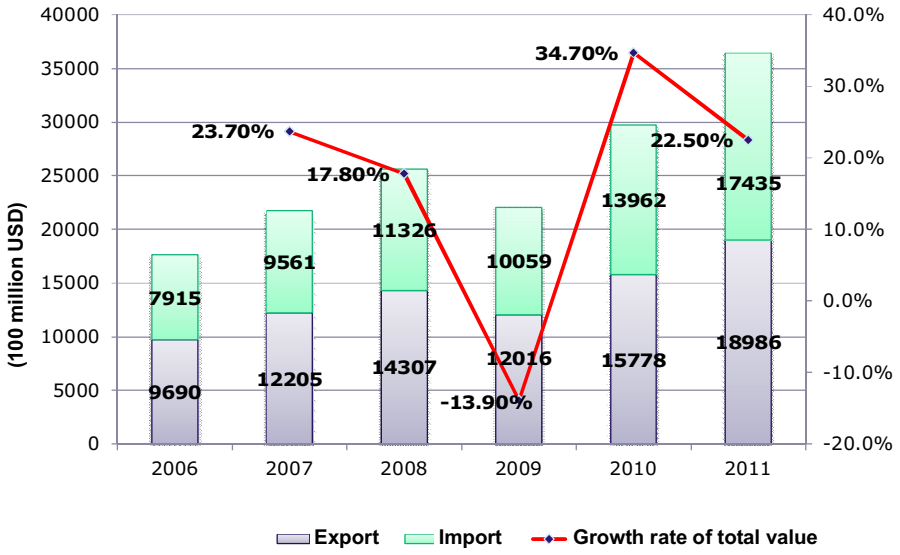

Figure 2.3. Total Amount of Trade of the PRC in 2006-2011
Source: China Statistical Yearbook 2011

The amount of trade between China and Northeast Asia (Japan, ROK, DPRK, Mongolia), is more than that of China-EU. Japan and ROK were to become the third and the sixth largest trading partner of China.

Trade of Japan with China

According to customs statistics, in 2011 Japan's foreign trade amount was USD 1.46 trillion, an increase of 29.2% over a year. The amount of export was USD 770.11 billion, while that of import was USD 692.84 billion. The trade surplus of Japan increased to USD 77.27 billion, with a dramatic increasing rate 169.4%.

China, the United States and ROK are the top three export partners of Japan, accounting for 42.9 percent of its total exports trade. China, the United States and Australia are top three import partners of Japan, sharing 38.3 percent of its total import trade.

In 2010, trade of Japan with China amounted to USD 303.06 billion, with an increase of 30.6%. China is the largest trading partner of Japan.

The main export products from Japan to China are electrical and mechanical products, base metals and transport equipment. The major commodities imported from China are mechanical and electrical products, textiles and toys, which represent 66.7% of total imports from China. China's labor-intensive products still have large advantage, such as textiles, footwear, umbrellas and bags and etc. These products usually get more than 50% market share in Japan.

Trade of ROK with China

In 2011, the foreign trade of Republic of Korea was USD 1.08 trillion, with an annual increase of 21.2%. China, the United States and Japan are top three export partners of ROK,

China is ROK's largest trading partner, largest export destination and largest import source. The bilateral trade turnover was USD 220.63 billion in 2011, with an increasing rate of 17.1%. Among them, the amount of exports was USD 134.2 billion and the amount of imports from China was USD 86.43 billion.

Machinery and electronic products, optical and medical equipment, and chemical products are the main product of ROK's exports to China. In 2011 the amount for these products were USD 50.06 billion, 22.99 billion and 16.46 billion respectively, together accounted for 66.7% of total exports to China.

Trade of Russia with China

In 2010, foreign trade in Russia has been growing intensely with an annual increasing rate of 43.9%. According to Russian customs statistics, its trade turnover in 2010 was USD 559.97 billion.

Trade of Russia with China was USD 57.05 billion, an increase of 49.6%. Mineral, wood and chemical products are the major of Russian exports to China. These three types of product represent 77.5 percent of total exports to China.

The main commodities imported from China are the mechanical and electrical products, textiles and its raw materials, and base metals and products, accounting for 64.3 percent of Russia's total imports from China. In addition to these products, footwear, umbrellas, furniture, toys and other light industrial products are important goods imported from China.

Trade of Mongolia with China

By the development of Sino-Mongolia economic and trade relations, China has become Mongolian most important trading partner, and continuous enhance this importance. From 1999, China has been the largest trading partner of Mongolia for 11 years.

The main commodities imported from Mongolia are primary raw materials such as metal ores, coal and oil. The major goods imported from China are clothing, steel, textile and fabrics.

In 2010, the trade volume of Mongolia reached USD 6.11 billion, an increase of 2.7 times compared with USD 2.24 billion in 2005. The trade volume between China and Mongolia reached USD 3.4 billion in same year.

Overview of Trade with provinces of GTR in China

The development of trade in provinces of GTR in China is shown on the tables 1.2. to 1.5. According to the tables, there are some features in trade between these provinces and Northeast Asia.

1) In 2006-2008, there has been great increase in trade in Heilongjiang, Jilin, Liaoning and Inner Mongolia. Heilongjiang has the largest annual growth rate above 30% before 2009. Due to the global financial crisis, trade in these provinces dropped by 11.9-29.9% in 2009 compared to the last year. In 2010, however, the total volume of import and export achieved a new improvement with the growth rate of 28.2-57.1%.

2) When compared the import with export, Liaoning and Heilongjiang has an export volume far over the import volume, while it is not the case in Jilin and Inner Mongolia.

3) As for major Northeast Asia countries in the trade with provinces in GTR in China, Russia occupies large part of trade in Heilongjiang, and Japan is the major country of trade in Jilin and Liaoning Province. Figure 2.5 presents the total value of import and export of Jilin Province with Northeast Asia in 2009. According to the figure, Trade with Japan accounted for about 20% of the total volume of import and export of Jilin Province in 2009.

Table 2.2. Value and Growth Rate of Trade of Heilongjiang Province, 2006-2010

(Unit: USD 100 Million, %)

	2006		2007		2008		2009		2010	
	Amount	Rate	Amount	Rate	Amount	Rate	Amount	Rate	Amount	Rate
Total Value	128.6	34.3	173.0	34.5	229.0	32.4	162.2	-29.9	255.0	57.1
Russia	45.4	18.3	107.3	60.4	110.6	3.1	55.8	-49.7	74.7	34.0
ROK	3.3	-7.3	4.2	-11.9	9.6	130.0	5.2	-45.5	7.5	44.0

	2006		2007		2008		2009		2010	
	Amount	Rate	Amount	Rate	Amount	Rate	Amount	Rate	Amount	Rate
Japan	3.0	11.5	5.9	-5.9	6.2	4.7	6.0	-2.7	6.7	10.6
Total Export	84.4	38.9	122.7	45.4	165.7	35.1	100.8	-40.0	162.8	61.5
Total Import	44.2	26.3	50.3	13.8	63.2	25.7	61.4	-2.8	92.2	50.0

Source: Heilongjiang Statistical Yearbook 2006-2010

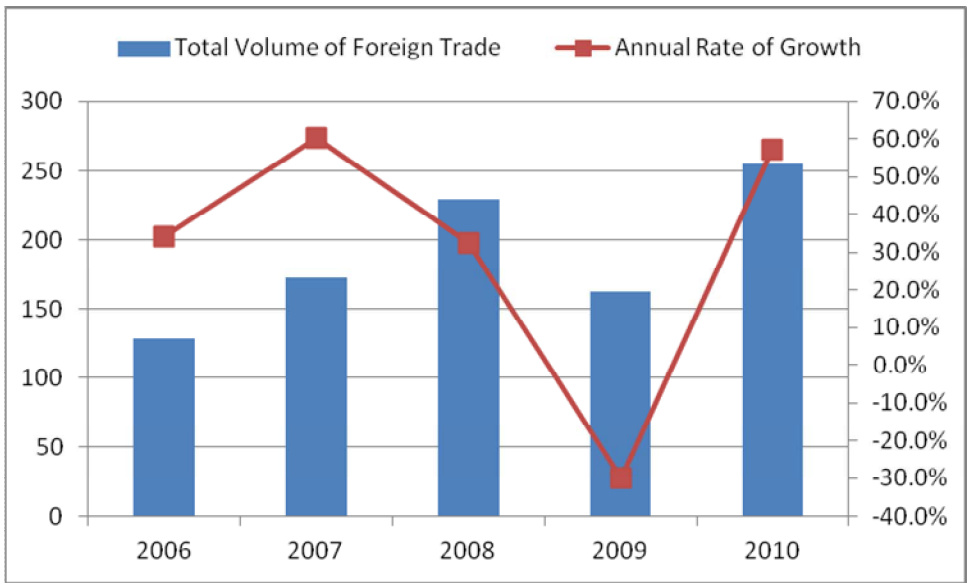

Figure 2.4 Total value of Foreign Trade and Annual Rate of Growth of Heilongjiang in 2000-2010 (USD 100 Million, %)
Source: Heilongjiang Statistical Yearbook 2006-2010.

Table 2.3 Value and Growth Rate of Trade of Jilin Province, 2006-2010
(Unit: USD 100 Million, %)

	2006		2007		2008		2009		2010	
	Amount	Rate	Amount	Rate	Amount	Rate	Amount	Rate	Amount	Rate
Total Value	79.14	21.2	102.99	30.1	133.41	29.5	117.47	-11.9	168.46	43.5
Total Export	29.97	21.5	38.58	28.7	47.72	23.7	31.32	-34.4	44.76	43.2
Total Import	49.17	21.1	64.41	31	85.69	33	86.16	0.6	123.7	43.5

Source: Jilin Statistical Yearbook 2006-2010

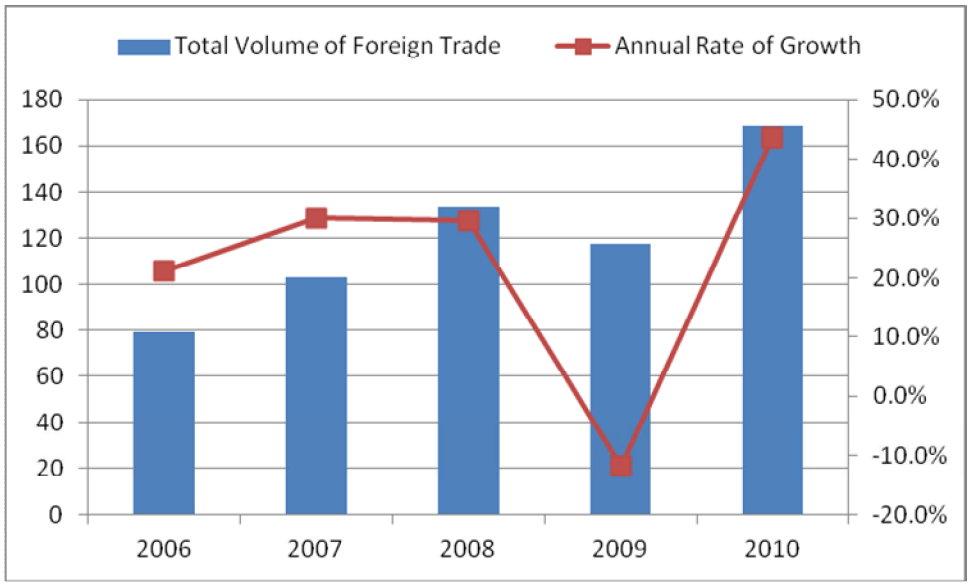

Figure 2.5 Total Value of Foreign Trade and Annual Rate of Growth of Jilin in 2000-2010
(USD 100 Million, %)
Source: Jilin Statistical Yearbook 2006-2010.

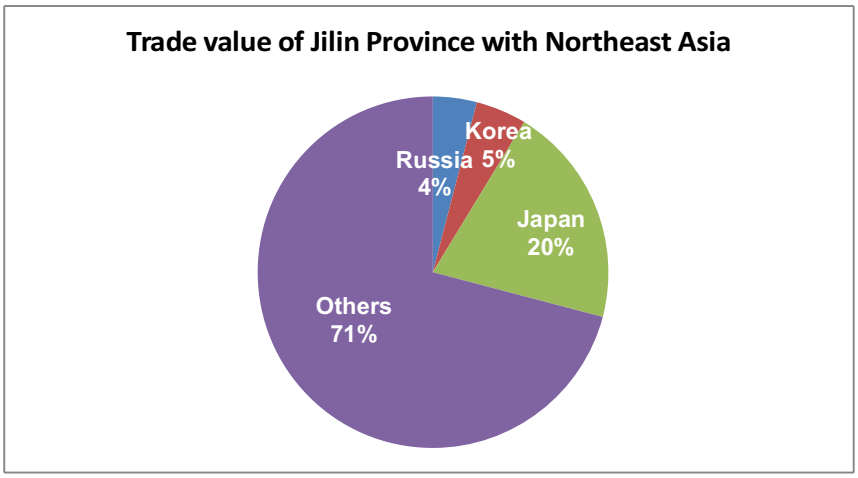

Figure 2.6 Total value of import and export of Jilin with Northeast Asia in 2009
Source: Jilin Statistical Yearbook 2009

Table 2.4 Value and Growth Rate of Trade of Liaoning Province, 2006-2010
(Unit: USD 100 Million, %)

	2006		2007		2008		2009		2010	
	Amount	Rate	Amount	Rate	Amount	Rate	Amount	Rate	Amount	Rate
Total Value	483.9	18	594.72	22.9	724.4	21.8	629.2	-13.1	806.7	28.2
Total Export	283.2	20.8	353.25	24.7	420.6	19.1	334.4	-20.5	431.2	28.9
ROK	33.7	16.9	46.02	36.7	56	21.8	33.3	40.5	39.8	19.5
Japan	68.9	9.2	79.05	14.7	92.6	17.1	77.1	16.7	97.3	26.2
Russia	-	-	7.98	-	9.28	16.3	0.09	-99.0	-	-
Total Import	200.7	14.2	241.47	20.3	303.8	25.8	294.8	-3	375.5	27.4

Source: Liaoning Statistical Yearbook 2006-2010

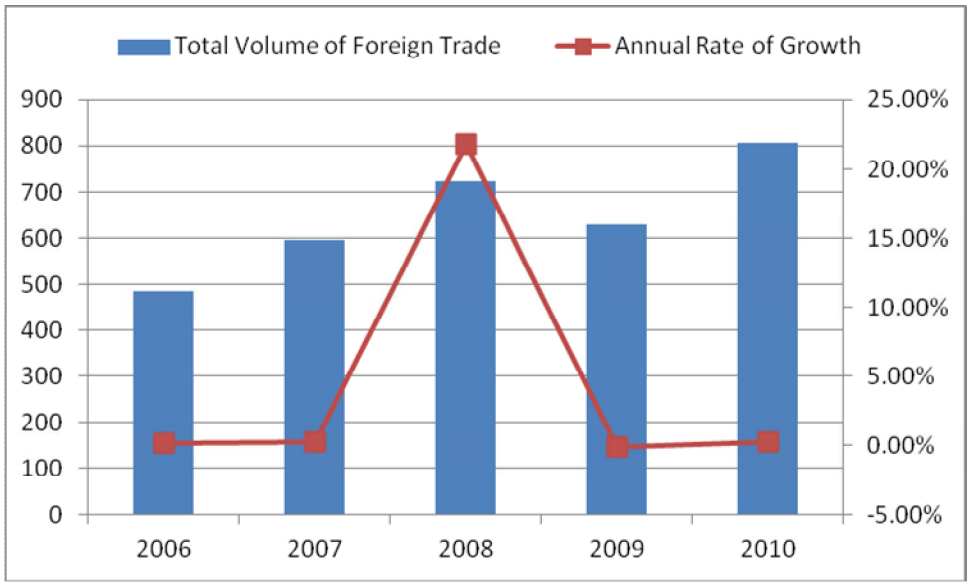

Figure 2.7 Total Value of Foreign Trade and Growth Rate of Liaoning in 2000-2010
(USD 100 Million, %)
Source: Liaoning Statistical Yearbook 2006-2010.

Table 2.5 Value and Growth Rate of Trade of Inner Mongolia, 2006-2010
(Unit: USD 100 Million, %)

	2006		2007		2008		2009		2010	
	Amount	Rate	Amount	Rate	Amount	Amount	Rate	Amount	Rate	Amount
Total Value	59.47	22.4	77.45	30.2	89.33	15.4	67.64	-24.1	87.19	28.7
Total Export	21.41	20.7	29.48	37.6	35.79	21.6	23.16	-35.3	33.35	44
Total Import	38.06	23.2	47.97	26.1	53.54	11.6	44.48	-16.6	53.84	20.8

Source: Inner Mongolia Statistical Yearbook 2006-2010

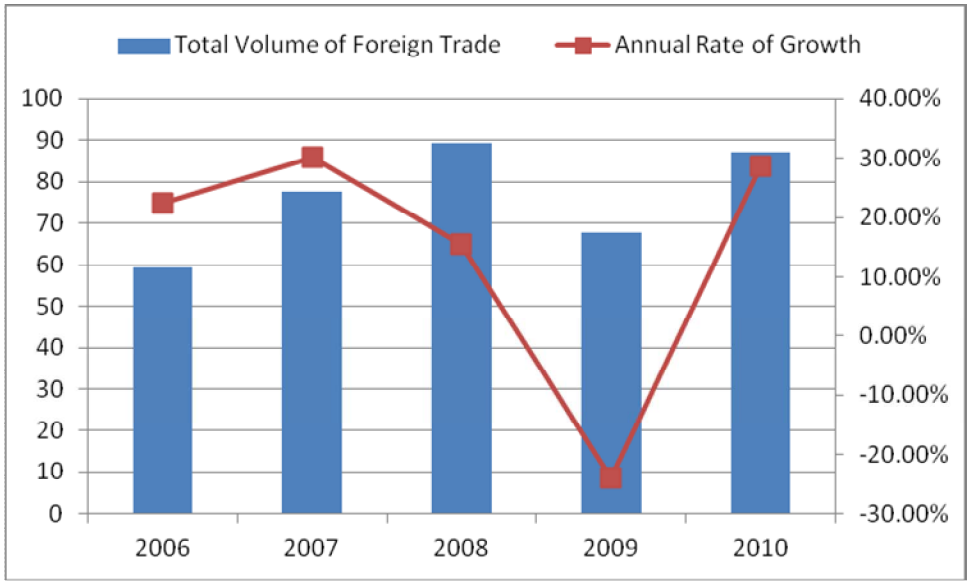

Figure 2.8 Total Value of Foreign Trade and Annual Rate of Growth of Inner Mongolia in 2000-2010(USD 100 Million, %)
Source: Inner Mongolia Statistical Yearbook 2006-2010.

3 Due Diligence Review of GTR Corridors

3.1 Traffic review

There are six transport corridors in Greater Tumen region. Four of them are located or at least partly stretched in China. They are:

- *Tumen Transport Corridor* (Corridor 1): ports in the Tumen River area (Zarubino/Posiet/Rajin) – Tumen/Hunchun – Changchun – Yirshi (Arxan) – East Mongolia – Trans-Mongolia Railway or SLB.
- *Suifenhe Transport Corridor* (Corridor 2): ports in the Primorsky Territory (Vostochny, Nakhodka, Vladivostok) –Grodekovo – Suifenhe – Harbin – Manzhouli – Zabaykalsk – SLB.
- *Dalian Transport Corridor* (Corridor 4): Dalian – Shenyang – Harbin – Heihe – Blagoveshchensk – SLB.
- *Korean Peninsula West Corridor* (Corridor 5): Busan – Seoul – Pyongyang – Sinuiju – Shenyang – Harbin.

The border crossing points (BCPs and ports) maintained specifically in the Concept Note along the four corridors are:

- Arxan (Mongolia – Inner Mongolia)
- Hunchun (Yanbian – Primorsky Territory)
- Dandong (Liaoning – DPKR)
- Suifenhe (Heilongjiang – Primorsky Territory)
- Manzhouli (Inner Mongolia – Chita State)
- Dalian
- Heihe (Heilongjiang – Amursky Oblast)

The cities of Dalian, Dandong and Yingkou have been developed as major ports and economic gateways in Liaoning Province to all of northeast China and Northeast Asia countries. Figure 3.1 illustrates the GTR corridors in China in green lines, BCPs and ports in red marks.

Figure 3.1 GTR corridors, BCPs and ports in China

3.1.1 Traffic along corridor stretches

There are altogether 17 road sections in four Transport Corridors in China. The specific technical indicators of these roads are shown below in Table 3.1.

