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特集：北東アジア輸送回廊の現状と展望

Special Feature: The Current Situation and Future Prospects for Northeast Asian Transportation Corridors

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Special Feature: The Current Situation and Future Prospects for Northeast Asian Transportation Corridors

GTI Greater Tumen Initiative

特集にあたって

特集：北東アジア輸送回廊の現状と展望

ERINA 調査研究部主任研究員　新井洋史

国境を超えた自由な人とモノの動きは、地域経済圏の形成と発展の基盤となる。こうした考え方から、ERINAでは設立以来一貫して、運輸に関わる諸問題を重点研究テーマの一つとしてきた。また、毎年開催している北東アジア経済発展国際会議においても、議論を積み重ねてきた。こうした努力の結果の一つが、北東アジア輸送回廊ビジョン（2002）である。このビジョンはさまざまな方面に影響を与えたが、その一つが大図們江イニシアチブ（GTI）[1]の枠内における運輸部門での協力である。

GTIは、その対象地域である大図們江地域（GTR）における輸送回廊の整備に資するため、2012年に「GTR横断輸送回廊に関する統合輸送インフラ及び国境通過円滑化調査」を実施した。本特集では、この調査の成果の主要部分を再編集して掲載することにより、GTRを通る輸送回廊の現状と展望を読者に提示することを目的としている。読者は、北東アジアの各国が、それぞれの国内において、また隣接する二国間協力を通じて、インフラの改善に積極的に取り組んできていることを理解できるものと思う。他方で、主に国境通過に関しては、いまだに障壁・障害も多く、改善の余地が大きい。

本特集の編集にあたっては、輸送回廊の中でも「綏芬河輸送回廊」及び「図們江輸送回廊」に重点をおいた。これらの回廊が、多くの関係者の参画による多国間協力プロジェクトの性格を持っているためである。ハード・ソフトのインフラ整備を必要とするという輸送回廊の本質も考慮すれば、これらの２つの回廊の整備は北東アジアにおける多国間地域協力のモデルケースとなるべきものだと考える。

残念ながら、紙面の都合もあり、本特集ではGTI調査の最終報告書のうちのかなりの部分を割愛した。上述の２つの回廊以外の回廊に関する記述、個別のインフラ施設に関する詳細なデータ及び政策提言に関わる部分等である。筆者（編者）自身がこの調査プロジェクトに参加して感じたことであるが、各国統一的な様式や精密度で地方レベルのデータや情報を収集することは、かなり困難な作業である。我々調査チームはその問題に直面したが、全員の努力により、完全とは言えないまでも相当量の情報の集積を行った。割愛された部分に関心がある読者は、GTIが公表している最終報告書を参照してもらいたい。

本特集は、図們江事務局で本調査のとりまとめを担当したバルバラ・クレチェトワ氏による概要説明に続いて、国別のレポートで構成される。それぞれの執筆者は、中国が中国交通運輸部規画研究院総合交通・発展戦略研究処副処長の高美真氏、モンゴルがモンゴル科学技術大学機械工学・数学部教授のD.ゴトフ氏、韓国が韓国鉄道技術研究院企画部のナ・ヘソン氏、ロシアが極東海運研究所運輸発展部長のミハイル・ホロシャ氏であり、日本は筆者（編者）が執筆した。

本特集の実現にあたっては、GTIの好意により、上述の調査の結果の主要部分を再録する許可をいただくことができた。また、掲載されている各論文については、各執筆者が快く再編集作業に応じてくださった。ここに記して、あらためて深く感謝を表すものである。

[1] 国連開発計画（UNDP）が支援する、中国、モンゴル、韓国及びロシアによる政府間協力機構。

GTI Greater Tumen Initiative

On the Special Feature

Special Feature: The Current Situation and Future Prospects for Northeast Asian Transportation Corridors

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The free movement of people and goods across borders is a foundation for the formation and development of an economic region. With this in view transport-related issues have been among the priority research themes of ERINA since its establishment. Also, the annual Northeast Asia International Conference for Economic Development (NICE) has accumulated discussion on these issues. The Vision for the Northeast Asia Transportation Corridors (2002) was the result of these efforts. This vision had an impact on various fields, one of which is cooperation in the transport sector in the framework of the Greater Tumen Initiative (GTI). [1]

In order to facilitate the development of transport corridors in the Greater Tumen Region (GTR), which is the target area of the GTI, it conducted an "Integrated Transport Infrastructure and Cross-border Facilitation Survey for Trans-GTR Transport Corridors" in 2012. The aim of this special feature is to provide the reader with the current situation and future prospects for the transportation corridors going through the GTR, by the reediting and publishing of the main parts of the outcomes of the study. The readers may understand that each country has been actively working to improve the infrastructure within its territory, as well as through bilateral cooperation with neighboring countries in Northeast Asia. On the other hand, with respect mainly to crossing borders many barriers and obstacles still remain, and there is great room for improvement.

Among the transport corridors, focus is given to the "Tumen River Transport Corridor" and "Suifenhe Transport Corridor ". This is because these corridors have the character of multilateral cooperation projects with a large number of participants. Considering the nature of a transportation corridor in that it requires development of the physical and non-physical infrastructure, the development of these two corridors should become the model of multilateral regional cooperation in Northeast Asia.

Unfortunately, due to the limitations of space, this special feature omits a significant portion of the final report of the GTI's survey. Among them are detailed descriptions of the corridors other than the above two corridors, and detailed data on individual infrastructure facilities and sections related to the policy recommendations. As the author-editor felt while participating in this research project, it is a fairly challenging task to collect local-level data and information in a uniform format and with precision across the countries. Faced with this problem, the research team, putting together all their efforts, gathered a substantial amount of information, even though it can't be said to be complete. Readers who are interested in the part that has been omitted should refer to the final report published by the GTI.

Following the introductory paper by Ms. Varvara KRECHETOVA, who was in charge of coordinating this study in the Tumen Secretariat, this special feature is composed of country-by-country reports. Ms. GAO Meizhen, Deputy-Director, Division of Strategy and Policy Study, the Transport Planning and Research Institute, the Ministry of Transport of the PRC covers the Chinese part; then Mr. D. Gotov, professor of the School of Mechanical Engineering and Mathematics, the Mongolian National University of Science and Technology the Mongolian part; Mr. NA Hee-Seung, Principal Researcher of the Planning Division, the Korea Railroad Research Institute the part for the ROK; Mr. Mikhail KOLOSHA, the Director of Transport Development Department, the Far-Eastern Marine Research, Design and Technology Institute the Russian part; and finally, the author-editor covers the Japanese part.

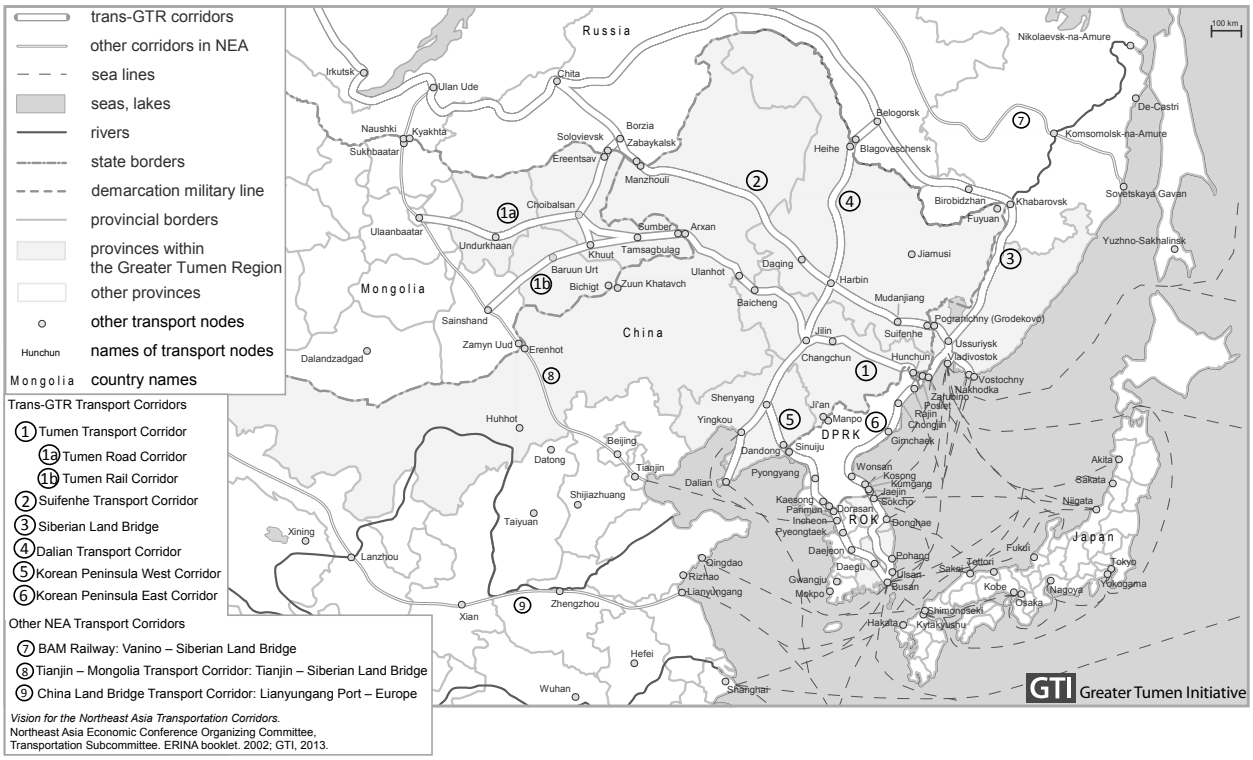
We are able to realize this special issue due to the courtesy of the GTI in providing the permission to publicize the main part of the survey results. In addition, each article has been contributed by each author, who kindly reedited the report submitted to the GTI. Recognizing their courtesy, the editor expresses deep appreciation.

[1] An intergovernmental cooperation mechanism among the PRC, Mongolia, the ROK and Russia, supported by the United Nations Development Programme (UNDP).

GTI Integrated Transport Infrastructure and Cross-Border Facilitation Study for the Trans-GTR Transport Corridors

KRECHETOVA, Varvara
Programme Officer, United Nations Development Programme Tumen Secretariat

Figure 1 Trans-GTR transport corridors



In 2012, detailed study of the transportation corridors in Northeast Asia has been implemented under the auspices of the Greater Tumen Initiative. The Study, with the full name "GTI Integrated Transport Infrastructure and Cross-Border Facilitation Study for the Trans-GTR Transport Corridors" (GTI Transport Corridors Study), was initiated by the member countries[1] in 2011 as the previous experience in the development of regional economic cooperation showed the urgency and importance of comprehensive multilateral strategic planning to achieve the maximum benefits for GTI members.

The inspiring example of planning exercise that lead to joint work for establishing and operationalization of the transportation corridors in Central Asia by international donors (Asian Development Bank, World Bank, European Bank for Reconstruction and Development, JICA and a number of others) and national governments and agencies is the "Central Asia Regional Economic Cooperation (CAREC)[2]: Transport Sector Strategy Study" prepared under the technical assistance of ADB. The Study gave the transport input to the CAREC Transport and Trade Facilitation Strategy[3], endorsed by Sixth Ministerial Conference on Central Asia Regional Economic Cooperation in 2007. By the end of 2011, thanks to multilateral efforts, 49% of road sections requiring improvements along the 6 CAREC corridors and 37% of

[1] People's Republic of China, Mongolia, Republic of Korea and the Russian Federation. DPRK withdrew from GTI on 5 November 2009.
[2] The Central Asia Regional Economic Cooperation (CAREC) Program is a partnership of 10 countries (Afghanistan, Azerbaijan, People's Republic of China, Kazakhstan, Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan) and 6 multilateral institutions (Asian Development Bank, European Bank for Reconstruction and Development, International Monetary Fund, Islamic Development Bank, United Nations Development Programme, and World Bank).
[3] Central Asia Regional Economic Cooperation (CAREC): Transport and Trade Facilitation Strategy. // CAREC official web-site. http://www.carecprogram.org/uploads/docs/CAREC-Transport-TradeFacilitation-Strategy.pdf. Accessed 25 February 2013.

railway sections were completed[4].

UNESCAP makes efforts to promote and improve the corridors in Northeast and Central Asia through the project "Operationalization of international intermodal transport corridors in North-East and Central Asia"[5]. The project aims at assisting to the member countries in prioritisation of international transport corridors for development and facilitating in establishment of multilateral mechanisms for theirs operationalization.

Similarly, the objective of the GTI Corridors Study is to "foster the development of a reliable, cost-effective and efficient integrated transport network in the GTR through planning and facilitating the activation and development of international transport corridors in the region"[6]. The objective determined the direction of research: analysis of current traffic along the corridors, review of major infrastructural and non physical constraints, projections of future traffic along the corridors and recommendations on removing the bottlenecks identified and on promotion of the transportation corridors. The main outcomes of the project thus are the detailed analysis of the current state of the NEA transport corridors and draft Regional Transport Strategy and Action Plan with list of projects and measures to develop and promote the integrated, functional network of transportation corridors successfully serving for export, import and transit in the Northeast Asia.

Geographically, the research focus was on the Greater Tumen Region (GTR), region under the cooperation mandate of GTI: China's Northeast, East of Mongolia, East of ROK and Primorsky Territory of Russia (Figure 1). To ensure relevancy and reliability of the Study results, the overall coverage was extended to include the sea segments of the corridors with western ports of Japan and exit points of the corridors outside the GTR.

The transport corridors studied are the selected ones from Northeast Asia Transport Corridors Vision presented in 2001[7]. Six of the nine developed corridors were included into the analysis (Figure 1): Siberian Land Bridge, Suifenhe Corridor, Tumen Corridor, Dalian Corridor, Korean East and Korean West Corridors. To fully reflect the current and future needs of the region, modifications were made to the routing of the Tumen Transport Corridor. At its' west end, the corridor has two branches, one to Trans-Siberian Railway via Ereentsav - Solovievsk, one to trans-Mongolia railway. Based on the development plans for railway network in Mongolia, railway and road segments are different at Mongolian territory.

The conformity of research depth and breath to the objective and project scope was ensured by joint team work of 6 outstanding transportation experts from China, Mongolia, Japan, ROK, Russia and Canada[8]. Experts from Northeast Asia contributed by producing detailed individual country reports on the relevant corridors' segments. International expert contributed analysis of experience in corridors development in other regions (Greater Mekong Subregion, Central Asia Regional Economic Cooperation, Maputo Development Corridor, Indonesia Malaysia Thailand - Growth Triangle, etc) as well as by summary of the findings into the regional report[9].

Based on the regional report, the following project conclusions are drown in regards the limitations and constraint to the traffic along the NEA corridors, prospects for the corridors development and the development road map.

Limitations and constraints for the traffic along the corridors are caused by both problems in their hard and soft infrastructure.

Physical constraints exist at all elements of the transportation corridors: missing road/rail links, break-of-gauges, missing bridges, sections with poor conditions or congested, insufficient BCPs capacities, lack of inland container and inland clearance depots, handling areas and facilities.

1. Along the Tumen Corridor, East-West rail link from Chinese border to trans-Mongolian railway is missing, while the link to Trans-Siberian Railway from Choibalsan requires upgrade. Therefore the whole corridor for moving Mongolian coal to the wide NEA market does not exist. Farther to the East, the rail link Hunchun-Makhalino is still non-operational impeding the potential transit traffic through Zarubino port and making the Tumen Corridor (Primorye-2 in Russian) non-functional.
   BCP at Arxan/Sumber (Nomrog) at China-Mongolia border has not been open, BCP Kraskino at Russian side of China-Russia border requires capacity increase.
   Road section of the Tumen Corridor in Mongolia is in poor condition, basically, there is no road at the

[4] Brief: Transport Sector // CAREC official web-site. http://www.carecprogram.org/uploads/docs/CAREC-Sector-Briefs/CAREC-Brief-Transport-Sector.pdf. Accessed 25 February 2013.
[5] Detailed project information available at UNESCAP web-site: http://www.unescap.org/ttdw/common/TIS/CorridorStudy/Corridor.asp. Accessed 26 February 2013
[6] Terms of Reference. Integrated Transport Infrastructure and Cross-Border Facilitation Study for the Trans-GTR Transport Corridors. 19 October 2011. GTI Secretariat.
[7] *Vision for the Northeast Asia Transportation Corridors*. Northeast Asia Economic Conference Organizing Committee, Transportation Subcommittee. *ERINA booklet*. 2002. Available at http://www.erina.or.jp/en/Research/db/pdf2001/01010e.pdf. Assessed on 26 February 2013.
[8] Project team included: International Consultant Mr. Jean-Fran?ois GAUTRIN, National Consultant China Ms. Meizhen GAO, National Consultant Japan Mr. Hirofumi ARAI, National Consultant Mongolia Mr. Gotov DUGERJAV, National Consultant ROK Mr. Hee-Seung NA, National Consultant Russia Mr. Mikhail KHOLOSHA.
[9] Total of 6 reports: Individual Country Report China, Individual Country Report Mongolia, Individual Country Report Russia, Individual Country Report ROK, Individual Country Report Japan, and Regional Summary Report.

Table 1. GTR Freight flows at BCPs and Ports[10]

(in thousand tons)

BCP/Port	2010			2020		
	Road/port	Rail	Total	Road/port	Rail	Total
Tumen Corridor						
Nomrog/Arxan (a)	0	0	0	10	15,200	15,210
Kraskino/Gvodezvo/Hunchun (b)	93	0	93	360	2,415	2,775
Quanhe(Hunchun)/DPRK (c)	200	0	200	360		360
Subtotal	293	0	293	730	17,615	18,345
Zarubino Port (d)	337		337	3,165		3,165
Suifenhe Corridor						
Zabaykalsk/Manzhouli (e)	403	21,358	21,761	710	30,740	31,450
Pogranichny/Suifenhe (f)	514	6,956	7,470	732	8,780	9,512
Subtotal	917	28,314	29,231	1,442	39,520	40,962
Siberian Land Bridge Corridor						
Solovievsk/Ereentsav (g)	1	37	38	4	565	569
Dalian Corridor						
Blagoveshchensk/Heihe (h)	178		178	419		419
Korea Peninsula East Corridor						
Khasan/Tumangang (i)		131	131		5,400	5,400
Grand Total	1,726	28,482	30,208	5,760	63,100	68,860
Grand Total Land Corridors	1,389	28,482	29,871	2,595	63,100	65,695

Note: numbers for Zarubino traffic are under "road"; ICRR: Individual country report Russia; ICRC: Individual country report China
(a) 15.2 million ton of coal from Mongolia (10.6 China, 2.3 ROK, 2.3 Japan);
(b) 2010: ICRR; 2020: 10% of 300,000 TEUs by road, rest by rail; 50% non containerized on corridor with 30% by road, 70% by rail;
(c) 2010: ICRR; 2020, 6% growth;
(d) 2010: ICRR; 2020: Export, Import 10% growth, transit in & out 100,000 TEU equal share
(e) 2010: ICRR for road & rail; 2020: ICRR optimistic
(f) 2010: ICRR; 2020: road 6% growth, rail export optimistic, import conservative ICRR
(g) 2010: ICRR; 2020: Export ICRR optimistic; import conservative + 0.5 million ton of Mongolian coal;
(h) 2010: ICRR; 2020: ICRR optimistic;
(i) 2010: ICRR; 2020: ICRR optimistic.

last section Tamsagbulag and the border with China at Nomrog.

Zarubino port capacity and facilities are another limitation for the corridor development with absence of specialized container terminal and equipment not suitable for heavy 20 feet containers or 40 feet containers. Port Posiet, located in the vicinity is coal dedicated port with serious constraints for expansion and unlikely to serve transit traffic along the corridors.

2. Siberian Land Bridge suffers from heavy congestion of Trans-Siberian Railway at Primorsky Territory, Zabaykalsky Territory, Amurskaya Oblast.
3. Dalian corridor is ending at Heihe due to the absence of bridge over Amur river that make the link Heihe - Blagoveshchensk inadequate. Once the issue is resolved, Dalian corridor might generate new traffic between Far East of Russia and Chinese Northeast.
4. Korean East and Korean West Corridor could become functional after the road and railway connection are fully restored between ROK and DPRK. Reconnected, DPRK railway system would require modernisation: electrification, double tracking, communication and signalling.

Non physical limitations are threefold:

1. First group of limitations manifest in non-existent or miniscule transit trade along the corridors. Situation is caused by absence of general or comprehensive transit agreements between the countries involved (GTI member countries) and aggravated by the treatment of transit by the Customs officers.
2. Restrictions for foreign road transport, mainly trucks, to enter countries.
3. Low level of adoption of electronic systems at border crossing posts along the corridors, even if countries do implement single window systems in general. Due to the remote position of the posts within the member countries, their BCPs on the trans-GTR corridors lack modern equipment.

[10] Prepared by Dr J-F.Gautrin GTI Integrated Transport Infrastructure and Cross-Border Facilitation Study for the trans-GTR Transport Corridors. Regional Summary Report. 2013. P.19

Presently, the **traffic along the six corridors** is mainly domestic with a small portion of regional trade. Dalian corridor serves dominantly domestic traffic in Chinese Northeast; Siberian Land Bridge is domestic Russian corridor. Priority corridors for regional trade are Tumen and Suifenhe Corridors, the second one is currently handling the most of regional freight traffic (Table 1).

Prospects of the corridors depend on GTI member countries' advance in creating integrated, fully connected transport network and favorable regulatory environment. More missing links closed, better cross-border procedures mean higher trade volumes moving through BCPs of the six corridors.

Table 1 presents **estimates of possible freight traffic 2020** under the assumptions that custom procedures are improved through GTR, all rail and road links along the six corridors are completed, ROK and DPRK relationships allow to run freight trains along the Korean East and West corridors, transit traffic on Tran-Siberian Railways increased, container feeder ships serve trade flow between Japan - Northeast China.

Figures in the table illustrate the current situation when due to not functional railways throughout the Tumen Corridor, it is incapable to be regional trade corridor. For 2020, a scenario when the fully completed Tumen corridor carries Mongolian coal to NEA consumers and serves the container traffic between Northeast China and Japan and beyond is analysed. For Suifenhe corridor, presently the main regional corridor, preserved trade pattern and growing trade volume are assumed. Increased volume of Mongolian coal would push higher volume of transit along the Siberian Land Bridge. Forecast for Dalian corridor still does not take in consideration the construction of Amur Bridge, however, once the rail bridge will connect Heihe and Blagoveshchensk the trade volume along the corridor may grow to higher level. Progress for both Korean corridors depend on opening of DPRK railway system and progress achieved with connection between port Rajin and Primorsky Territory railways. Forecast for Korean East corridor connection to Russia is made based on the assumption of Russian coal exports to DPRK.

Both current and forecasted figures are based on the data provided by the regional consultants for the national segments of the corridors and BCPs, ports. The figures were harmonised on bilateral basis taking in consideration prospective regional flows (for instance, increased coal production in Mongolia and respective exports to Northeast China and Japan by Tumen Corridor; by 2020 the total movement of coal by railway in Mongolia would reach 66 million ton[11]). Nonetheless the opinions on the prospective figures differ based on experts' understanding of the possible level of improvements, timeframe needed for operationalization, etc. Zarubino port (Primorsky Territory of Russia) and estimates of its potential are the most prominent example: some experts argue that in situation of fully functional NEA transportation system and high level of custom facilitation for transit up to 30 to 40 million tons per year possible at the port in 2030[12]. There is the second opinion about Korean East Corridor's Rajin - Khasan section where rail freight traffic 2020 is estimated in 8.3 million tons[13].