Table 3.1. Key technical indicators for roads in GTR corridors in China

Corridor	Technical indicators						
	Section	Road no.	Technical classification [1]	Mileage above level 2 (Km)	Total mileage (km)	Administrative classification	Average traffic (pcu/d)
Suifenhe Transport Corridor	Vladivostok to Suifenhe	-	Above level 2	210	210	-	-
	Suifenhe to Mudanjiang	G301	Above level 3	42	160	National	1585
	Mudanjiang through Harbin to Daqing	G10	Express Way	432	432	National	11785
		G301	Above level 3	181	549	National	2686
	Daqing to Manzhouli	G301	Above level 2	620	620	National	2649
	Manzhouli to Chita	-	Below level 2	-	486	-	-
Tumen Transport Corridor	Zarubino to Hunchun	-	Above level 2	63	63	-	-
	Hunchun through Yanji to Changchun	G12	Express Way	423	423	National	11196
		G302	Above level 3	358	567	National	4780
Tumen Transport Corridor	Changchun to Ulanhot	G302	Above level 2	427	427	National	6593
	Ulanhot to Arxan	S203	Above level 3	95	290	Provincial	-
Dalian Transport Corridor	Dalian to Yingkou	G15	Express Way	150	150	National	28053
		G202	Above level 2	216	216	National	11524
	Yingkou to Shenyang	G15	Express Way	74	74	National	35026
		G202	Above level 2	103	103	National	17501
	Shenyang to Harbin	G1	Express Way	433	433	National	18176
		G102	Above level 2	297	297	National	12404
		G202	Above level 2	535	535	National	7004
	Harbin to Heihe	G202	Above level 2	286	286	National	4589
Korean Peninsula West Corridor	Dandong to Shenyang	G1113	Express Way	134	134	National	13663
		G304	Above level 3	210	256	National	5620
	Shenyang to Harbin	G1	Express Way	433	433	National	18176
		G102	Above level 2	297	297	National	12404
		G202	Above level 2	535	535	National	7004

Source: Transport Planning and Research Institute, Ministry of Transport

Tumen Transport Corridor **(Corridor 1):**

Tumen Transport Corridor is the first corridor in GTI project. Across Jilin Province and the eastern part of Inner Mongolia Autonomous Region, Tumen Transport Corridor stretches from Tumen City of Yanbian Prefecture to the east Mongolia. The corridor is connected with Trans-Mongolia Railway or Siberian Land Bridge (SLB). The length in China is about 1,100 Km. There are both railway and road transportation in Tumen Corridor. Railway network includes sections of Hunchun–Jilin, Jilin–Changchun and Changchun–Songyuan–Ulanhot–Arxan with a length of 1,267 km in total. Road network includes sections of Zarubino-Hunchun, Hunchun-Yanji-Changchun, Changchun-Ulanhot and Ulanhot-Arxan with a total length of 1,707 km.

Suifenhe Transport Corridor **(Corridor 2)**

The total length of Suifenhe Transport Corridor in China is about 1,500 km. Across north Heilongjiang Province and east Inner Mongolia, Suifenhe corridor connects three important ports in the Primorsky Territory (Vostochny, Nakhodka, Vladivostok), then passes through Grodekovo, Suifenhe, Harbin and Manzhouli, and is finally linked to SLB. The corridor is the major channel for the trade with Russia in Northeast China.

[1] Level 2 highway is a two-lane road with roadbed width of about 12m and paved in asphalt and concrete.

***Dalian Transport Corridor* (Corridor 4)**

Right through the three provinces in Northeast China, Dalian Transport Corridor runs all the way north to Heihe in Heilongjiang Province and then connects with Trans-Mongolia Railway and Siberian Land Bridge (SLB). The total length in China is around 1,600 km. There are both railway and road in Dalian Corridor. Apart from Harbin-Heihe section, all the other sections use electrified double-track railway. The highway between Dalian to Harbin has been established with mainly four-lane highway; the road between Harbin to Heihe is a secondary road technically.

***Korean Peninsula West Corridor* (Corridor 5)**

Korean Peninsula West Corridor connects ROK with DPRK, and then stretches northwest to China. The corridor in China connects Dandong port to Shenyang in Liaoning Province, and then overlaps with the Dalian Corridor from Shenyang to Harbin.

3.1.2 Traffic at entry points (BCP and ports)

There are 58 cross-border ports and points. Details are shown in Table 3.2.

Table 3.2 Cross-Border Ports and Points in the GTR Region

Location	Bordering country	Number of ports	Railway	Roads	Water ports	Airline ports
Total		58	8	18	23	9
Heilongjiang	Russia	15	Suifenhe	Dongning, Suifenhe, Mishan, Hulin	Mohe, Huma, Heihe, Xunke, Jiayin, Tongjiang, Raohe, Luobei, Sunwu	
	----	10	Harbin		Harbin, Jiamusi, Huachuan,Suibin, Anfujin.	Harbin, Jiamusi, Qiqihar, Mudanjiang
Jilin	Russia	2	Hunchun	Hunchun		
	DPRK	7	Tumen, Ji'an	Quanhe, Sanhe, Linjiang, Kaishantun, Nanping		
	----	2			Da'an	Changchun
Liaoning	DPRK	3	Dandong	Dandong	Dandong	
	----	6			Dalian, Yingkou, Jinzhou,Hulu Island	Shenyang, Dalian
Inner Mongolia	Russia	6	Manzhouli	Manzhouli Heishantou, Shiwei	Heishantou, Shiwei	
	Mongolia	5	Erenhot	Zhuengadabuq, Ganqimaodao, Erenhot, Arihashate		
	----	2				Hohhot, Hailar

Source: Consultant.

Ports along the coastal line of Liaoning Province

Ports along the coastal line of Liaoning Province have always been major starting points for vessels from GTR areas of China to Northeast Asia.

There are six such ports, Dalian, Yingkou, Jinzhou, Dandong, Hulu Island and Panjin Port. Till the end of 2010, these ports had altogether 267 berths of different categories (among these berths, 160 are of the capacity of more than 10,000 tons); the transfer capacity of the ports adds up to 530 million tons (including the 12.06 million TEU of containers).

In 2010, the throughput of these ports was 680 million tons, among which 170 million were of foreign trade; the container throughput was 9.69 million TEU. These three figures are respectively up by 125%, 75% and 156% from the 2005 to 2010. The cargo throughput of the ports from 2000 to 2010 is shown in Figure 3.2.

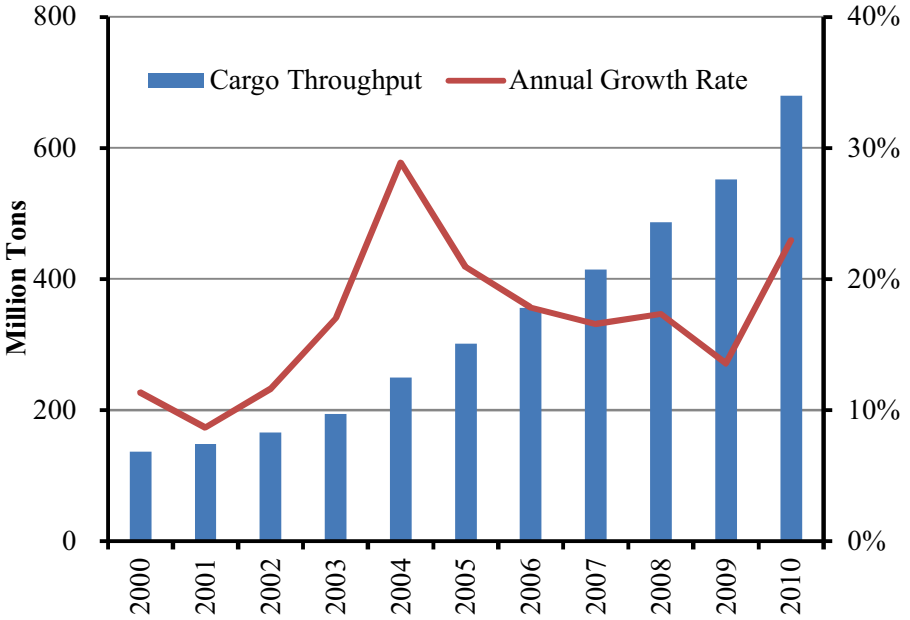

Figure 3.2 Growth in Cargo Throughput of the Liaoning Port
Source: Consultant.

Dalian Port and Yingkou Port are the mainly container ports in this area. The container throughput of the two ports was 5.26 million TEU and 3.34 million TEU respectively. Among these, the Japanese line contributed 900,000 TEU; and the ROK line, 700,000 TEU. Throughput of Dalian Port, Yingkou Port and Dandong Port in 2010 was shown in Table 3.3:

Table 3.3 Throughput of Chinese Ports in 2010

(Unit: million tons)

Freight category	Total	Dalian Port	Yingkou Port	Dandong Port
1.Total	593	314	226	53
2.Dry bulk	196	66	91	39
2.1 Coal	50	10	33	7
2.2 Mines	81	30	42	9
3.Liquid bulk	82	61	21	-
3.1 Crude oil	42	34	8	-
4.Break-bulk freight	174	128	37	9
5.Containers	8.9	5.3	3.3	0.3

Source: Transport Planning and Research Institute, Ministry of Transport

Suifenhe Port

Suifenhe Port is located in Heilongjiang Province, southeast of Suifenhe City, with both road and rail crossings. The main items imported are timber, oil, fertilizer, concentrate, powder, pulp, scrap steel and rubber etc. The items exported are mainly clothing, footwear, household appliances, fruits and vegetables, grain, meat, lumber and building decoration materials etc.

Commodity import through Suifenhe Port has been increasing. From 2006 to 2009, Customs in Suifenhe has monitored 33.124 million tons freight of import and export, involving a total value of USD 8.4 billion. 1.387 million vehicles and 4.846 million persons crossed through the border point Suifenhe. In 2010, 7.2 million tons freight passed through the port.

The freight flow of Suifenhe railway port is steadily rising (see Table 3.4). In 2011, the total value of import and export was USD 2.335 million, decreasing by 4% over the previous year and taking up 14.1% of the total value in Heilongjiang Province. Of the total import and export value, export contributed USD 1.024 billion, decreasing by 6.5% and taking up 23.6% of the total in Heilongjiang Province; whereas import was USD 1.312 billion, decreasing by 1.8% and taking up 10.7%.

Table 3.4 Import and Export by the Railway Port of Suifenhe 2007 -2011

(Unit: 10,000 tons)

Year	Import	Export	Total
2007	923.8	34.8	958.7
2008	832.5	32.8	865.4
2009	666.5	34.5	701
2010	708.4	35.6	744
Jan. to June 2011	286.86	15.25	302.11

Source: Consultant.

Quanhe Port

The growth of freight transport through Quanhe Port has stopped after the rapid growth from 1996 to 2000. Backward infrastructure in DPRK has stayed in the way of transportation. Even at its highest, the volume of freight transported was only 192,000 tons, quite limited in its scale (as shown on the Figure 3.3). Latest figures show that from January to September of 2012, import and export volume of Quanhe Port reach 143,753 tons, entry- exit passenger volume reach 250,417, at a year-on-year growth of 30.7%.

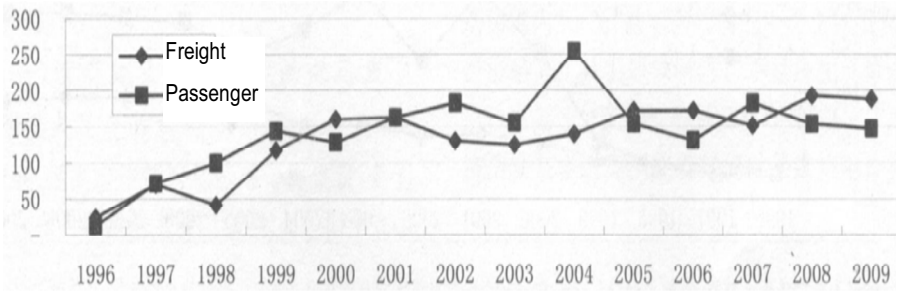

Figure 3.3 Volume of Freight and Passengers through Quanhe Border-Crossing Port (Unit: 1000 tons, 1000 persons)

Hunchun Port

Hunchun Port is located in southeast of Jilin Province, the Tumen River downstream areas. The road and rail ports in Hunchun are both the national first class port. It is the only road port in Jilin Province that is open to Russia.

The backwards in infrastructure and software in Russia and disputes between China and Russia have constrained development of the Tumen (Hunchun) transport corridor. Volume of freight transported through Hunchun Port rose from the 21,000 tons in 1999 to 90,000 tons in 2005. After that, the growth stopped. The number of passengers that passed the port rose to 146,000 in 2000, and then to 216,000 in 2001. The 2001 performance has never been surpassed ever since (as shown on the Figure 3.4). Latest figures show that from January to September of 2012, import and export volume of Hunchun Port reach 63,370 tons, entry-exit passenger volume reach 247,753, at a year-on-year growth of 13.5%.

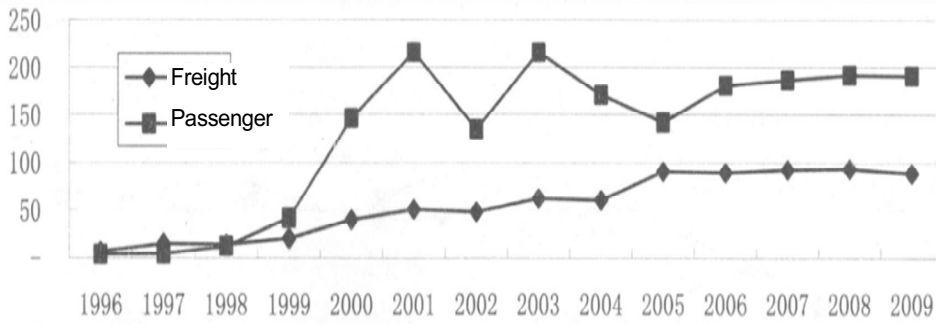

Figure 3.4 Volume of Freight and Passenger passed in Hunchun Port
(Units: 1000 tons, 1000 persons)

Manzhouli Port

Located in the triangle area of China and Russia and Mongolia, Manzhouli Port is an important transportation hub of the Eurasian Continental Bridge. It is China's largest railway and road ports, and is responsible for over 60% of Sino-Russian trade.

Imported goods to Manzhouli Port are crude oil, refined oil, timber, pulp, primary plastics, steel scrap and steel, etc. While the major exported goods are textiles, steel, automobiles, mechanical equipment, mechanical and electrical products, fruits and vegetables etc.

Manzhouli port, the largest land port in China, witnessed the passage of 26.60 million tons of freight, up by 1.8% from a year ago, keeping the growth trend (see Figure 3.5 below). Among the freight volume, railway port contributed 16.104 million tons, decreasing by 19.8% over the previous year; export 2.109 million tons with a growth rate of 62.5%; transport transfer 7.725 million tons, increasing by 58%. The import and export freight volume of road ports was 658,000 tons, up by 7.6%. The total number of passengers entering and exiting the port was 1.406 million, keeping slight changes on a yearly basis.

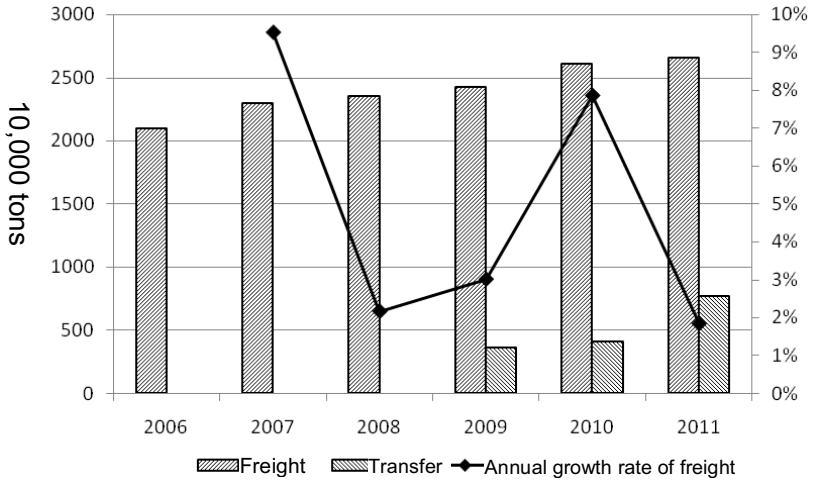

Figure 3.5 Freight Volume in Manzhouli Port from 2006-2011
Source: Consultant.

According to the customs, total value of imports and exports through Manzhouli Ports reached USD 6.44 billion in 2011, decreasing by 34.6% over the previous year. Total value of imports was USD 5.06 billion, decreasing by 43.6% over the previous year; total value of exports was USD 1.38 billion, up by 58.6% over the year 2010. Figures 3.6 and 3.7 show the percentage of imported goods and exported goods from Manzhouli Port in 2011.

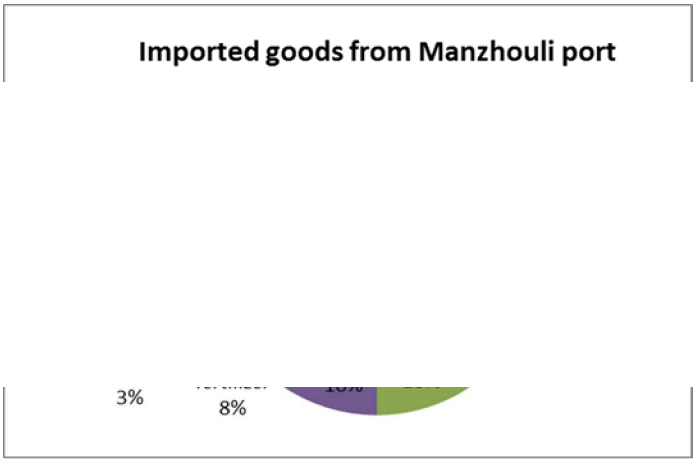

Figure 3.6 Percentages of imported goods from Manzhouli port in 2011
Source: China Association of Port-of-Entry

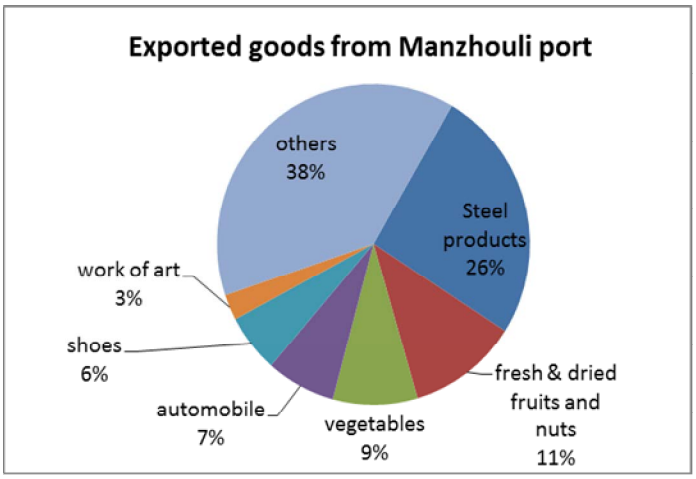

Figure 3.7 Percentage of exported goods from Manzhouli port in 2011
Source: China Association of Port-of-Entry

Arxan Port

Arxan Port is the second class port of China. It is located 45km away west from Arxan City (Figure 3.10), Mongolia Sumber Port is on its opposite side, this is an important channel for China carrying out economical and technical cooperation with Mongolia, Commonwealth of independent states and the whole Europe, expanding product and labor export, expanding opening to the outside and developing international tourism industry. It realized temporary customs clearance on Oct 25th of 2009. After fully completed, in short run, passenger and cargo capacity will reach 50,000 tons and 100,000 persons, and in the long run, they will respectively reach 4 million to 10 million tons and 1million to 3 million persons.

Figure 3.8 Location of Arxan Port
Source: Consultant.

3.2 Infrastructure capacity review

3.2.1 Road network

In 2007, the state council issued “Plan to Reinvigorate Northeast China”, proposing that we should consummate the comprehensive transportation system of northeast China, and strengthen the construction of highway and foreign channel. Under the push of regional integration strategy, highway network in northeast China has already begun to take shape, by the end of 2010, the expressway mileage of northeast China has reached 6,900 km, among which Liaoning Province has the highest expressway network density, nearly doubled compared with the data of 2005.

In contrast, road network density of Inner Mongolia is relatively low. However, with expressway mileage of Inner Mongolia reached 2000 km in 2009, the traffic condition has improved a lot, location advantage further revealed, and investment environment has also further optimized, it has provided a better developing platform for the economic development for both Inner Mongolia, even the whole GTR.

The provinces in GTR have witnessed a significant increase in the length of highways above grade 2 during the last five-year period.

By 2010, the length of highways in Heilongjiang Province has reached 151,945.2 kilometers and the road density has reached 33.5 km per square kilometers. There have been 1,357.5 km of expressways, 1,451.2 km of Grade 1 highways and 9,063.1 km of Grade 2 highways in Heilongjiang. According to the administrative classification, there are 5,268.6 km of national highways and 8,106.8 km of provincial highways.

By 2010, Inner Mongolia has completed 85,000 km of highways, including 2,600 km of expressways, 4,400 km of Grade 1 highways and 13,000 km of Grade 2 highways. The highways above Grade 2 accounted for 23.5% of the total mileage.

The total road mileage in Liaoning Province has reached 103,228 km by 2011, including 3,300 km of expressways, 2,595 km of Grade 1 road and 16,987 km of Grade 2 road. The road density has reached 70.14 km/100 km^2. According to the administrative classification, there are 6,465 km of national highways and 8,557 km of provincial highways.

Until the end of 2011, Jilin highway mileage reached 91,800 km, increasing by 1.55% compared with previous year. Among them, classified highway mileage was 83,800 km, accounting for 91.3% of the whole mileage, and expressway mileage reached 2,252 km, an increase of 402 km with last year.

3.2.2 Rail network

The railway mileage in Liaoning, Jilin, Heilongjiang and east Inner Mongolia is 16,885.6 km, accounting for 19.5 percent of the national railway operating mileage. The average railway density is 136.1 km/10,000 km^2. Table 3.5 shows the railway network along GTR corridors. As can be seen in the table, Suifenhe Corridor and Dalian Corridor have relatively better rail infrastructure. In Suifenhe Corridor, the sections from Grodekovo to Suifenhe (26 km) and from Mudanjiang to Hailar (1,119 km) use double-track railway. In Dalian Corridor, the section of Harbin-Changchun-Shenyang-Dalian (928 km) use electrified double-track railway. Overlapped with Dalian Corridor from Shenyang to Harbin, Korean Peninsula West Corridor also enjoys a better railway condition. The under-construction railway of Shenyang-Dandong will also use double-track railway. The infrastructure in Tumen Corridor is relatively backwards with most of the railway single-track. The railway infrastructure in Heilongjiang Province is further introduced then.