In order to grasp the opportunities in serving regional trade flows, the following **strategic directions**[14] of transport policy cooperation under the GTI framework along with the an Action Plan and an investment programme are suggested by the Study:

1. Connectivity: "In order to achieve economic growth and sustainable development throughout the GTR, GTI member countries need to increase connectivity among each other in a spirit of ensuring "win-win" situations for all".
   Action Plan and investment program propose construction of two bridges between China and Russia: Heihe-Blagoveshchensk, Tongjiang-Nizhneleninskoye.
2. Support to Transport Infrastructure Improvements: "efficient and effective transport and trade facilitation infrastructures have to be put in place along transport corridors to provide for a seamless movement of people and goods across borders". The measures are to include modernisation, increase of capacity of existing road, rail sections, ports, completing the connections to the border crossings, improvement of BCPs, creating infrastructure to facilitate custom clearance and freight logistics (Inland Container Depot, Rail Container Yard, Logistic Centre).
   For instance, to reach the objectives of this strategic direction, reconstruction of Hunchun - Makhalino railway, expansion of Zarubino port, rail and road connections in Easter Mongolia and number of other projects are suggested by the Action Plan.
3. Software Support to Transport Corridor Functioning: "Transport Corridors to function properly need, in addition to good infrastructures, to be supported by a series of effective border crossing regulations and procedures covered in part through

[11] GTI Integrated Transport Infrastructure and Cross-Border Facilitation Study for the trans-GTR Transport Corridors. Individual Country Report Mongolia. 2013. Prepared by Gotov Dugerjav.
[12] Survey on Zarubino Port Cargo Turnover Outlook: Summary Report. GTI, 2010, GTI Integrated Transport Infrastructure and Cross-Border Facilitation Study for the trans-GTR Transport Corridors. Individual Country Report Russia. 2013. Prepared by Mikhail Kholosha.
[13] GTI Integrated Transport Infrastructure and Cross-Border Facilitation Study for the trans-GTR Transport Corridors. Individual Country Report ROK. 2013. Prepared by Na Hee-Seung.
[14] The directions are as formulated by Dr J-F.Gautrin in the GTI Integrated Transport Infrastructure and Cross-Border Facilitation Study for the trans-GTR Transport Corridors. Regional Summary Report. 2013. P.32-34. The Draft Regional Transport Strategy is submitted to the member countries consideration and will be discussed within 2013.

inter-states agreements".
Under the direction, Action Plan includes measures for custom harmonisation, introduction of risk management, advance in introduction of the Single Window, customs treatment of transit should be covered. The direction is also addresses other impediment for transit movements - lack of regional transit agreements - by strongly recommending development of "fully operational inter-state transport and transit agreements signed by all GTI country partners".

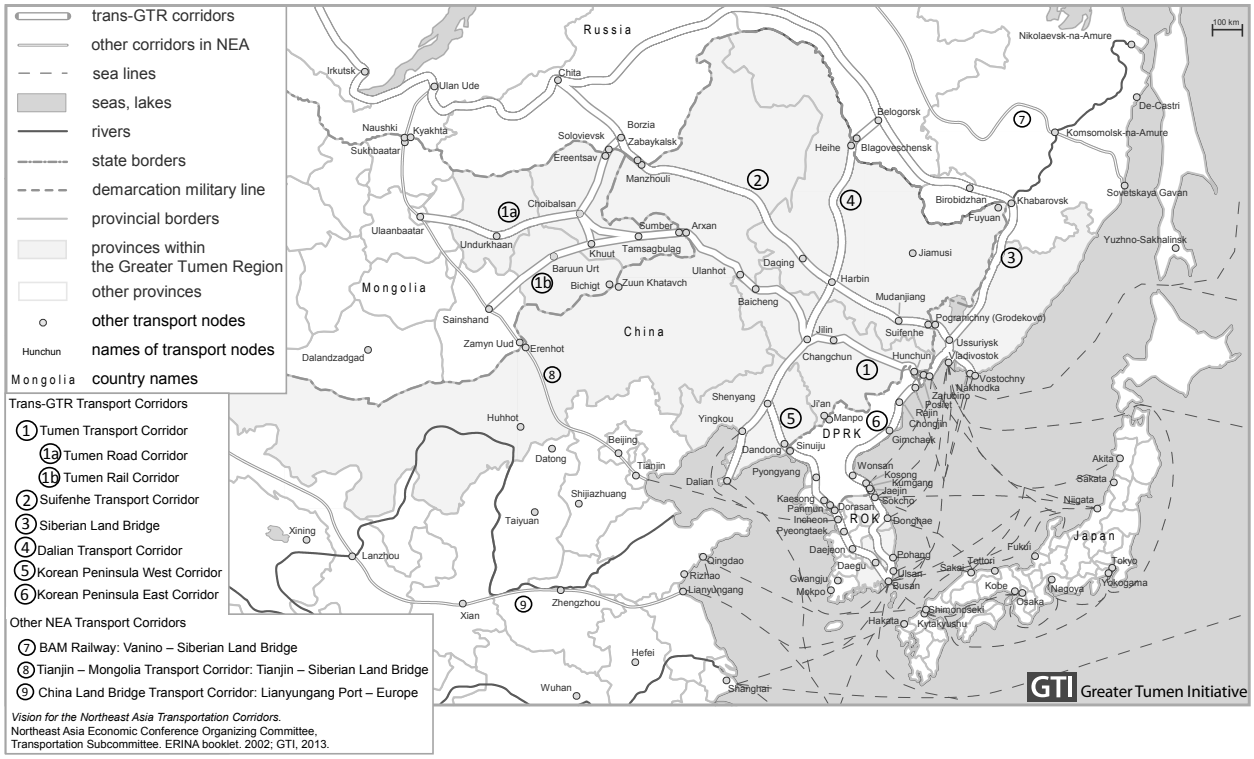
4. Management of Transport Corridors: Success in development of transport corridors is highly dependent on a strong management structure. For trans-GTR corridors, a management structure of three layers might be recommended. "The upper layer consists in having national/regional organizations coordinating activities along corridors; the second layer consists in managing sub-corridors to ensure project implementation, with the third level consisting of management tools for monitoring the performance of transport corridors".
5. Private Sector Involvement: private sector to be involved "as much as possible in all aspects of development of the transport corridors: project identification and planning, financing, operation, monitoring, etc."

Information gathered by the Study team and conclusions drawn show the need and justify both regional and each member country measures to develop the transport network in GTI by completing the absent segments of roads, railways, improving logistics infrastructure with inland container depots and clearance terminals, investing in ports, improving custom and other cross border regulations, etc. The results of this comprehensive, detailed and reassuring study of the trans-GTR transport corridors are to be used in coming years by GTI and its Transport Board members to shape cooperative activities to promote regional freight and passenger movements.

GTI大図們江地域（GTR）横断輸送回廊に関する統合輸送インフラ及び国境通過円滑化調査

国連開発計画（UNDP）図們江事務局プログラムオフィサー　バルバラ・クレチェトワ

図１　GTR横断輸送回廊



2012年、大図們江イニシアチブ（GTI）の下で、北東アジア輸送回廊の詳細な調査が実施された。正式名称「大図們江地域（GTR）横断輸送回廊に関する統合輸送インフラ及び国境通過円滑化調査」（以下、「GTI輸送回廊調査」）というこの調査を実施することは、2011年に加盟国[1]によって決定された。地域経済協力の進展に関する過去の経験から、GTIメンバー国が最大限の利益を達成するためには、包括的かつ多国間の戦略的計画を持つことが緊急かつ重要であることが示されていたためである。

中央アジア輸送回廊の構築とその運用面での国際的な援助機関（アジア開発銀行（ADB）、世界銀行、欧州復興開発銀行、JICAなど）や各国政府・機関による共同作業につながった印象的な計画策定の例として、「中央アジア地域経済協力（CAREC）[2]：運輸セクター戦略調査」があり、これはADBの技術協力の下で実施された。この調査は、2007年に中央アジア地域経済協力に関する第６回閣僚会議で承認された「CAREC運輸・貿易円滑化戦略[3]」の運輸部分へのインプットとなった。2011年末までに、多国間の努力により、６本のCAREC回廊のうち改善を要する道路区間の49％、鉄道区間の37％が完成した[4]。

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[1] 中華人民共和国、モンゴル、韓国、ロシア。北朝鮮は2009年11月５日にGTIから脱退した。

[2] 中央アジア地域経済協力（CAREC）プログラムは、10カ国（アフガニスタン、アゼルバイジャン、中国人民共和国、カザフスタン、キルギス、モンゴル、パキスタン、タジキスタン、トルクメニスタン、ウズベキスタン）と６つの多国間機関（アジア開発銀行、欧州復興開発銀行、国際通貨基金、イスラム開発銀行、国連開発計画、世界銀行）のパートナーシップである。

[3] "Central Asia Regional Economic Cooperation（CAREC）: Transport and Trade Facilitation Strategy." CAREC公式ウェブサイト http://www.carecprogram.org/uploads/docs/CAREC-Transport-TradeFacilitation-Strategy.pdf（2013年２月25日アクセス）

[4] Brief: Transport Sector // CAREC公式ウェブサイト http://www.carecprogram.org/uploads/docs/CAREC-Sector-Briefs/CAREC-Brief-Transport-Sector.pdf（2013年２月25日アクセス）

国連アジア太平洋経済社会委員会（UNESCAP）は、プロジェクト「北東・中央アジアにおける国際複合一貫輸送回廊の実用化[5]」プロジェクトを通じて、北東・中央アジアの回廊の推進・改善の取り組みを行っている。このプロジェクトは、加盟国が国際輸送回廊を開発する際の優先順位付けを支援し、その実用化のための多国間メカニズムの設立を促進すること目的としている。

同様に、GTI輸送回廊調査の目的は、「地域における国際輸送回廊の活性化及び整備を計画、促進することを通じて、GTRにおいて信頼性、費用対効果及び効率性が高い統合輸送網の整備を促進する[6]」ことである。この目的から、調査項目として、回廊沿線の輸送量の現状分析、主なインフラ制約及び非物理的な制約の整理、回廊上の将来輸送量の予測及び識別されたボトルネックを除去し、輸送回廊を推進するための提言を取り上げることが決定された。本プロジェクトの主な成果は、一つには北東アジア輸送回廊の現状の詳細分析であり、また「地域交通戦略」の素案及び北東アジアにおける輸出入及びトランジット需要に的確に対応できる統合された機能的な輸送回廊網を整備・促進するためのプロジェクトや施策のリストを含む「行動計画」の素案である。

地理的には、本研究はGTI協力の対象地域である大図們江地域（GTR）、すなわち中国の東北部、モンゴルの東部、韓国の東部とロシアの沿海地方（図１）に焦点を当てている。調査全体の対象範囲は、調査結果の整合性と信頼性を高めるために、日本の日本海側港湾を含む海上部分とGTR域外にある回廊の出口点を含む範囲まで拡張されている。

調査対象の輸送回廊は、2002年に提示された「北東アジア輸送回廊ビジョン[7]」から選択した。提示された９本の輸送回廊のうち、シベリア・ランドブリッジ、綏芬河輸送回廊、図們江輸送回廊、大連輸送回廊、朝鮮半島東部及び西部輸送回廊の６つ（図１）を分析対象とした。地域の現在及び将来のニーズを完全に反映するため、図們江輸送回廊のルートに関して修正が行われた。同回廊の西端において２本に分岐しており、１本はソロビヨフスク～エレンツァフ経由でシベリア鉄道につながり、もう１本はモンゴル縦貫鉄道につながる。モンゴルの鉄道網開発計画に基づき、モンゴル領内では鉄道区間と道路区間が別々のルートとなっている。

調査の目的と範囲に合致した、十分に深く意味のある調査が、中国、モンゴル、日本、韓国、ロシア、カナダからの６名の卓越した交通専門家の共同のチームワーク[8]によってなされた。北東アジアからの専門家は、それぞれ関連する回廊区間についての、詳細な国別レポートを取りまとめることに貢献した。国際専門家は、他地域の回廊整備（大メコン圏（GMS）、中央アジア地域経済協力、Maputo開発回廊、インドネシア・マレーシア・タイの成長の三角地帯など）での経験についての分析を提供したほか、調査結果を「地域レポート」の形に取りまとめた[9]。

この地域レポートによれば、本プロジェクトの結論として、以下のような北東アジア輸送回廊上の輸送の限界と制約、回廊整備の展望と開発ロードマップが導き出される。

輸送回廊上の輸送の限界と制約は、そのハード及びソフトインフラの両方の問題によって引き起こされている。

物理的な制約は、輸送回廊のすべての要素について存在している。すなわち、道路／鉄道の未接続区間、軌間の違い、橋梁の未整備、劣悪な条件や混雑している区間、能力不足の国境検問所、内陸コンテナデポや内陸通関デポ、荷捌き地や荷捌き設備の欠如である。

１．図們江回廊では、中国との国境からモンゴル縦貫鉄道へとつながる東西の鉄道路線が存在せず、またチョイバルサンからシベリア鉄道へのリンクは改良を必要としている。したがって、モンゴルの石炭を広く北東アジア市場に輸送するための全体的な回廊が存在していない。さらにその東では、琿春～マハリノの鉄道路線が休止中で、ザルビノ港経由の潜在的なトランジット輸送を妨げており、図們江回廊（ロシアではプリモーリエ-２回廊）が機能していない。中国・モンゴル間のアルシャン～スンベル（ヌムルク）国境検問所は未開放であり、中国・ロシア間のロシア側にあるクラスキノ国境検問所は処理能力を

[5] 詳細情報は国連アジア太平洋経済社会委員会のウェブサイトで入手可能。http://www.unescap.org/ttdw/common/TIS/CorridorStudy/Corridor.asp （2013年２月26日アクセス）

[6] Terms of Reference. Integrated Transport Infrastructure and Cross-Border Facilitation Study for the Trans-GTR Transport Corridors. 19 October 2011. GTI Secretariat.

[7] Vision for the Northeast Asia Transportation Corridors. Northeast Asia Economic Conference Organizing Committee, Transportation Subcommittee. ERINA booklet. 2002. http://www.erina.or.jp/en/Research/db/pdf2001/01010e.pdf. 2013年２月26日アクセス）

[8] プロジェクトチームのメンバーは、国際コンサルタントのジーン＝フランシス・ガトリン氏、中国担当の高美真氏、日本担当の新井洋史氏、モンゴル担当のドゲルジャル・ゴトフ氏、韓国担当のナ・ヘソン氏、ロシア担当のミハイル・ホロシャ氏である。

[9] 全部で６本のレポートから構成されている。Individual Country Report China, Individual Country Report Mongolia, Individual Country Report Russia, Individual Country Report ROK, Individual Country Report Japan及びRegional Summary Reportである。

表１　国境検問所及び港湾におけるGTR貨物輸送量[10]

（千トン）

国境通過点/港湾	2010			2020		
	道路/港湾	鉄道	合計	道路/港湾	鉄道	合計
図們江輸送回廊						
ヌムルク～アルシャン（a）	0	0	0	10	15,200	15,210
クラスキノ/グボスデボ～琿春（b）	93	0	93	360	2,415	2,775
圏河（琿春）～北朝鮮（c）	200	0	200	360		360
小計	293	0	293	730	17,615	18,345
ザルビノ港（d）	337		337	3,165		3,165
綏芬河輸送回廊						
ザバイカルスク～満洲里（e）	403	21,358	21,761	710	30,740	31,450
ポグラニチヌイ～綏芬河（f）	514	6,956	7,470	732	8,780	9,512
小計	917	28,314	29,231	1,442	39,520	40,962
シベリアランドブリッジ						
ソロビヨフスク～エレンツァフ（g）	1	37	38	4	565	569
大連輸送回廊						
ブラゴベシチェンスク～黒河（h）	178		178	419		419
朝鮮半島東部輸送回廊						
ハサン～豆満江（i）		131	131		5,400	5,400
総計	1,726	28,482	30,208	5,760	63,100	68,860
陸上回廊合計	1,389	28,482	29,871	2,595	63,100	65,695

注: ザルビノ港の輸送量は道路のもの。以下、ICRR: Individual country report Russia、ICRC: Individual country report China。
（a）モンゴルからの石炭1,520万トン（中国1,060万トン、韓国 230万トン、日本230万トン）。
（b）2010: ICRR。 2020: 300,000 TEUの10％は道路、残りは鉄道。50％は非コンテナ貨物で、うち30％が道路で、70％が鉄道。
（c）2010: ICRR。2020: ６％ の増加率。
（d）2010: ICRR。2020: 輸出、輸入は10％の増加率。トランジットは出入りとも100,000 TEU。
（e）2010: ICRR。2020: ICRRの楽観見通し。
（f）2010: ICRR。2020: 道路は６％ の増加率。鉄道輸出はICRRの楽観見通し、輸入は保守的見通し。
（g）2010: ICRR。2020: 輸出はICRRの楽観見通し。輸入は保守的見通し＋ モンゴル産石炭50万トン。
（h）2010: ICRR。2020: ICRRの楽観見通し。
（i）2010: ICRR。2020: ICRRの楽観見通し。

高める必要がある。

図們江回廊のモンゴル国内の道路区間の状態は悪く、最後の区間であるタムサクブラクから中国との国境のヌムルクまでは基本的に道路がない。

ザルビノ港の能力や設備は、同回廊発展のもう一つの制約となっており、コンテナ専用ターミナルがなく、満載の20フィートコンテナや40フィートコンテナに対応できる設備が存在していない。近傍に位置するポシェット港は拡張の余地が限られる石炭専用港であり、輸送回廊に沿った中継輸送を取り扱う可能性は低い。

２．シベリア・ランドブリッジは、沿海地方、サバイカル地方及びアムール州におけるシベリア鉄道の混雑の影響を受けている。

３．大連輸送回廊では、アムール川に架かる橋がないため、ブラゴベシチェンスク～黒河の連結が不十分であり、黒河で途切れている。この問題が解決されれば、大連輸送回廊により、ロシア極東と中国東北部の間に新たな流れが生み出されるだろう。

４．朝鮮半島東部輸送回廊及び同西部輸送回廊は、韓国と北朝鮮の間で道路や鉄道の接続が完全に復元された後に機能することになろう。再接続後には、北朝鮮の鉄道システムは、電化、複線化、通信及び信号などの近代化を必要とするであろう。

非物理的な制約は、３重になっている。

１．第一の制約は、回廊上のトランジット貿易貨物が全くないか、非常に少ないことに現れている。こうした状況は、関係国（GTIの加盟国）の間に一般的または包括的なトランジット協定が存在しないことによって生じており、さらに税関職員によるトラン

[10] J-F.ガトリン氏による。"GTI Integrated Transport Infrastructure and Cross-Border Facilitation Study for the trans-GTR Transport Corridors. Regional Summary Report". 2013. P.19

ジットの取り扱いの仕方によって悪化している。

2．外国の自動車、主にトラックの入国に関する制限。

3．一般的にシングルウィンドウシステムを導入している国であっても、回廊上の国境検問所での電子システムの採用が低レベルであること。それぞれの国の中心から離れた位置にあるため、GTR横断回廊上の国境検問所では近代的な設備が欠けている。

現在、６本の輸送回廊上の輸送量の大部分が国内輸送であり、一部に地域貿易がある。大連輸送回廊は主に中国東北部の国内輸送に対応し、シベリア・ランドブリッジは主にロシア国内輸送の回廊である。地域貿易のための優先回廊は、図們江輸送回廊と綏芬河輸送回廊であり、後者は現在の地域貨物輸送量の大部分を処理している（表１）。

回廊の将来展望は、GTI加盟国が、統合された完全に接続された輸送ネットワークと良好な規制環境を形成することに向けて前進するかどうかにかかっている。多くの不連続箇所（ミッシングリンク）を解消し、国境手続きを改善することは、６本の回廊の国境通過点での貿易量が高まることを意味する。

表１は、2020年時点での想定されうる貨物輸送量の推計も示している。その際の前提は、税関手続きがGTR全体にわたって改善され、６本の回廊のすべての鉄道と道路の接続が完了し、韓国・北朝鮮の関係が朝鮮半島東西の回廊に沿ってトランジット貨物列車が運航できるようになっており、シベリア横断鉄道の輸送量が増加し、日本と中国東北部を（訳注：ロシア沿海地方を経由して）結ぶコンテナ航路が運航していることである。

鉄道が図們江輸送回廊全体で機能するようになっていないことから、同回廊が地域貿易の回廊となってなりえないという現状を、表１は示している。2020年については、完全に整備された図們江輸送回廊が、モンゴルの石炭を北東アジアの消費者に輸送し、また中国東北部と日本以遠の間のコンテナを輸送するようになるというシナリオを描いている。綏芬河輸送回廊は現時点で主要な地域の回廊であり、現在の貿易パターンを維持しつつ、貿易量が増加することが想定されている。モンゴルの石炭量が増加することで、シベリア・ランドブリッジによるトランジット輸送が押し上げられるだろう。大連輸送回廊については、アムール橋の建設を考慮してしない予想であるが、もし鉄道橋が黒河市とブラゴベシチェンスクを結ぶことになれば、回廊上の貿易量はより一層増加するだろう。朝鮮半島の二つの回廊の進捗は、北朝鮮の鉄道システムの開放、及び羅津港と沿海地方との接続の進展に依存する。朝鮮半島東部輸送回廊とロシアとの結節点での予測は、北朝鮮に対するロシアの石炭輸送を前提としたものである。

現在及び予測の両方の数値は、各国における回廊の各区間、国境通過点及び港湾について、各国担当者から提供されたデータに基づいている。これらの数値は、将来的な地域の物流量を考慮して二国間で調和させたものである。(例えば、図們江輸送回廊でのモンゴル石炭生産増に伴う中国東北部や日本への輸出増である。2020年にはモンゴル国内の鉄道による石炭の総輸送量は6,600万トンに達する見込みである[11]。）しかしながら､将来的な数値に関する見解は､(調査に参加した専門家ごとに)異なっている。各専門家が､どの程度の改善が可能であると考えるのか、実用化に要する時間がどの程度なのかなどといった事柄について、異なった見方をしているためだ。ザルビノ港（ロシア沿海地方）の潜在力の予測は最も顕著な例である。一部の専門家は、北東アジアの輸送システムが完全に機能するようになり、かつトランジット貨物の税関手続きが高いレベルに達するという状況になれば、2030年には最大で年間3,000万～4,000万トンが可能となると主張している[12]。また、朝鮮半島東部輸送回廊の羅津～ハサン区間についても、2020年の鉄道貨物輸送量が830万トンになるという別の意見がある[13]。

本調査では、地域の貿易貨物流動に対応する可能性を把握するために、行動計画や投資プログラムと併せて、以下のようなGTIの枠組みの下での運輸政策協力の戦略的方向性[14]を提示している。

1．接続性：「GTR全域のおける経済成長と持続可能な発展を達成するために､GTIの加盟国は､全員にとってwin-winの状況を実現するという精神を持ちつつ、相互の接続性を向上させる必要がある。」

[11] "GTI Integrated Transport Infrastructure and Cross-Border Facilitation Study for the trans-GTR Transport Corridors. Individual Country Report Mongolia". 2013. Prepared by Gotov Dugerjav.

[12] "Survey on Zarubino Port Cargo Turnover Outlook: Summary Report." GTI, 2010, "GTI Integrated Transport Infrastructure and Cross-Border Facilitation Study for the trans-GTR Transport Corridors. Individual Country Report Russia." 2013. Prepared by Mikhail Kholosha.

[13] "GTI Integrated Transport Infrastructure and Cross-Border Facilitation Study for the trans-GTR Transport Corridors. Individual Country Report ROK." 2013. Prepared by Na Hee-Seung.