Table 3.5 Railway network along GTR corridors

Section		Total mileage (km)	Multiple track (km)	Electrifi-cation (km)	Track gauge	Notes
Suifenhe Transport Corridor	Grodekovo–Suifenhe	26	26		Broad/Standard	
	Suifenhe–Mudanjiang	193			Standard	
	Mudanjiang–Harbin–Hailar	1,119	1,119		Standard	
	Hailar–Manzhouli	186			Standard	
	Manzhouli–Zabaykalsk	10			Broad/Standard	
Tumen Transport Corridor	Zarubino–Hunchun	63			Broad	
	Hunchun–Jilin	470			Standard	
	Jilin–Changchun	128	128		Standard	
	Changchun–Songyuan-Ulanhot–Arxan	669			Standard	

Section		Total mileage (km)	Multiple track (km)	Electrifi-cation (km)	Track gauge	Notes
Dalian Transport Corridor	Blagoveshchensk–Heihe	85				Planned
	Heihe–Suihua	548			Standard	
	Suihua–Harbin	125	125		Standard	
	Harbin–Changchun–Shenyang–Dalian	928	928	928	Standard	
Korean Peninsula West Corridor	Harbin–Changchun–Shenyang	546	546	546	Standard	
	Shenyang–Dandong	277			Standard	
	Shenyang–Dandong	208	208	208	Standard	Under construc-tion

Source: various

By the end of 2009, the total railway operating mileage in Heilongjiang Province is 4,920.1 km, of which 4,840.1 km are state-owned and 80 km are joint-venture railways. Railway density in Heilongjiang Province is 1.53 times more than the national level and the railway mileage per capita is 1.5 km/million people.

Table 3.6 shows the carrying capacity indicators for main railways in Suifenhe Corridor. There are two railways in Suifenhe Corridor, namely, Harbin-Suifenhe Railway (Binsui Railway) and Harbin-Manzhouli Railway (Binzhou Railway). The utilization ratio of carrying capacity of Binsui Railway is around 46% to 67% in 2010. Binzhou Railway has the lowest utilization ratio of 30.1% and the highest utilization ratio of 85.8%.

Table 3.6 Carrying capacity indicators for main railways in corridors

Railway	Section	Total mileage (km)	Carrying load in 2010 (10,000 tons/km)		Max. Freight Density in 2010 (10,000 tons)		Utilization ratio of carrying capacity (%)
			Up	Down	Up	Down	
Binsui (Harbin–Suifenhe) Railway	Harbin-Mudanjiang	351	16,588,072	2,117,198	5,513	792	46.3
	Mudanjiang-Xiachengzi	98.3	618,933	35,506	687	41	66.6
	Xiachengzi- Suifenhe	94.5	600,306	43,113	516	34	66.7
Binzhou (Harbin-Manzhouli) Railway	Harbin-Ranghulu	170	6,022,242	5,154,388	3,487	2,522	36
	Ranghulu -Hongqiying	90.4	5,871,157	1,112,555	5,707	728	59
	Hongqiying – Ang'angxi	9.2	5,871,157	1,112,555	4,209	318	85.8
	Ang'angxi -Boketu	278.2	7,655,151	661,823	6,600	723	52.5
	Boketu -Tuduhe	95.5	5,658,654	352,961	5,813	340	66.3
	Tuduhe- Hailar	114.7	5,861,298	359,885	5,844	526	40
	Hailar - Manzhouli	186.7	4,975,656	362,534	4,511	328	30.1

Source: Railway Administration

3.2.3 Land BCP

Suifenhe

Suifenhe Port is located in southeast Heilongjiang Province, boarding Primorsky Territory in Russia in the east. There are two roads and a railway connected to Russia. The railway in Suifenhe is linked to Vladivostok in Russia, and connects three important ports in the Primorsky Territory (Vostochny, Nakhodka, and Vladivostok).

The railway yard includes a south part and a north part. The south yard is used for both passengers and cargoes with a total area of 100,000 square meters. There are domestic waiting lounge (2,800 m^2), International Joint Inspection Office (7,000 m^2) and platforms for passengers (4551 m^2) and cargoes (1,170 m^2) in the south yard. There are also 4 standard-gauge railways, 14 broad-gauge railways and 4 transshipment lines. The north yard is only for cargoes, occupying 270,000 square meters, of which platforms take up 1,170 square meters. There are 11 railways in standard-gauge, 13 railways in broad-gauge and 4 mechanical transshipment lines. The railway yard in Suifenhe Port has achieved an annual capacity of cargo transshipment of 10 million tons and passenger capacity of 1 million people.

Figure 3.9 Suifenhe BCP-photo 1

Figure 3.10 Suifenhe BCP-photo 2

Hunchun

Port of Hunchun has both road and railway crossings. The road crossing has an annual cargo capacity of 600,000 tons and an annual passenger capacity of 600,000 people, with a total area of 48 thousand square meters and a construction area of 4,894 square meters. Hunchun railway crossing occupies 1.220 thousand square meters with a construction area of 21.5 thousand square. The railway crossing has a transshipment and inspection capacity of 800,000 tons and 500,000 people for cargo and passenger in the initial stage. The capacity will rise to 25 million tons and 1 million people respectively in the medium-term.

Figure 3.11 Hunchun BCP

Quanhe

Quanhe BCP is an international passenger transportation port, on the other side is Yuanting Port of Democratic People's Republic of Korea, it is the only passage for China enter Rajin Economic Zone and was approved national first-class port in December of 1988. Government invested 23 million RMB into Quanhe Road Port, completing the construction of inspection building (3000 m^2) and frontier inspection station monitoring squadron barracks(1700 m^2), closed port area, construction of parking lot (3000 m^2), maintenance project of Quanhe frontier bridge, and the construction of water supply, water drainage, power supply, heating, telecommunications and related infrastructure. Till now, Quanhe Port has formed the delivery capacity of 600,000 tons of cargo and 600,000 persons. Local transport department has invested 240 million RMB to build a concrete port road from urban to frontier (43 km).

Figure 3.12 Hunchun Quanhe BCP

Tumen Port

Tumen Port has both road and railway crossings. It has been invested RMB 3.2 million in the construction of the inspection office. Now a 200,000 tons annual capacity of freight traffic and a 300,000 annual capacity of passenger traffic have been achieved in Tumen Port.

Figure 3.13 Tumen BCP -photo 1

Figure 3.14 Tumen BCP-photo 2
Source：www.Liuping902.blog.163.com

Manzhouli Port

The railway crossing in Manzhouli port has 24 railways in broad-gauge, 27 railways in standard-gauge and more than 90 transshipment lines and other specific lines. It has been invested 600 million RMB to improve the facility in Manzhouli port. Recently the broad-gauge station has a parking capacity of 2020 trucks and the standard-gauge station 1,712 trucks. The annual transshipment capacity has reached over 20 million tons.

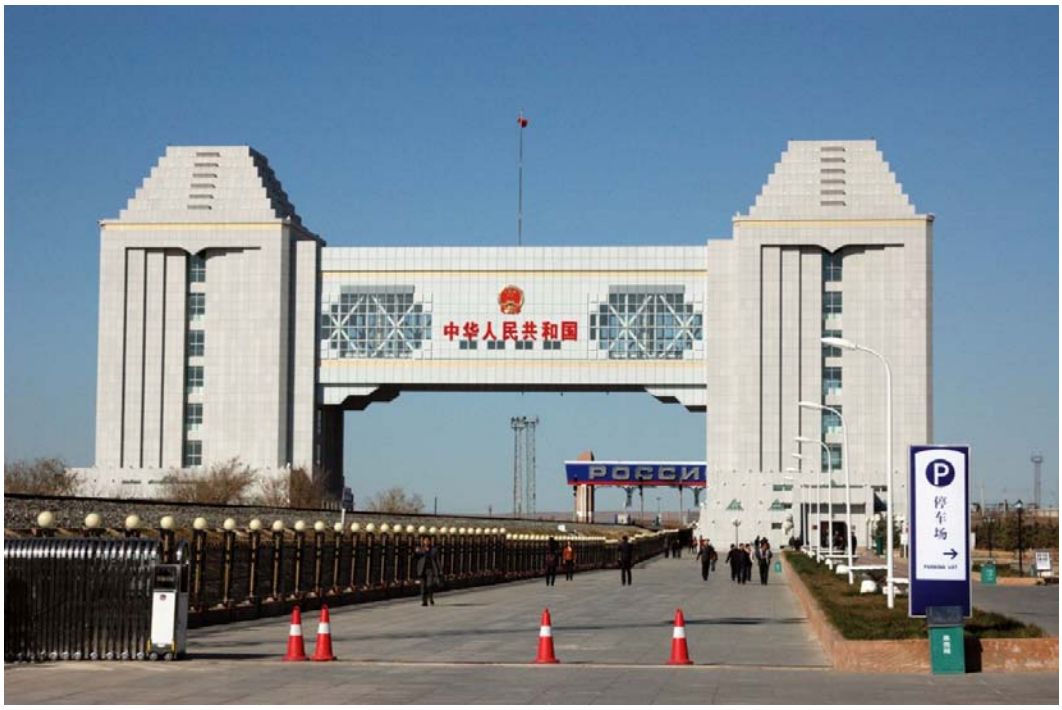

Figure 3.15 Manzhouli Railway BCP

The international road crossing in Manzhouli port was put into use in 1998 with 340 thousand square meters of inspection area for cargo and 300 thousand square meters for passenger. The carrying capacities for freight and passenger traffic have reached 2 million tons and 2 million people respectively.

Figure 3.16 Manzhouli Road BCP

Arxan Port

Arxan is seasonal road BCP. It has already opened and operated seasonally from May 1 to November 1. The facility in Arxan Port was relatively backwards before. The road linked to the port was in a third technical level. The plan for a new port road was approved in Dec. 2009. The new road adopted a second technical level was built and completed in 2010. The joint inspection building and the bridge between Arxan and Sumber, with 325 meter in length and 12 meter in height, was done in 2009.

Figure 3.17 The Bridge between Arxan and Sumber

Port logistics park: with a total area of 50,000 m^2, including the parking lot (16,000 m^2), and the trade, logistics, processing and warehousing areas.

Figure 3.18 Arxan Road BCP
Source: www.china.org.cn

3.2.4 Ports

Dalian Port

Dalian is a major city and seaport in the south of Liaoning province, Northeast China. It faces Shandong to the south, the Yellow Sea to the east and the Bohai Sea to the west and south. Dalian is China's northernmost warm water port. Dalian port has a significant history of being used by foreign powers. Today it serves as a regional financial base and an important international shipping center and logistics hub in Northeast Asia.

Traffic in Dalian Port is very convenient, Harbin- Dalian Line is connected with the developed railway line of Northeast China, China's longest highway Shenyang – Dalian line is connected with national highway network of Northeast China, thus it plays an important role in international trade and domestic material exchange. Till now, Dalian Port is equipped with 7professional handling operation area and 48 berths. Through the railway and highway network of Northeast China, Dalian Port is connected with Russia and

DPRK and has the ability to be the starting point of Asia- Europe bridge. Transportation by sea has opened up 8 international container routes to Hong Kong, Japan, Southeast Asia and Europe, 8 domestic passenger transportation routes, and regular tourism routes. Main transport network has provided a superior condition for the development of Dalian Port.

Figure 3.19 Dalian Port – Photo 1

Figure 3.20 Dalian Port – Photo 2

Dandong Port

The Port of Dandong is located on the right bank at the mouth of the Yalu River. It is bordered by the Yellow Sea in the south and is separated from the DPRK in the east. It was set up as a trading port in 1907. Till now, it has become the center of Northeast Asian Economic Zone and East section of Economic Zone of Bohai Sea, the north most international trade port, the new sea channel of Northeast China, the most convenient marine railway logistic channel to Russia, Mongolia, ROK, DPRK and Japan, it is also the main channel connection of China to Korean peninsula and Eurasia. Since large-scale construction began in the mid-1980s, the Port, together with the ports at Dalian and Yingkou, has become an important distributing center in northeast China. Dandong is a port city connected by rail with Shenyang and Sinuiju in DPRK.

Figure 3.21 Dandong Port – Photo 1

Figure 3.22 Dandong Port – Photo 2

3.3 Performance Review of Corridors

3.3.1 Supporting legal environment of transport movements: facilitation measures and frameworks

In recent years, economic and trade activities, goods and personnel exchanges between China and Northeast Asia have been increasing rapidly. Despite the adverse impact of the financial crisis, trade value of Northeastern China with Japan and ROK totaled USD 28 billion, with an increase of 44% from 2005. The *Implementation of the Planning for Cooperation between Northeastern China and the Far East and Siberia of Russia (2009-2018),* the *Planning for Joint Development of Rajin and Golden Flat Economic Zone* by China and DPRK, as well as the *Declaration of the 4th Trilateral Leader's Meeting* of the ROK, the PRC and Japan, all put forward the goal of 'realizing land and waterway connectivity in northeast Asia', paving the way for establishment of regional transportation cooperation mechanism.

A. Multiple-tiered transport cooperation mechanisms initially formed

China has primarily established a multiple-tiered transport cooperation mechanism with Northeast Asian countries. Currently, major transport cooperation mechanism includes:

- National and Ministerial level:

  The *Meeting of Transport Ministers under the Shanghai Cooperation Organization (SCO)* mechanism designates the major tasks in formulating multilateral transport facilitation agreement, improving international transport routes in the region, researching on and developing integrated multi-modal transport system and ensuring the implementation of Asia Highway Agreement etc.

Ministerial Meeting on Logistics between ROK, PRC and Japan aims to exchange information on international logistics and solve issues of common concern so as to establish efficient and seamless international logistics network in Northeast Asia.

Other mechanisms shall also include the annual meeting of the sub-committee of transport under the Committee for the Sino-Russian Premiers' Meeting and Vice-Ministerial Meeting on Transport between PRC and Japan.

- Provincial and Local Level

Inner Mongolia and the 3 provinces in Northeastern China all have regular or as needed meeting and visits with Russia, Mongolia, DPRK and other neighboring countries. For example, since 2004 Heilongjiang province has established the transport cooperation and regular meeting mechanism with counterpart neighboring regions in Russia. They discussed and have solved some practical issues in trade facilitation and transport.

B. Bilateral and Multilateral Transport Agreement Signed

Bilaterally, China signed road transport agreements with Mongolia, Russia and DPRK. China signed shipping agreements with Japan and ROK respectively. Besides, China has also signed the agreement on utilizing Zarubino Port, Posiet Port with Russia and utilizing Rajin Port, Chongjin Port with DPRK. Between PRC and Russia, a total of 6 road transport cooperation agreements and 10 waterway transport cooperation agreements have been signed. There are 2 road transport agreements between China and Mongolia. A total of 2 road transport cooperation agreements and 10 waterway transport cooperation agreements have been signed between China and DPRK.

Multilaterally, China is discussing with other 5 member states of the SCO for signing governmental agreement on facilitating international road transport under the SCO. Ever since the year of 2000, under the coordination of United Nations Conference on Trade and Development (UNCTAD), China, Russia and Mongolia have held multiple meeting on trilateral cross-border transport framework agreement. In addition, China, Russia, Japan and ROK also signed the agreement on the international project of establishment of Loran C and Chayka Joint Navigation Service.

C. Regional transport facilitation agreement concluded or to be concluded

Tumen municipal government of China and Onsong People's Committee entered into a Border Trade Market Agreement to establish a border trade market in Namyang of DPRK on April 27, 2007. The borderers' trade was officially opened on October 13, 2010, becoming the second border trade market to DPRK in Jilin province.

Shenyang Railway Administration of China, Chongjin Railway Administration of DPRK, and Far East Railway Administration of Russia held the Joint Conference of Railway Administration Department from DPRK Russia and China (The Regional Railway Freight Transport Conference Among China, DPRK and Russia) in Tumen, China on December 25, 2007, and *International Railway Freight Transport Agreement of Tumen (China)-Namyang (DPRK), Tumangang - Khasan (Russia)* was concluded to fully restart the railway intermodal transport among China, Russia and DPRK. A delegation from Tumen visited Russian Far East Railway Administration to discuss about the implementation of the terms in the agreement signed by the three parties in March 2008. Tumen Xinhuan Material Trade Company Limited and DPRK Railway Province, together with DPRK Railway Association entered into an Agreement on the Issues of International Railway Freight Forwarding Transport in November, 2010. Tumen-Tumangang - Khasan railway international transport work is progressing steadily.

A political delegation from Tumen visited Chongjin to investigate and proposed to bring the agreement of joint developing Chongjin by DPRK and China into the National Economical Cooperation Agreement Bill of China and DPRK in February 2011. Based on negotiation, agreements including the Tumen-Chongjin Railway Transport Agreement, the Joint Utilization of Chongjin Port Agreement, and the Dock Leasing and Renovation Agreement of the 3-4 Linkage Routes of Chongjin Port are concluded. In terms of the economical cooperation, an agreement on the establishment of a joint venture by Haihua Company (China) and Korea Association have been signed. .

As the only representative of China, Suifenhe in Heilongjiang province presented the Global Mayor Forum in Moscow in 2008 and China-Russia Economy and Trade Cooperation Forum in Moscow in 2009 successively; hosted the first session of Logistics Cooperation Forum, the second China-Russia Economy & Trade Cooperation Forum and the Senior Forum on the Development of Yanbian, China; and also undertook the second China-Russia Political Party Forum, the fourth International Wood Fair and three Famous Commodity Fairs in succession.

Table 3.7 List of bilateral international road transport agreement signed in Northeastern Asia

Signatories	Time signed	Current status
PRC and Mongolia (International Road Transport Agreement between PRC and the Mongolia Government)	1991	Implemented
PRC and Russia (International Road Transport Agreement between PRC and Russia Government)	1992	Implemented
PRC and DPRK (International Road Transport Agreement between China and the DPRK Government)	2008	Implemented

3.3.2 Overall noted Constraints and Challenges of freight and passenger movements along GTR corridors

Since 1978, the national government has emphasized on the development in Northeast China. National and local governments have invested more and more to improve the transportation and infrastructure along major GTR corridors. There is much room for improvement, however, due to the unbalanced development among and within different areas. The major problems remain in the transportation infrastructure and its facilitation and service, representing for both the hardware and the software of the transportation system.

Major problems in infrastructure are:

- Some road sections in GTR corridors are low in technical grade. Road sections to some ports are Grade 2 highways such as Ports of Manzhouli, Heihe, Suifenhe and Tongjiang, while others are below technical grade 3.
- The ports' transshipment capacity is insufficient for further development. There is a shortage of infrastructure in many boarding ports. For instance, limited storehouses and transshipment equipment in ports of Heihe, Tongjiang and Mishan induce the problem of low transshipment capacity in Heilongjiang Province.
- The boarding bridges are constructed in low efficiency, and some roads are not even linked up. Yalu River Bridge has been built, while the projects to build bridges in other ports are proceeding slowly. The construction of Heihe Bridge, for instance, has been considered for ten years, but is still without concrete schedules.
- The infrastructure in BCPs and ports is lagging behind. There are limited inspection area for both cargoes and passengers in Tumen Port, Ji'an Port and Hunchun Port in Jilin Province.

Major problems in transportation facilitation and service are:

- Unnecessary procedures and relatively high fees in customs clearance contribute to the low efficiency in ports' transportation. Some boarding ports still maintain the outdated way in customs clearance, thus resulting in a long procedure and a low accuracy.
- There are problems of inconsistent technical standards of size and weight of vehicles on highways. According to the transport agreement between China and Russia, size and weight of vehicles are limited as: 21m*4.2m*2.5m, 44 tons. While the inconsistent technical standards in China cause problems.
- International freight transport lines cover little of major cities in international trade. The international transport lines from Heilongjiang Province going directly to major inland cities in Russia merely account for 25% of the total coverage. Therefore, trucks from big cities in China such as Harbin, Changchun, Mudanjiang and Jiamusi can only wait for goods transferring in the port city in Russia without going directly to the central cities.

4 Future Development Potential

4.1 Review of Economic Development Projects likely to impact future traffic

4.1.1 Economic Development Plans

The central government has paid great attention to the socio-economic development of the provinces in Greater Tumen Region. A *Northeast China Revitalization Plan* was proposed in 2003 to speed up the development in Northeast China. The plan includes the government's provision of financial assistance and relevant preferential policies. It also proposed concrete measures to deepen the reform of state-owned enterprises, to establish a social security system, and to accelerate their industrial restructuring and technological transformation.

The Old Northeast Industrial Bases in Northeast China cover three provinces (Heilongjiang, Jilin, and Liaoning) as well as the five eastern prefectures of Inner Mongolia: Xilin Gol, Chifeng, Tongliao, Hinggan and Hulunbuir. These areas enjoy great and complete conditions for further development with abundant natural resources, and a solid industrial foundation. The considerable scale of strategic industries and key enterprises based on energy, raw materials, equipment manufacturing indicates a large development potential. Therefore, the very region of Northeast old industrial base is one of the key areas for future development in China.

The core of the plan is to revitalize the region's traditional industry, while speeding up development in aspects of structural regulation, regional cooperation, economic reform, the construction of an environment-friendly economy, and increased efforts in education, healthcare, and cultural projects. Cooperation with Russia, ROK, DPRK and Mongolia will become important factors in this revitalization program.

Five years after Northeast China Revitalization, provinces in GTR have achieved significant economic developments. Inner Mongolia stands out as the province with the No.1 economic growth rate, while Jilin and Liaoning reach No.2 and No.5. According to provincial economy and social development plan (2011-2015), in the next five years, Inner Mongolia, Liaoning Province, Jilin Province and Heilongjiang Province will keep a rapid economic growth trend with annual GDP growth rate of 11-12%, far above the national level of 7%. These areas will keep a 13-15% annual growth rate of the total volume of import and export (see Figure 4.1). Goals for the provinces are as follows.

Liaoning will double the per capita GDP and leap into the front ranks of the developed provinces in eastern China by the end of the "12th Five-Year Plan" (2015). The revitalization of the old industrial base in Liaoning will be gradually achieved. Jilin will keep an annual GDP growth rate of above 12% in 2010-2015. There will be a solid progress in transformation of economic development with significantly improvement in both quality and efficiency. Heilongjiang will have its GDP doubled by 2015 based on GDP in 2010. Heilongjiang will keep a rapid economic growth and become the bridgehead for the northern development in the revitalization plan. Inner Mongolia will achieve a evident improvement in both the quality and efficiency of economic growth with an annual GDP growth rate of above 12% in 2010-2015.

Table 4.1 GDP and foreign trade forecast in major provinces in GTR

	Liaoning	Jilin	Heilongjiang	Inner Mongolia
GDP in 2010 (Billion RMB)	1,827.8	857.7	1,023.5	1,167.2
Annual GDP growth rate in 2010-2015 (%)	11	Above 12	Above 12	12
GDP in 2015 (Billion RMB)	3,050	Above 1,500	2,047	2,054
Total volume of import and export in 2015 (billion USD)	-	31	-	16
Annual growth rate of trade value (%)	15 (import)	13	14.4	-

Source: Provincial economy and social development plan (2011-2015)

In order to meet the goals for socio-economic development, the following strategic plans of economic development in northeast China are proposed. Liaoning Coastal Economic Belt will accelerate China's opening up process in coastal areas in the northeast. Furthermore, Shenyang Metro Area will build a "Regional Economic Community", which is very important to promote revitalization of old industrial base in Liaoning. In addition, Chang-Ji-Tu pilot zone will be the pioneering area with an integration of industrial competitiveness in Northeast China, providing a driving force to achieve the rapid development in Jilin and other northeast provinces.

Liaoning Coastal Economic Belt

Liaoning Coastal Economic Belt was integrated into national strategies as a whole development zone under the approval of the State Council in July 1, 2009. A strategy entitled "5 Points and One Line" was initiated.

The "Five Points" indicate five key development areas in the province and cover seven zones: the Changxing Island Harbor Industrial Zone in Dalian; Yingkou Coastal Industrial Base; Liaoxi Jinzhou Bay Coastal Economic Zone; Dandong, and the Zhuanghe Huayuankou Industrial Zone. The five zones together cover a planned area of nearly 500 square kilometers.

The "One Line" mentioned in the strategy represents a new motorway along the coast. The coastline of 1,433 kilometers will become the connection between the five above zones. Dalian plays a significant role in the economic belt development, while Yingkou and Dandong also have large economic potential.

Central Liaoning City Cluster (Shenyang Metro Area)

The strategic plan of *Central Liaoning City Cluster* or *Shenyang Metro Area* was proposed by the provincial government. It was approved as the eighth integrated pilot zone in national development strategy in April 2010. Centered in Shenyang City, Shenyang Metro Area will integrate eight cities around into a “Regional Economic Community”, having great importance to promote the development of Shenyang metropolitan area in Liaoning.

Chang-Ji-Tu pilot zone

In August 30, 2009, the State Council proposed Chang-Ji-Tu Pilot Zone Plan or Ogitu Pilot Zone Plan to accelerate the process of regional integration in Changchun, Jilin and area of Tumen River (Yanbian). As the central area for a close cooperation in GTR, Chang-Ji-Tu pilot zone will be the pioneering area with great industrial competitiveness, and also a driving force to achieve the rapid development in Jilin and other provinces in Northeast China. The integration of Changchun, Jilin and area of Tumen River as a whole emphasizes the direct hinterland role of Changchun and Jilin to support the development of Tumen River Area. The integration is the potential need for further development of Tumen River Area and for realization of Northeast China Revitalization.

4.1.2 Transport Development Projects

According to provincial “12th Five-Year” plan for transportation development (2011-2015), Inner Mongolia, Liaoning, Jilin and Heilongjiang will have specific plans and relevant projects to improve their transportation in the next five years.

Heilongjiang

- Railway: Heilongjiang will build railways totaled 800 km in the next five years. By 2015, Heilongjiang will achieved over 7,000 km of railway operations, 700 km of passenger transportation line, 40% coverage of double-track railways and a great improvement in electrified railways. Passenger transportation line will be built in sections of Harbin to Dalian, Harbin to Qiqihar and Harbin to Mudanjiang. The railway container terminal in Harbin will also in the plan.
- Highway: Heilongjiang will accelerate the construction of highways linking to other provinces, and enhance the transportation with surrounding provinces and with the Russian Far East. By 2015, there will be 4,500 km of express highways, 18,000 km of highways above Grade 2 and 140,000km of rural highways in Heilongjiang. Express highways between Suifenhe to Mudanjiang will be constructed as well as a number of terminals for passenger and freight.
- Civil aviation: The Harbin airport expansion will be accomplished by 2015.

Jilin

In 2011-2015, Jilin is planning:

- To expand or newly build section of Siping-Changchun in Beijing-Harbin railway and section of Jilin-Changchun in Hunchun-Ulanhot express highways;
- To improve the technical grade of highways to Ports of Quanhe and Changlingzi etc.; finish the construction of boarding bridges in Quanhe Port;
- To construct integrated terminals for passengers and logistics park in Chang-Ji-Tu areas;
- To develop cross-border transportation from Ogitu areas and improve the coverage of international transport lines to major ports and inland cities in Russia and DPRK based on the international transport corridors;
- To lead the international transport enterprises to be specialized and large-scaled enterprises.

Liaoning

- Railway: The total railway operation mileage will reach to 7,000 km, including more than 1,700 km of passenger transportation line.
- Highway: Liaoning will enhance the construction of express highway network with its center in Shenyang and a radius of three hours transportation distance. Much emphasize is placed on building a number of express highways, expansion of sections of Beijing-Harbin expressway in Liaoning and improving road network in the coastal economic zone.
- Port: Focused on the International Shipping Center of Dalian and Northeast Asia, and port group along the coast, Liaoning will gradually improve the port distribution. Terminals particularly for crude oil, ore, coal and containers are to be built. Navigation channel of the harbor will be improved. Another ten harbor areas will be newly built. By 2015, there will be six great ports with a cargo throughput of 1 billion tons and a container throughput of 18 million TEU.

4.1.3 Freight traffic related projects

Table 4.2 shows the freight traffic in major provinces in GTR during the last decade. In Jilin Province and Liaoning Province, road traffic carries the largest part of the freight, accounting for 81.5% and 86.03% of the total volume.

As for road transportation, Liaoning Province carries the most part of freight among the major provinces in GTR. The large traffic may because of the great carrying capacity of Dalian Port, Yingkou Port and Dandong Port in Liaoning. Its freight traffic on road doubled from 350 million tons in 2000 to 1273 million tons in 2010, which is two times and three times more than that in Inner Mongolia and in Jilin Province.

Table 4.2 Freight Volume though railway and road in Jilin, Liaoning, Heilongjiang and Inner Mongolia, 2000-2010

(Unit: 10,000 tons)

Year	Jilin		Inner Mongolia		Heilongjiang		Liaoning	
	Railway	Road	Railway	Road	Railway	Road	Railway	Road
2000	5,766	23,640	9,648	34,979	13,077	39,685	13,057	64,515
2001	5,671	23,649	10,151	36,145	13,371	40,135	13,616	63,281
2002	5,781	24,777	11,107	37,239	13,369	40,317	13,869	64,104
2003	6,153	25,211	12,288	38,532	14,267	39,031	13,885	65,981
2004	6,552	26,659	14,739	42,697	15,143	40,712	15,014	70,164
2005	6,634	27,441	18,167	51,020	16,123	44,376	15,029	74,799
2006	6,159	28,965	21,393	58,978	15,859	48,389	16,306	82,142
2007	6,199	31,573	25,382	73,300	16,599	51,996	17,752	90,387
2008	7,422	23,558	39,070	60,941	17,511	35,424	19,141	92,938
2009	7,478	18,262	43,084	70,832	16,558	36,486	20,316	105,088
2010	7,490	33,013	52,069	85,162	17,463	40,582	20,689	127,361

Source: Jilin Statistical Yearbook 2011, Liaoning Statistical Yearbook 2011, Inner Mongolia Statistical Yearbook 2011, Heilongjiang Statistical Yearbook 2011.

Table 4.3 Annual growth rates of freight traffic in major provinces in GTR 2000-2010

Year	Inner Mongolia		Liaoning Province		Jilin Province		Heilongjiang Province	
	Railway	Road	Railway	Road	Railway	Road	Railway	Road
2000-2005	10.7%	5.4%	3.5%	1.2%	1.6%	3.7%	8.7%	1.1%
2006-2010	24.1%	13.2%	5.5%	10.6%	2.6%	8.4%	14.0%	1.3%

Source: Consultant.

When we look at the annual growth rates of freight traffic in major provinces in GTR (Table 4.3), Inner Mongolia stands out as the province with highest annual growth rates in both railway and road. Figure 4.1 shows the growth rate of road freight traffic each year in 2001-2010 in Inna Mongolia. There is a significant decrease in transportation in 2008, which may due to the global financial crisis. The financial crisis affected foreign trade among GTR and consequently influence the freight traffic.

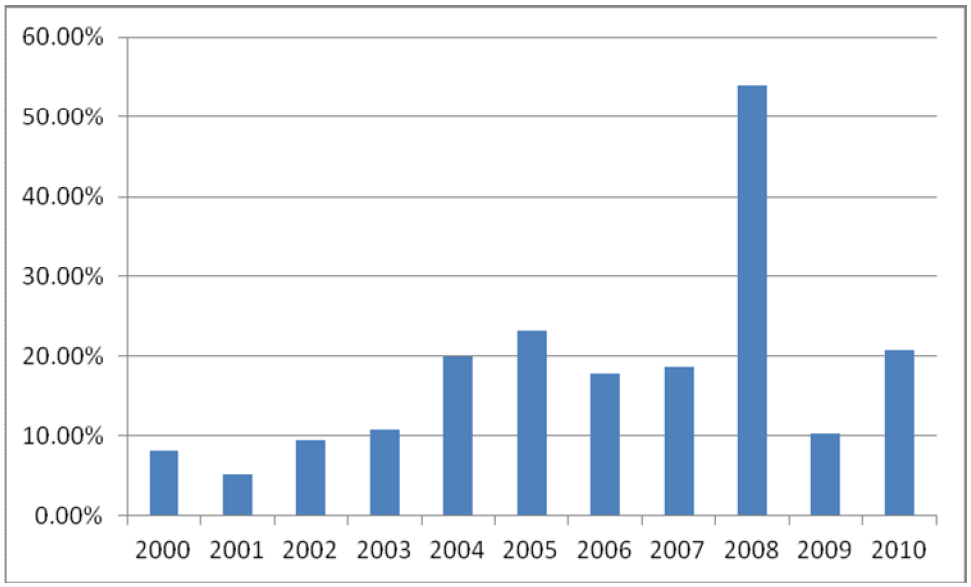

Figure 4.1 Growth rate of road freight traffic in Inner Mongolia 2001-2010
Source: Based on Liaoning Statistical Yearbook 2011

Railway freight volume also presents steady growing trend, as is shown in figure, except influence of 2008 financial crisis, the growth rate of railway freight volume has remained at around 15% since 2005(Figure 4.2).

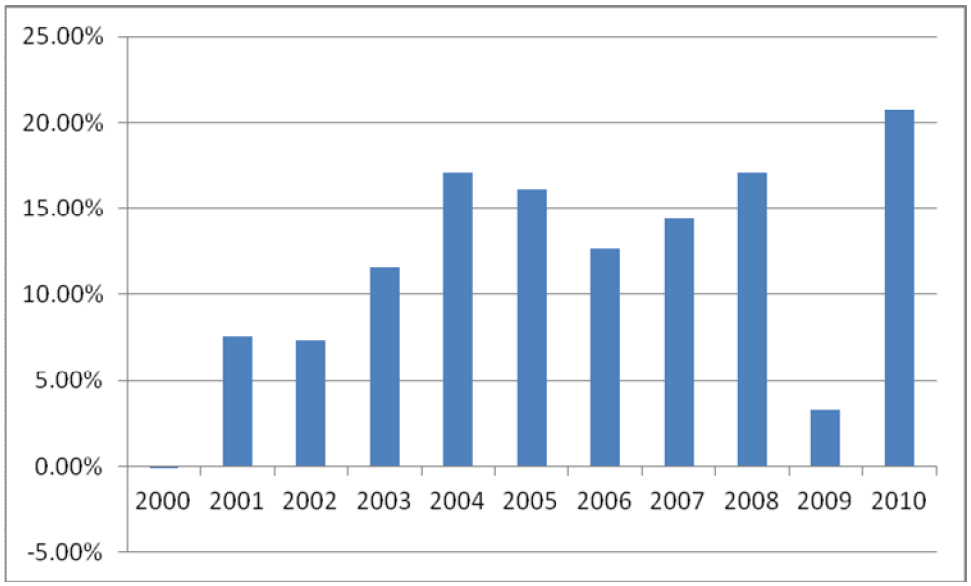

Figure 4.2 Growth Rate of Railway Freight Volume in Heilongjiang, 2000-2010
Source: Heilongjiang Statistics Yearbook, 2011.

4.1.4 Passenger related projects

Table 4.4 shows the passenger transportation in major provinces in GTR during the last decade. Different from freight traffic, most passengers go through road in all the provinces. Liaoning stands out as the province with the largest passenger traffic through both road and railway. The railway carried 102 million passengers in 2000 and 133 million passengers in 2009. While the road carried 404 million passengers in 2000 and the number went all the way up to 876 million in 2010.

Table 4.4 Passenger Volume though railway and road in Jilin, Liaoning, Inner Mongolia and Heilongjiang, 2000-2010

(Unit: 10,000 persons)

Year	Jilin		Inner Mongolia		Heilongjiang		Liaoning	
	Railway	Road	Railway	Road	Railway	Road	Railway	Road
2000	5,785	18,170	3,378	20,061	9,819	39,864	10,174	40,385

2001	5,346	19,001	2,956	21,041	9,692	40,900	10,038	41,207
2002	4,962	19,904	2,824	22,421	9,188	41,490	9,701	43,554
2003	4,232	20,112	2,552	20,831	8,207	39,347	8,706	41,076
2004	4,687	22,293	3,235	25,510	8,724	42,170	9,591	47,370
2005	4,618	22,870	3,259	28,604	8,251	46,808	9,503	49,917
2006	4,590	24,198	3,437	31,817	8,801	51,023	9,883	53,317
2007	4,855	26,506	3,489	35,039	9,495	54,592	10,417	59,562
2008	5,320	50,511	3,876	16,207	9,872	31,379	11,958	77,510
2009	5,687	52,723	4,093	17,998	10,000	32,947	13,377	81,585
2010	5,770	58,577	4,213	19,830	10,468	36,001	13,336	87,699

Source: Jilin Statistical Yearbook 2011, Liaoning Statistical Yearbook 2011 Inner Mongolia Statistical Yearbook 2011, Heilongjiang Statistics Yearbook 2011.

Table 4.5 Provincial Annual Growth Rates of Passenger Traffic in 2000-2010

Year	Inner Mongolia		Liaoning Province		Jilin Province		Heilongjiang Province	
	Railway	Road	Railway	Road	Railway	Road	Railway	Road
2000-2005	2.9%	7.0%	-1.3%	4.5%	-4.1%	5.2%	-2.2%	1.9%
2006-2010	4.6%	0.2%	5.8%	11.1%	3.6%	20.7%	3.2%	-0.2%

Source: Consultant.

Table 4.5 shows the annual growth rates of passenger traffic in major provinces in GTR from 2000 to 2010. Generally speaking, from 2000 to 2005, railway passengers volume reduced in general, but as government increased railway infrastructure investment in the 11th five-year plan, provincial railway passenger volume got a steady increase. Correspondingly, because of the sharing of railway traffic, there's a reduction in the increase of annual rate of road traffic in Inner Mongolia and Heilongjiang. As for annual growth rates of passenger traffic, Jilin Province stands out with the remarkable annual growth rate of 20.7% in 2005-2010. As can be seen in Figure 4.3, road passenger traffic in Jilin Province is going up every year and the growth rate soared in 2008, this is because of the change in highway traffic volume statistical methods (diameter) in whole China. If we don't consider the data in 2008, average growth rate of Jilin road traffic from 2006 to 2010 is 5.93%.

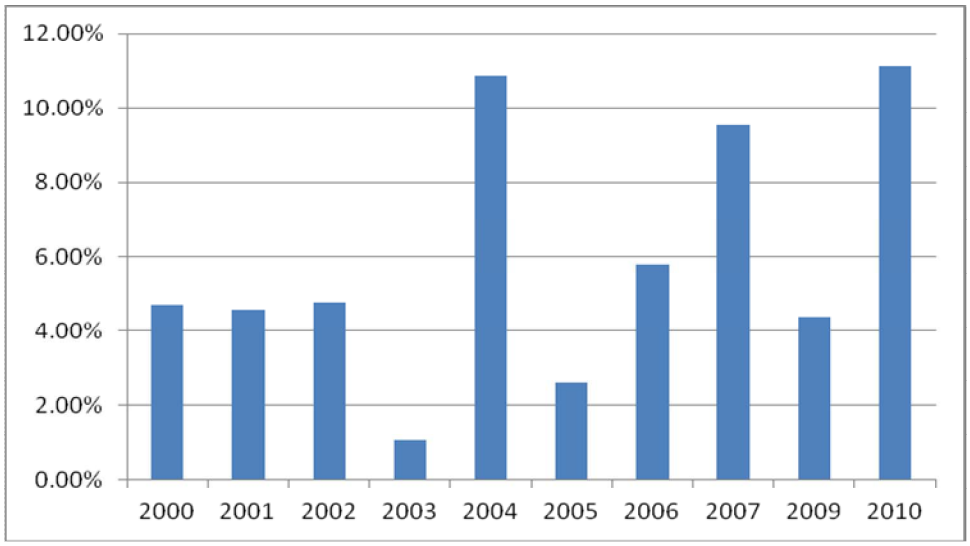

Figure 4.3 Growth rate of road passenger traffic in Jilin Province, 2001-2010
Source: Based on Jilin Statistical Yearbook 2011.

While road passenger traffic doubled in Inner Mongolia and tripled in Jilin Province, the railway traffic remained stable in the last decade. Compared with the road's carrying capacity, the railway has limited improvement. There implies a limited railway network and infrastructure in Northeast China which needs further planning and development.

4.2 Traffic and Transport Demand Forecasting

4.2.1 Freight

There are various factors that influence traffics such as GDP growth, population growth, increase of vehicles, volume of the industrial and agricultural products, and consumption of the fuel, etc. In Inner Mongolia, Jilin Province and Liaoning Province, freight and passenger traffic change greatly with the foreign trade which contributes largely to GDP indices. Therefore, GDP indices have a strong relationship with freight traffic. Under most conditions, we adopt the fitting model and elastic coefficient method for forecasting the freight and passenger traffic. For Heilongjiang railway and road passenger traffic, because of the low fitting relation with GDP, we only adopt elastic coefficient method for forecasting.

Since different provinces have relatively independent social and economic developments, the traffics of freight and passenger are predicted accordingly. GDP indices used in the model are calculated at comparable prices which have a better indication for traffics. The coefficients of determination of different regressions are around 0.9, indicating that the model used here can better describe and predict the change of freight and passenger traffics with the increasing GDP indices.

Elastic coefficient method means using the prediction of one factor's change to predict another factor's change, it is an indirect prediction method, and basic mathematical model is as follows:

$$y_t = y_t'(1+i)^t$$

$$i = E_s q = i'/q'^{*} q$$

Among which,

y_t —— Forecast object on time t;

y_t' —— Value of forecast object on time t;

i' —— Previous average growth rate of forecast object, %;

i —— Later average growth rate of forecast object, %;

E_s —— Elastic coefficient;

q' —— Previous average growth rate of analog variable, %;

q —— Later average growth rate of analog variable, %;

We forecast the freight and passenger traffics in 2015 and 2020. According to the economy and social development plan (2011-2015) of Inner Mongolia, Liaoning Province, Jilin Province, the annual growth rates of GDP are 12%, 11% and 12% respectively. So the traffic prediction in 2015 adopts the annual growth rates of 11%-12%. In the long run (2016-2020), we used a conservative annual growth rate of 7% for the forecast according to the national economy and social development plan.

A. Inner Mongolia

Regression equation:

Freight traffic by road: y = 5.1434x + 13013

Freight traffic by railway: y = 4.7557x - 12455

Figure 4.4 shows freight traffic growth with GDP indices in Inner Mongolia in 2000-2009. There was a rapid improvement in freight traffic by road in Inner Mongolia from 2003-2007 and an evident fluctuation since 2008. The drop in 2008 and 2009 may partly be due to the global financial crisis at that time. Because of the fluctuation, regression on GDP indices shows a lower R^2 (0.87). The forecast shows that freight traffic carried by road in Inner Mongolia will reach to 941 million tons in 2015 and 1,370 million tons in 2020.