[14] The directions are as formulated by Dr J-F.Gautrin in the "GTI Integrated Transport Infrastructure and Cross-Border Facilitation Study for the trans-GTR Transport Corridors. Regional Summary Report." 2013. P.32-34. 地域運輸戦略の原案は加盟国の検討のため提出されており、2013年中に議論される予定である。

行動計画及び投資プログラムでは、中ロ間の二つの橋の建設を提案している（黒河～ブラゴベシチェンスク、同江～ニジニレニンスコエ）。

2．輸送インフラ整備の支援：「国境を越える人やモノのシームレスな移動のために、効率的かつ効果的な輸送・貿易円滑化のインフラが輸送回廊上に整備されなければならない。」施策としては、既存の道路、鉄道区間、港湾の近代化及び容量の拡大、国境通過地点への連絡路の完成、国境通過点の改善、通関や貨物ロジスティクスサービスを円滑化するためのインフラ（内陸コンテナデポ、鉄道コンテナヤード、ロジスティックセンター）の整備などがある。

この戦略的方向性の目標を達成するために、行動計画では、例えば琿春～マハリノ鉄道の再開、ザルビノ港の拡張、モンゴル東部の鉄道や道路の接続やその他多くのプロジェクトが提示されている。

3．輸送回廊を機能させるソフト面でのサポート：「輸送回廊が正常に機能するためには、優れたインフラに加えて、部分的には国家間の合意を通じてカバーされる効率的な一連の国境通過制度・手続によってサポートされる必要がある。」

この方面では、行動計画の中に、税関の調和に向けた施策、リスクマネジメントの導入、シングルウィンドウの導入の進展、トランジット貨物の通関手続などが含まれている。この方面では、トランジット輸送に係るその他の障害として、地域トランジット協定の欠如にも言及しており、「全GTI加盟国が署名する完全に有効な政府間の輸送・トランジット協定」の整備を強く提案している。

4．輸送回廊の運営：輸送回廊の整備がうまくいくかどうかは、力のある運営体制の有無に大きく依存する。GTR横断輸送回廊には、３層の運営体制が推奨されよう。「上位層は回廊沿線の活動を調整する国家/地域機関をもって構成され、第２層はプロジェクトの実施を確実にするためにサブ回廊を管理するものであり、第３層は輸送回廊のパフォーマンスをモニタリングするための管理ツールである。」

5．民間セクターの関与：「プロジェクトの特定と計画立案、資金調達、運営、モニタリングなど、輸送回廊整備のすべての面で可能な限り、」民間部門が関与すべきである。

調査チームが収集した情報やそこから導き出された結論では、道路・鉄道の欠落区間の完成、内陸コンテナ・デポや通関ターミナルのロジスティクスインフラの改善、港湾への投資、税関及びその他国境通過規制等の改善などにより、GTIの輸送ネットワーク整備の施策を、地域として実施することも、また各国独自のものとして実施することも必要かつ正当だということが示されている。GTR横断輸送回廊に関する包括的、詳細かつ心強い本調査結果は、地域の貨物・旅客の動きを促進するための協力活動を形成するため、今後数年間にわたり、GTI並びにその運営者（役員）が利用するものとなろう。

［英語原稿をERINAにて翻訳］

Current Situation and Future Prospects of the Trans-GTR Corridors (Segments in PRC)

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1 Introduction

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), *Suifenhe Transport Corridor* (Corridor 2), *Dalian Transport Corridor* (Corridor 4), and *Korean Peninsula West Corridor* (Corridor 5).

Three provinces in northeast China: Liaoning, Jilin, Heilongjiang province and Inner Mongolia autonomous region are part of research scope, object of GTI transport corridor also includes relevant area of ROK, Mongolia and Russia.

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, accounting for 20.74% and 10.01% of the national level respectively. Recently, this area has witnessed significant economic developments. In 2010, the total GDP in these provinces reached to 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.

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.

The report made diligence review to trade, transport, transport coordination and the legal environment of transport movement in GTR China, carried out the transport demand analysis and forecasts. It also analyzed main problems and solutions that restrict the influence of GTI transport corridor and proposed related regional and national strategies about strengthening transport

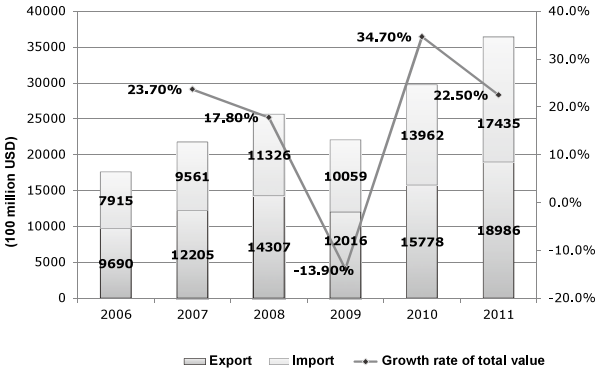
Figure 1.1 GTI corridors, BCPs and ports in China

cooperation with northeast Asian countries, made a list of recent important projects for future action.

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 2.1)

Figure 2.1 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 2.2. to 2.5. 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 previous 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 2.6 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

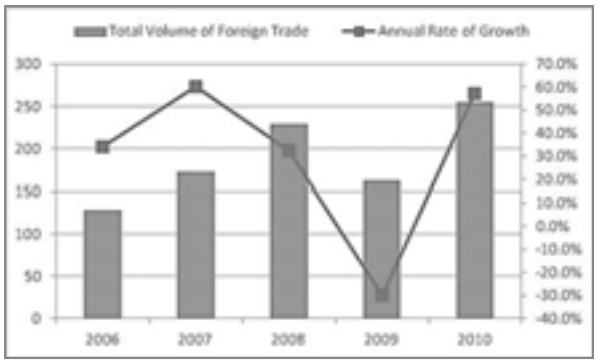
(Unit: USD 100 Million, %)

	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
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 2006-2010

(USD 100 Million, %)



Source: Heilongjiang Statistical Yearbook 2006-2010

Table 2.3 Value and Growth Rate of Trade of Jilin Province, 2006-2010

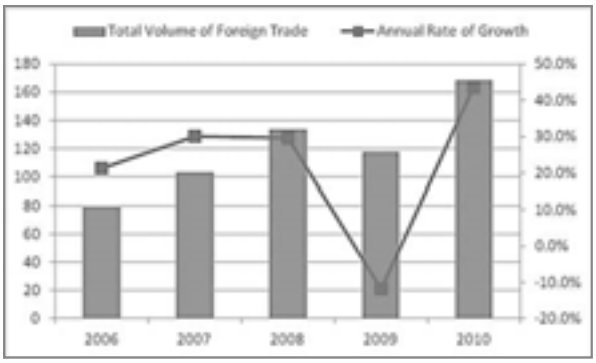
(Unit: USD 100 Million, %)

	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

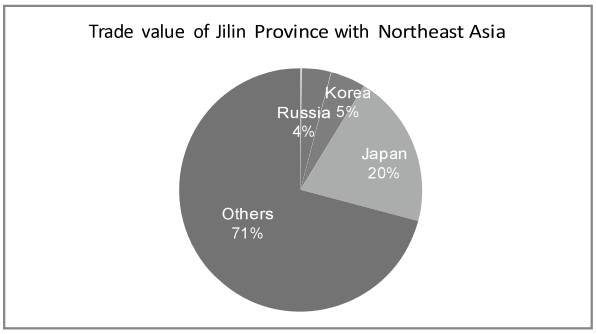
Figure 2.5 Total Value of Foreign Trade and Annual Rate of Growth of Jilin in 2006-2010

(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

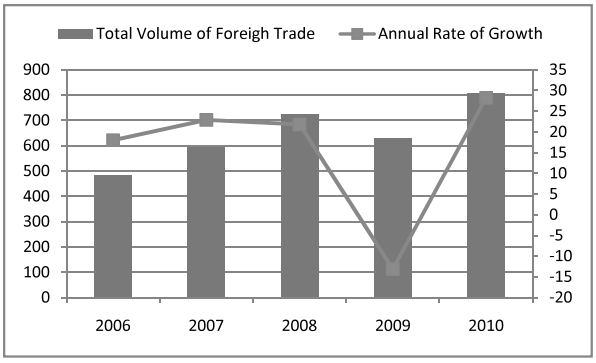
(Unit: USD 100 Million, %)

	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 2006-2010

(USD 100 Million, %)



Source: Liaoning Statistical Yearbook 2006-2010

Table 2.5 Value and Growth Rate of Trade of Inner Mongolia, 2006-2010

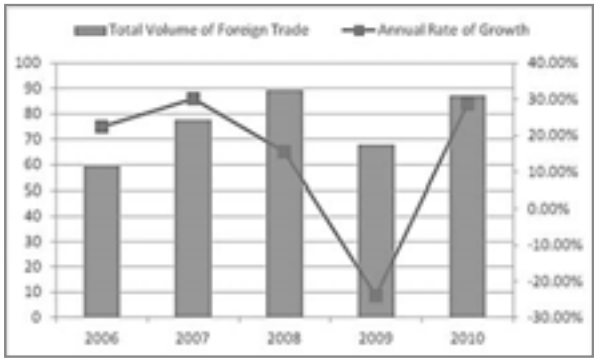
(Unit: USD 100 Million, %)

	2006		2007		2008		2009		2010	
	Amount	Rate	Amount	Rate	Amount	Rate	Amount	Rate	Amount	Rate
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 2006-2010

(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) specified along the four corridors are:

- Arxan (Mongolia - Inner Mongolia)
- Hunchun (Yanbian - Primorsky Territory)
- Dandong (Liaoning - DPRK)
- 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 1.1 illustrates the GTR corridors, BCPs and ports.

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.

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.

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.

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,

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

Corridor	Technical indicators						
	Section	Road number	[1]Technical classification	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	1,585
	Mudanjiang through Harbin to Daqing	G10	Express Way	432	432	National	11,785
		G301	Above level 3	181	549	National	2,686
	Daqing to Manzhouli	G301	Above level 2	620	620	National	2,649
	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	11,196
		G302	Above level 3	358	567	National	4,780
Tumen Transport Corridor	Changchun to Ulanhot	G302	Above level 2	427	427	National	6,593
	Ulanhot - Arxan	S203	Above level 3	95	290	Provincial	-
Dalian Transport Corridor	Dalian to Yingkou	G15	Express Way	150	150	National	28,053
		G202	Above level 2	216	216	National	11,524
	Yingkou to Shenyang	G15	Express Way	74	74	National	35,026
		G202	Above level 2	103	103	National	17,501
	Shenyang to Harbin	G1	Express Way	433	433	National	18,176
		G102	Above level 2	297	297	National	12,404
		G202	Above level 2	535	535	National	7,004
	Harbin to Heihe	G202	Above level 2	286	286	National	4,589
Korean Peninsula West Corridor	Dandong to Shenyang	G1113	Express Way	134	134	National	13,663
		G304	Above level 3	210	256	National	5,620
	Shenyang to Harbin	G1	Express Way	433	433	National	18,176
		G102	Above level 2	297	297	National	12,404
		G202	Above level 2	535	535	National	7,004

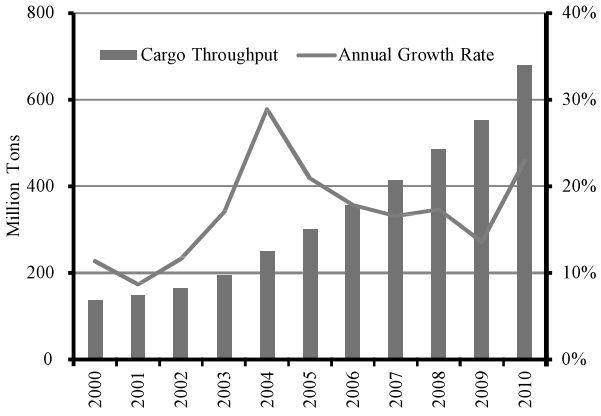
Source: Transport Planning and Research Institute, Ministry of Transport

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 3.1.

Dalian Port and Yingkou Port are the main 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

Figure 3.1 Growth in Cargo Throughput of the Liaoning Ports



Source: Consultant.

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

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, Fuyuan	
	----	10	Harbin		Harbin, Jiamusi, Huachuan, Suibin, Fujin.	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	Zhuengada buq, Ganqimao dao, Erenhot, Arihashate		
	----	2				Hohhot, Hailar

Source: Consultant.

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

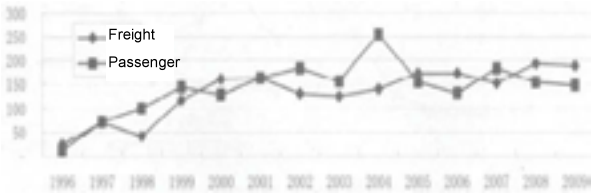
Quanhe Port

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 3.2). 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 3.2 Volume of Freight and Passengers through Quanhe Border-Crossing Port

(Unit: 1,000 tons, 1,000 persons)



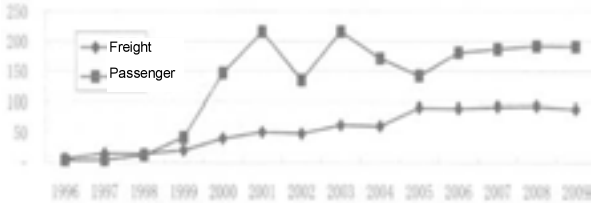
Hunchun Port

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 3.3). 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 3.3 Volume of Freight and Passenger passed in Hunchun Port

(Units: 1,000 tons, 1,000 persons)



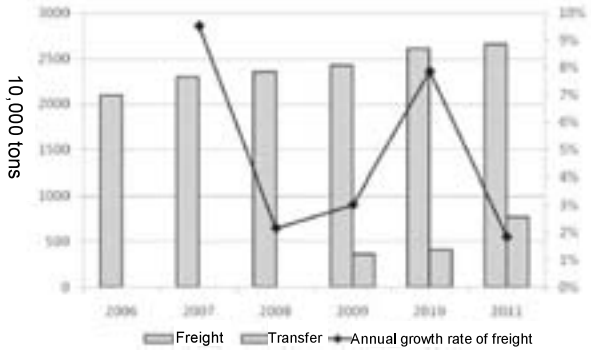
Manzhouli Port

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. 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 3.4). Among the freight volume, railway import 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.

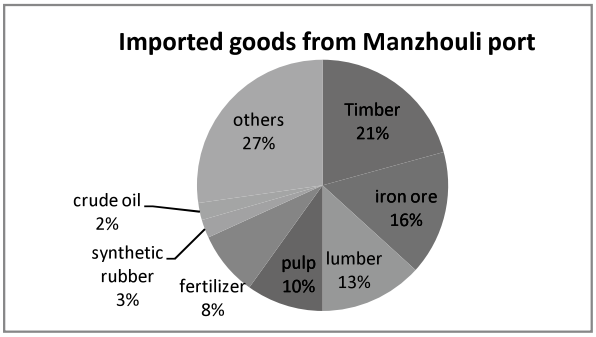
Figure 3.4 Freight Volume in Manzhouli Port from 2006-2011



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 3.5 and 3.6 show the percentage of imported goods and exported goods from Manzhouli Port in 2011.

Figure 3.5 Percentages of imported goods from Manzhouli port in 2011



Source: China Association of Port-of-Entry

Figure 3.6 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 3.7), Mongolia's Sumber Port is on its opposite side, this is an important channel for China carrying out economic 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 October 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 3.7 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 2,000 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 and 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/100km^3. 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	
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 (4,551 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.

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.

Photograph 3.1 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 (3,000 m^2) and frontier inspection station monitoring squadron barracks(1,700 m^2), closed port area, construction of parking lot (3,000 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).

Photograph 3.2 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.

Photograph 3.3 Tumen BCP -photo 1

Photograph 3.4 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 2,020 trucks and the standard-gauge station 1,712 trucks. The annual transshipment capacity has reached over 20 million tons.

Photograph 3.5 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.

Photograph 3.6 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.

Photograph 3.7 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.

Photograph 3.8 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.

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.

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(Table 3.7). 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.

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

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.

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

4.1.1 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.

4.1.2 Freight traffic

Table 4.1 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 645 million tons in 2000 to 1,273 million tons in 2010, which is two times and three times more than that in Inner Mongolia and in Jilin Province.

Table 4.1 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	Road1	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

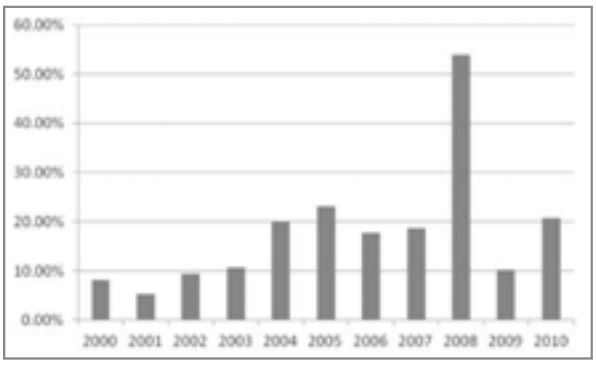
Table 4.2 Annual growth rates of freight traffic in major provinces in GTR 2000-2010

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 4.2), 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 Inner 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.

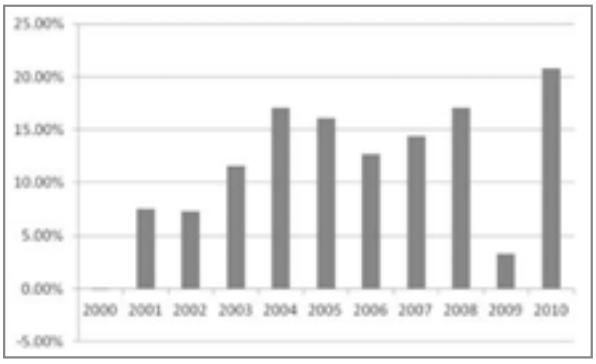
Figure 4.1 Growth rate of road freight traffic in Inner Mongolia 2001-2010



Source: Based on Inner Mongolia 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

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 3. 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 Russian side takes about 8 times longer than that in Chinese side and the clearance time for the passengers in Russia side is generally about 5 times longer 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 maximum 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

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 Difference in gauges and axle load requirements	Severe Moderate	Urgent Urgent	Connection of the rail link 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 needed.	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	To continue the negotiations and sign the agreement
	Difference in road vehicle size and loading standard	Moderate	Quite urgent	To 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

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.

5.2 Suggestions

I. Signing of transport agreements

- Expedite the signing of bilateral and multilateral transport agreements 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 is 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.

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 China and DPRK, being helpful to construct a big channel from Northeast Asia area to Europe. On 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.

GTI

大図們江地域（GTR）横断輸送回廊の現状と展望（中国区間）

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（要旨）

６本の大図們江地域（GTR）輸送回廊のうち、図們江輸送回廊、綏芬河輸送回廊、大連輸送回廊及び朝鮮半島東部輸送回廊の４本が中国領内を通過している。

大図們江地域にかかる省・区（黒龍江省、吉林省、遼寧省及び内モンゴル自治区）の総面積は199万平方キロメートル、人口は１億3,400万人で、それぞれ国全体の20.74％、10.01％を占める。最近、この地域ではかなりの経済成長が進んでいる。2010年、これらの省・区のGRPの合計額は４兆9,170億元（7,740億ドル）に達し、中国のGDPの12.3％を占めた。2001年～2005年の平均GRP成長率は12.1％で、国全体より1.8％高かった。2006年～2010年も高成長を続け、平均成長率は14.3％で、国全体より3.3％高かった。

外国貿易

2006～2008年に、黒龍江、吉林、遼寧、内モンゴルでは大幅に貿易額が増加した。2009年までの貿易増加率は黒龍江が最高で、平均で年率30％を超えた。世界金融危機のため、2009年には各地域とも貿易が減少し、前年比11.9～29.9％のマイナスとなった。しかし2010年には輸出入総額が増加し、増加率は28.2～57.1％を記録した。

輸入と輸出を比べた場合、遼寧及び黒龍江は輸出が輸入を大きく凌駕しているが、吉林及び内蒙古は様相が異なる。

中国国内のGTR地域（３省・１区）と主な北東アジア諸国との貿易を見ると、ロシアが黒龍江の貿易の大部分を占め、日本が吉林及び遼寧の主要な貿易相手国となっている。日本は2009年の吉林省の貿易総額の約20％を占めた。

輸送量の状況

大連港及び営口港は、この地域の主要なコンテナ港湾である。この２港のコンテナ取扱量は、それぞれ526万TEU及び334万TEUであった。このうち、日本航路が約90万TEU、韓国航路が70万TEUであった。

綏芬河口岸（道路）における財の輸入量は増加を続けてきている。鉄道の綏芬河口岸の貨物流動も着実に増加している。2011年の輸出入総額は23.35億ドルであった。輸出入総額のうち、輸出は10.25億ドル、輸入は13.12億ドルであった。

ハード・ソフトのインフラの立ち遅れにより、図們江輸送回廊（琿春）の発展が制約されている。琿春口岸経由の貨物輸送量は、1999年の2.1万トンから2005年の9.0万トンまで増加した。その後、増加は止まった。最近のデータによれば、2012年の１月から９月までの琿春口岸の輸出入貨物量は63,370トンに達し、出入国者数は247,753人であった。

中国最大の内陸口岸である満洲里口岸は2,660万トンの貨物を取り扱った。この貨物量のうち、鉄道口岸輸入量は1,610.4万トンであった。道路口岸の輸出入貨物量は65.8万トンだった。2011年の満洲里口岸の輸出入総額は64.4億ドルに達した。

インフラ能力

2010年末時点の中国東北地方の高速道路延長は6,900kmに達した。このうち、遼寧省の高速道路密度が最も高く、2005年からほぼ倍増した。

遼寧、吉林、黒龍江及び内モンゴル東部の鉄道延長は16,885.6kmで、国内の鉄道営業延長の19.5%を占める。綏芬河輸送回廊と大連輸送回廊の鉄道インフラ状況は、相対的に良好である。

綏芬河口岸の鉄道駅は、年間1,000万トンの貨物積替能力及び100万人の旅客処理能力を持つ。満洲里鉄道口岸の年間積替能力は2,000万トンを超えるに至っている。

大連港は７か所の専用港区と50を超える大水深バースを備える。

法的環境

中国は、モンゴル、ロシア及び北朝鮮との間でそれぞれ二国間の道路運送協定を締結している。さらに中国は、ザルビノ港とポシェット港の利用に関してロシアとの間で、羅津港と清津港の利用に関して北朝鮮との間で協定を締結している。中国とロシアとの間には、計６件の道路運送に関する協定と計10件の水路運送に関する協定が締結されている。中国とモンゴルの間には２件の道路運送に関する協定が締結されている。中国と北朝鮮の間では、計２件の道路運送に関する協定と計10件の水路運送に関する協定が締結されている。

制約及び課題

インフラ面での主な問題の一つとして、GTR輸送回廊の一部区間の道路等級が低いことがあげられる。

中ロ間で鉄道軌間が異なることにより、積替コストが40～50％増加し、鉄道の競争力を押し下げている。ロシア側の駅から綏芬河駅の区間、綏芬河駅から次の駅までの区間の年間輸送能力は、いずれも1,000万トンしかない。しかしながら、現状の綏芬河駅での発着、積替貨物量は1,000万トンを超えている。したがって、駅では常に貨物が滞貨している。

円滑な輸送を制約するものとして、過剰な税関業務手続き、口岸検査要員配置の不足や短時間の口岸開庁時間、運転手や車掌らの査証手続きに要する期間の長さ、道路運行車両の大きさや積載基準の違い、限定された貨物運送ルートや対象地域、国際運送保険及び補償制度の欠陥、未成熟のロジスティクス産業などが挙げられる。

提言及び取るべき措置

提言としては、運送協定の締結、規則・基準の調整、国境口岸整備の強化と通関効率性の向上、運輸市場開放の拡大と同等な輸送環境の整備、輸送効率の向上と運輸・ロジスティクスコストの削減が挙げられる。

代表的なプロジェクトとしては、吉林－琿春間鉄道旅客専用線、中ロ同江鉄道大橋プロジェクト、琿春浦項現代国際物流パークプロジェクト、北東アジア（琿春）国際貿易･物流集散配達センタープロジェクト、中ロ琿春－カムショーバヤ間1,000万トン級国際積替駅建設プロジェクトなどが挙げられる。

［英語原稿をERINAにて翻訳］

GTI

Enhancing Northeast Asia and Mongolia Economic Cooperation through Transport Network Development

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1. Introduction:

NEA cooperation. As is well known, Northeast Asia is a home to the 4 of the world's major powers, 2 of the 5 permanent members of the UN Security Council and 2 of the largest economies of the world. It is also a home to one of the world's hottest flash points. The situation in the sub-region remains fragile, although it is relatively stable, on the whole thanks to the determination and efforts of the countries of the sub-region.