The freight traffic by railway increased steadily since 2000. Coefficient of determination of the regression equation is 0.98. The forecast shows a steady and rapid increase in freight traffic by railway in Inner Mongolia with the future traffic 1,282 million tons in 2015 and 1,746 million tons in 2020.

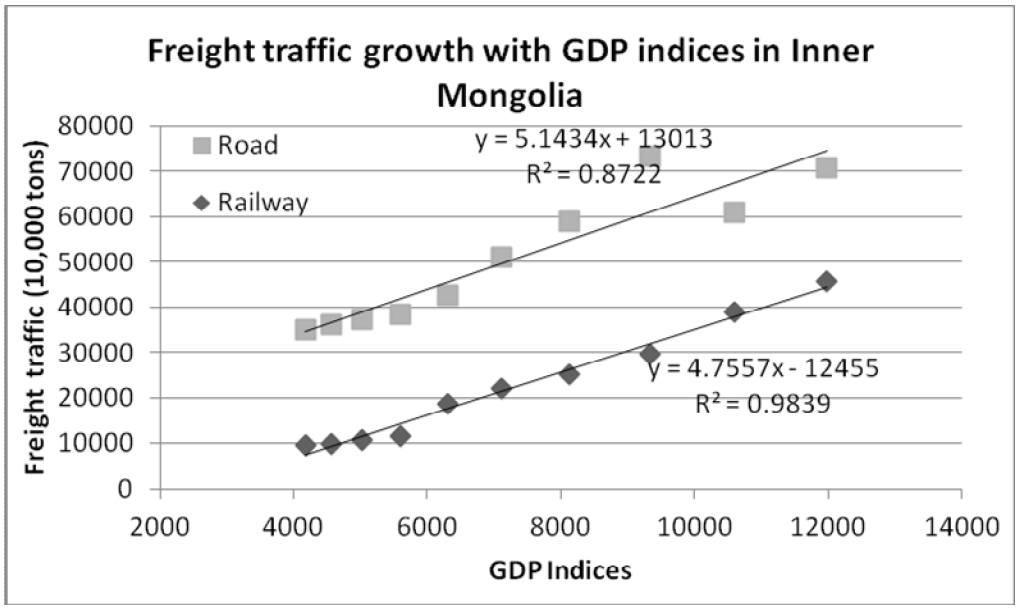

Figure 4.4 Freight traffic growth with GDP indices in Inner Mongolia, 2000-2010
Source: consultant.

*The GDP indices in this table are calculated at comparable prices. The base year (1952) GDP index is 100.

Elastic Coefficient Method:

Freight volume and GDP of Inner Mongolia from 2000 to 2010 are shown below:

Table 4.6 Freight Volume and GDP of Inner Mongolia from 2000 to 2010

(Units: 10,000 tons, RMB 100 million)

Year		2000	2001	2002	2003	2004
Freight	Road	34,979	36,145	37,239	38,532	42,697
	Railway	9,648	10,151	11,107	12,288	14,739
GDP		1,392	1,546	1,734	2,150	2,721
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	58,978	73,300	60,941	70,832	85,162
	Railway	21,393	25,382	39,070	43,084	52,069
GDP		4,944	6,423	8,496	9,740	11,672

Source: National Statistic Yearbook 2011.

Annual growth rate of freight volume and GDP in Inner Mongolia are as follows:

Table 4.7 Annual Growth Rate of Freight Volume and GDP of Inner Mongolia 2000-2010

Year		2000	2001	2002	2003	2004
Freight	Road	6.3%	3.3%	3.0%	3.5%	10.8%
	Railway	8.2%	5.2%	9.4%	10.6%	19.9%
GDP		9.70%	10.6%	13.2%	17.6%	20.9%
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	15.6%	24.3%	-16.9%	16.2%	20.2%
	Railway	17.8%	18.6%	53.9%	10.3%	20.9%
GDP		19.1%	19.2%	17.8%	16.9%	15.0%

Source: Consultant.

We can get that in 2015, road freight volume in Inner Mongolia will be 1,158 million tons, and in 2020 it will reach 1264 million tons; in 2015, railway freight volume will reach 912 million tons, and in 2020, it will reach 1,088 million tons.

B. Liaoning Province

Regression equation:

Freight traffic by railway: y = 3.3114x + 48815

Freight traffic by road: y = 0.5249x + 11167

Figure 4.5 illustrates freight traffic growth with GDP indices in Liaoning in 2000-2010. Railway plays a dominant role in freight traffic in Liaoning with a fourfold carrying capacity than that of road. Regression of freight traffic by railway on GDP indices has a R^2 of 0.98. The forecast shows that freight traffic carried by railway in Liaoning will reach to 1,563 million tons in 2015 and 1996 million tons in 2020.

In road freight traffic, the freight volume has a high fitting degree of 0.96 between 2000 to 2010, after forecast, road freight volume of Liaoning in 2015 and 2020 will reach 229 million tons and 277 million tons.

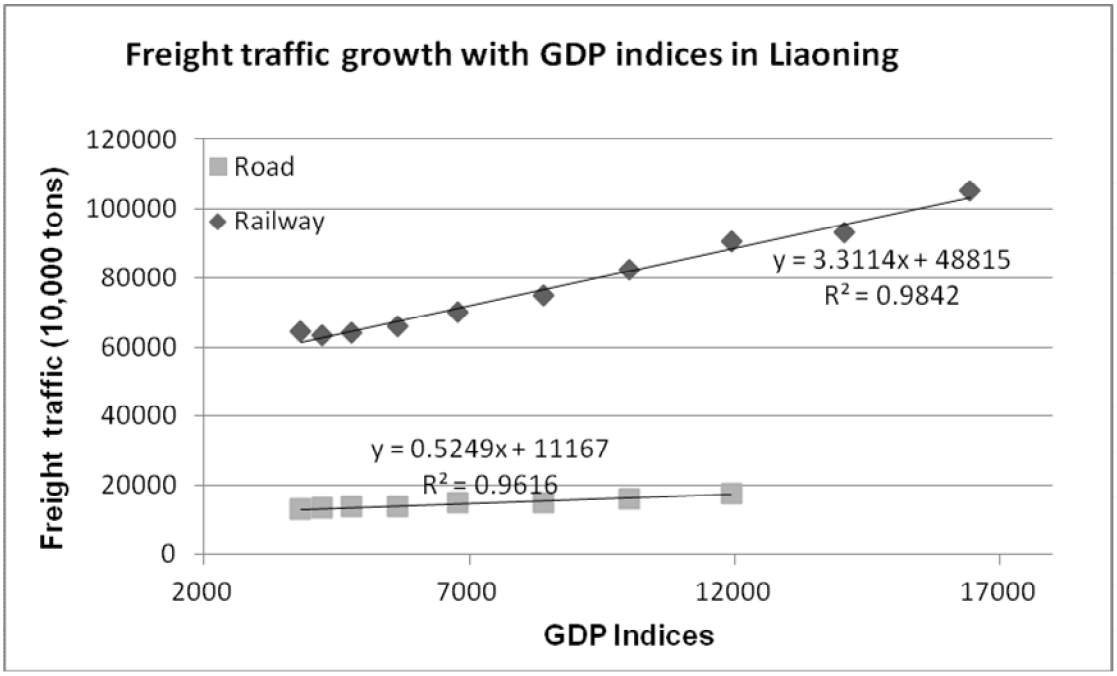

Figure 4.5 Freight traffic growth with GDP indices in Liaoning, 2000-2010
Source: consultant

The GDP indices in this table are calculated at comparable prices. The base year (1952) GDP index is 100. The data in 2000-2007 are used to forecast an upper bound of freight traffic in Inner Mongolia.

Elastic Coefficient Method:

Freight volume and GDP of Liaoning from 2000 to 2010 is as shown below:

Table 4.8 Freight Volume and GDP of Liaoning from 2000 to 2010

(Units: 10000 tons, RMB 100 million)

Year		2000	2001	2002	2003	2004
Freight	Road	64,515	63,281	64,104	65,981	70,164
	Railway	13,057	13,616	13,869	13,885	15,014
GDP		4,669	5,033	5,458	6,003	6,873
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	82,142	90,387	92,938	105,088	127,361
	Railway	16,306	17,752	19,141	20,316	20,689
GDP		9,305	11,164	13,669	15,212	18,457

Source: National Statistic Yearbook 2011.

Annual growth rate of freight volume and GDP in Liaoning are as follows:

Table 4.9 Annual Growth Rate of Freight Volume and GDP of Liaoning from 2000 to 2010

Year		2000	2001	2002	2003	2004
Freight	Road	-2.6%	-1.9%	1.3%	2.9%	6.3%
	Railway	3.2%	4.3%	1.9%	0.1%	8.1%

GDP		8.9%	9.0%	10.2%	11.5%	12.8%
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	9.8%	10.0%	2.8%	13.1%	21.2%
	Railway	8.5%	8.9%	7.8%	6.1%	1.8%
GDP		14.2%	15.0%	13.4%	13.1%	14.2%

Source: Consultant.

We can get that in 2015, road freight volume in Liaoning will be 1,679 million tons, and in 2020, it will reach 1,817 million tons; in 2015, railway freight volume will reach 254 million tons, and in 2020, it will reach 269 million tons.

C. Jilin Province

Regression equation:

Freight traffic by road: y = 1.0218x + 9371.9

Freight traffic by railway: y = 0.2632x + 4940.7

Figure 4.6 shows freight traffic growth with GDP indices in Jilin Province in 2000-2009. Compared to traffics in Inner Mongolia and Liaoning Province, the traffics in Jilin Province are relatively small. Even though, Jilin Province has seen a steady improvement in road freight traffic since 2000. Road traffic takes a dominant position in the overall freight traffic. The regression equation has a high coefficient of determination of 0.99. In 2015, road freight traffic will arrive at 273 million tons. In 2020, it will be 346 million tons.

There is some improvement in railway freight traffic in Jilin Province, despite a slight drop in 2006. The fluctuation from 2005 to 2006 affects the regression model, contributing to a smaller R^2 (0.76). Still, we can use the model for crude prediction. The freight traffic carried by railway will become 96 million tons in 2015 and 114 million tons in 2020.

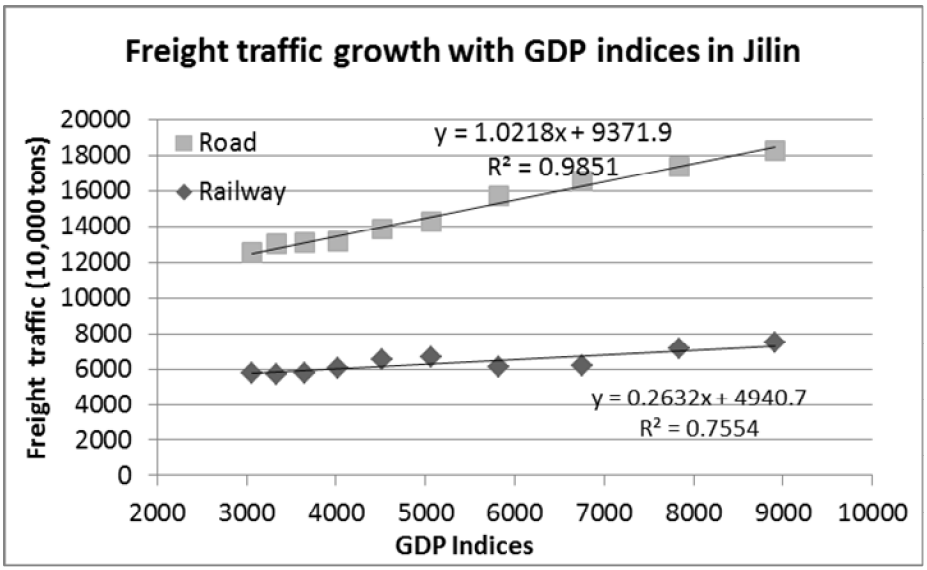

Figure 4.6 Freight traffic growth with GDP indices in Jilin, 2000-2010

Source: Consultant

* The GDP indices in this table are calculated at comparable prices. The base year (1952) GDP index is 100.

Elastic Coefficient Method:

Freight volume and GDP of Jilin from 2000 to 2010 is as shown below:

Table 4.10 Freight Volume and GDP of Jilin from 2000 to 2010

(Units: 10,000 tons, RMB 100 million)

Year		2000	2001	2002	2003	2004
Freight	Road	23,640	23,649	24,777	25,211	26,659
	Railway	5,766	5,671	5,781	6,153	6,552
GDP		1,845.6	2,032	2,246	2,523	2,958
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	28,965	31,573	23,558	18,262	33,013
	Railway	6,159	6,199	7,422	7,478	7,490
GDP		4,275	5,285	6,426.1	7,278.8	8,668

Source: National Statistic Yearbook 2011.

Annual growth rate of freight volume and GDP in Jilin are as follows:

Table 4.11 Annual Growth Rate of Freight Volume and GDP of Jilin from 2000 to 2010

Year		2000	2001	2002	2003	2004
Freight	Road	6.2%	0.0%	4.8%	1.8%	5.7%
	Railway	-5.2%	-1.6%	1.9%	6.4%	6.5%
GDP		9.2%	9.3%	10.2%	10.2%	11.7%
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	5.6%	9.0%	-25.4%	-22.5%	80.8%
	Railway	-7.2%	0.6%	19.7%	0.8%	0.2%
GDP		15.0%	16.1%	16.0%	13.6%	13.8%

Source: Consultant.

We can get that in 2015, road freight volume in Jilin will be 443 million tons, and in 2020, it will reach 467 million tons; in 2015, railway freight volume will reach 83 million tons, and in 2020, it will reach 84 million tons.

D. Heilongjiang

Freight volume and GDP of Heilongjiang from 2000 to 2010 is as shown below:

Table 4.12 Freight Volume and GDP of Heilongjiang from 2000 to 2010

(Units: 10,000 tons, RMB 100 million)

Year		2000	2001	2002	2003	2004
Freight	Road	39,685	39,900	40,317	39,031	40,712
	Railway	12,959	13,671	13,258	14,118	14,975
GDP		3,151.4	3,390.1	3,637.2	4,057.4	4,750.6
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	48,389	51,996	35,424	36,486	40,582
	Railway	15,859	16,599.3	17,510.9	16,557.9	17,462.5
GDP		6,211.8	7,104	8,314.4	8,587	10,368.6

Source: National Statistic Yearbook 2011.

Annual growth rate of freight volume and GDP in Heilongjiang are as follows:

Table 4.13 Annual Growth Rate of Freight Volume and GDP of Heilongjiang (2000-2010)

Year		2000	2001	2002	2003	2004
Freight	Road	2.58%	0.54%	1.05%	-3.19%	4.31%
	Railway	-0.02%	7.57%	7.29%	11.55%	17.08%
GDP		8.20%	9.30%	10.20%	10.20%	11.70%
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	9.04%	7.45%	-31.87%	3.00%	11.23%
	Railway	12.66%	14.36%	17.04%	3.28%	20.75%
GDP		12.10%	12.00%	11.80%	11.40%	12.70%

Source: Consultant.

We can get that in 2015, road freight volume in Heilongjiang will be 433 million tons, and in 2020, it will reach 438 million tons; in 2015, railway freight volume will reach 317 million tons, and in 2020, it will reach 356 million tons.

Table 4.14 Future freight traffic in major provinces in GTR

(Unit: 10,000 tons)

Year	Inner Mongolia		Liaoning Province		Jilin Province		Heilongjiang	
	Railway	Road	Railway	Road	Railway	Road	Railway	Road
2015	91,171.8	115,802.4	25,364.4	167,932.7	8,289.9	44,278.9	31,660.6	43,291.1
2020	107,758.3	126,475.5	26,865.1	181,726.7	8,435.5	46,694.2	35,563.9	43,768.8

Source: Consultant.

According to the prediction, Liaoning Province will have the largest freight traffic (Table 4.15). This is partly because of the great carrying capacity of Dalian Port, Yingkou Port and Dandong Port. Liaoning will also experience the most rapid annual growth rate of freight traffic among major provinces in GTR in the following decade. During 2009 to 2015, the annual growth rate of both railway and road freight traffic in Liaoning will be above 10%. Jilin province will have a relatively small annual growth rate (below 5%) in railway freight traffic.

Table 4.15 Annual growth rates of freight traffic in major provinces in GTR 2000-2020

Year	Inner Mongolia		Liaoning Province		Jilin Province		Heilongjiang Province	
	Railway	Road	Railway	Road	Railway	Road	Railway	Road
2000-2005	10.7%	5.4%	3.5%	1.2%	1.6%	3.7%	8.7%	1.1%
2006-2010	24.1%	13.2%	5.5%	10.6%	2.6%	8.4%	14.0%	1.3%
2011-2015	11.9%	6.3%	4.2%	5.7%	2.1%	6.0%	12.6%	1.3%
2016-2020	7.5%	4.0%	2.6%	3.6%	1.2%	3.5%	7.4%	0.8%

Source: Consultant.

The annual growth rates of freight traffic in major provinces in GTR showed in Table 4.15 provide the benchmark for future growth rate of freight traffic in GTR corridors, which can be used for forecast once the data are available. At present, we can only offer the annual growth rates of freight traffic in major provinces in GTR as references, within the limit of best available data. The same goes for freight traffic through main BCPs.

4.2.2 Passengers

We use the regression model on GDP indices to come to a trend forecast for passenger traffic in major provinces in GTR. Since the National Northeast Development Strategy proposed in 2003, the railway passenger traffic has experienced a sharp increase in these provinces. It is apparent in Table 4.5, the railway passenger traffic has a negative annual growth rate in 2000-2004, and then keep increasing rapidly in 2005-2009. In order to predict the future development better, we should take into account the National Northeast Development Strategy as a driving force. Therefore we use data in 2004-2009 for railway passenger traffic forecast in the major provinces in GTR. The analyses in different provinces are as follows.

A. Inner Mongolia

Regression equation:

Passenger traffic by railway: y = 0.0935x + 2510.1

Figure 4.7 shows railway passenger traffic growth with GDP indices in Inner Mongolia in 2000-2010. Regression of road passenger traffic on GDP indices has a R^2 of 0.95. The forecast shows that passenger traffic carried by road in Inner Mongolia will reach to 241 million persons in 2015 and 242 million persons in 2020. Table 4.8 shows the forecasting results.

As for road, passenger traffic in 2004-2009 indicates a light increasing trend and is always around 30-40million, because it has a low fitting relation with GDP, here we use elastic coefficient method for forecasting.

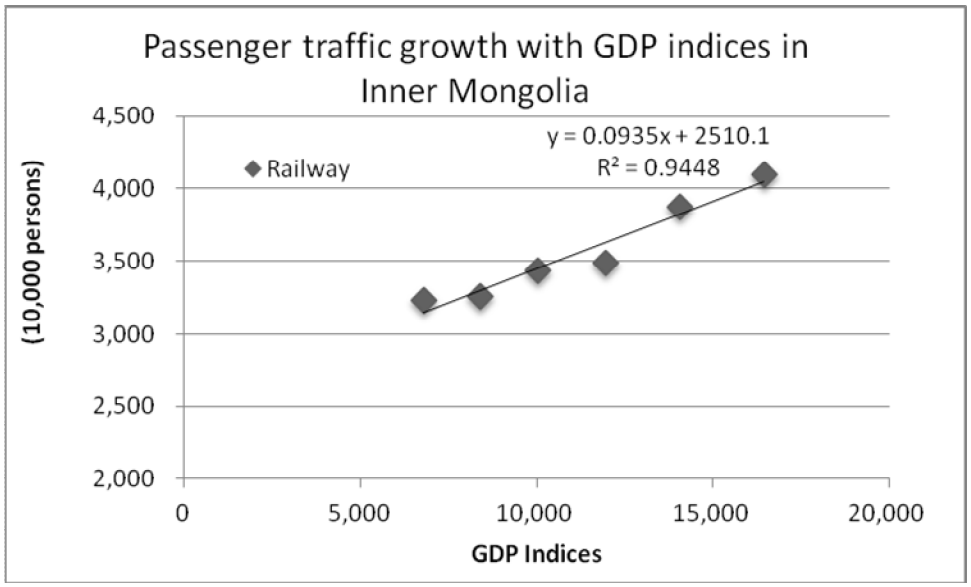

Figure 4.7 Railway Passenger traffic growth with GDP indices in Inner Mongolia, 2000-2010
Source: Consultant.

* The GDP indices in this table are calculated at comparable prices. The base year (1952) GDP index is 100. Forecast of railway passenger traffic in Inner Mongolia is based on data in 2004-2009.

Elastic Coefficient Method:

Passenger volume and GDP of Inner Mongolia from 2000 to 2010 are as shown below:

Table 4.16 Passenger Volume and GDP of Inner Mongolia from 2000 to 2010

(Units: 10,000 tons, RMB 100 million)

Year		2000	2001	2002	2003	2004
Freight	Road	20,061	21,041	22,421	20,831	25,510
	Railway	3,378	2,956	2,824	2,551.8	3,235
GDP		1,391.88	1,545.79	1,734.31	2,150.41	2,721.08
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	31,817	35,039	16,207	17,998	19,830
	Railway	3,437	3,488.7	3,875.82	4,093	4,213
GDP		4,944.25	6,423.18	8,496.2	9,740.25	11,672

Source: National Statistic Yearbook 2011.