This area of the world includes countries with very diverse political and economic conditions. The basis of an international economic cooperation framework could be a combination of rich mineral resources of Mongolia and investment capital and advanced technology from Japan and South Korea, as well as a considerable pool of workforce from China (PRC) and North Korea. Priority should be given to the development of those economic relations which involve the countries concerned directly into international cooperation.

Cooperation between the countries in the region should be based on the principles of reciprocity, sovereignty, territorial integrity, non-interference into internal affairs and removal of restrictions in trade and economic cooperation.

Table 1.1 Mongolia's foreign trade

	Export			Import		
	2009	**2010**	**2011**	**2009**	**2010**	**2011**
Total	**1888 385.1**	**2 908 502.2**	**4 780 350.5**	**2 137 673.5**	**3 200 053.3**	**6 526 882.4**
NEA	**1 414 023**	**2 499 662.6**	**4 449 328.7**	**794 553.8**	**1 355 282.5**	**2 851 436.7**
DPRK	-	25.5	-	47.1	798.5	740.0
ROK	15 458.1	30 519.9	1 896.1	155 102.2	181 781.9	350 648.5
PRC	1 393 906.7	2 466 265.5	4 400 735.7	538 582.6	970 976.0	2 007 572.2
Taiwan	94.0	182.0	10.0	3 768.4	5 238.1	8 966.5
Japan	4 564.2	2 669.7	10 694.6	97 053.5	196 488.0	483 509.5

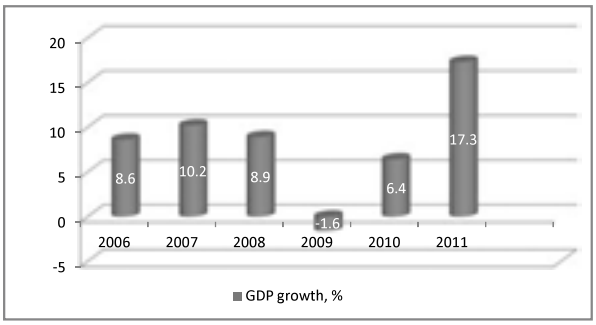
Source: National Statistical Office, Mongolia

Mongolia's foreign trade is mainly carried with NEA countries (see table 1.1). Mongolia believes that the development of multilateral cooperation in NEA is of special significance for the economic development, strengthening cooperation and mutual confidence among the countries of the sub-region.

1.1 Mongolia's Macroeconomic Review

The economy of Mongolia did return to solid growth in 2011. Growth for 2011 has reached 17.3%, up from 6.4 % in 2010, and is being spurred by the development of large copper, coal and gold mining projects. High GDP forecasts are based on (i) continued strong flows of foreign direct investment, which has more than doubled between 2010 and 2011; (ii) continued rapid expansion of the mining sector, especially coal; (iii) public investment being raised by a factor three; and (iv) strong consumer demand due to the disbursements of cash to the citizens ahead of the 2012 elections.

Figure 1.1 GDP growth, Mongolia



Source: Mongolian Statistical Yearbook, 2011

The coal sector has become the fastest growing sector, surpassing copper exports in becoming the top export earner for the country. The PRC, the largest thermal coal consumer in the world, remains the only destination for coal from Mongolia. It is expected to grow even faster in the near future when large coal mining projects start production. At US$ 11.3 billion, Mongolia's external trade grew 3.8 times in last 5 years (see table 1.2). Amount of import is 39% higher than the amount of export.

Figure 1.2 Share of GDP, Mongolia

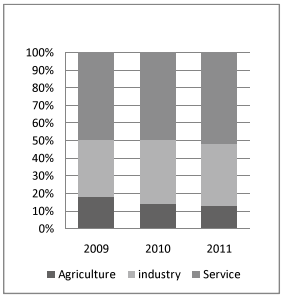
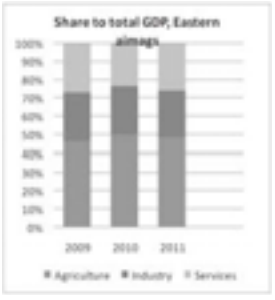


Figure 1.3 Share of GDP, Eastern aimags



Source: Mongolian Statistical Yearbooks

Equipment, machineries and electrical appliances are the most imported products as the accelerating economy requires fuels for growth. On other hand, led by coal, mineral products account for most of the export. As of 2011, 92% of Mongolia's total export went to PRC and 32% of the total import came from the same country.

Table 1.2 Foreign Trade of Mongolia over the last 10 years, Million US$

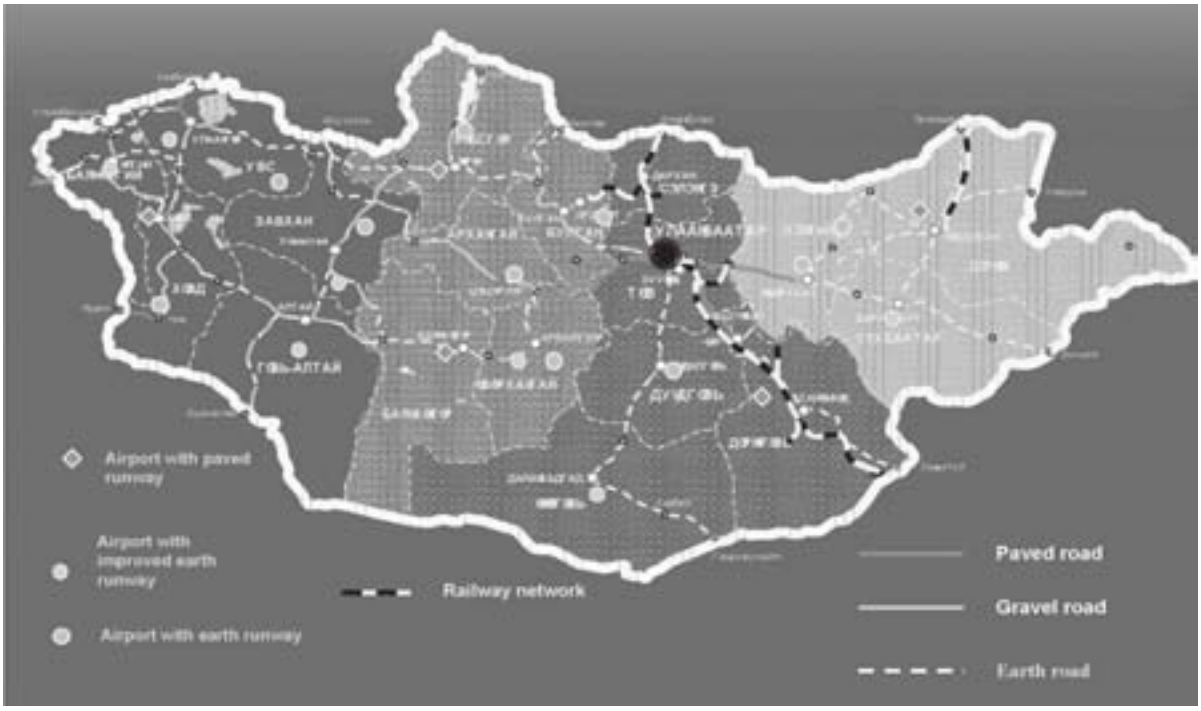
Year	Exports				Imports				Trade balance
	Russia	PRC	Others	Total	Russia	PRC	Others	Total	
2002	48.09	220.5	255.57	524	237.63	167.7	313.64	690.74	-166.78
2003	41.2	287	287.7	615.9	265.4	196.3	339.3	801	-185.1
2004	20.6	413.9	435.2	869.7	341.9	257.2	422	1,021.1	-151.4
2005	27.9	514.2	523.5	1,064.9	417.9	307.3	459.3	1,184.3	-119.4
2006	45.1	1.050.2	447.5	1,542.8	547.8	365	422.2	1,435.0	107.8
2007	58.5	1,411.4	477.3	1,947.2	745	568.9	753.9	2,061.8	-114.6
2008	86.3	1,635.9	812.3	2,534.5	1,242.3	898.7	1,103.5	3,244.5	-101
2009	68.2	1,393.9	423.3	1,885.4	772.8	538.6	826.3	2,137.7	-252.3
2010	82.7	2,466.3	359.5	2,908.5	1,096.7	970.9	1,132.4	3,200.0	-291.5
2011	95.9	4,400.7	283.9	4,780.5	1,595.9	2,007.6	2,923.1	6,526.9	-1,746

2. Infrastructure capacity review

2.1. Transport sector of Mongolia

The transport sector in Mongolia is divided over four modes - railway, roads, air, and inland waterway. As can be seen in Table 2.1 in freight transport, the railway is the

Figure 2.1 Transport Networks of Mongolia



Source: Ministry of Roads, Transport, Construction and Urban Development, Mongolia

Table 2.1 Summary Transportation Statistics for Mongolia

	2007	2008	2009	2010	2011
Freight (Thousand tones)	23,281.6	23,904.4	24,729.7	29,415.9	43,956.6
By Rail	14,072.6	14,646.9	14,164.5	16,753.2	18,327.4
By Road	9,207.1	9,255.7	10,563.8	12,610.2	25,635.3
By Air	1,887.2	1,847.0	1,369.3	1,641.6	2,930.9
Freight (Million TKM)	9,030.2	9,051.4	8,981.3	12,106.4	16,300.2
By Rail	8,360.7	8,261.4	7,817.0	10,286.7	11,382.2
By Road	661.9	782.1	1,160.7	1,834.0	4,910.3
By Air	7,720.6	7,926.5	3,666.7	4,169.5	7,708.6
Passengers (Million)	209.9	231.6	232.4	250.7	296.2
By Rail	4.5	4.4	3.1	3.5	3.8
By Road	205.0	226.9	229.0	246.7	291.8
By Air	0.4	0.4	0.3	0.4	0.6
Passengers (Million PKM)	3,263.1	3,607.3	3,173.1	3,607.4	4,696.1
By Rail	1,406.4	1,400.5	1,003.1	1,220.0	1,400.1
By Road	869.7	1,215.0	1,535.9	1,480.2	2,321.8
By Air	987.1	991.9	634.1	907.2	974.1

Source: *Mongolia Statistical Yearbook 2011*, National Statistical Office, Ulaanbaatar 2011

dominant mode both in terms of tones and tone-kilometers. With the historic significance of mining industries in Mongolia, the railway has been the primary mode of transport for the heavy and bulk freight. Given the poor condition of the roads, the high cost of air transport, and the limited range of the waterways, the railway has had little competition in freight transport from other modes. As shown in Table 2.1, the majority of freight traffic in Mongolia is handled by the railway (approximately 86%).

The rail share is very high compared to other developing countries, where highways carry the majority of the freight traffic in terms of tones (e.g. in PRC highways carry 76.5% of freight traffic whereas railways only carry 13.1%). This can mainly be attributed to the bad conditions of the highways in Mongolia.

Road network. Mongolia's road network overall (including both state and local roads) totals approximately 49,000 kilometers, connecting 21 major cities and towns and 160 smaller villages (soums and bags) (Figure 2.1). Roads in Mongolia are administratively classified into two: (i) State Roads, which are intended to connect Ulaanbaatar with aimag (province) centers, important towns, and important border crossings; and (ii) Local Roads, which are intended to connect aimag centers with other aimag and soum centers.

There are approximately 11,063 km of state roads and 38,187 km of local roads in Mongolia. Most of the roads in Mongolia are poorly maintained gravel or earth roads and as much as 75.6% of state roads and 97.7% of local roads are earth roads. Only about 1,670 kilometers of state and local roads are classified "paved", while an additional 3,820 km of state and local roads are classified as "gravel" and "improved earth road".

It is recognized that development of key infrastructure such as roads will contribute to Mongolia's global integration and improve the living conditions of the poor by improving access to goods and services. One measure of the growing importance of roads is reflected in the strong growth in vehicle ownership in Mongolia since 1990. The largest growth was observed in private car ownership, which grew at an annual average rate of 23.43%. This is followed by publicly-owned cars, which grew at an average annual rate of 18.85% during the same period.

Rail network. One of the primary weaknesses of railway transport in Mongolia is its limited coverage. The railway network extends only 1,815 km, principally in the north-south direction connecting to the Russian and Chinese Railways, respectively. The Mongolian main railway line passes through Ulaanbaatar, and connects the Chinese rail system in the south with the Russian Trans-Siberian line in the north, a distance of about 1,400 km. The transport network in eastern Mongolia, which also shows the Choibalsan-Ereentsav rail line, is presented in Figure 2.1. The second rail line in Mongolia is in eastern Mongolia. This line is 237.6 kilometers long, is broad gauge, and runs from Choibalsan to the border with the Russian Federation at Ereentsav. From there the rail line continues on for another 90 kilometers to Borzya, where it links with the Trans-Manchurian Railway. From here a connection can be made to the Trans-Siberian Main Line, which is 247 kilometers away. The distance from Borzya to the Russian terminal station at Zabaikalsk at the Russian Federation-PRC border is 117 kilometers. The Choibalsan-Ereentsav line was constructed in 1939. Rail type R-50 and wooden sleepers are used for this line. The maximum gradient is 9% and the minimum curve radius is 300 m. There are only six stations along this line and the capacity of the railway is seven train pairs a day. Due to limited freight being generated along the line and the decrease in trade between the Russian Federation and Mongolia, this line is currently operating below capacity.

In 2010 The State Great Khural (Parliament) of Mongolia has endorsed the State policy on Railway Transportation (Figure 2.2). According to the Policy approximately 5,683.5 km of main railway composition shall be newly built in Mongolia in 3 stages.

Figure 2.2 Railway network development plan of Mongolia

The first stage (approximately 1,100 km in total) is:

- Dalanzadgad -Tavantolgoi-Tsagaan suvarga-Zuunbayan 400 km;
- Sainshand-Baruun Urt -350 km;
- Baruun Urt-Khuut - 140 km;
- Khuut-Choibalsan - 150 km.

The rail lines will have broader gauge of 1,520 mm with axle load of 25 tons per axle.

2.2. Border Crossing Points (BCPs)

Zamyn Uud is the largest border crossing in Mongolia, both in terms of general cargo and overall tonnage. Besides petroleum products, 90% of the total import, and 75% of the total export pass through Zamyn-Uud. Transit traffic is also significant. The BCP is located on the Trans-Mongolian Railways, which links up with the Trans-Siberian Railways in the north and the rail line to Beijing and Tianjin in the south. Mongolia has transit arrangements with the PRC through the port of Tianjin. As a result, much of their third-country trade is routed along this corridor. In addition, the PRC is Mongolia's main trading partner and most bilateral general cargo traffic goes through this BCP.

In general, there are relatively low numbers of passengers using the borders, other than the drivers of the coal and general cargo trucks. The exception is Zamyn Uud, which has significant numbers of people engaging in cross-border trade, many returning the same day by road or rail. There is also some tourist traffic, mainly southbound, but the amount is small and seasonal.

In 2010 ADB approved the Regional Logistics Development Project at this location that is designed to handle much of the rail traffic, especially containers. This is a major project for a multimodal terminal costing $71.59 million, of which $40 million would be funded by an ADB loan. Given ADB's heavy investment in the rail border sector, it was considered the primary focus of the assessment should be on the residual road BCP activities, covering both passenger and freight traffic, which would not be enhanced by this development.

3. Future Development Potential

3.1 Review of on-going/planned economic development projects likely to impact future traffic

State Policy on Railway Transportation endorsed by the State Great Hural (Parliament) of Mongolia says that the issues of broadening the main railway composition, direction to build new railway and processing and exporting of mining products shall be resolved in close relation.

Nowadays, there are 3 on-going mega-projects that have great impact on future traffic:

1) Tavan Tolgoi (TT) coal mine project

In 2020, volume of the unprocessed products of the mine would be 67.7 million tons. This mine has 6 operational sites:

- West Tsanhi (owned by Erdenes Tavantolgoi): 15.0 million tons per year;
- East Tsankhi (Erdenes Tavantolgoi): 15.0 million tons per year;
- Ukhaa khudag (Energy resources): 15.2 million tons per year;
- "Small" Tavantolgoi (Tavantolgoi LC): 8.0 million tons per year;
- West Naran (Energy Resources): 10.0 million tons per year;
- Tsant Uul (Hunnu):4.5 million tons per year.

2) Nariin Sukhait (NS) coal mine project

In 2020, volume of the unprocessed products of the mine would be 30.5 million tons. This mine has 3 operational sites:

- Ovoot tolgoi, Sumber (South Gobi): 14.0 million tons per year;
- Nariin Sukhait (MAK): 15.0 million tons per year;
- Nariin Sukhait (MAK joint venture): 1.5 million tons per year;

3) Oyu Tolgoi (OT) copper mine project

Expected production volume is 2.1 million tons of copper concentrate.

On the basis of the washing and crashing outcomes of each mine, it is expected that in 2020 total coal exploration would reach up to 98.2 million tons 66.8 million tons of which will be transported by rail.

Exploration of Tavantolgoi mine will reach 46.5 million tons per year, of which:

- 29.7 million tons - coking coal;
- 16.8 million tons - steam coal.

Exploration of Nariin Sukhait would be 20.3 million tons per year, of which:

- 14.1 million tons -coking coal;
- 6.2 million tons - steam coal

3.2 . Traffic and Transport demand forecasting

3.2.1. Road traffic forecast

For planning and designing roads, traffic along the corridor can be classified as normal traffic, diverted traffic and generated traffic. **Normal traffic** is traffic that currently uses the road on both directions between the origin and destination. **Diverted traffic** means traffic transferred from other routes after the construction of the road not changing its origin and destination. **Generated traffic** is newly created traffic due to economic growth and demand increase after construction of the road. In general, traffic forecast can be undertaken on the basis of the various factors such as population growth, GDP growth, increase of vehicles, volume of the industrial and agricultural products, and consumption of the fuel and so on.

Simple forecasting technique suggested to use the following variables: income growth measured by GDP/capita growth rate, population growth rate and income elasticity, price and cross price elasticity. The equation which is often used is:

For passenger transportation:

$$GRPT = [\{(GDPpc \times IEp)/100 + 1\} \times (PGR/100+1) - 1] \times 100 \quad (1)$$

Where: GRPT = growth rate of passenger traffic per year;
GDPpc = Growth rate of GDP/capita;
IEp = GDP/capita traffic elasticity;
PGR = population growth rate.

Where: IEp = GDPa/Q (GDPa: GDP/capita and Q is traffic volume.)

For freight transportation:

GRFT = GDP × IEf **(2)**

Where:

GRFT = annual average growth rate of freight traffic;

GDP = Annual growth rate of GDP;

IEf = GDP/capita freight traffic elasticity.

GDP/capita traffic elasticity is fluctuated between 1.2 - 2.0 for most developing countries. As for Mongolia, it is higher that this fluctuation depending on long distance traffic and poor road conditions. It is determined by the Feasibility studies on road construction, conducted by the ADB, WB and Kuwait foundation. For example, in the Transport Rehabilitation project funded by WB and Road development project funded by ADB the GDP/capita traffic elasticity was used as for passenger transportation 1.4-1.8, and for freight transportation: 1.0-1.5. However, in the prefeasibility study of the Millennium Road project it was taken: for passenger transportation -1.4-2.0 and for freight transportation- 1.1.-1.5.

On the basis of the above mentioned methodology and gathered data growth rates of the passenger and freight traffic between the sections of the road corridor 1a would be as follows (Table 3.1):

Accordingly, traffic would increase per year by 19.9-25.2% for passenger transportation, for freight 8.0-10.7%-freight transportation until 2025. However in the project area, especially between Choibalsan (possibly Khuut) and Sumber BCP (Nomrog bridge) a new railway line is planned to be built. Considering this situation, the following growth rates (Table 3.2) have been used for traffic estimates through Sumber BCP (Nomrog bridge).

On the basis of the above future growth rates, daily average normal traffic between 2012 and 2025 has been estimated (Table 3.3). In addition, diverted and generated traffic have been shown as well.

If construction of the road section is completed in 2015, current daily traffic will be doubled reaching 899 vehicles. In 2025, average daily traffic will be increased 10.9 times reaching up to 3,632 compared with 2015 (Table 3.3).

During the field trip along the Road Corridor 1a, the revision traffic count between the cities has been conducted in order to verify the above traffic survey (Table 3.4).

Table 3.1 Annual growth rates of the passenger and freight traffic

Years	Growth rate			GDP/capita traffic elasticity		Growth percentage	
	GDP	Population	GDP/capita	Passenger traffic (IEp)	Freight traffic (IEf)	Passenger traffic	Freight traffic
2015	7.7	2.0	5.7	1.75	1.39	25.2	10.70
2020	7.0	2.0	5.0	1.62	1.35	23.5	9.45
2025	7.0	2.0	5.0	1.35	1.15	19.9	8.05

Table 3.2 Future growth rates of passenger and freight traffic

Type of Vehicles	2012-2015	2016-2020	2021-2025
Car Small/Medium	5.0	23.0	15.0
Jeep 4WD	5.0	23.0	10.0
Truck Light	3.0	9.0	8.0
Truck Medium	3.0	9.0	8.0
Truck Heavy	3.0	9.0	8.0
Truck Articulated	3.0	9.0	8.0
Bus Light	5.0	23.0	15.0
Bus Medium	5.0	23.0	15.0
Bus Heavy Duty	5.0	23.0	15.0
Weighted average	**4.1**	**19.7**	**13.3**

Table3.3 Traffic forecast between Choibalsan and Sumber BCP (Nomrog bridge)

Years	Cars Small/ Medium	Jeep 4WD	Truck Light	Truck Medium	Truck Heavy	Truck Articulated	Bus Light	Bus Medium	Bus Heavy	Total of the Normal Traffic	Diverted traffic	Generated traffic	Total traffic
2012	245	61	65	24	24	8	33	2	2	464	0	0	464
2013	257	64	68	25	25	9	34	2	2	487	0	0	487
2014	270	67	72	27	27	9	36	2	2	512	0	0	512
2015	332	83	78	29	29	10	44	3	3	610	191	98	899
2016	408	102	85	32	32	11	54	3	3	729	210	119	1,058
2017	502	125	93	34	34	12	67	3	3	874	230	145	1,248
2018	617	154	101	38	38	13	82	3	3	1,050	235	176	1,460
2019	759	189	110	41	41	14	101	4	4	1,263	245	214	1,722
2020	934	233	120	45	45	16	124	4	4	1,524	249	261	2,034
2021	1,074	267	130	48	48	17	143	5	5	1,737	260	213	2,210
2022	1,235	307	140	52	52	18	164	5	5	1,981	275	244	2,499
2023	1,421	354	152	56	56	20	189	6	6	2,259	290	279	2,828
2024	1,634	407	164	61	61	21	217	7	7	2,578	310	319	3,207
2025	1,879	468	177	66	66	23	250	8	8	2,944	323	365	3,632

Source: Preliminary study on Road Section between Choibalsan and Sumber-Degee River, funded by the National Development and Innovation Committee, Mongolia and Modified by the Consultant on the basis of the traffic count revision during the field survey in April, 2012

Table 3.4 Summary of Traffic Counts by O/D survey Site- Two Directions- April 22-26, 2012

Road section O/D	**Car**	**Jeep**	**Light truck**	**Medium truck**	**Heavy truck/ articulated truck**	**Minibus**	**Medium bus**	**Heavy bus**	**Motorcycle**	**Total**	**Daily traffic along the Road corridor**
Ulaanbaatar toll gate-Nalaikh/ Nalaikh-UB toll gate	71/51	12/11	14/18	5/3	7/5	7/4	3/5	1/0	0/0	120/97 (an hour)	2604
Nalaikh-Baganuur/ Baganuur-Nalaikh	53/46	16/12	17/16	3/5	4/6	6/7	2/0	0/0	3/1	104/93 (an hour)	2364
Baganuur-Undurkhaan / Undurkhaan-Baganuur	22/29	10/15	25/29	12/17	4/6	14/19	3/3	0/0	4/4	94/122 (3hour)	864
Undurkhaan- Choibalsan/ Choibalsan-Undurkhaan	26/14	8/10	7/5	4/2	3/5	2/4	1/3	1/1	2/4	54/48 (4 hour)	306
Choibalsan-Sumber (Nomrog)/ Sumber Nomrog)-Choibalsan	17/12	8/7	7/6	3/4	3/4	2/3	3/2	0/0	3/3	46/41 (5 hour)	208
Total											**6138**

3.2.2 Rail traffic forecasts

Rail traffic is connected mainly with minerals transportation in Mongolia. Therefore, potential mining projects should be considered in order to forecast transportation demand for the Corridor.