Annual growth rate of passenger volume and GDP in Inner Mongolia are as follows:

Table 4.17 Annual Growth Rate of Freight Volume and GDP of Inner Mongolia 2000 to 2010

Year		2000	2001	2002	2003	2004
Freight	Road	7.99%	4.89%	6.56%	-7.09%	22.46%
	Railway	14.18%	-12.49%	-4.47%	-9.64%	26.77%
GDP		9.70%	10.60%	13.20%	17.60%	20.90%
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	11.23%	10.13%	-53.75%	11.05%	10.18%
	Railway	5.47%	1.50%	11.10%	5.60%	2.93%
GDP		19.10%	19.20%	17.80%	16.90%	15.00%

Source: Consultant.

We can get that in 2015, road freight volume in Inner Mongolia will be 220 million tons, and in 2020, it will reach 227 million tons; in 2015, railway freight volume will reach 48 million tons, and in 2020, it will reach 49 million tons.

B. Liaoning Province

Regression equation:

Passenger traffic by road: y = 3.0186x + 6689.4

Passenger traffic by railway: y = 0.6894x + 645.1

Figure 4.8 illustrates passenger traffic growth with GDP indices in Liaoning Province in 2000-2010. There was a rapid increase in road passenger traffic in Liaoning Province from 2000-2007 despite a slight drop in 2003. Passenger volume increased from 404 million in 2000 to 877 million, more than 100% growth. The road passenger traffic will arrive at 943 million persons in 2015 and 1,021 million persons in 2020.

As for railway, passenger traffic in 2004-2009 also indicates a steady but relatively slow increasing trend. R^2 of the regression equation is around 0.90. In 2015, the passenger traffic carried by railway will be 200 million persons, much smaller than road traffic. In 2020, the conservative forecast shows that traffic will arrive at 263 million persons.

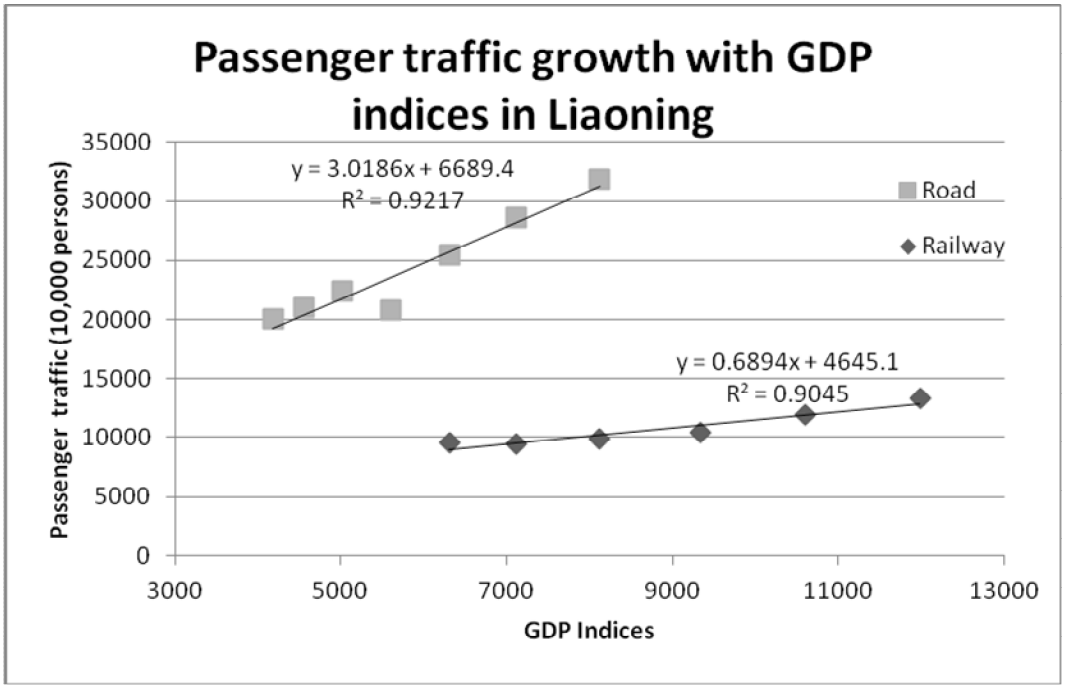

Figure 4.8 Passenger traffic growth with GDP indices in Liaoning, 2000-2009
Source: Consultant

* The GDP indices in this table are calculated at comparable prices. The base year (1952) GDP index is 100. Forecast of road passenger traffic in Liaoning is based on data in 2000-2007; Forecast of railway passenger traffic is based on data in 2004-2009.

Elastic Coefficient Method:

Passenger volume and GDP of Liaoning from 2000 to 2010 are as shown below:

Table 4.18 Passenger Volume and GDP of Liaoning from 2000 to 2010

(Units: 10,000 tons, RMB 100 million)

Year		2000	2001	2002	2003	2004
Freight	Road	40,385	41,207	43,554	41,076	47,370
	Railway	10,174	10,038	9,701	8,706	9,591
GDP		4,669	5,033	5,458	6,003	6,873
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	53,317	59,562	77,510	81,585	87,699
	Railway	9,883	10,417	11,958	13,377	13,336
GDP		9,305	11,164	13,669	15,212	18,457

Source: National Statistic Yearbook 2011.

Annual growth rate of passenger volume and GDP in Liaoning are as follows:

Table 4.19 Annual Growth Rate of Freight Volume and GDP of Liaoning from 2000 to 2010

Year		2000	2001	2002	2003	2004
Freight	Road	5.2%	2.0%	5.7%	-5.7%	15.3%
	Railway	-1.7%	-1.3%	-3.4%	-10.3%	10.2%
GDP		8.9%	9.0%	10.2%	11.5%	12.8%
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	6.8%	11.7%	30.1%	5.3%	7.5%
	Railway	4.0%	5.4%	14.8%	11.9%	-0.3%
GDP		14.2%	15.0%	13.4%	13.1%	14.2%

Source: Consultant.

We can get that in 2015, road freight volume in Liaoning will be 1248 million tons, and in 2020, it will reach 1381 million tons; in 2015, railway freight volume will reach 150 million tons, and in 2020, it will reach 154 million tons.

C. Jilin Province

Regression equation:

Passenger traffic by road: y = 5.8961x - 3608.9

Passenger traffic by railway: y = 0.2471x + 3356.9

Figure 4.9 shows passenger traffic growth with GDP indices in Jilin Province in 2000-2009. The road passenger traffic in Jilin Province has risen steadily in 2000-2007, and has a sharp increase in 2008. The rapid increase causes a lower R^2 of 0.83. In the future, Jilin will keep a quick upward trend with 1,000 million persons in 2015 and 1,418 million persons in 2020.

Compared to road carrying capacity of passengers, railway only carries a small part of the passengers. According to Figure 4.9, railway passenger traffic remains stable in the last six years. In the long run, the passenger traffic still remains stable. The passenger traffic will be 77 million persons in 2015 and 95 million persons in 2020.

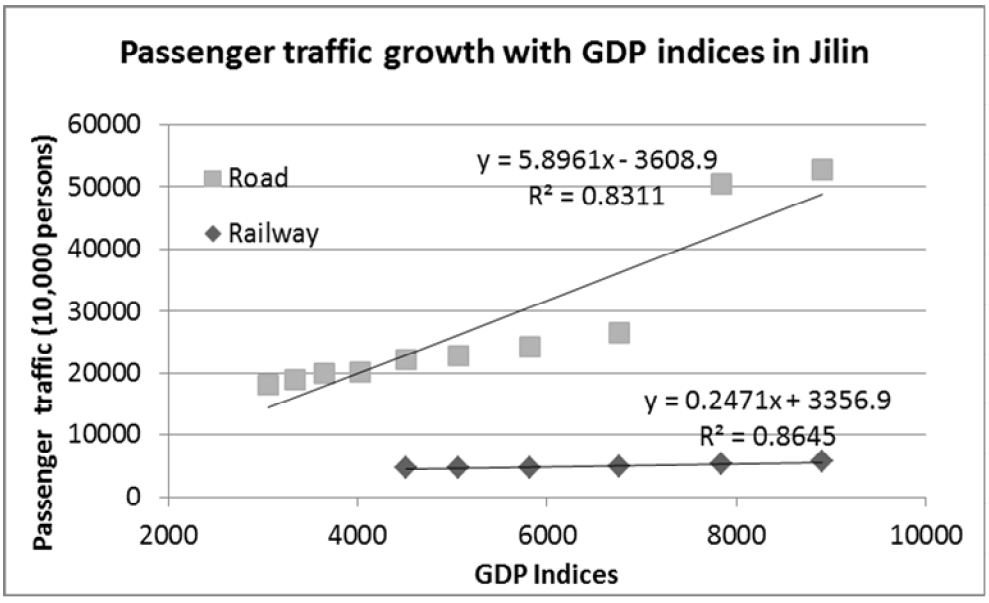

Figure 4.9 Passenger traffic growth with GDP indices in Jilin, 2000-2009
Source: consultant

* The GDP indices in this table are calculated at comparable prices. The base year (1952) GDP index is 100. Forecast of railway passenger traffic in Jilin is based on data in 2004-2009.

Elastic Coefficient Method:

Passenger volume and GDP of Jilin from 2000 to 2010 are as shown below:

Table 4.20 Passenger Volume and GDP of Jilin from 2000 to 2010

(Units: 10,000 tons, RMB 100 million)

Year		2000	2001	2002	2003	2004
Freight	Road	18,170	19,001	19,904	20,112	22,293
	Railway	5,785	5,346	4,962	4,232	4,687
GDP		1,845.6	2,032	2,246	2,522.6	2,958
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	24,198	26,506	50,511	52,723	58,577
	Railway	4,590	4,855	5,320	5,687	5,770
GDP		4,275	5,285	6,426.1	7,278.8	8,668

Source: National Statistic Yearbook 2011.

Annual growth rate of passenger volume and GDP in Jilin are as follows:

Table 4.21 Annual Growth Rate of Freight Volume and GDP of Jilin from 2000 to 2010

Year		2000	2001	2002	2003	2004
Freight	Road	4.7%	4.6%	4.8%	1.0%	10.8%
	Railway	-1.9%	-7.6%	-7.2%	-14.7%	10.8%
GDP		9.2%	9.3%	10.2%	10.2%	11.7%
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	5.8%	9.5%	90.6%	4.4%	11.1%
	Railway	-0.6%	5.8%	9.6%	6.9%	1.5%
GDP		15.0%	16.1%	16.0%	13.6%	13.8%

Source: Consultant.

We can get that in 2015, road freight volume in Jilin will be 1087 million tons, and in 2020, it will reach 1227 million tons; in 2015, railway freight volume will reach 57.9 million tons, and in 2020, it will reach 58 million tons.

D. Heilongjiang

Passenger volume and GDP of Heilongjiang from 2000 to 2010 are as shown below:

Table 4.22 Passenger Volume and GDP of Liaoning from 2000 to 2010

(Units: 10,000 tons, RMB 100 million)

Year		2000	2001	2002	2003	2004
Freight	Road	39,864	40,900	41,490	39,347	42,170
	Railway	9,819	9,692	9,188	8,207	8,724
GDP		3,151.4	3,390.1	3,637.2	4,057.4	4,750.6
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	51,023	54,592	31,379	32,947	36,001
	Railway	8,801	9,495.1	9,872.1	9,999.8	10,468
GDP		6,211.8	7,104	8,314.4	8,587	10,368.6

Source: National Statistic Yearbook 2011.

Annual growth rate of passenger volume and GDP in Heilongjiang are as follows:

Table 4.23 Annual Growth Rate of Freight Volume and GDP of Heilongjiang 2000 to 2010

Year		2000	2001	2002	2003	2004
Freight	Road	3.38%	2.60%	1.44%	-5.17%	7.17%
	Railway	-0.02%	-1.29%	-5.20%	-10.68%	6.30%
GDP		8.20%	9.30%	10.20%	10.20%	11.70%
Year		**2006**	**2007**	**2008**	**2009**	**2010**
Freight	Road	9.00%	6.99%	-42.52%	5.00%	9.27%
	Railway	6.67%	7.89%	3.97%	1.29%	4.68%
GDP		12.10%	12.00%	11.80%	11.40%	12.70%

Source: Consultant.

We can get that in 2015, road freight volume in Liaoning will be 375 million tons, and in 2020, it will reach 377 million tons; in 2015, railway freight volume will reach 10.8 million tons, and in 2020, it will reach 10.9 million tons.

Table 4.24 Future passenger traffic in major provinces in GTR

(Unit: 10,000 persons)

Year	Inner Mongolia		Liaoning Province		Jilin Province		Heilongjiang	
	Railway	Road	Railway	Road	Railway	Road	Railway	Road
2015	4,765	22,046	14,955	124,757	5,795	108,688	10,899	37,481
2020	4,932	22,704	15,440	138,131	5,800	122,725	10,974	37,736

Source: Consultant.

According to the prediction (Table 4.24), Liaoning will have the largest passenger traffic both through road and railway by the end of 2015 and 2020, and Liaoning province will have relatively smallest traffic. Liaoning will experience the most rapid annual growth rate of passenger traffic through railway which indicates the strong railway network in Liaoning. Inner Mongolia will also have a great improvement in road passenger traffic among major provinces in GTR in the following decade. However, all the four regions will have limited improvements in their railway passenger transportation in the future, indicating that the rail network has already been used to the largest potential.

Table 4.25 Annual growth rates of passenger traffic in major provinces in GTR 2000-2020

Year	Inner Mongolia		Liaoning Province		Jilin Province		Heilongjiang Province	
	Railway	Road	Railway	Road	Railway	Road	Railway	Road
2000-2005	2.9%	7.0%	-1.3%	4.5%	-4.1%	5.2%	-2.2%	1.9%
2006-2010	4.6%	0.2%	5.8%	11.1%	3.6%	20.7%	3.2%	-0.2%
2011-2015	2.5%	2.1%	2.3%	7.3%	0.1%	13.2%	0.8%	0.8%
2016-2020	1.6%	1.4%	1.5%	4.6%	0.1%	7.7%	0.5%	0.5%

Source: Consultant.

The annual growth rates of passenger traffic in major provinces in GTR showed in Table 4.25 provide the benchmark for future growth rate of passenger traffic in GTR corridors, which can be used for forecast once the data are available. At present, we can only offer the annual growth rates of passenger traffic in major provinces in GTR as references, within the limit of best available data. The same goes for passenger traffic through main BCPs.

5 Measures and Investment Programme proposed to improve transport movements along the corridors

5.1 Constraints for traffic flows along the trans-GTR corridors

Despite a lot of the efforts and work made by Chinese government and the four GTR provinces in infrastructure and supporting facilities, some problems still exist in such issues due to the differences in mechanism, standard, facilities and capacity, as well as the development phase. These mainly lie in:

5.1.1 Infrastructure

The issues have been described in Chapter 2. The variance in gauge between China and Russia generates an increase of 40%-50% in cost in transshipment, making the railway less competitive. In China, the operating mode of Hunchun-Makhalino Railway is “joint-venture”, while that of Tumen-Hunchun Railway is “local” one. The coordination between the two railways of different nature results in a big barrier in the railway development.

Just take Suifenhe Railway as an example. The yearly handling capacity from Russia’s station to Suifenhe Station is only 10 million tons, so is Suifenhe Station to the next domestic city. However, currently, the freight volume of receiving and distributing as well as transshipment of Suifenhe Station is more than 10 million tons; thus, the cargo is always backlogged in the Station. Harbin-Manzhouli and Harbin-Suifenhe railway lines are fully loaded, but the facilities are in low standard. Combined with low speed and long operation duration, it falls into a bottleneck to the foreign trade.

5.1.2 Transport facilitation

I. Excessive customs working procedures

The facilities for joint inspection are small and the old mode for the site check and inspection is still in use. The customs clearance is in low efficient for long time of inspection, low accuracy, excessive work load and complicated procedures.

In international corridor 2 (Suifenhe-Manzhouli) and corridor 1 (Arxan-Hunchun), the problems such as the complicated customs procedures and the low efficiency of the customs clearance etc. in Russian side still remain. For example, the investigation on the Russian port shows that the manual check in Russia side is still in use for incoming freight cars, the clearance time in Russia side takes about 8 times than that in Chinese side and the clearance time for the passengers in Russia side is generally about 5 times than that in Chinese side.

II. Short of staff allocation for port inspection and insufficient port opening time

With the increment of the freight volume at the port, the problem of inconvenient working time exists in many ports in the past years. Currently, round-the-clock opening of the port for the railway freight transport is realized, and the 12-hour opening of port daily for the highway passenger traffic is carried out at Suifenhe Port. However, there are still the problems of the insufficient staff allocation for port inspection and inconvenient working time in port. At present, the work system of eight hours per day and 6 working days weekly carries out for cargo inspection at Suifenhe Highway Port, this causes the consequence that almost 80 freight trucks can’t get the clearance in time and stay at the port every day. Especially, in the important festivals stipulated by Russian and during the period of the river being frozen, the issue of the truck delay is especially serious.

III. Long time for visa procedures of driver and conductor

The employed people (including driver and conductor, personnel for transport management etc.) for the international road transportation will frequently go back and forth between the border ports because of business. However, the visa procedures of these persons are same as the ordinary ones. They have to be subject to the unified inspection by the relevant department for the clearance formalities. Due to the complicated procedures and long duration, as well as the short validity time of the visa, it brings big influence on the work of people for the international road transportation.

IV. Different items and standards of charge and high cost

There are many problems such as many items and high standards of charge being collected at the cross border ports between China and Russia. Due to the difference of the items and standards of charge, the Chinese transport enterprises shall pay more clearance fees each time when crossing the ports of Russia side. For example, the charging items at the general port shall include: 2,300 Rubles/car escort fee by customs, 1,800 Rubles/car fees by municipal government, 700 Rubles/car service fees by port, 210

Rubles/car fees for document and translation fees by Automobile Transport Company (Ltd.) and 250 Rubles/car bill fees by customs. All these fees reach to an amount of 5,260 Rubles/car, about RMB 1,547. The charging standard is different too. These make a big burden for China's transport enterprises and make them less competitive.

V. Difference in road vehicle size and loading standard

The specifications of the outline size and loading standard of vehicles are different between China and Russia. For example, most Russian cargo trucks have sizes exceeding 16m and the max. limit is up to 20m; the limit of China's semi-trailer is 13m long and the hinge-truck 16.5m according to the specification of *Limits of dimensions, axle load and masses for road vehicles* (GB1589).

The difference in standard not only decreases the versatility of domestic and international transport resulting in poor efficiency, but also leads to repeated weighing and check resulting in poor transport efficiency and higher cost.

VI. Poor cargo transport route extension and less radiation area

According to the planning for sea-land intermodal transport in Northeastern Asia, a series of road transport corridors will be constructed for connecting the pivotal cities and harbors. The extension of transport route is the key for the support of the plan.

Currently, there are only a few lines extending to the inland of China and Russia. As of 2010, only two lines, i.e., Harbin-Suifenhe-Vladivostok and Harbin-Dongning-Vladivostok, extend into pivotal cities of the two countries. This constrains the expansion of transport market. Cargoes are transferred in the ports, increasing the transferring procedures and transport time, as well as cost. Thus, it dampens the technical and economical advantages in door-to-door transport services.

VII. Defective international transport insurance and compensation system

Different countries have quite varied compulsory transport liability insurance requirements. In case of traffic accidents, liabilities and compensation can hardly be agreed.

VIII. Underdeveloped logistics industry

Most logistics supplier enterprises are small-sized and their management concept and level is relative low. From view of businesses in Tumen transport corridor, transport enterprises and logistics firms of related countries generally have a small size and insufficient financial strength, poor logistics management technology and capability, insufficient use of information technology, thus, they are incapable of business in a large scale.

5.1.3 Cooperation mechanism

The infrastructure construction of transport and treaty ports at borders requires the agreement and approval of central governments of related countries. The effective bilateral or multilateral cooperation mode and cooperation mechanism is urgently to be established.

To be specific, the transport corridor from Hunchun to Busan via Rajin, in the form of leasing port, has poor transport facilities in DPRK; the transport corridor from Hunchun to Sokcho via Zarubino, in the form of cooperation, has poor supervision system at port in Russia; Rason International Logistics Joint Venture, in the form of cooperation, lacks proper financial strength. All these issues have to be addressed by governments and enterprises through the smooth coordination.

Table 5.1: Constraints along the trans-GTR corridors

Infrastructure	Constraint	Importance (How much it restricts the flow)	Timeframe (Reflects the Urgency)	Mitigation measures
Rail	Missing link between Arxan-Nomrog-Khuut	Severe	Urgent	Connection of the rail link.
	Difference in gauges and axle load requirements	Moderate	Urgent	Harmonization of technical specifications of rails with Russia and other countries.
Road	Some road sections to BCPs are in low technical grade.	Moderate	Quite Urgent	Construction of the road sections

Bridge	Bridges between neighbor countries are need	Severe	Urgent	Speed up the processes for construction of Heihe Bridge, etc.
BCP	The ports' transshipment capacity is insufficient.	Severe	Quite Urgent	Improve the storehouses and transshipment equipment in ports of Heihe, Tongjiang and Mishan, etc.
Transport regulation	Transit transportation agreement between Mongolia and PRC is not signed still	Moderate	Quite urgent	Continue the negotiations and sign the agreement
	Difference in road vehicle size and loading standard	Moderate	Quite urgent	Harmonize the standard and adjust specification of vehicle dimension.
	Different items and standards of charge and high cost	Severe	Quite Urgent	To cut off and harmonizing charges for border crossing.
Cooperation mechanism	The effective bilateral or multilateral cooperation mode and cooperation mechanism is urgently to be established.	Severe	Urgent	To have the agreement and approval of central governments of related countries. To set smoother coordination among governments and enterprises.