The Mines of principal interest are indicated in the map in the Figure 3.1 and Table 3.5. Significant copper deposits are found at Oyu Tolgoi and Tsagaan Suvarga. The coal deposits at Tavantolgoi and Nariin Sukhait are known to be particular significant. Tavan Tolgoi strategic coal deposit covering totally 80 thousand hectors area is located in the Ulaan nuur area of Tsogttsetsii soum, Omnogobi province, with approving reserves of 1.5 billion ton coking and energy coal, and possible exploitation reserves of 4.9 billion ton. Totally 13 companies and consortiums had expressed their interest to invest in Tavan Tolgoi coal deposit after the invitation, based on the principals and guidelines of the State Great Khural, had been sent to the companies with financial ability and experience in mining sector. They are South Korean consortium of 11 companies, Russian consortium of 3 companies, USA, China, Japanese consortium, India, Brazil, Australia and Switzerland. The

Figure 3.1 Important Mines in Mongolia

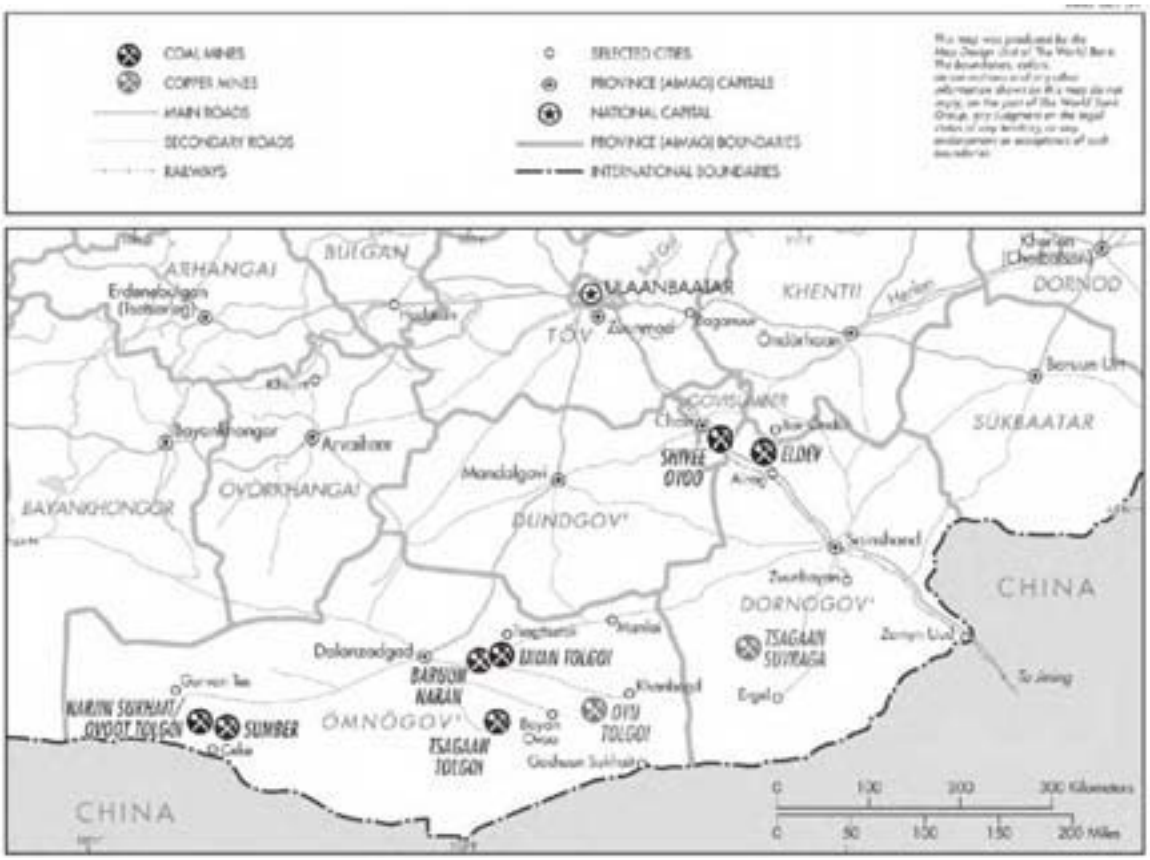


Table 3.5 Potential Major Mines in Southern Mongolia

Mine	Minerals	Life, years	Production (thousand tons/year)	Employment Estimate	Start date Estimate
Tavan tolgoi	Coal	200+	15,000	1500	2012
Ukhaakhudag	Coal	40	10,000	1000	2009
Baruunnaran	Coal	20	6,000	500	2012
Tsagaan tolgoi	Coal	20	2,000	150	2015
Nariin Sukhait	Coal	40	12,000	150	2015
Ovoot tolgoi	Coal	50	5,000	400	2008
Sumber	Coal	50	5,000	400	2015
Shivee Ovoo	Coal	200+	14,000	600	2015
Oyu Tolgoi*	Copper	50	2,000	4000	2012
Tsagaan Suvrraga*	Copper	20	250	1000	2012
Total				**7800**	

Note: *- Production figure is for copper concentrate (30% copper)

initial introduction is made for the representatives of them and the Working group with consultants is reviewing and comparing the proposals received from them. The second negotiation will start after the infrastructure issue will be resolved.

Demand of NEA for coal. Northeast Asia demand for cocking coal would be 168 million tons in 2020. This is 5 times bigger than amount of processed coal in Tavantolgoi (Figure 3.2).

Coal deposits are scattered all over the country and coal in the past was mostly used in thermal power facilities before becoming a major export commodity. However, it is in the south that the major developments are taking place. The Government-controlled Tavan Tolgoi mine is situated in South Gobi desert 98 km east of Dalandzadgad. It has been in operation since 1967 and has estimated reserves of 1.9 billion tons of coking coal from a total of 4.5 billion tons of reserves and could produce as much as 20 million tons per year. The mine is situated 400 km from the nearest railway, which poses a logistical problem. Plans for the development of a new rail link, either directly south or eastwards to connect with the existing trans-Mongolian

Figure 3.2 Demand for coal in Northeast Asia, million tons per year, 2020

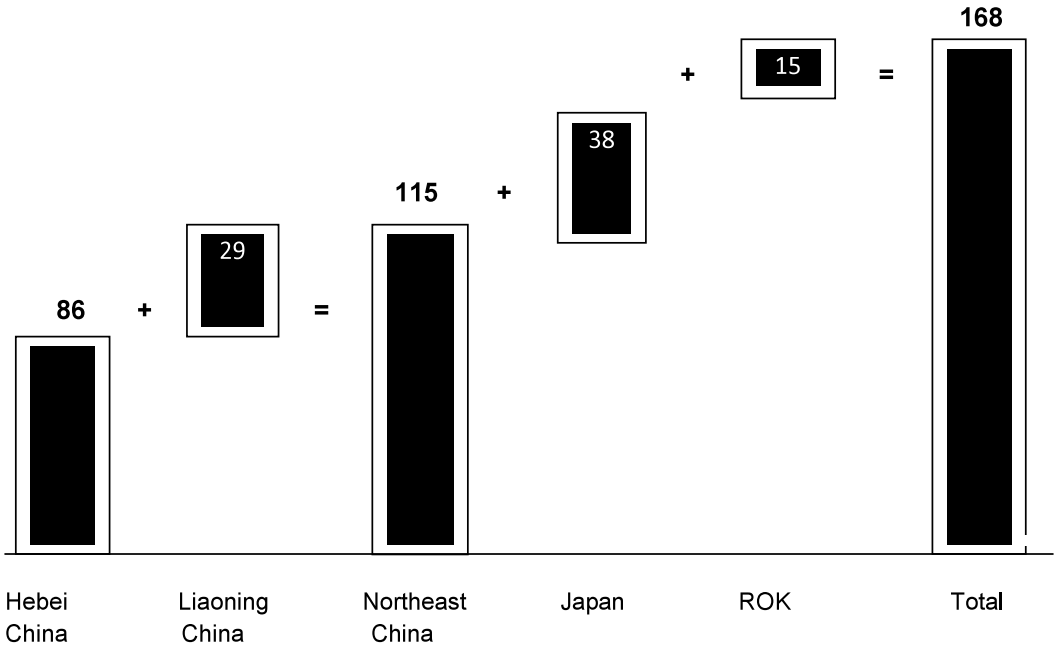


Figure 3.3 Mineral transportation flow, million tons

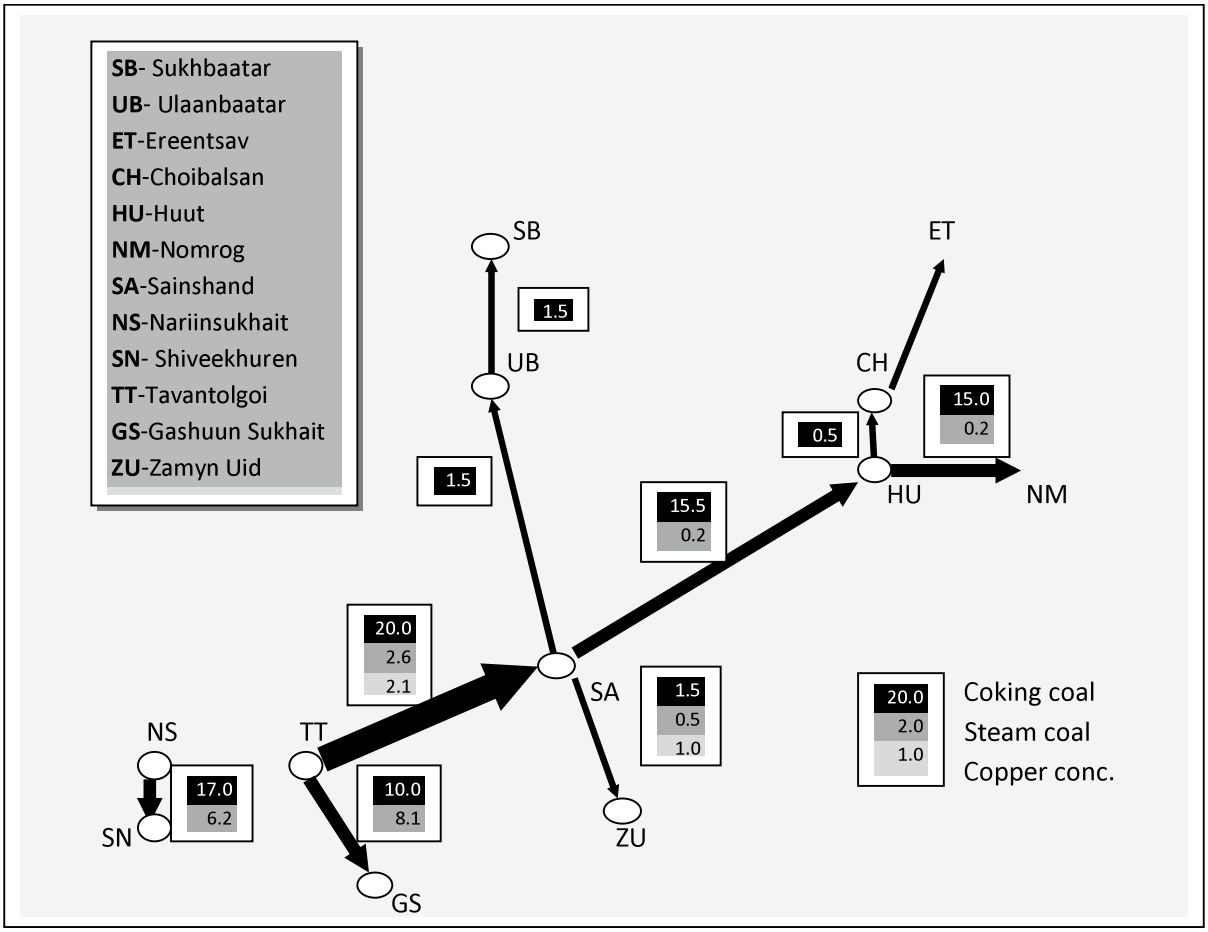


Figure 3.4 Margin from Mongolian coking coal export to China

In USD

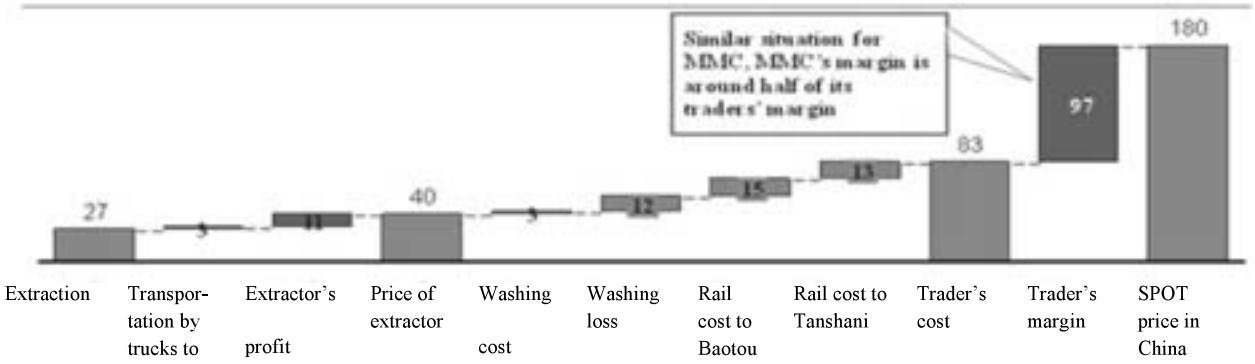
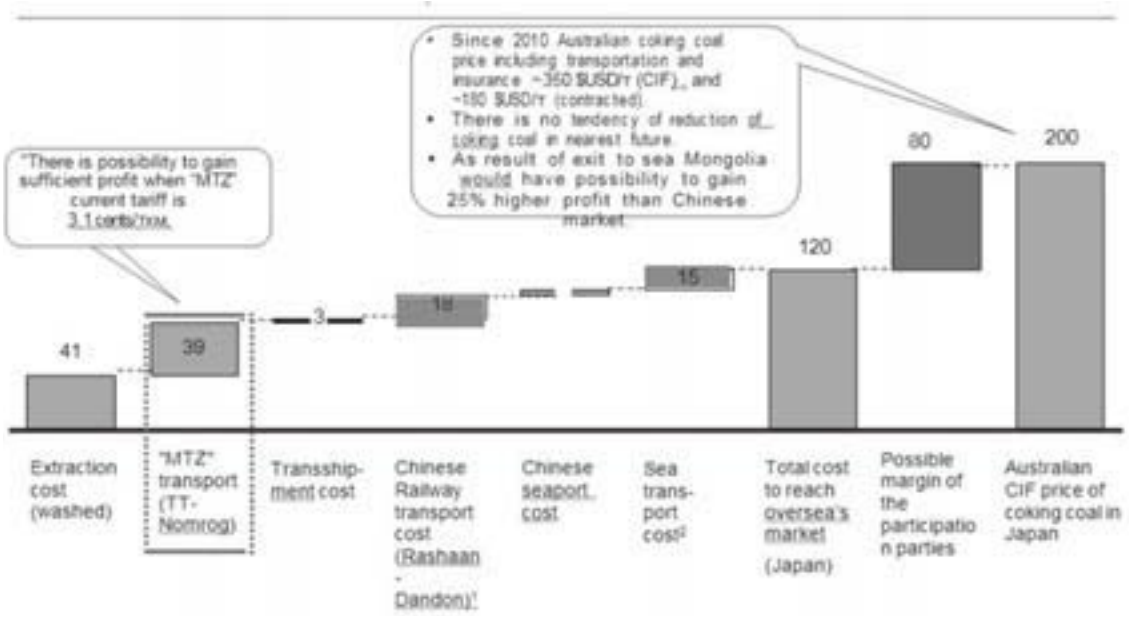


Figure 3.5 Possible profit margin from Mongolian coking coal export

In USD



Source: Consulting company-Boston group

line, have yet to be firmed up.

Approximately 100 km south of Tavan Tolgoi are the Tsagan Tolgoi mines and about 200 km to the east are the Nariin Sukhait coal deposit and the Ovoot Tolgoi coal development. The Ovoot Tolgoi coal development has estimated surface coal reserves of 114 million tons. The project is situated next to the existing MAK/Qinhua coal mine, approximately 45 km north of the Mongolian/Chinese border and the Chinese town of Ceke. A major coal basin runs 120 km east and west of Nariin Sukhait and many other coal mines in the basin have significant reserves that would eventually be exploited.

As mentioned earlier that approximate volume of coal to be transported by rail in 2020 would be 66 million tons. This volume of coal will be distributed to following routes (see Figure 3.3):

Per year- 23.2 million tons from Nariin Sukhait to Shivee Khuren;

Per year- 18.1 million tons from Tavantolgoi to Gashuun Sukhait;

Per year- 24.7 million from Tolgoi to Sainshand;

Per year- 15.7 million from Sainshand to Khuut;

Per year- 15.2 million tons from Khuut to Sumber BCP (Nomrog);

Per year- 0.5 million tons from Khuut to Choibalsan.

According to our estimates, 15.2 million tons coal would be delivered mainly to Chinese market. However, some shares of the coal would be exported to Republic of Korea (ROK) and Japan as well.

On the basis of the interviews' of officers from the freight forwarders, transport operators and railway specialists, we assume that very rough shares would be as follows:

Eastern China: 10.6 million tons (70%) per year
ROK: 2.3 million tons (15%) per year
Japan: 2.3 million tons (15%) per year.

Above share is very rough and it will depend on transportation costs, market prices and so on.

Figure 3.4 and 3.5 show margin from Mongolian

Table 3.6 Tourism Products for Eastern Mongolia

Tourism Resources	Existing and Potential Products	Potential Market Segments By Activity
Unique steppe flora and fauna, especially Mongolian gazelle	Steppe and Flora Tours	Ecotourism, education, photography, and research
Unique landscapes and lakes of Sukhbaatar and Dornod Aimags	Adventure 4WD Safari Tours	Hard and Soft adventure travel based on walking, climbing, riding, swimming, fishing, photogrpahy, and visits to herdsmen's ger camps
Historic and archeological sites of the Mongols and other groups in Hentii, Dornod, and Sukhbaatar	Archeological Discovery Tours	Culture, research, education, and ecotourism
Culture of nomadic herdsmen and unique steppe landscape	Soft Adventure, Sightseeing Tours	Sightseeing and photography based on visits to herdsmen; optional horseback riding tours and hiking tours
Buir, Ganga, and Sumiin Steppe lakes	Lake Resort Facilities; Fishing Tours	Rest, relaxation, entertainment, and medical treatments; special interest in freshwater fishing
Hunting Areas at Khenti-Batashreet, Dornod-Bayan Uul, Dornod-Matad-Sumber, and Sukhbaatar	Hunting Expeditions	Hunting Segments
Unique Landscapes, flora and fauna, lakes	Incentive Tours	Team building exercises in unique environment: horseback riding, paragliding, survival games
Unique Landscapes, flora and fauna, lakes, and nomadic lifestyle	Caravan Tours	Hard and Soft adventure travel based on camping, visiting herdsmen's gers, photography

Source: ***Marketing and Product Development;*** UNDP; WTO Project RAS/00/088; Madrid 2002

coking coal to China (current situation) and possible profit margin from its export to Japan respectively. Margin for coking coal shipments to markets other than China is positive and enables diversification.

3.2.3 Tourism demand in the project area

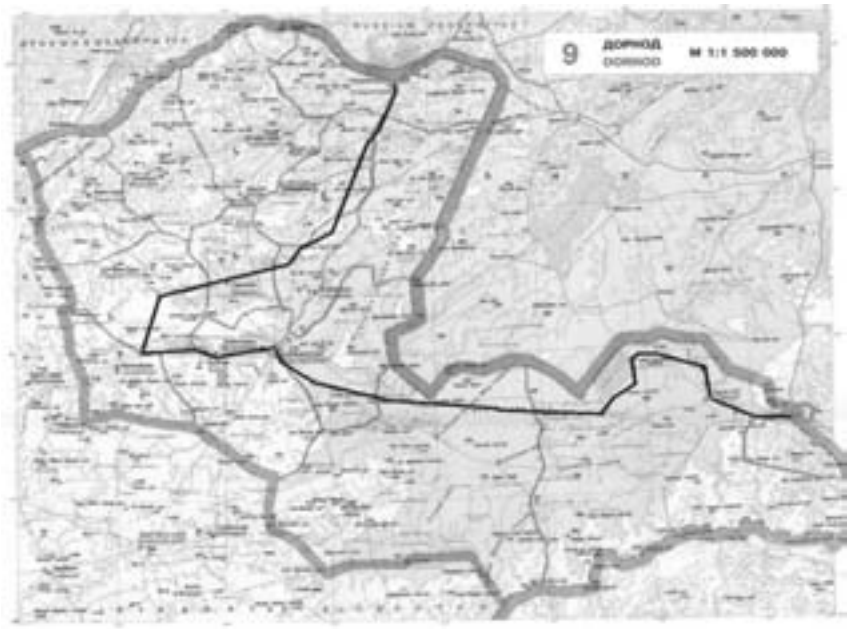
The tourism sector, including especially ecotourism, is projected to be a key driver of sustainable economic development in the Project Area. The minerals and petroleum sector development and resulting cross-border trade will take 7 to 10 years to materialize based on the need for further exploration and development of institutional and transport infrastructure to support a viable export-oriented industry. Therefore, in the short-term cross-border tourism appears as the only viable option, particularly in light of the environmental assets and both governments' interest in their preservation on both sides of the river.

Natural and Cultural Assets. As shown in Table 3.6, the eastern region of Mongolia has an abundance of natural and cultural resources. Each aimag (province) has its own mix of natural and cultural sites. For example in Hentii, a small town called Dadal, located near the Mongolian-Russian border, has become popular in recent years, as it is said to be the birthplace of Chinggis Khan. There is a monument in the town built in 1962 commemorating the 800th anniversary of Chinggis Khan's birth. Near the monument, in a picturesque setting near a lake is the Oronno Resort. This facility is a sanatorium where the local waters and medicines are used to help people recovering from skin ailments. Along the Onon and Baiji rivers, which flow near the town of Dadal, are the Ugtam uul wildlife refuge and Mongol Daguur reserves. The latter is well-known for being the home of large variety of water birds.

The Mongolian Plateau Zone (MPZ), which encompasses a significant portion of the Project Area, is a globally important region for biodiversity and attracts scientists, environmentalists, and various kinds of nature enthusiasts such as bird watchers. There are over 600 species of birds, including a large number of migratory species such as the black stork, marsh duck, and rock thrush. The lakes in the area - Lake Buir (Mongolia and PRC) and Lake Dalai (PRC) - are sites for nesting birds such as Daurian, Japanese and Black cranes, Mandarinca duck, and numerous types of geese, such as the Swan Goose. The area contains nearly 70 species of mammals including endangered animals such as the Manchurian Moose (*Alces alces cameloides*), Mongolian Gazelle, or White-Tailed Gazelle (*Procapra gutturosa*), and Eurasian Otter (*Lutra lutra*). There are over 40 varieties of freshwater fish including the Amur sturgeon, Siberian Gudgeon, and Taimen. The MPZ also has diverse topography, climate, and vegetation, which supports a wide variety of animals inhabiting the area. There are 23 species of higher plants and a range of grassland species such as *Aneurolepidum Chinese, Stipa baicalensis, Stipa capillata, Stipa grandis, Filifolium sibiricum, Cleistogenes squarrosa, and Festuca ovina.* The high grass steppes of the MPZ are the world's last un-fragmented grasslands, and are recognized as an important resource for preservation.

Tourism Route to the Dornod aimag would be Sumber (Nomrog)-Arxan (PRC) BCP-Nomrog Preserve-Khalkh Gol soum-Ikh Burkhant Complex-Buir Lake-Menen Steppe-Choibalsan City-Tug Mountain-Kherlen Bars-Utaat Minchuur Hot Spa-Khukh Lake-Mongol Daguur Preserve-Ereentsav-Solovievsk (Russia) BCP with total length over 1,000 km (Figure 3.6).

Figure 3.6 Possible tourism route on Dornod aimag



Source: Purevsuren Gombosuren, the Mongolian National Tourist Center

4. Road and Rail Transport corridors

According to the Policies of the Government of Mongolia on Millennium Road project and Railway Network Development, approved by the Mongolian Parliament, following transportation corridors shall be considered as critical important for the country's economic development. Most of export and import goods of Mongolia are/will be carried out to the markets, especially to the main potential markets (Northeast Asia- PRC, ROK and Japan).

Mongolia is facing to facilitate and enhance mining infrastructure development in the Mongolian railway System and the Government of Mongolia has approved a "State Policy on Rail Transportation" in June, 2010. Purpose of the policy is to increase the railway capacity to carry, broaden an unified national network of efficient state railway directed at satisfying the ever growing future transport demand both effectively and reliably, and further, to improve the national transit capability, advance the legal environment, structure and organization of the sector, utilize the large mineral deposit, expedite the national economic and social development through exporting and exporting after processing, and ensure sustainable development for the future. Within the framework of the policy, new railway network routes that are capable of delivering surging coal outputs to foreign markets are being outlined by the Government of Mongolia.

Conclusions and recommendations:

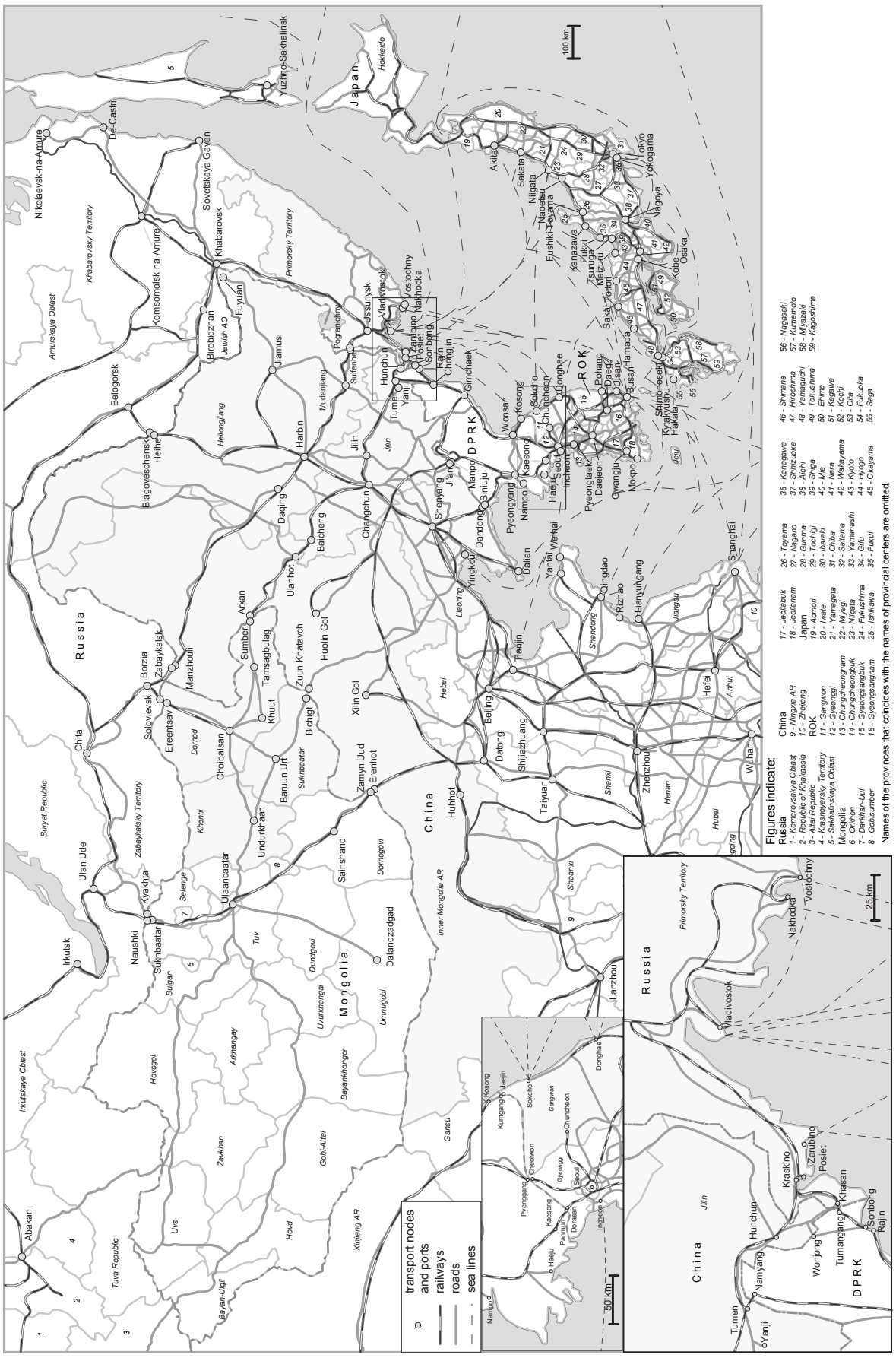
Based on observations during the desk and field surveys, and interviews, the following conclusions and recommendations can be made for Road and Railway corridors' development strategy in the Project Area (Figures 4.1-4.3):

- The Khalkgol (Sumber) - Rashaan BCPs connection through the Nomrog Bridge seems to be the most cost-effective and feasible connection between Mongolia and NEA especially between Mongolia and PRC, at this time for further development of the tourism sector in both countries. This bridge has been constructed. Due to environmental considerations on both sides of the border, however, it is recommended that this bridge is only used for ecotourism and environmental protection related activities and all the other freight traffic should be carried through another route to be developed further north, away from the Nomrog SPA.
- Even though significant mineral resources exist in the Project Area, it will be very difficult to attract private sector investors without building the basic transportation and other required infrastructure. With the exception of some mega-projects, such as the Tavantolgoi (coal mine with proven reserves of 6 billion tons of coking coal) and Oyu Tolgoi (copper and gold mine) Project, it is very unlikely that mining companies will assist in the required transportation infrastructure investment

Photograph 4.1 Nomrog river bridge (Sumber BCP) with 340 meter length

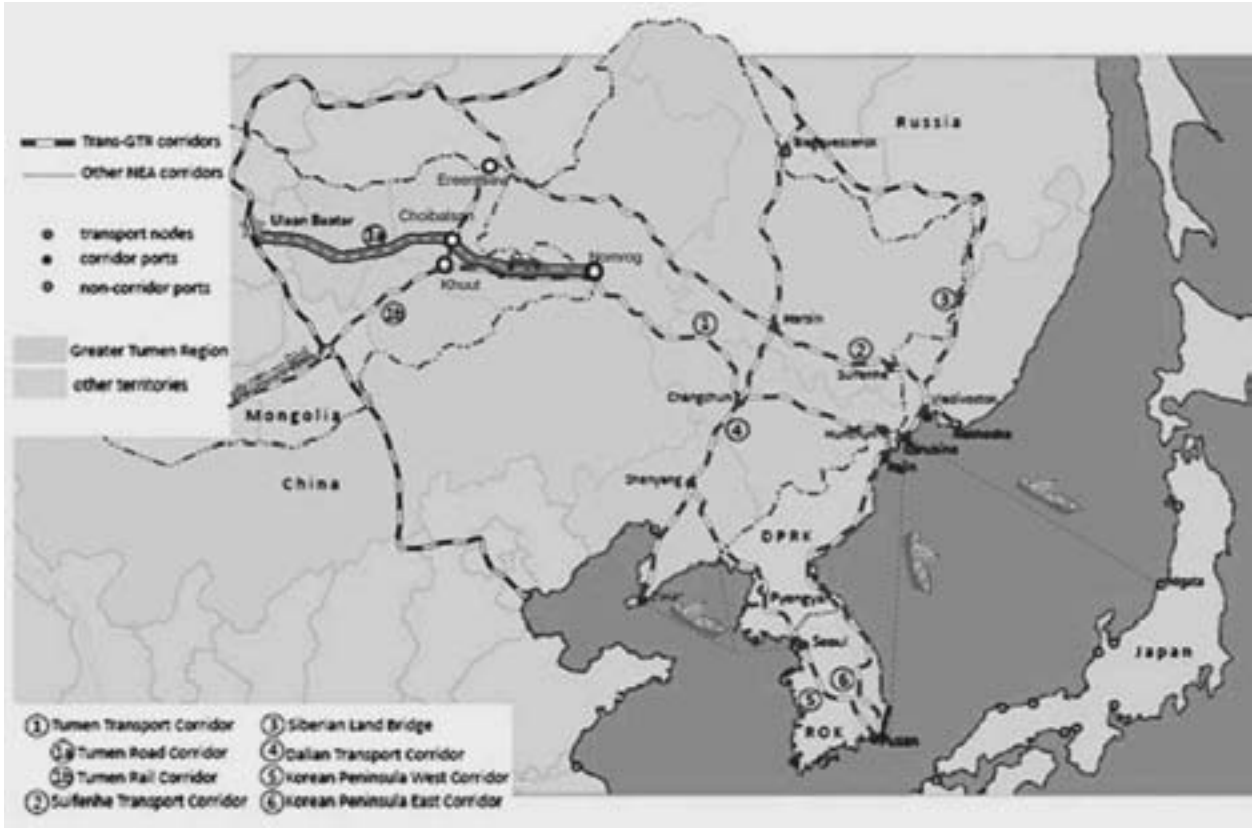
Source: Photo by author (2012)

Figure 4.1 Existing rail and road networks in GTI region



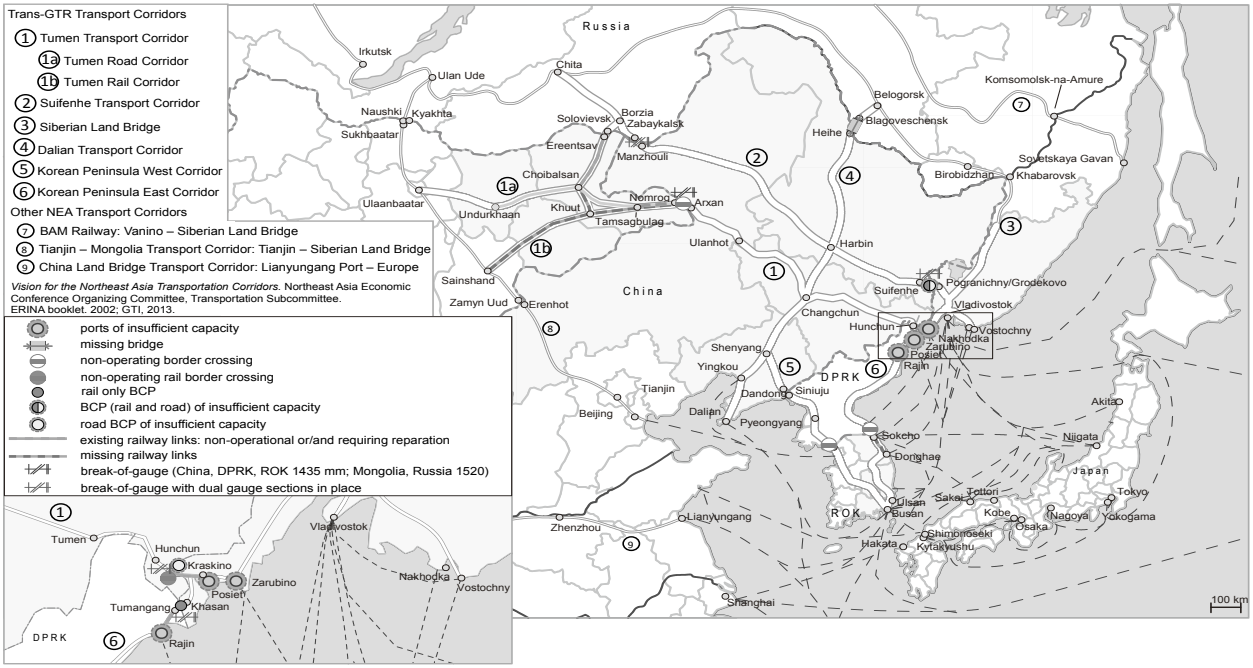
Source: Final report of the GTI transport corridors

Figure 4.2 Trans-GTI corridors



Sourse: by the Dr. D.Gotov

Figure 4.3 Major bottlenecks along the trans-GTI corridors



Source: Final report of the GTI transport corridors

in the Project Area.

- A detailed market study that aims to develop detailed traffic forecasts by different commodities and origin-destination (O-D) pairs between PRC and Mongolia, as well as other international destinations should be undertaken.
- The competitiveness of the proposed new rail line through the Project Area against the existing rail networks, both in Mongolia as well as in PRC and the Russian Federation, should be evaluated in further detail.
- Main constraints and problems limiting the use of the transport corridors are inadequate development of the infrastructure, especially missing rail and paved road sections along the Corridors. In addition to that, there is no any BCP at the Sumber (Nomrog river) area in operation. Also we need to reach suitable technical decisions to solve potential negative impacts on environment.
- If the constraints were lift up, traffic would be increased to great extent. Particularly, tourism and border trade between Mongolia and PRC would be much increased along the Road Corridor and freight traffic of coal, coking coal, copper concentrate and iron ore to PRC and further to ROK and Japan would be increased enormously along the Rail Corridor.
- In order to implement these corridors it is required to make negotiations on railway transportation with neighboring countries such as China and Russia.
- Investment Programs are required to missing infrastructure links, namely:
  - Conduct feasibility studies, design and construction Railway section between Khuut and Sumber (Nomrog) BCP;
  - Upgrading rail section between Choibalsan and Ereentsav including replacement of existing wooden sleepers with concrete ones, introducing modern signalization system and electrification, and
  - Preparing feasibility study, detailed design and construction of paved road between Choibalsan city vicinity and Sumber (Nomrog) BCP.

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Endorsement of State policy on Rail Transportation (2010). Resolution of the Parliament of Mongolia No: 32;

GTI

輸送ネットワークの発展を通じた北東アジアとモンゴルの経済協力強化

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（要旨）

北東アジア地域の輸送ネットワークの発展は、鉱物資源の豊富なこの地域において統合的な関係を確立するためのカギとなる。モンゴルにとっては、自国の輸送ネットワークは世界における孤立や国内の孤立を低減するために戦略的重要性を持っている。アジアにおいて７番目に大きな国であるモンゴルは、世界最大の内陸国でもある。国境線の総延長は8,162kmであり、このうち北側の3,485kmはロシア連邦と接していて、残りは東部、南部および西部で中国と接している。海港もしくはゲートウェーへの交通アクセスを改善することは、モンゴルの外国貿易における競争力を強化するためにカギとなる要素の一つだ。他の北東アジアの国々もまた、地域の輸送ネットワークの発展により裨益するであろう。

［英語原稿をERINAにて翻訳］

Current Situation and Future Development of the Trans-GTR Corridors (Segments in ROK)

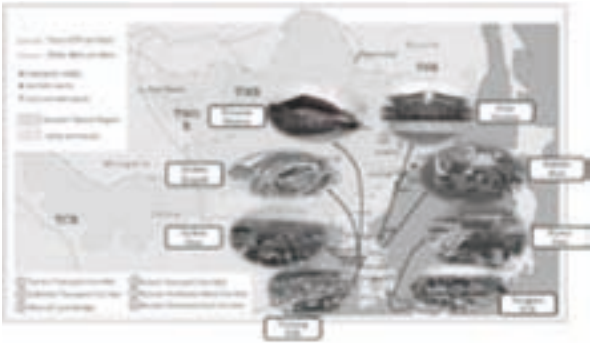
NA, Hee-Seung, Principal Researcher, Korea Railroad Research Institute

1 Introduction

The International traffic and logistics system in Northeast Asia can be composed by Asian Highway (AH), Trans-Asia Railway Network, arterial railway networks in China, Russia and Japan and regional logistics feeder networks. The key stronghold of traffic and logistics system in the Korean peninsula will also consist with six nodes and a linked structure of "Incheon, West Economic Zone" – "Pyongyang, Nampo zone" – "Wonsan, Hamhung zone" – "East (Mt. Kumgang) Economic zone" – "Busan, Ulsan zone" – "Saemangeum, Mokpo zone" will be formed centering on Seoul.

The existing state of traffic infrastructure along the corridors of ROK is shown in figure 1.1. The Jejin station, Sokcho and Pusan port, Yangsan ICD is located in Korean Peninsula East Corridor 6. The Dorasan station, Incheon port and airport, Uiwang ICD is located in Korean Peninsula West Corridor 5.

Figure 1.1 Existing state of traffic infrastructure along the corridors of ROK



2 Due Diligence Review of GTR Corridors

2.1 Traffic Review

In 2011, current state of freight traffic flows through ports is shown in Figures 2.1-2.2 and Tables 2.1-2.3. On the sea freights O/D by zone (ROK - the three Northeastern provinces, Hefei, Beijing/Tianjin, and Far-East Russia, etc.) is used. The ports of Busan, Incheon, Gwangyang and Pyeongtaek in ROK are taken into consideration for Korean Peninsula West Corridor 5. The ports of Busan, Sokcho, Donghae and Mukho in ROK are taken into consideration

Figure 2.1 Current data on freight traffic flows through ports of ROK (Import-Export)

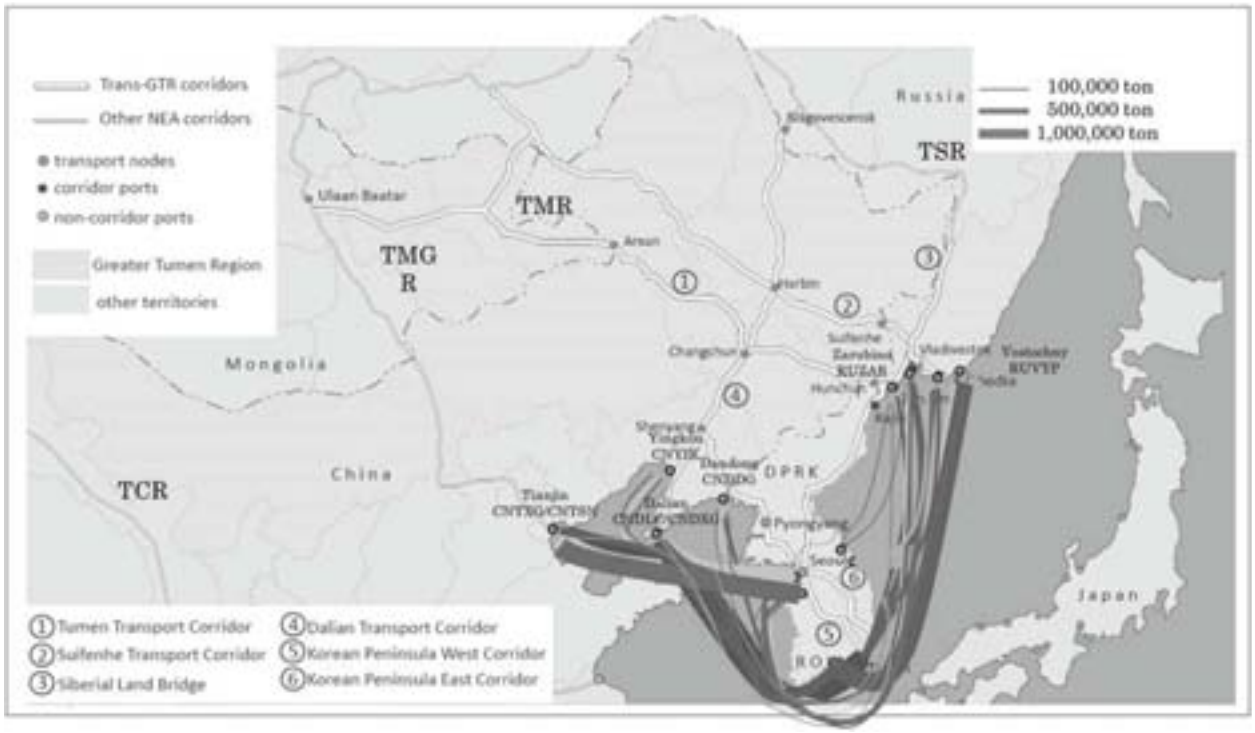


Figure 2.2 Current data on freight traffic flows through ports of ROK (Transit)

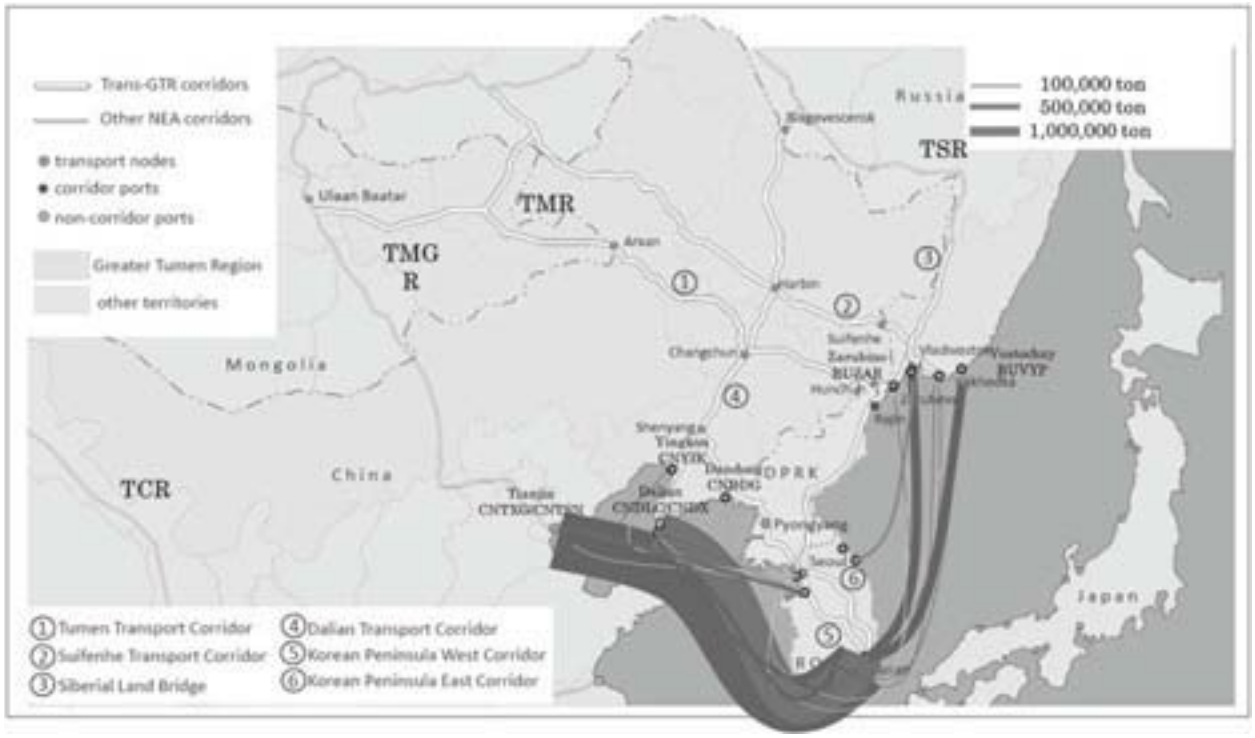


Table 2.1 Current data on freight traffic flows through Busan port

(Unit: ton)