5.2 Suggestions

I. Signing of transport agreements

- Expedite the signing of the agreement of bilateral and multilateral transport agreement such as *Transit transportation agreement between Mongolia and PRC Government* and *Transport Facilitation Agreement of Shanghai Cooperation Organization* (SCO). At the same time, the GTI member countries would seek new multilateral transport agreement among all GTI members.
- Determine the conditions on the sea-land intermodal transport among four countries -China, Russia, Japan and ROK- in the Northeast Asia area. Discuss the key issues on the signing of sea-land intermodal transport Agreement among countries based on the available bilateral transport agreement between China and ROK, China and Japan, China and Russia.

II. Coordination of rules and standards

- Coordinate port charging items and standard.
- Coordinate international transport vehicle insurance system and compensation mechanism, as well as standards concerned.
- Discuss the vehicle size, load of the transport vehicles on international road transport routes acceptable to countries concerned. Discuss the issues on the treatment measures of oversize or overload transport in the international road transport routes based on the current status of vehicle technical standards between two countries concerned.

III. Strengthen border crossing port construction and enhance clearance efficiency

- Simplify customs formalities and upgrade inspection efficiency. Make positive discussion with Russia side and find the agreed solutions in terms of sampling frequency and inspection time, to solve the problems in low inspection speed, redundant formalities and varied standards.
- Prolong the working time at border crossing ports. The clearance of a work system of 6 days a week, 12-hour service per day and round-the-clock service at the ports can be carried where applicable. Currently, round-the-clock opening of the port for the railway freight transport is realized, and the 12-hour opening of port per day for the highway passenger traffic is carried out at Suifenhe Port. In the coming time, try to carry out a work system of 6-days a week and 12-hour service per day in summer for highway cargo transport in Suifenhe, Dongning, Mudanjiang and Manzhouli Port.

- Strengthen informatization construction and popularize electronic business service platforms at ports, implement the function of electronic declaration, electronic transfer of forms and electronic clearance; popularize paperless clearance and electronic business at more ports.
- Intensify the cooperation and coordination of customs with the relative departments for implementing the regulation of the inspection application in advance so that one-time inspection can be completed.

IV. Expand the opening of transport market and create an equivalent transport environment

- Complete the research on the demands of passenger and cargo, recover and improve existing sea-land intermodal transport routes, open and maintain new transport routes.
- Open and extend international transport routes. Focus on the negotiation of the opening time for Vostochny-Suifenhe (Dongning)-Harbin-Qiqihar, Harbin–Qiqihar–Fuyuan–Birobidzhan; summarize the experience in existing transport routes, and extend the routes further to other key cities of two sides.
- Discuss the bonded system and specific policies, simplify the customs inspection procedures for cross-border transport, and enormously cut the taxes for cross-border transport, to significantly increase the feasibility and cost efficiency of transporting from Northeast China to a third country via Russian ports.
- Explore cross-border tourism. Take opportunity to plan the cross-border tourism routes in Tumen River area in conjunction with the cooperation development activities in Changchun-Jilin-Tumen and other regions. Plan and advertise a cross-border tourism routes across China, DPRK, Russia, Japan and ROK through highway, railway and marine transport, to create an international tourism passage and to upgrade the development level of border tourism business.

V. Improve transport efficiency and decrease transport logistics cost

- Intensify the coordination with other departments to facilitate the entry and exit of the crew. For the entry and exit of drivers, crew, and escort personnel having registered in transport and customs authorities, a fast-track procedure shall be adopted to reduce the period for visa. Meanwhile, actively try to simplify the border control procedures and clearance formalities for drivers and crew to realize a rapid customs clearance.
- Establish logistics terminals and logistics centers at port. Promote the construction of logistics terminal centers at port to create a modern logistics center with multiple functions including bonded warehouse, collecting and distribution and information inquiry.
- Build up the public logistics information system and popularize the application of electronic information technology. Jointly develop the container intermodal transport management information system and establish international logistics information sharing platform between governmental bodies and enterprises.

5.3 Measures

I. Enhance the exchange and coordination

Enhance the exchange and coordination with the neighboring governmental bodies and enterprises via multiple cooperation mechanism to advance the international cooperation development activities in Tumen River area to proceed in a systematic and permanent way.

From the perspective of balancing the domestic economic development and closing the regional cooperation in Tumen River area, take advantage of the multiple cooperation mechanisms of relevant countries, such as the summit conference mechanism, the regional cooperation & development mechanism of Tumen River area, the regional cooperation mechanism for revitalizing the Northeast China and Northeast Asia, the investment and trade expo mechanism of Northeast Asia, and etc., to establish the bilateral & multilateral dialogue and information exchange system among all the countries participating in the development of Tumen River area, to intensify the communication and contact among the countries concerned, and to promote the international cooperation development activities in Tumen River area to proceed in a systematic and permanent way. Regularly discuss and coordinate issues necessary to the Tumen River transport corridor, including transport, port, tariff, customs clearance, regulations and etc..

Based on the intergovernmental communication, strengthen the communication between government and enterprises and between different enterprises to establish an linkage mechanism between government and enterprises. Promote the regional economic development by guidance from the government and fund from the enterprises.

Based on enterprises and facilitated by government in fund and technology, adopt the operation mode of joint venture. Jointly negotiate the equity proportion, sign the contract, establish and operate the joint venture, and share the risks by both investing parties. Integrated in the planning and implementing of the infrastructure construction, including ports, railways, highways, sea transport routes, etc., and of the comprehensive operation and development.

II. Simultaneously perform the corridor construction and logistics construction, especially the logistics construction

Make full use of the resource advantages of neighboring countries and the policy advantages of our country, actively organize the logistics, and improve the cargo handling capacity of ports in Tumen River area to advance its international cooperation development.

Firstly, attract export and import commodities from more enterprises to the export channel and attract more logistics industry by optimizing all the preferential policies. Secondly, accelerate the construction of development zones and industrial parks and some big investment projects to flourish logistics.

III. Explore more channel to raise fund for project construction

As fund being a big problem for the construction of international transport passage in Tumen River area, schemes for fund raising shall be established based on the economic development fact of the neighboring countries.

Russian Far East located in underdeveloped economy area, therefore, for the Russian side, fund source shall be extending to the central area of Russia to attract Russian corporations with good economical strength to participate in the implementation of projects.

Economy of DPRK is underdeveloped, but the preferential policies granted by the DPRK government can be utilized to achieve the special China-aided fund. Actively attract the surplus fund from developed countries such as ROK and Japan to be involved in the development process. Meanwhile, compete for the policy and financial support from the United Nations Development Programme (UNDP).

Mongolia, in its fledging period of industrialization, is lack of economical resources such as fund, labor and technology, but is abundant in natural resources; therefore, both the foreign investment attracted by mineral exploration and the fund from international financial organizations can be an important financial source for the infrastructure construction fund.

In China, discuss the way to attract international capital and folk capital to participating in the development in addition to the corresponding input by governments at all levels. Step up the promotion, improve the investment environment to attract foreign fund; perfect the governmental guarantee policies to decrease the risks for enterprises to participate in the development of Tumen River area; find the way to make full of scattered folk capital in Yanbian region to shift it to investment from consumption, and further to convert them to key project investment from service industry investment of scattered form and small amount.

5.4 Typical Projects

I. Jilin-Hunchun Passenger-dedicated Railway Line

With a total length of 359km, Jilin-Hunchun Passenger-dedicated Railway Line starts from Jilin city and terminates in Hunchun city of Jilin province. With a designed speed of 250km/h, this railway runs through 7 counties and cities i.e. Jilin, Jiaohe, Dunhua, Antu, Yanji, Tumen and Hunchun. Along the whole line, there are 106 bridges with a total length of 87km and 86 tunnels with a total length of 149km. An investment of about RMB 41.6 billion was invested in this project which was commenced on November 1, 2010. With a total construction period of 18 months, the whole line is expected to be put into the operation in October 2014. After its completion, it will be connected with high-speed railways such as Harbin-Dalian Passenger-dedicated Line and Harbin-Qiqihar Passenger-dedicated Line through Changchun-Jilin Intercity Railway. This project will relieve transportation pressure of eastern region of Jilin province, strengthen traffic link between interior of Jilin and Tumen River area, accelerate construction of Changchun-Jilin-Tumen Development and Opening up Pilot Area and enhance regional communication of Northeast Asia.

II. China-Russia Tongjiang Railway Bridge Project

China-Russia Tongjiang Railway Bridge is located between Tongjiang city of Heilongjiang province and Nizhneleninskoye of Russia. The bridge starts from North Tongjiang Station of local railway of Tongjiang of China in the south, runs into Russia across Heilongjiang River through Hayu Island in the north and is connected with sub-branch of Birobidzhan- Nizhneleninskoye Railway in Nizhneleninskoye, being able to connect with Far East Railway. The line has a total length of 31.615km and the total length of the bridge is 6.864km. North Tongjiang Transshipment Station and Chinese frontier inspection station are established. The designed cargo handling capacity of the bridge will reach 20 million to 25 million tons per year, with an

estimated investment of RMB 2.026 billion from China. On April 28, 2012, China and Russia singed a revised agreement on the construction of the bridge.

III. Hunchun Pohang Modern International Logistics Park Project

Hunchun Pohang Modern International Logistics Park Project is invested by Pohang Group of ROK and the planned investment is RMB 1.2 billion. This project covers an area of 1.5km^2 and will be developed and constructed by 3 stages. Development and construction of the project at the first stage (covering an area of 0.315km^2) will be completed in 2013. This logistics park will become a logistics center, a transportation organization and management center with transportation junction terminal facility, as well as a logistics information center serving Northeast Asia. In this way, it will drive rapid development of commercial and trade logistics business of Northeast Asia and promote development of Hunchun International Cooperation Demonstration Area. On September 10, 2012, construction commencement ceremony of Hunchun Pohang Modern International Logistics Park was performed in Hunchun.

IV. Northeast Asian (Hunchun) International Trade Logistics Center Project

Covering an area of 361,600m^2, Northeast Asian (Hunchun) International Broader Trade Logistics Collection & Distribution Center is invested and constructed by Jilin Lvdu Zhiye Co., Ltd. with a total investment of RMB 3 billion. This project will be constructed by three stages and totally RMB 135 million will be invested for the first stage at which broader trade market and office building will be mainly constructed. This project was commenced in May 2012 and currently, the construction was in progress. It is expected to be put into trial operation in March 2013. After its completion, the logistics center will become an large size broader trade logistics collection & distribution center for broader zone of China, DPRK and Russian, promoting resource development and formation of logistics of Hunchun and Northeast Asia area further.

V. China-Russia Hunchun-Kamyshovaya (Railway Ten-million-ton International Interchange-loading Station Project.

China-Russia Hunchun-Kamyshovaya Railway is an important traffic & transportation channel between Hunchun and Zarubino of Russia. The Ten-Million-Ton International Interchange-loading Station will be constructed by Northeast Asia Railway Group through reconstructing Hunchun Interchange-loading Station. With a total investment of about RMB 270 million, this project will improve cargo transportation capacity of Hunchun-Kamyshovaya Railway further, meet the demand for transportation of China-Russia international bulk cargo and effectively promote cooperation in economy and trade between China and Russia. On August 3, 2011, ground-breaking ceremony of the Ten-million-ton International Interchange-loading Station was performed in Hunchun.

VI. Dachen Hunchun International Aquatic Product Trading Market & International Cold Chain Logistics Center Project

Dachen Hunchun International Aquatic Product Trading Market & International Cold Chain Logistics Center Project is invested by Yantai Dachen Hunchun Aquatic Product Co., Ltd. With a planned total investment of RMB 110 million, the project covers an area of 2.78 hectares, for which million-ton refrigeration house, aquatic product processing & trading market as well as cold chain logistics will be mainly established. After the aquatic product trading market is completed, it will radiate countries such as Russia, DPRK, ROK, Mongolia and Japan. After the International Cold Chain Logistics Center is completed, refrigeration capability of the refrigeration house will reach 10,000 tons. Currently, the project is in progress and it is expected to be completed and put into use by 2012.

VII. China-DPRK Yalu River Broader Highway Bridge Project

China-DPRK Yalu River Broader Highway Bridge has a total length of 12.71km, 11.07km of which is in China and 1.64km of which is in DPRK. The bridge has a length of 3030.4m, including 1,408m in China and 1,622m in DPRK. After its completion, the bridge will have a long-term traffic capacity of 50,000 person-times per day in terms of passengers and 20,000 trucks per day. This bridge will promote contact and economic & trade communication between Chinese and DPRK's, being helpful to construct a big channel from Northeast Asia area to Europe. Om February 25, 2010, an agreement for construction of the bridge was concluded formally. Then the main bridge project was commenced formally on September 2, 2011 with a construction period of 3 years.

VIII. Dongning-Hunchun Railway Project

With a total length of 220km, Dongning-Hunchun Railway has a planned construction period of 4 years and a total investment of RMB 7.7 billion. This project will connect important port cities along the border such as Tumen and Hunchun of Jilin province and Dongning and Suifenhe of Heilongjiang province thus to connect multiple ports along China-DPRK boarder and China-Russia broader within this area, becoming a key channel which will drive and promote regional economic growth of ports along the borders. Currently, preliminary work of the project is on its way.

IX. Won Jing Ri Port-Rajin Port Highway Reconstruction Project of DPRK

With a total length of 53.5km, Won Jing Ri Port-Rajin Port Highway Reconstruction Project of DPRK is connected with Quanhe River Port of China in the north and Rajin Port of DPRK in the south. The total planned investment is RMB 226 million which will be mainly used for reconstruction of subgrade, bridges & culverts, protection works, road surface etc. Its designed speed is 40km/h. This project is an important project for joint development of Rason Area by China and DPRK based on cooperation. After its completion, driving from Quanhe River port of Hunchun to Rajin Port of DPRK will take only 40 minutes instead of 90 minutes before its completion. As of April 2012, an investment of RMB 165 million had been invested and basic vehicle traffic of the highway was realized.

6 Recommendations for National Action Plans and GTI Strategy

6.1 National Action Plans

Table 6.1: Framework for National Action Plan

	Measures, Programs or Projects	Estimated Cost	Implementing Agency	Time Frame	Rationale
Tumen Corridor	Jilin-Tumen-Hunchun Passenger-dedicated Railway Line	RMB 41.6 billion	Ministry of Railways	2010-2014	After its completion, it will be connected with high-speed railways such as Harbin-Dalian Passenger-dedicated Line and Harbin-Qiqihar Passenger-dedicated Line through Changchun-Jilin Intercity Railway. This project will relieve transportation pressure of eastern region of Jilin province, strengthen traffic link between interior of Jilin and Tumen River area, accelerate construction of Changchun-Jilin-Tumen Development and Opening up Pilot Area and enhance regional communication of Northeast Asia.
	Hunchun Pohang Modern International Logistics Park Project	RMB 1.2 billion	Jilin provincial government, Yanji local government	2012-2013 2013-	This logistics park will become a logistics center, a transportation organization and management center with transportation junction terminal facility, as well as a logistics information center serving Northeast Asia. In this way, it will drive rapid development of commercial and trade logistics business of Northeast Asia and promote development of Hunchun International Cooperation Demonstration Area.
	Northeast Asian (Hunchun) International Broader Trade Logistics Collection & Distribution Center Project	RMB 3 billion		2012-2013 2013-	After its completion, the logistics center will become a large size broader trade logistics collection and distribution center for broader zone of China, DPRK and Russian, promoting resource development and formation of logistics of Hunchun and Northeast Asia area further.
	China-Russia Hunchun-Kamyshovaya (Railway Ten-million-ton International Interchange-loading Station Project.	RMB 270 million		2011-	China-Russia Hunchun-Kamyshovaya Railway is an important traffic and transportation channel between Hunchun and Zarubino of Russia. This project will improve cargo transportation capacity of Hunchun-Kamyshovaya Railway further, meet the demand for transportation of China-Russia international bulk cargo and effectively promote cooperation in economy and trade between China and Russia.
Suifenhe Transport Corridor	Qiqihar-Harbin-Mudanjiang Passenger-dedicated Railway Line				

	Fully improve the technical level and pavement condition of port roads, and basically realize high-grading of highways leading to the important BCPs.				Accelerate the construction of border port highways and establish the international corridor.
Dalian Transport Corridor	push forward the construction of Dalian Seaport, focus on Dayao Bay Bonded Seaport District, Shenyang Bonded Logistics Center				
Korean Peninsula West Corridor	China-DPRK Yalu River Broader Highway Bridge Project	RMB 1.8 billion	Ministry of Transport. Department of Transport, Jilin Province.	2011-2014	After its completion, the bridge will have a long-term traffic capacity of 50,000 person-times per day in terms of passengers and 20,000 trucks per day. This bridge will promote contact and economic and trade communication between Chinese and DPRK's, being helpful to construct a big channel from Northeast Asia area to Europe.

I. "Several opinions on the further implementation of the strategy for revitalizing old industrial bases in northeast China"

Several opinions on the further implementation of the strategy for revitalizing old industrial bases in northeast China issued by the State Council has explicitly brought up in 2009：

Reconstruction of railway system in NEC provinces

Start the construction of Beijing-Shenyang passenger dedicated railway, Shenyang-Dandong passenger dedicated railway, Harbin-Qiqihar passenger dedicated railway and Jilin-Tumen railway, Dalian-Dandong railway, Harbin-Mudanjiang railway, Harbin-Jiamusi railway etc.; promote the reconstruction of the existing railways (for example, MuSui railway etc.) and the construction of railways along the border in northeast China, Arxan-Arihashate railway, Baiyinhua-Chifeng-Jinzhou port coal transporting rail line, Tongjiang railway border bridge, coastal port railway etc.

Speed up the infrastructure construction and improve coordination of different departments of transport

Based on the existing conditions of NEA China, enhance the construction of freeway and continually realize the "Road to Every Village" rural road projects shall be increased for Heilongjiang, Jilin province and east Inner Mongolia Autonomous Region. The coordination and promotion team of transportation infrastructure construction for northeast China shall be established, to coordinate, guide and promote the construction of the transportation installations for northeast China, and to organize the preparation of integrated transportation planning of northeast China.

Open further to the outside world

Accelerate the development and opening-up of Liaoning Coastal Economic Belt and Changchun-Jilin-Tumen Area. Integrate the coastal area and bordering area opening-up with foreign resource development and regional economic cooperation, and also support the development of border trade center, economic cooperation zone and import & export & processing zone in areas meeting the requirements. Sino-Russia regional cooperation development funds shall be studied and established, to support the implementation of projects in Sino-Russia regional cooperation planning outline. Foreign ports shall be used to carry out the cross-border transport cooperation of domestic trade goods and boost the normalized operation of river-sea and land-sea transport channel in Heilongjiang province and Jilin province. Actively search the innovation of management system in areas under customs' exceptional supervision, push forward the construction of Dalian Northeast Asia international shipping center which centering on Dayao Bay Bonded Seaport District, and speed up the construction of Suifenhe Comprehensive Bonded Zone and Shenyang Bonded Logistics Center, to promote the development of bonded logistics and bonded processing industry in Northeast China.

II. "Planning Outline for Tumen River Regional Cooperation and Development in China—Regarding Changchun-Jilin-Tumen as Leading Zone of Developing and Opening-up"

In 2009, official reply of the State Council concerning *Planning Outline for Tumen River Regional Cooperation and Development in China—Regarding Changchun-Jilin-Tumen as the Leading Zone of Developing and Opening-up*, whose planning period lasts from 2009 to 2020, indicates that Changchun-Jilin-Tumen Forerunner Area of Developing and Opening-up shall be brought into national strategy. The Outline brings up the following:

Strengthen the Infrastructure Construction.

Perfect the integrated transportation system within this zone, by forming a smoothly-jointed and efficient-as-a-whole transportation network, taking the outward access and the interprovincial access as the key point. Speed up the construction of Harbin-Dalian Passenger Dedicated Railway, ChangJi Passenger Dedicated Railway and Jilin-Tumen Railway, etc., promote the expansion and reconstruction of the artery and the interprovincial branch line all-through project that connects Liaoning province and Heilongjiang province. The construction shall focus on freeways and loop lines for the central city, to form a regional freeway network and to accelerate the construction of the national and provincial arterial freeway and tourism highway. Appropriately start the verification of the second phase of Changchun Longjia International airport and the removal & reconstruction of Yanji Airport, also, plan and research the issue on flight resumption and transformation of Jilin Airport.

Promote Changchun-Jilin-Tumen's participation in the international and regional cooperation of GTR region, and accelerate the construction of International Corridor.

The key point is to implement the integrated transportation infrastructure cooperation project, to build international transport corridors that link up the economic zones of Northeast China, to raise the clearance capacity of Changchun Longjia International Airport and to construct International Airport Logistics Channel. The cross-border infrastructure cooperation project actively promotes the construction of international trade center at Hunchun port and further perfects the land-sea combined transport on the Hunchun-Zhalunuo-Shuxin-Xinxie route. The infrastructure construction at the important bordering ports shall be accelerated, the customs clearance capacity and cargo handling capacity shall be further enhanced, and the utilization efficiency and economic benefit shall be raised; based on two customs supervision warehouses of Air China and China Southern Airlines in Changchun Longjia International Airport, the construction of International Airport Logistics Channel perfects the function of bonded warehouse and customs hall in Longjia International Airport, extends the function of International Airport Logistics Channel, and increases the air harbor throughput capacity of goods. Upgrade the public information system, and build as the transfer point and delivery center of imports & exports combined transport, and the aviation logistics center in Northeast Asia, by concentrating on aviation goods to play the role of radiation. The function of International logistics for Yanji Air Harbor shall be strengthened.

Positively push forward the construction of cross-border economic cooperation zone.

Adequately play the role of Hunchun border economic cooperation zone in the Tumen River regional development and opening-up, to form a multifunctional economic zone as soon as possible combine with investment trade, export and processing, international logistics, etc. Actively create advantages, and build the cross-border economic cooperation zone step by step. Discuss about building a more open economic cooperation zone in Hunchun city to improve the level of opening-up and cooperation in the border, based on the primary establishment of the cross-border cooperation zone and the International Channel in GTR.

Positively participate in international cooperation mechanism in GTR.

Based on the existing initiative cooperation mechanism in GTR, regularly hold professional seminars such as Economic cooperation forum of Northeast Asia to build the platform for information exchange, which is of mutual trust and interaction, and personnel contact. Local government's right shall be properly extended in participation in the Tumen River Regional cooperation development.

Strive to upgrade the level of modern service and develop modern logistics industry.

Rely on the regional integrated transportation networks to help certain logistics enterprise get larger and stronger, and form a bidirectional modern logistics network, which takes Changchun and Hunchun as the two nodes, Jilin, Dunhua and Yanji as the important logistics points, and connects Inner Mongolia in the west, Suifenhe and Manzhouli in the north, and Dalian and Dandong port in the south. Actively introduce and develop large logistics enterprises, stimulate the Third-Part Logistics and mainly build specialized logistics park in Yanji regarding car, petrifaction, agriculture product, building material, metallurgy, as well as international logistics base specially for Northeast Asia in Yanji, Longjing, Tumen and Hunchun.

III. "Several Opinions on Supporting the Construction of International Cooperation Demonstration Area in Tumen River Region (Hunchun) of China"

The International Cooperation Demonstration Area in GTR (Hunchun) of China approved by the State Council, was established in Hunchun, Jilin Province on April 13rd 2012, and "*Several Opinions on Supporting the Construction of International Cooperation Demonstration Area in GTR (Hunchun) of China*" was issued.

The "Opinions" have explicitly brought up that an important platform for cooperation, development and opening-up with the Northeast Asia shall be built, and, economic and technical cooperation with Northeast Asia countries (for example, DPRK, Russia, Japan, the Republic of Korea, Mongolia, etc.) and Hong Kong, Macao and Taiwan shall be vigorously developed, relying on the base of Changchun-Jilin-Tumen industry and aiming to promote the development and opening-up of Hunchun. Adjust the industrial structure and optimize industrial layout, in order to promote Hunchun International Cooperation Demonstration Area to be an effective cooperation carrier for complementary of advantages within Northeast Asia under new international and domestic environment, push forward the leading development of Changchun-Jilin-Tumen Forerunner Area, and create conditions for more open economy and trade cooperation; Rapid and convenient transnational transport corridors and integrated transportation hub shall be constructed within Northeast Asia, dependent on the support from China's important land ports to DPRK, Russia, Mongolia and ports jointly constructed with DPRK and Russia, the link that connects China with ROK, Russia and Mongolia, and the network that connects national land-sea combined transport corridors along the Japan Sea; the Northeast China shall be constructed as a commodity trade and logistics center for Northeast Asia, to accelerate the transformation of the economy developing way as the main line, by making the best of both international and domestic markets and the two resources, further optimizing the cooperation among regional industries, stimulating the efficient flowing and organization of production factors, cultivating and developing regional export processing and advanced manufacturing industry in border region, making industries larger and stronger, such as resource exploitation beyond the border, productive service, international logistics purchase and transnational tourism.

Regarding the infrastructure construction and for the construction need of Hunchun International Cooperation Demonstration Area, the function of Hunchun International Cooperation Demonstration Area shall be comprehensively promoted, by the means of speeding up the construction of Jilin-Tumen-Hunchun Railway and high-class highway from Hunchun city to the bordering ports, etc., as well as the early stage work of Hunchun-Dongning Railway, extending and reconstructing the infrastructure at Quanhe Port, Hunchun Port and Hunchun Railway port transshipment station, etc., and further improving facilities for such as road, water supply, heat supply, power supply, communication, waste water treatment and waste treatment; international window with unblocked traffic, comprehensive function and inward & outward radiation shall be built, through the ways of reconstructing the highway from Quanhe Port to Luojin Port, supporting the reconstruction and extension of Luojin Port and Zarubino Port, newly constructing the Quanhe-Yuanting port cross-border bridge, and smoothing the external passages to Hunchun International Cooperation Demonstration Area.

In terms of aid policy, increase support for finance and taxation policy. The construction of Hunchun International Cooperation Demonstration Area has obtained national support on the area-construction-related construction of the major infrastructure beyond the border, adding Hunchun Railway port as a coal import port, the construction of local electronic port from 2012 to 2015; promotion of the trial of local trade goods cross-border transportation in Jilin Province, the availability study of developing business in Russian Zarubino Port via Hunchun, and important issues (such as research on major problems, special planning and system of organization) within Tumen River area through the aid of the special fund for Asian regional cooperation from the central finance.

In addition, strengthen the leadership. Innovate and improve the provincial coordination mechanism, establish and perfect significant projects and expert consultation committee for major policy. The China-DPRK and Sino-Russia bilateral cooperation mechanism and the multilateral cooperation mechanism shall be improved to promote and raise the level of cooperation mechanism of related national and local government within Northeast Asia under the frame of Great Tumen Initiative.

It is aimed that a relatively comprehensive infrastructure system shall be completed, favorable system of organization, market, policy and legal environment shall be formed, transportation network shall be further improved, opening-up system shall obtain a remarkable success, logistics for commodity trade shall flourish, cross-border cooperation model shall be on its initial establishment, and the opening economic development pattern shall be basically formed by 2015; the important functional area of economy with reasonable layout and comprehensive function shall be established, the innovation of system of organization and mechanism shall gain new breakthrough, the platform for opening-up shall be perfected, the cooperation in cross border shall gain a great success, the regional integrated transportation hub shall be made the best use of, the logistics for commodity trade and the cross-border tourism shall get more and more flourishing, and then an opening economy development structure shall be formed in general by 2020.

6.2 GTI Transport Strategy

The 12th Five-Year Plan for Economical, Social and Traffic Development and For Highway and Waterway Transportation Development in relative provinces

In the 12th Five-Year Plan for Economical, Social and Transportation development and for Highway and Waterway transportation development of each province, there are corresponding development plans and major projects as to the traffic development, and those referring to the transportation planning and projects of Tumen areas are:

A. Heilongjiang Province

Highway: completely improve the transportation capacity of the comprehensive transportation passages, focus on the construction of international and border transportation passages, enhance the service level of export highways in industrial parks, scenic spots etc., concentrate on improving the rural highway network and the layout of transport station facilities, and strengthen the construction of provincial exit corridor trunk lines, to consolidate the transport links with neighboring provinces and Russia's Far East region, to achieve an initial formation of an efficient, convenient and safe highway infrastructure network. And strengthen and adjust highway traffic's ability in promoting economic development and adjusting the industrial layout and urban layout. In the whole province, the freeway mileage shall break through 4500 kilometers, secondary and above highway shall be more than 18000 kilometers, and rural highway shall over 140000 kilometers, Suifenhe-Mudanjiang freeway and a number of passenger and freight terminals shall also be constructed by 2015. Strive to achieve highway passenger quantity of 440 million passenger/time and passenger transportation volume of 30.4 billion person kilometers, with an average annual growth rate of 5.1% and 5.7% respectively; achieve highway freight transportation volume of 480 million tons and freight transportation mileage of 83.0 billion ton kilometers, with an average annual growth rate of 4.0% and 2.1% respectively.

Railway: construct passenger dedicated railways of Harbin-Dalian, Harbin-Qiqihar, Harbin-Mudanjiang, etc., and construct railway stations such as Harbin container center station. In the whole province, newly constructed railways shall reach 800 kilometers, and the total railway operating mileage shall be more than 7000 kilometers, including passenger dedicated railways of more than 700 kilometers and multiple tracks of 40%. Meanwhile, the electrification rate shall be improved significantly.

Waterway transportation: continue to improve the transit capability of Songhua River and further enhance the navigable guarantee rate for the channels of Heilongjiang/Amur River, Wusuli/Ussuri River and Nen River, with raising the compliance rate to 44% and maintenance rate to 100% for high-grade channels; speed up the construction of opening-up ports, raise the professional and mechanical level of ports, fundamentally smooth its connection with highway and railway, realize the freight handling capacity up to 19.5 million tones and passenger handling volume up to 4.5 million passenger/time, with an increase of 25% and 18%. Improve and perfect the waterway transportation support systems to realize that the facilities are in good condition and the functions are complete.

Port: accelerate the construction of border port highways and establish the international corridor. Fully improve the technical level and pavement condition of port roads, and basically realize high-grading of highways leading to the important national land ports. Plan to construct 7 port highways of a total length of 236 kilometers, including Hulin, Mohe.

B. Jilin province

Highway: construct efficient, safe and convenient highway transportation network. With a newly built freeway of 2,700 kilometers, the total freeway mileage shall be more than 4,500 kilometers to realize the access of freeway to all counties (cities). Continue to ascend the traffic capacity of trunk highways, and realize that the existing national and provincial highway of level 2 and above take up 90% and 70% respectively of the total mileage; the important highway sections between the county and rural area achieves the secondary and above highway standard. Continue to quicken the construction of rural highway and enable all the qualified administrative villages to be available with cement (asphalt) roads. Strengthen the construction of passages to external regions, and propel the construction of high-grade highways connecting the ports and of border port bridges. The highway along the border shall generally reach the standard of grade 3 and above.

Railway: construct the rapid intercity railway network. With a newly built railway of 2,305 kilometers, and a reconstructed and expanded railway of 1,875 kilometers, the total railway operating mileage reaches 6,330 kilometers, there into the rapid railways with speed over 200 km/hour reaches 1,850 kilometers in length; the proportion of railways being double-tracked and electrified shall be remarkably increased, reaching 51% and 48% respectively. Complete the rapid railway passages in east-central urban agglomeration, achieve the goal of "freeways being available to every city, and railway to every county", and greatly improve the railway transport capacity.

Port: Improve the customs clearance capacity of port. Strengthen the construction of land port; establish quick and convenient customs clearance mechanism, smooth the key transportation passages connecting our province with Russia, ROK, and Mongolia, and enhance the customs clearance capacity of the port comprehensively. Further develop the aviation port function and construct airport Logistics Park. Perfect the function of Changchun and Jilin land port so as to realize effective docking with the harbor district of Dalian, Yingkou, and Dandong， and to propel the construction of the land ports in central city.

Carry out the planning and implementing scheme of the Changchun-Jilin-Tumen pilot area, focus on the infrastructure construction of the intra-area transportation and the cross-border passages, consolidate and expand the international land-sea transportation routes; strengthen the cooperation with countries of the northeast Asia to make the most of the northeast Asia expo serving as an important platform for the economic and trade cooperation and cultural communication between our country and the Northeast Asia countries, constantly improve the summit conference mechanism between our province and the local government of Northeast Asia nations, and actively promote the establishment of cross-border economic cooperation demonstration areas. Comparatively perfect foreign-related management system shall be developed by 2015, including clearing the international transportation channel to the Japan Sea, making positive progress in the construction of cross-border economic cooperation districts with Russia and ROK and developing and forming a batch of high-level international industry cooperation parks; basically realize economic correlation among cities of Yanji, Longjin, and Tumen and the regional economic integration of Changchun and Jilin to significantly enhance the competitiveness and influence of Changchun, Jilin, and Tumen.

C. Liaoning Province

Highway: strengthen the construction of the freeway network centering on Shenyang and covering the whole province with a traveling radius of 3 hours, focus on constructing a number of freeways and extending the section of Beijing-Harbin Freeway in Liaoning Province. Enhance the construction of intercity rapid passage and industrial road. Improve the coastal freeway network in the coastal economic belt. Transform and build the general highway of 260,000 km. Further density and perfect the provincial freeway network to realize that each and every county shall obtain access to freeway; speed up to implement the construction of clearing the customs and of the freeway for external passages connecting neighboring provinces, to completely raise the traffic capacity and service level of freeway; realize networked freeways among central urban clusters and between coastal ports and hinterlands. Further improve the general highway network system, complete a number of interval rapid passages, achieve the secondary standard or above for trunk freeway and fundamentally bituminized for county-level highway; reinvent those bituminous pavement highways with extended service term to realize a virtuous circle development in highway maintenance. Strive to achieve a mileage of 5000 km for provincial freeway by 2015.

Railway: speed up the construction of passenger dedicated railways such as Shenyang-Beijing railway, express railways such as Dandong-Dalian railway, coal transporting passages such as Suizhong-Xilinhot railway, port railways such as Xianrendao. Carry out the expansion and reconstruction of Railways including Jinzhou-Chifeng line and electrified remodeling of all key trunk and branch railway network. Speed up the railway engineering construction such as Shenyang-Tieling intercity railway and Dalian North Railway Station. By 2015, the railway operating mileage shall reach 7000 km, including passenger dedicated railways of more than 1700 km. It will be the first railway network in the country to achieve that passenger dedicated railways covering all provincial cities, and that railways reaching all counties on land.

Port: continue to optimize the port layout, basically complete the port structural adjustment; the service capacity of public infrastructures such as shipping passages and anchorages shall satisfy the requirements of large-scale ships; gradually improve functions like bonded port, logistics and processing etc.; highly connecting water transportation with other modes of transportation, and fundamentally realize information management in port operations. The important port infrastructures of Dalian Northeast Asia International Shipping Center shall be completed; a series of preliminary projects of emerging small and medium-sized ports serving for Liaoning Coastal Economic Belt shall be constructed and put into operation. Focus on the construction of port combination and coastal port group of Dalian Northeast Asia International Shipping Center, to improve the port layout. Stress on the construction of specialized marine terminals such as crude oil, ore, coal, container etc., dredge and upgrade the shipping passage in the port area, and develop and construct 10 new ports. Strive to form 6 hundred-million-ton harbors with cargo dealing capacity up to one billion tons and above and container throughput volume up to 18 million TEU, to form a modern port clusters with reasonable layout, optimized structure and strong comprehensive competition ability by 2015.

The province's highway transportation network shall be more perfect, the port distribution shall be more reasonable, the efficiency and quality of transportation service shall be significantly boosted, the safety and emergency support capacity shall be significantly strengthened, and the work of energy saving and environmental protection shall be further strengthened, so as to form a convenient, safe and environmental comprehensive transportation system and to realize preliminary traffic modernization by 2015.

D. Inner Mongolia Autonomous Region

Highway: focus on the construction of passages to external regions, intra-regional passages, rural roads and the state border defense highways, take efforts to expand the highway network coverage, and increase the accessibility and level of highway. Establish exit routes for freeways between the autonomous region and neighboring provinces, ensure the smooth flow of the main passage, build high-grade highways between leagues, leagues to banners, and main transportation arteries to key industrial parks, and initially form the framework of trunk road network in the region. Newly construct highway of 13,000 km in mileage, make sure that investment in highway infrastructure shall reach 200 billion RMB, and strive to achieve 230 billion RMB, the total highway mileage in the region shall reach 170,000 km by 2015. There are 38 key highway construction projects, having a construction mileage of 5577 km and planned investment of 133 billion RMB.

Railway: speed up the construction of railway passages. Improve the regional rail network, focus on building rapid passenger dedicated railways, coal transporting lines, passages to external of the region and port passages, improve the capacity of railway transportation, and obtain 16,000 km for total mileage of railways in operation. Speed up the construction of a number of rapid passenger dedicated railways, and smooth the contact between the autonomous region and the important cities of the north, northwest and northeast China. Focus on the construction of the one-hour full rapid passenger dedicated railways circling Hohhot-Baotou-Erdos, and two-hour full rapid passenger dedicated railways circling Baotou-Linfen-Wuhai-Yinchuan-Erdos. Construct railway passages between the autonomous region and neighboring provinces to expand the connection network with neighboring provinces. Focus on constructing Xilinhot-Ulanhot railway and Xilinhot--Erenhot railway, and perfect the layout of road network in the region as soon as possible to form the second east-west railway passage in the autonomous region.

Waterway transportation: speed up the construction of waterway transportation between inland rivers and the boundary rivers, actively develop water transportation, and gradually improve the existing less advanced situation of waterway transportation infrastructure in our region. 5 projects of waterway transportation engineering under construction are planned to invest 460 million RMB, including 3 projects for inland rivers with a planning investment of 380 million RMB; and 2 for boundary rivers with an planning investment of 80 million RMB.

Port: speed up the construction of port highways, build port high-grade highways linking the neighboring areas of Russia and Mongolian, several key port roads, such as Ceke, Zhuengadabuqi, Ganqimao etc., shall be constructed in accordance with first level highway. There are 6 port roads construction projects, which involving planning investment of 4 billion RMB, with a construction mileage of 753 km, including first level highway of 287 km and first level single carriage highway of 466 km.

The trunk freeway network in the autonomous region shall be mostly completed by 2015. All important exit passages between the autonomous region and its neighboring provinces shall be equipped with freeways, the capital city Hohhot shall be connected by freeways or first-class highways with all other leagues, important resource transportation passages shall be freeways or first-class highways, banners and important ports shall be linked with first-class highways, breakthroughs shall be obtained in the construction of highways in rural and pastoral areas and of border defense highways, station facilities of road transportation shall be further improved, the construction of inland river trade terminals and the regulation of channel border rivers shall see a significant improvement.

6.3 Contents Regarding the Outline of City's 12th Five-Year Plan

Outline of the 12nd Five-Year Plan for National Economic and Social Development of Yanbian Korean Autonomous Prefecture

Construct convenient and efficient corridor, and speed up the formation of transportation network system. The accessibility for road network shall be improved by focusing on the construction and perfection of regional high-class road network and by increasing capital investment. Promote the transformation of national and provincial highway network, and also improve the overall service level of arterial highway within the region. Freeways connecting every two counties shall be realized, and main framework for freeway connecting adjacent districts and the eight counties (cities) within the Yanbian autonomous prefecture shall be constructed by 2015. Speed up the construction of international and national railway corridor with high standard and high capacity, to form a relatively comprehensive railway passage network. Accelerate the construction of large customs clearance, promote the construction process of highways to DPRK and Russia and railway construction, and further enhance the customs clearance capacity, and raise port utilization rate and economic benefits. Strive to upgrade the Shuangmufeng (Antu) border official passage to a national port, and open up the Fenshuiling port of Chunhua (Hunchun).

Highway projects

Focus on the Wangqing-Yanji freeway with a total investment of 3.36 billion RMB, covering a freeway with a mileage of 50.9 km and a first-class highway of 38.4 km; the Xiaogouling-Yanjiang section of Heda freeway

takes a total investment of 9 billion RMB and has a construction mileage of 140 km; the Yanji-Dapuchaihe freeway takes a total investment of 12.6 billion RMB and has a construction mileage of 168.2 km; the flood reconstruction of Antu-Dongqing highway costs a total investment of 0.6 billion RMB and has a construction mileage of 85 km; the highway from Kaishantun (Longjing) to Baijin Power Station costs a total investment of 3600 millionRMB and has a construction mileage of 104 km; the reconstruction of Hunchun-Changlingzi Port Highway consumes a total investment of 2000 million RMB and has a construction mileage of 13.2 km; the widening project of Yanjing-Longji section of Laosong highway costs a total investment of 4600 million RMB and has a construction mileage of 18 km; the Helong-Guangping highway via Qingshan costs a total investment of 2600 million RMB and has a third-class highway of 89 km; the upgrading project of Helong-Nanping highway takes a total investment of 2500 million RMB and has a first-class highway of 50 km long.

Railway projects

Focus on the Jilin-Hunchun railway project with a total investment of 28.6 billion RMB and a construction mileage of 247.5 km within Yanbian prefecture; the construction project of Baihe-Dongjingcheng railway via Dunhua with a total investment of 7.2 billion RMB and a construction mileage of 178 km within Yanbian prefecture; the project of the segment within Yanbian prefecture of Hunchun-Dongning railway with a total investment of 4.1billion RMB and a construction mileage of 135 km; actively strive for the Tumen-Hunchun-Changlingzi railway extension and reconstruction project, the Tumen-Mudanjiang River railway (via Wangqing) extension and reconstruction project, the Chaoyangchuan-Helong railway (via Longjing) reconstruction project , the Nanping-Maoshan iron-ore port railway project; actively promote the collaborated reconstruction project of Tumen (China)-Namyang (DPRK)-Tumangang (DPRK) - Khasan (Russia) railway, the reconstruction project of Tumen (China)-Chongjing (DPRK) railway, the construction and reconstruction project of Tumen(China)- Rajin (DPRK) railway, and the port project of Shuaiwanzi (Hunchun in China)-Xunrongli (DPRK) railway.

Port facilities projects

Focus on the project of Tumen railway port inspection building (reconstruction of Tumen Station) with a total investment of 5000 million RMB and a building area of 15,000 square meters; the port construction project of Helong- Nanping railway with a total investment of 2800 million RMB, has an annual cargo dealing capacity of 120 million tons; the port construction project of Chunhua Fenshuiling (Hunchun) with a total investment of 2000 million RMB, is to open up the Chunhua Fenshuiling; the port project of Shuangmufeng (Antu) with a total investment of 748 million RMB, is to construct port inspection building and ancillary facilities; the port project of Shuaiwanzi (Hunchun) railway with a total investment of 566 million RMB, is to construct port inspection building and ancillary facilities; the port project of Longjing Kaishantun railway with a total investment of 500 million RMB, is to construct port inspection building and ancillary facilities.