		2011											
		Export			Import			Export_Transit			Import_Transit		
		Full Con.	Bulk		Full Con.	Bulk		Full Con.	Bulk		Full Con.	Bulk	
Busan Port	CNDDG	0	0		0	93,341		18	0		0	0	
	CNDLC	237,921	8,695		690,346	407,465		1,045,446	235		2,824,146	0	
	CNDXG	2,939	0		7,054	0		205,518	0		304,717	0	
	CNTSN	219,023	2,806		299,759	22,239		96,524	0		492,241	112	
	CNTXG	331,808	24,332		700,938	0		1,969,333	1,003		4,140,651	1,587	
	CNYIK	8,320	0		58,381	1,505		570	0		38,770	0	
	China_Total	800,011	35,833	835,844	1,756,478	524,550	2,281,028	3,317,409	1,238	3,318,647	7,800,525	1,699	7,802,224
	RUVVO	324,279	353,314		38,756	110,469		1,088,357	3,537		78,976	992	
	RUVYP	488,003	9		119,020	8,582		730,412	81		307,748	0	
	RUNJK	5,680	3,812		0	36,474		27	6,014		0	0	
	RUZAR	0	0		0	0		0	524		0	0	
	Russia_Total	817,962	357,135	1,175,097	157,776	155,525	313,301	1,818,796	10,156	1,828,952	386,724	992	387,716

Note: CNDDG(Dandong), CNDLC(Dalian), CNDXG(Dalianxingang), CNTSN(Tianjin), CNTXG(Tianjinxingang), CNYIK(Yingkou), RUVVO(Vladivostok), RUVYP(Vostochniy), RUNJK(Nakhodka), RUZAR(Zarubino)
Source: KOREA CUSTOMS SERVICE

for Korean Peninsula East Corridor 6. The Port of Dandong, Dalian, Dalian Xingang, Tianjin, Tianjin Xingang and Yingkou in China are taken into consideration for Korean Peninsula West Corridor 5. The Port of Vladivostok, Vostochny, Nakhodka and Zarubino in Russia are taken into consideration for Korean Peninsula East Corridor 6. For transport demand, freight is targeted not only the import-export freight but also the transit. The freight traffic data of 9 years old is investigated to be contemplating Korea Customs Service data base. The freight traffic volume increased steadily for 9 years despite world economic crisis in 2008. Especially, freight traffic volume of Pusan Port for import-export and transit is massive. The freight traffic volume of Incheon, Gwangyang, Pyeongtaek and Mukho Port for import- export is crucial factor. Recently freight traffic volume for transit increased rapidly between ROK and Russia. The current data on freight traffic flows through ports to be considered are shown below;

2.2 Infrastructure capacity review

There is various infrastructure policy of ROK to solve the bottlenecks. GTI corridors need to satisfy the growing transportation demand, so it needs to increase the capacity and operating speed. The expansion of highway network and high speed railway project should be secured for

Table 2.2 Current data on freight traffic flows through Incheon port

(Unit: ton)

		2011											
		Export			Import			Export_Transit			Import_Transit		
		Full Con.	Bulk		Full Con.	Bulk		Full Con.	Bulk		Full Con.	Bulk	
Incheon Port	CNDDG	45,674	9,839		206,374	139,344		17,452	785		581	3,668	
	CNDLC	98,957	24,139		229,924	478,532		619	129		1,779	562	
	CNDXG	0	0		0	4,553		0	0		0	0	
	CNTSN	11	210		0	43,542		0	0		0	0	
	CNTXG	239,353	35,304		345,392	975,975		128	706		945	1,243	
	CNYIK	61,426	259		98,761	0		63	0		130,895	118	
	China_Total	445,421	69,751	515,172	880,451	1,641,946	2,522,397	18,262	1,620	19,882	134,200	5,591	139,791
	RUVVO	136	13,435		2,703	281,156		80	0		4	0	
	RUVYP	601	0		13,209	186,523		0	0		20	0	
	RUNJK	0	0		0	440,067		0	0		0	0	
	RUZAR	0	4,034		0	0		0	0		0	0	
	Russia_Total	737	17,469	18,206	15,912	907,746	923,658	80	0	80	24	0	24

Note: CNDDG(Dandong), CNDLC(Dalian), CNDXG(Dalianxingang), CNTSN(Tianjin), CNTXG(Tianjinxingang), CNYIK(Yingkou), RUVVO(Vladivostok), RUVYP(Vostochniy), RUNJK(Nakhodka), RUZAR(Zarubino)
Source: KOREA CUSTOMS SERVICE

Table 2.3 Current data on freight traffic flows through Donghae port

(Unit: ton)

		2011											
		Export			Import			Export_Transit			Import_Transit		
		Full Con.	Bulk		Full Con.	Bulk		Full Con.	Bulk		Full Con.	Bulk	
Donghae Port	CNDDG	0	0		0	41,489		0	0		0	0	
	CNDLC	0	0		0	30,098		0	0		0	0	
	CNDXG	0	0		0	0		0	0		0	0	
	CNTSN	0	0		0	3,017		0	0		0	0	
	CNTXG	0	0		0	54,593		0	0		0	0	
	CNYIK	0	0		0	0		0	0		0	0	
	China_Total	-	-	-	-	129,197	129,197	-	-	-	-	-	-
	RUVVO	2,962	178,018		1,248	1,645		374	207		25	87	
	RUVYP	0	0		0	1,705,073		0	0		0	0	
	RUNJK	0	9		0	155,038		0	0		0	0	
	RUZAR	0	44		0	794		0	0		0	0	
	Russia_Total	2,962	178,071	181,033	1,248	1,862,550	1,863,798	374	207	581	25	87	112

Note: CNDDG(Dandong), CNDLC(Dalian), CNDXG(Dalianxingang), CNTSN(Tianjin), CNTXG(Tianjinxingang), CNYIK(Yingkou), RUVVO(Vladivostok), RUVYP(Vostochniy), RUNJK(Nakhodka), RUZAR(Zarubino)
Source: KOREA CUSTOMS SERVICE

solution of bottlenecks. Traffic and logistics facilities in ROK have been expanded as of the following.

2.2.1 Road network

Traffic congestion cost has been ever growing due to concentrated population/industrialization in Metropolitan area and Seoul-Busan axis. Population, business firms and cars in Metropolitan area represent 46.3%, 45.7% and 46.5% respectively, despite it only accounts for 11.8% of the entire national area. Lack of integrated traffic policy considering urban spatial characteristics and circulation pattern led to worsened congestion. Therefore, a national arterial road network has been implemented for the road development. In comparison to 2001, the total extension of roads increased by 13,587km in 2009. As of 2009 the total extension of roads is 104,983km and it has been increasing by an annual average of 1.75% since 2001. The national expressways increased by 1.43 times from 2,637km in 2001 to 3,776km in 2009 (Table2.4).

As for the roads in ROK, it is planned to promote balanced development of the national territory by implementing grid type national arterial road network consisting with seven south-north axes and nine east - west axes. Large traffic areas in between expressways and regions will be connected with an express arterial network and the big city beltway network will be built as part of the arterial traffic network. The total extension of expressways as of present is 3,776km and it will be expanded by stages according to priorities. In order to secure a foundation for long-term development of the national territory, the ROK government has established a composite arterial road network plan that comprehensively includes expressways and national roads.

A long-term highway construction plan to deal with traffic congestion caused by inconsistent development and expansion; 1) 7 South-North axes, 4 East-West and 3

circulation belts to be jointly developed by central and local governments and private investors by 2020 2) Projects to mitigate traffic congestions on a gradual basis in Metropolitan areas including Busan, Daegu, Gwangju and other big cities 3) Gradual construction of bypass near small and medium sized cities to ease the congestion (Long-term estimate: 1,308km).

As shown in Table 2.5 and Table 2.6, the current state of road traffic infrastructure along Korean Peninsula East and West Corridors is investigated respectively.

Table 2.4 Statistics of Road Network of ROK

(Length, km)

	2003	2004	2005	2006	2007	2008	2009
National Expressway	2,778	2,923	2,968	3,103	3,368	3,447	3,776
National Highways	14,234	14,246	14,224	14,225	13,832	13,905	13,820
Provincial Highway	17,485	17,476	17,710	17,677	18,175	18,193	18,138
Country road	45,625	48,262	49,885	49,318	49,535	50,174	50,501
Other roads	17,130	17,371	17,506	17,738	18,109	18,517	18,749
Total	97,252	100,278	102,293	102,061	103,019	104,236	104,983

Source: Korea Expressway Corporation

Table 2.5 Road Infrastructure of Busan-Incheon Corridor (ROK West Corridor)

Country	Length, Km	Lanes	Condition	Traffic, AADT
ROK	447	4/6/8	Good	60,000-158,500

Source: Korea Expressway Corporation

Table 2.6 Road Infrastructure of Busan-Kosong Corridor (ROK East Corridor)

Country	Length, Km	Lanes	Condition	Traffic, AADT
ROK	475	2/4	Good	7,000-70,000

Source: Korea Expressway Corporation

2.2.2 Rail network

In terms of railway, stage 1 of Gyeongbu Rapid-transit Railway (Seoul - Daegu) was opened in 2004 and stage 2 (Daegu - Busan) was opened in 2010. Rapid-transit railway contributed to the formation of a half-day life zone in ROK. The total extension of railways is 3,377.9km as of 2009 and it consists of 240.4km of rapid- transit railway and 3,137.5km of general railway. The rate of double-track railway implementation is 43.9% as of 2009 and is increasing annually. In line with the basic condition of green traffic, the investment is in a trend of both quantitative and qualitative increase. The investment cost increased from KRW 3,376.1 billion in 2004 to KRW 5,183.8 billion in 2009. Investment for railway construction and facility modernization (double- tracking and electrification) since 1998 has been increasing and, as a result, the investment ratio increased significantly by 30% or higher.

Railroad transport in ROK displays worse traffic congestion or bottleneck on Seoul-Busan axis than on any other routes. Particularly such congestion seems most intense at the Seoul-Siheung section where Honam, Gyeongbu, Gyeongin and Gyeongwon Lines are interfaced, which requires the continuous expansion of railroads to address such traffic congestion.

High-speed railway projects have been conducted as follows; 1) Double-tracking typical railroads and linking them with regional lines along with modernization of signaling system 2) Upgrading the speed of existing lines for high speed railway service (Gyeongbu, Honam and connection line) up to 180km(from existing 140km) 3) Making continuous endeavors to develop tilting train and next-generation high speed railway, and to structure the integrated high-tech research institute to advance railroad technologies.

In addition, restructuring the subsidiary companies and enhancing the work efficiency will be implemented with the support of the government for railroad automation project. The efforts will also be made to lay the foundation for the economically-independent management, while developing neighborhood area and complex facilities near the station as a top priority to secure passenger convenience.

As for ROK railways, the stage 2 project of Gyeongbu rapid-transit railway has completed. In addition, Honam rapid-transit railway is under construction with a goal to handle increasing transportation demand resulted by the West Coast development and to encourage local development. In the long run, it is necessary to implement an international railway transport base in order to have the rapid-transit railway network connected to TCR and TSR and therefore ROK performing as a gateway to the continents of Asia and Europe. The ROK government has established a systematic national railway network implementation plan to connect rapid-transit railway with general railway network.

As shown in Table 2.8 and Table 2.9, the current state of railway traffic infrastructure along Korean Peninsula East and West Corridors is investigated respectively.

Table 2.7 Statistics of Railway Network of ROK

Section	Railway Length, Km	Route length, Km		Double-track length,Km	Electrified length, Km	Opening year	
		Passenger	Freight			Date	Section
Total	3,377.9	3,240.5	3,043.9	1,482.7	1,894.8		
Gyeongbu line: Seoul~Busan	441.7	441.7	439.9	441.7	441.7	1905.01.01	Seoul~Choryang
Donghae Nambu line: Busanjin~ Pohang	145.8	145.8	145.8	2.1	4.6	1935.12.16	Busanjin~ Pohang

Source: Korea Railroad Research Institute

Table 2.8 Rail Infrastructure of Busan-Incheon Corridor (ROK West Corridor)

Country	Length, Km	No. of tracks	Gauge, mm	Propulsion	Freight Speed
ROK	480	2/4	1,435	Electric/Diesel	100-160

Source: Korea Railroad Research Institute

Table 2.9 Rail Infrastructure of Busan-Kosong Corridor (ROK East Corridor)

Country	Length Km	No. of tracks	Gauge, mm	Propulsion	Freight Speed
ROK	489		1,435	Electric/Diesel	80-160

Source: Korea Railroad Research Institute

2.2.3 Land BCP

Gyeongeui railway and road (Gyeongeui Line, National Road No. 1, 4-lane road in both directions) and Donghae railway and road (Donghae Line, National Road No. 7, 2-lane road in both directions), which are connecting

between ROK and DPRK, are the most important traffic networks in terms of not only the economic cooperation between ROK and DPRK, but also activation of inter-Korean exchange and implementation of a traffic network connecting to TAR and AH. On September 17, 2003, ROK and DPRK agreed on the details of Gyeongeui and Donghae railway and road connection project as of the following.

Facility Structure

- In case of railway, both Gyeongeui Line and Donghae Line will be connected as single-track railways.
- In case of roads, Gyeongeui Line will be built as a 4-lane road considering Kaesong Industrial Complex and Donghae Line will be built as a 2-lane road.

Border Station

- Border stations will be installed in the ROK and DPRK areas outside the Demilitarized Zone (DMZ) considering special characteristics of the DMZ and successful CIQ function for people and goods using railway and road systems.

Tracks between Boarder Stations

- Traction by diesel locomotives of ROK

ROK - DPRK Road Connection Status

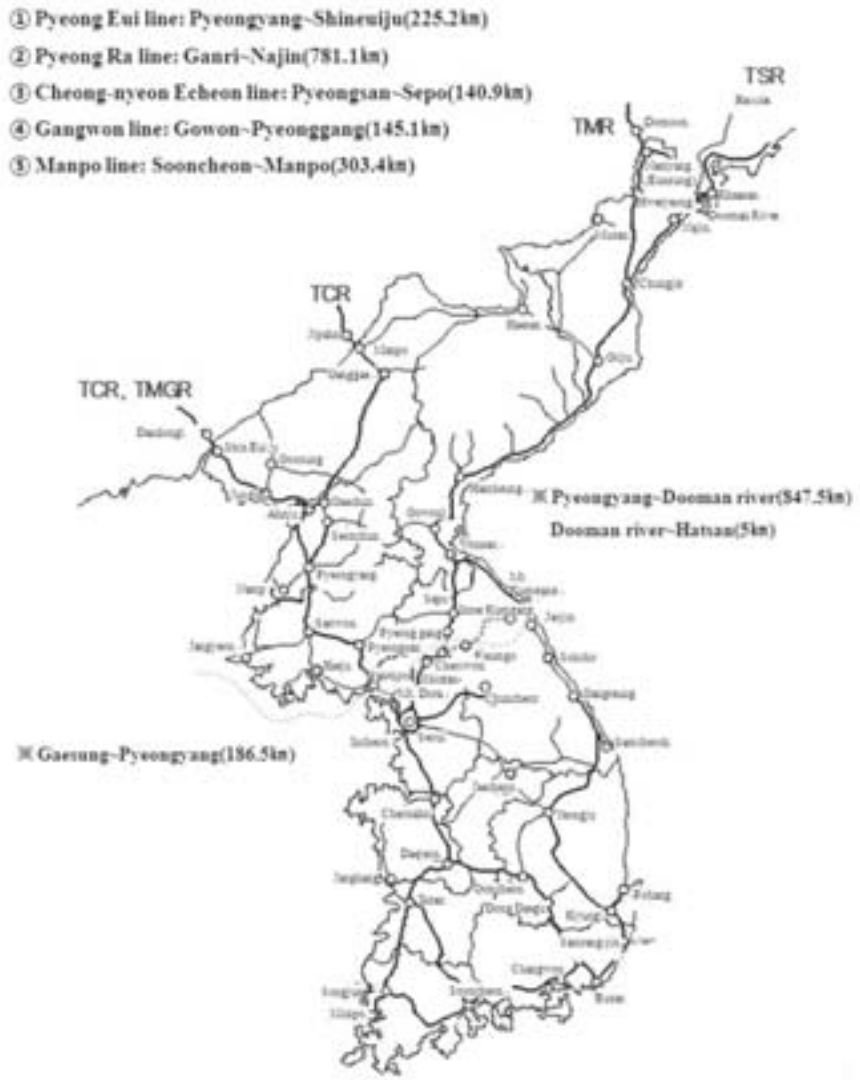
In the ROK– DPRK road network, 13 routes are cut off and this includes 6 routes of national roads. National Road No. 1, as of now, is completed of the 4-lane and 2-lane pavement up to the Joint Security Area and Panmunjeom respectively. As for National Road No. 3, it has been expanded to a 2-lane road to Woljeong-ri and 4-lane road to Yeoncheon for connection of the cut-off sections between Cheolwon and Pyeonggang. In National Road No. 5, a design for a 2-lane road to Saengchang is in progress for connection between Hwacheon and Pyeonggang. In addition, a 2-lane road pavement to Geumgok has completed. As for National Road No. 7, a design for a 2-lane road to the cease-fire line has completed for connection between Ganseong and Jangjin. Of the 13 routes with cut-off roads, 7 routes are of national and lower level roads. One is a regional road and the remaining six are other roads. For the ROK– DPRK road connection, ROK and DPRK agreed on Gyeongeui Line road connection (National Road No. 1, Munsan - Gaeseong) at the 1st and the 2nd Inter-Korean Ministerial Talk in July and August 2000. At the 7th Inter-Korean Ministerial Talk in August 2002, an agreement was reached on the Donghae Line road connection (Songhyeon-ri - Goseong). Gyeongeui Line, of which construction for road connection began in September 2002, measures a total of 12.1km. ROK handles the 5.1km section from the Tongildaegyo Bridge to the Military Demarcation Line (MDL) and DPRK is in charge of the 7.0km section from the MDL to Gaeseong. Pavement of the sections in ROK and DPRK was completed at the end of October 2003 and the end of November 2004 respectively. Donghae Line road connection project covers a total extension of 24.2km. For this, ROK is in charge of the 4.2km section from Songhyeon-ri to the MDL and DPRK is in charge of the 20.0km section from the MDL to Goseong. Pavement of the sections in ROK and DPRK was completed at the end of October 2004 and the end of November in the same year respectively.

Construction of all sections for the 4-lane Gyeongeui Line road and 2-lane Donghae Line road was completed at the end of 2004. The roads are being frequented by the traffic of humans, goods and vehicles since November 2004. For one year in 2004, a total of 30,899 cars used Gyeongeui Line and Donghae Line roads. 15,314 cars drove through Gyeongeui Line and 15,585 cars through Donghae Line. These figures indicate that the roads were used by an average of 2,500 cars a month and around 80 cars a day. However, only two routes of the existing cut-off roads have been connected and connection to other arterial axes in DPRK is insufficient. For example, in Donghae Line, construction for road connection has been carried out only up to the Mt. Geumgang zone and Donghae Line beyond this point lacks in basic conditions as a general motoring road in terms of center lines, lanes and shoulders. Therefore, in the present state, the roads can be used as transportation roads up to the Mt. Geumgang area. For the section north of Mt. Geumgang, such as Tongcheon, Wonsan and Hamheung, usability of the roads as motoring road is low.

ROK - DPRK Railway Connection Status

The government has been promoting restoration of Gyeongeui Line since 1985 in order to connect railway networks between ROK and DPRK. For Gyeongeui Line, working design and deliberation on environmental impact assessment were completed in 1985 and 1994 respectively. In addition, land purchasing has been continuously carried out since. As for Gyeongwon Line restoration project, working design and deliberation on environmental impact assessment were completed in 1991 and 1992 respectively. At present, purchasing of the land for project sites is in progress. In addition, working design for Mt. Geumgang Line was completed and construction plans for Donghae Bukbu Line were established in 1999. The ROK– DPRK railway connection started in full scale after ROK and DPRK had agreed on the Gyeongeui Line railway connection at the 1st and the 2nd Inter-Korean Ministerial Talk in July and August 2000 immediately after the Inter-Korean Summit. In particular, the Gyeongeui Line restoration project was completed on Sep. 16, 2000. As a result, in ROK, construction in the 10.2km section from Munsan and the MDL was completed and therefore railway service to Imjingak Station began in September 2001 and to Dorasan Station in April 2002. For efficiency of construction, the construction for 8km section from Munsan Station to Imjin River bridge was handled by (formerly) Korean National Railroad. For the 4km section from Imjin River bridge to MDL, the ROK Armed Forced was in charge of engineering work and removal of underground utilities and the (formerly) Korean National Railroad handled installation of facilities. At the 7th Inter-Korean Ministerial Talk in August 2002, an agreement was reached on commencement of Gyeongeui and Donghae Line railway construction and, accordingly, a commencement ceremony for construction of the Gyeongeui and Donghae Line railway connection was held jointly by ROK and DPRK on September 18, 2002. At the 8th Inter-Korean Economic Cooperation Committee meeting in March 2004, ROK agreed on providing materials for stations in DPRK necessary for the railway opening. The 27.3km section of Gyeongeui Line between Munsan and Gaeseong was built as a single-track railway and the construction cost was approx. KRW

Figure 2.3 Trans Korean Railway Network



Source: Korea Railroad Research Institute

Table 2.10 East corridor (Donghae Line) Transit Facilities

Classification	Road Transit Facilities	Railway Transit Facilities	Dorasan Logistics Center
Project Period	Sep. 23, 2004 – Jun 12, 2006	Sep. 23, 2004 – Apr. 30, 2006	Jun. 2006 – Sep. 30, 2010
Gross Area	14,055 m^2	6,705 m^2	12,041 m^2
Site Area	60,704 m^2	46,679 m^2	126,590 m^2
Building Scale	1 underground level, 2 ground levels	1 underground level, 2 ground levels	1 ground levels
Key Facilities	3 facilities including transit facility, Transit screening offices, offices of the related organizations	Jejin Station building, transit facility and 1 office building for the related government bureaus	8 facilities including general management building, plant quarantine shed, light cargo gate, management building of yard for common use
Implemented by	Wonju Regional Construction Management Administration	Korea Rail Network Authority	Korea Rail Network Authority
Construction Cost	KRW 54.8 billion	KRW 18.6 billion	KRW 47.7 billion
Completion Date	Jun. 12, 2006	Apr. 30, 2006	Sep. 30, 2010

Table 2.11 West corridor (Gyeongeui Line) Transit Facilities

Classification	Road Transit Facilities	Railway Transit Facilities	Dorasan Logistics Center
Project Period	Sep. 23, 2004 – May 3, 2006	Sep. 23, 2004 – Apr. 30, 2006	Oct. 2005 – Dec. 24, 2007
Gross Area	18,310 m^2	15,825 m^2	19,488 m^2
Site Area	75,178 m^2	38,656 m^2	328,181 m^2
Building Scale	1 underground level, 2 ground levels	1 underground level, 2 ground levels	1 ground levels
Key Facilities	13 facilities including transit facility, Transit screening offices, offices of the related organizations, departure processing office and the 3rd freight warehouse	Dorasan Station building, transit facility and 1 office building for the related government bureaus	25 facilities including container yard, customs shed, animal quarantine mooring, plant quarantine shed, parking lot and railway car inspection facility
Implemented by	Seoul Regional Construction Management Administration	Korea Rail Network Authority	Korea Rail Network Authority
Construction Cost	KRW 42.5 billion	KRW 36.2 billion	KRW 84 billion
Completion Date	May 3, 2006	Apr. 30, 2006	Dec. 24, 2007

Photograph 2.1 Donghae Line immigration (Jejin Station, East corridor)

Photograph 2.2 Gyeongeui Line immigration (Dorasan Station, West corridor)

90.3 billion (1USD = 1200 KRW). As for Donghae Line, KRW 91.2 billion was invested in a 25.5km single-track railway construction. At the 4th meeting of the Working Level Committee for the Inter-Korean Railway and Road Connection in April 2004, the basic agreement on railway operation between ROK and DPRK was initialed. With the basic agreement, together with vehicle operation agreement, a basic system for railway connection was secured.

Border Crossing (Jejin and Dorasan) Stations and Transit Facilities

Jejin and Dorasan Stations are Infrastructure of ROK at Border Crossing Points. The Jejin and the Dorasan station are located in Korean Peninsula East Corridor 6 and

West Corridor 5 respectively.

Jejin and Dorasan Stations are close to Mt. Kumgang and Kaesong Industrial Park in DPRK respectively. Infrastructure of ROK at Border Crossing Points aim to revitalize the special zone for economic cooperation. It will be a key role to the success of special economic zone project. In the long term view, Kaesong Industrial Park, Mt. Kumgang Tourism Business and Trans-Korean Railway/road will become powerful driving-force of the 'Inter Korean Economic Community' in the future.

Currently two border crossing stations secure the Inter-Korean Transit Office Facilities including container yard (Table 2.10 and Table 2.11).

Gyeongeui and Donghae railway/road connection project was completed now. In such a process, a bilateral or multilateral talk was held to connect the missing link. Road infrastructure was accomplished earlier, accelerating Kaesong industrial zone development from 2003 and promotes the Mt. Kumgang tourism project in 2004. Road infrastructure further revitalized the Mt. Kumgang tour to increase the tourist up to 300,000 annually. That is, inter-Korean infra project apparently led to promoting the borderland development project.

2.2.4 Ports

In terms of ports, cargo handling capacity and container processing capacity of both new and existing facilities has increased. In comparison to 2001, the total cargo handling capacity and container processing capacity increased by 3.3 million tons and 11,090,000 TEU respectively in 2009. There are 30 trade ports (14 nationally managed ports and 16 regionally managed ports) and 25 coastal ports currently in operation. As trade ports, 9 in the West Coast, 13 in the South Coast and 8 in the East Coast are equipped with 757 berths and 793,015 tons of cargo handling capacities as of the end of 2009.

In the area of logistics, inland container depots (ICD) have increased to alleviate the burden of containers piling up in ports in addition to improving cargo handling capacities. Composite logistics depots are under construction in each of the 5 zones. At present, logistics complexes are being developed and operated in 22 locations nationwide.

2.3 Performance Review of Corridors

The transportation and logistics system of the Northeast Asian region include the major transportation systems of railways, roads, marine and air transportation and the logistics centers connecting these systems. In spite of the differences in the political and economic systems and the geographical barriers, the Northeast Asian countries have begun to build the basic structure for the transportation and logistics system. While the land transportation by rail and road is still incomplete, most of the transportation depends on the marine and air transportation means.

The land transportation network of the Northeast Asian region is based on the 2-vertical and 2-horizontal axes. The 2-vertical axes are Busan (Korea) - Khabarovsk (Russia) and Dalian (China) - Khabarovsk (Russia). The 2-horizontal axes are Busan (Korea)-Dalian (China) and The Tumen River area – Chita (Russia). The hub cities of the lines are Busan, Dalian, Rajin, and Vladivostok.

The transportation and logistics system of the Northeast Asian region has been developed to a basic level, however, is still suffering from various problems based on the superannuated system, unbalanced infrastructure, unreasonable route layout, and the bottlenecks in the corridors.

As a whole, the infrastructure of the transportation and logistics system of the Northeast Asian region fall behind and the system efficiency is lower compared with those of the EU and the North American.

The transportation and logistics system of the Northeast Asian region show many unreasonable route layout, based on the unbalanced demand between the regions/countries and/or insufficient transportation infrastructure.

In addition, the transportation infrastructure in this region has many bottlenecks, formed by different railway gauges, old transition systems, bottlenecks at border points, biased air route allotment for national-flag airlines, complicated customs clear system, etc.

To find the solution for these problems, the GTI program of UNDP "Integrated Transport Infrastructure and Cross-Border Facilitation Study for the Trans-GTR Transport Corridors" is very important and timely for the development of GTR.

The cooperation for transportation in the Northeast Asian region has long been processed on two-party basis. However, recent trend shows multi-party cooperation initiatives including the ROK, DPRK and Russia for TKR-TSR connection and the GTI (Greater Tumen Initiative) based on the TRADP (Tumen River Area Development Programme), since early 1990s. In addition, the ministers' meeting of Korea, China, and Japan, since 2006, is a new development for the integration of the transportation and logistics system of the region.

In addition, various MOU and committee was signed in fields of transportation and logistics as following: Memorandum of Understanding on Cooperation in the field of Construction, Transport and Logistics between Mongolia and ROK(2011), Agreement of sea-land intermodal freight vehicle transportation between ROK and China (2010), Statement of intent between the aviation and railway accident investigation board (ARAIB) of the Republic of Korea and the Japan transport safety board (JTSB) maters of aviation and railway safety (2009), ROK-DPRK-Russia Railway Ministerial Meeting(2006), ROK-DPRK-Russia conference of the supreme representative(2004), Korea-Russia Transportation Cooperation Committee, member (2001,2002).

Rajin-Khasan project is the project for which the consultation between ROK-DPRK and Russia has been advanced in the past. Rajin-Khasan project refers to the trial effort for TKR-TSR project, But ROK cannot participate this project by ROK-DPRK relations strained. 'Rajin' is the strategic area in the Northeast Asia which is expected to attract the logistics cooperation among the DPRK, ROK and China and/or Russia. Recently, Chinese Government has been driving the 5-Point 1-Line Coastal Economic Belt Construction Initiative and the Chang-Ji-Tu Development Zone Initiative, along the Yalu and Tumen Rivers in the

Liaoning and Jilin Provinces. These initiatives are not limited to the 3 Northeast provinces of China, but underline cooperation and exchanges with the neighboring countries which are DPRK, Russia, Mongolia, ROK and Japan, in trading and economy, science and technology, and resources. For this, international transportation routes account for a significant part. The projects as the construction of the new bridge between Sinuiju and Dandong, and entrustment of the right for operating the Rajin harbor have been actively driven to construct transportation routes between DPRK and China.

In order to realize the project "Integrated Transport Infrastructure and Cross-Border Facilitation Study for the Trans-GTR Transport Corridors", a multilateral approach should be proposed to design and develop infrastructure facilities and operations in GTR. Based on the multilateral approach, a phased approach should be adopted. For the first phase, small and medium-scale localized project can be implemented. In the second phase, large-scale projects with heavy financial requirements can be built. In each phase, priority projects with importance can be selected. Low-cost and government-led pilot projects need to be implemented at the early stage and then we will be developed to the high-cost and large scale private projects that will attract the international investment.

3 Future Development Potential

3.1 Review of on-going/planned economic Development Projects likely to impact future traffic

China has been ROK's largest trade partner since 2004. In addition, it is necessary to respond to an increase of intra-trade among Korea, China, Russia and Japan and within the Northeastern Asian regions. Since large-scale transnational development projects are promoted around GTI areas and most of the related infrastructures have been implemented, it is necessary for Korea to prepare for a rapid increase in the new freight traffic demand in the future.

Gyeongeui railway and road (Gyeongeui Line, National Road No. 1, 4-lane road in both directions) and Donghae railway and road (Donghae Line, National Road No. 7, 2-lane road in both directions), which are connecting between ROK and DPRK, are the most important traffic networks in terms of not only the economic cooperation between ROK and DPRK, but also activation of inter-Korean exchange and implementation of a traffic network connecting to TAR and AH. Closely relevant with traffic demand triggered by Kaesong Industrial Complex and tourism development in Kaesong area, Gyeongeui railway and road, especially, are considered capable to handle the traffic demand generated in the initial stage of development. However, as the scale of development increases, the capacity will be exceeded at a certain point in time and this will result in traffic congestion. To solve this problem, it is necessary to establish short, mid and long-term plans for expansion of the existing connection infrastructures, new transportation means and connection methods. The plans as such must be established on the basis of analysis of the capacity of traffic facilities in DPRK and the estimated traffic demand between ROK and DPRK.

Kaesong industrial zone development, Mt. Kumgang tourism and Inter-Korean railway project that symbolize the inter-Korean economic cooperation serve the driving force in building the inter-Korean economic community. Railway and road connection projects between the two Koreas, among others, that aim at revitalizing the special zone for economic cooperation are more than important infrastructure, the key to the success of special economic zone project.

Gyeongeui railway and road connection project was completed and the cargo train between Munsan and Pongdong began running beginning in Dec 2007. In such a process, a bilateral or multilateral talk on connection of TKR and TRS among ROK, DPRK and Russia was held, and the two Koreas agreed in 2002 on connection of Donghae railway and road as a result of the effort to cooperate among the two Koreas and Russia. Road opening, which was relatively free from political issue, was accomplished earlier, accelerating Kaesong industrial zone development project from 2003 and Mt. Kumgang tourism project was converted to an overland travel from cruise tour beginning in 2004, which further revitalized the Mt. Kumgang tour to increase the tourist up to 300,000 annually. That is, inter-Korean railway project apparently led to promoting the borderland development project.

Despite of successful completion of the trans-Korean railway project, Gyeongeui line stopped its operation regretfully in December 2008 due to political deadlock between the two Koreas. Kaesong Industrial Zone still depends on individual logistics network, instead of joint logistics system. Difficulty in securing the economical efficiency under the unique situation between ROK and DPRK was what already expected from the beginning. However it's necessary to maintain the virtuous circle for special zone for economic cooperation and infrastructure between the two Koreas as a breach to deal with the deadlock between the two Koreas. When it comes to DPRK infrastructures, low-cost and government-led pilot projects need to be implemented at the early stage and then they will be developed, on a long-run, to the high-cost and large scale private projects that will attract the international investment. It's the strategy to modernize the DPRK's infrastructures system and create the virtuous circle of international logistics business so as to sharpen the international competitiveness.

3.2 Traffic and Transport Demand Forecasting

In this study, transportation demand for the integrated traffic network in the Korean peninsula is forecast and the set of transportation demand is divided into 4 areas within GTI region (a. ROK - DPRK, b. ROK - China/ Russia, c. DPRK - China/ Russia and d. transit shipment to China/ Russia) as shown in Figure 3.1. The arterial traffic networks for which transportation demand is estimated are Korean Peninsula West Corridor 5 and Korean Peninsula East Corridor 6.

This study assumes the economic growth rate of DPRK according to a scenario to maintain status quo and an optimistic scenario. Under the two scenarios, the annual average GDP increases in DPRK are assumed to be 5% and 10% respectively between 2011 and 2020 and 7% and 15% respectively between 2021 and 2025. For demand forecast,

Figure 3.1 Transportation demand set of 4 areas within GTI region (a. ROK - DPRK, b. ROK - China/ Russia, c. DPRK - China/ Russia and d. transit shipment to China/ Russia)

Source: Author

Figure 3.2 Freight O/D in 10 zones of ROK and DPRK

Source: Author

estimation curves are applied through a regression model in relation to the time-series data collected.

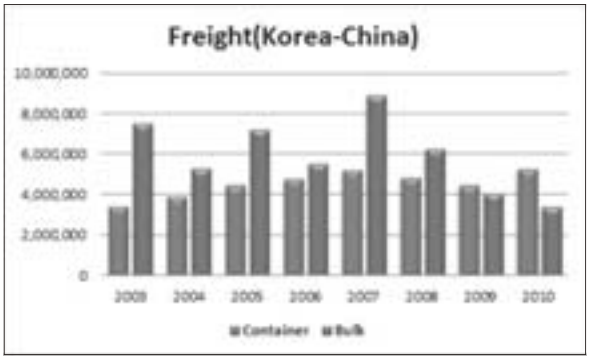
Of the demand for freight traffic in the GTI-linked zones, the traffic demand to Korean Peninsula West and East Corridor of GTI is estimated according to the quo and the optimistic scenario (as of 2015, 2020 and 2025) as follows. The freight traffic demand in the GTI-linked zones is divided into ROK - DPRK, Korea - China/ Russia, DPRK - China/ Russia, Korean Port - transit shipment to Russia/ China and demand for Changchun - Jilin – Tumen project. Each of the demand generated is equivalent to the total amount of traffic demand prior to division by transportation means.

ROK - DPRK Freight Traffic Demand

Based on the O/D of Mr. Seong (2005, ROK), estimations are calibrated considering the latest environments. As for specific demand, a scenario of cooperation for exchange between ROK – DPRK is taken into consideration.

To estimate freight demand between ROK and DPRK, freight O/D in 10 zones of ROK and DPRK used in previous studies are calibrated and used (Figure 3.2). Assuming an increase in exchange between ROK and DPRK and completion of the Gaeseong Industrial Complex development plans according to the scenario to maintain status quo, the annual freight demand between ROK and

Figure 3.3 Results of freight traffic estimation between ROK and China (Note: Korea is ROK)



Unit : ton

yy	Container
2010	5,268,517
2015	6,626,945
2020	7,790,578
2025	8,954,211

Source: Author

Figure 3.4 Results of freight traffic estimation between ROK and Russia (Note: Korea is ROK)

Unit : ton

yy	Container
2010	907,960
2015	1,438,089
2020	1,726,299
2025	2,014,510

Source: Author

Figure 3.5 Results of freight transit traffic estimation between ROK and China (Note: Korea is ROK)

Unit : ton

yy	Container
2010	9,282,754
2015	12,816,153
2020	15,693,449
2025	18,570,746

Source: Author

DPRK in 2025 is estimated as 124.53 million tons. Assuming a trend of increase in exchange between ROK and DPRK, development of Gaeseong Industrial Complex and an additional development of 4 special zones of economic cooperation between ROK and DPRK according to the optimistic scenario, the annual freight demand between ROK and DPRK in 2025 is estimated as 197.78 million tons. The estimation of Freight Traffic between ROK and DPRK is as follows for quo and optimistic scenario respectively.

Korea - China/ Russia Freight Traffic Demand

On-the-sea freights O/D by zone (Korea - the Three Northeastern Provinces, Hebei, Beijing/ Tianjin, far-east Russia, etc.) is used. For transport demand, estimation targeted only the import - export freight excluding transit shipment.

As shown in Figure 3.3, freight traffic volume of ROK-China increased steadily for 10 years despite world economic crisis in 2008. In the GTI-linked zones, the freight traffic demand to West and East Corridor is estimated according to the freight traffic data of 10 years old as follow. The freight demand between ROK and China will increase about two times for 15 years. The freight demand of transportation between ROK and China in 2025 is estimated to be 20.05 million tons.

Similar with China, freight traffic of ROK-Russia volume increased steadily for 10 years despite world economic crisis in 2008 (Figure 3.4). The freight demand will increase about two times for 15 years. The freight

Figure 3.6 Results of freight transit traffic estimation between ROK and Russia (Note: Korea is ROK)

Unit : ton

yy	Container (Bulk)
2010	1,945,739
2015	2,834,560
2020	3,792,712
2025	4,750,865

Source: Author

Table 3.1 Traffic demand of Korean Peninsula West and East Corridor in the GTR (2025)

Unit: Mil. ton

2025 year	ROK-DPRK	ROK-China	DPRK -China	Transit (China)	Transit (Russia)	ChangJiTu	Total
Total demand	124.53 (quo) 197.78 (optimistic)	20.05 (ROK - Dongbei) 10.22 (ROK - Russian Far East)	9.93 (DPRK - Jilin / Heilongjiang) 8.11 (DPRK - Liaoning)	-	-	-	172.83 (quo) 246.09 (optimistic)
Demand of West Corridor	104.86 (quo) 146.09 (optimistic)	20.05 (ROK - Dongbei)	8.11 (DPRK - Liaoning)	18.85	-	-	151.87 (quo) 193.09 (optimistic)
Demand of East Corridor	19.67 (quo) 51.70 (optimistic)	10.22 (ROK - Russian Far East)	9.93 (DPRK - Jilin / Heilongjiang)	-	4.98	1.36	46.16 (quo) 78.19 (optimistic)

Source: Author

demand of transportation between ROK and Russia in 2025 is estimated to be 10.22 million tons.

DPRK - China/ Russia Freight Traffic Demand

Trade volumes by region in DPRK - China (DPRK - the Three Northeastern Provinces, Beijing, Tianjin, Hebei, Shandong peninsula) is used. The demand for freight traffic of DPRK - Jilin / Heilongjiang in 2025 is estimated to be 9.93 million tons. And the demand for freight traffic of DPRK – Liaoning in 2025 is estimated to be 8.11 million tons.

Transit Shipment to China/ Russia

The estimation targeted transit shipment between Korea ports and the China/ Russia.

As shown in Figure 3.5, freight traffic volume of ROK-China increased steadily for 10 years despite world economic crisis in 2008. In the GTI-linked zones, the freight traffic demand to West and East Corridor is estimated according to the freight traffic data of 10 years old as follow. The freight demand between ROK and China will increase about two times for 15 years. The freight demand of transportation between ROK and China in 2025 is estimated to be 18.85 million tons.

Similar with China, freight traffic of ROK-Russia volume increased steadily for 10 years despite world economic crisis in 2008 (Figure 3.6). Especially, freight traffic volume for transit increased rapidly between ROK and Russia. The freight traffic demand will increase about two times for 15 years. The freight demand of transportation between ROK and Russia in 2025 is estimated to be 4.98 million tons.

Demand for Chang-Ji-Tu

An increase in the gross economy of Jilin Province according to the Changchun - Jilin - Tumen development plan (gross economy of Jilin Province to double in 2012, to quadruple in 2020) is taken into consideration. Of the freight volume to be generated by the Changchun - Jilin - Tumen development, approx. 11.46% is to Korea.

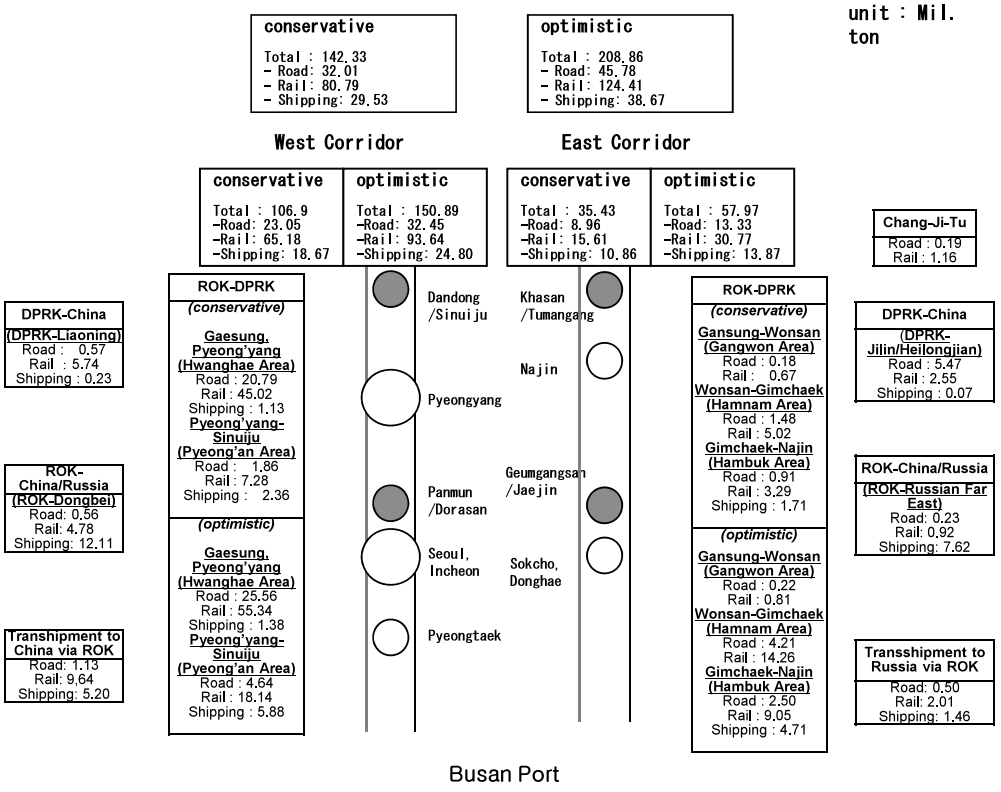
In the GTI-linked zones, traffic demand to Korean Peninsula West and East Corridor of GTI is estimated

Figure 3.7 Traffic demand to Korean Peninsula West and East Corridor

2020

Freight Traffic Demand of Korean Peninsula West and East Corridor related to the GTR (ROK)

unit : Mil. ton



according to the quo and the optimistic scenario as follows.

The traffic demand to Korean Peninsula West Corridor in 2025 is estimated to be 151.87 million tons according to the scenario to maintain status quo and 193.09 million tons according to the optimistic scenario (Table 3.1). The traffic demand to Korean Peninsula East Corridor in 2025 is estimated to be 46.16 million tons according to the scenario to maintain status quo and 78.19 million tons according to the optimistic scenario (Figure 3.7).

3.2 Special Issue Analysis: ROK-DPRK transport infrastructure and services

3.2.1 Inter-Korean Transit

Roles of Inter-Korean Transit Office

Inter-Korean Transit Office is operating 'overland route transit sites' designated to allow transit between ROK

and DPRK according to the 'Inter-Korean Exchange and Cooperation Act.' As a result of the ROK - DPRK railway and road connections and commencement of overland tours to Mt. Kumgang, a temporary transit office was established in February 2003 to process Inter-Korean transit operations. On November 20, 2003, the official Inter-Korean Transit Office was installed.

Inter-Korean Transit Office handles transit management, such as screening and quarantine of people visiting DPRK, civil affairs in relation to the transit, support for customs clearance of goods carried in and out between ROK and DPRK and contact and cooperation with DPRK in relation to train operation. The office maintains a cooperative system to work jointly with the Ministry of Unification, Ministry of Justice, Korea Customs Service, Ministry of Ministry of Health and Welfare, Ministry for Food, Agriculture, Forestry and Fisheries, Food and Drug Administration and Cultural Heritage Administration at the northernmost end of the Gyeongeui Line and Donghae Line roads and railways. Inter-Korean Transit Office is also serving as a gateway to the ROK - DPRK cooperation districts within DPRK, such as Kaesong Industrial Complex and Mt. Kumgang.

Inter-Korean Transit Procedures

The procedures and methods of inter-Korean transit are different from those applied to departure to or arrival from foreign countries. In general, one requires going through departure process by carrying a passport at the airport to depart from a country. However, to visit DPRK, visitors need to obtain an approval on the visit to DPRK in advance and have a certificate for visit to DPRK issued by the Minister of Unification instead of a passport (Table 3.2). As for screening, customs clearance and quarantine, the same procedures as of immigration apply.

Table 3.2 Differences between Immigration and Border Passage

Classification	Immigration	Border Passage
Differences	· Travel between countries, international trading · Visa and passport required · Handled by Immigration Office (Ministry of Justice)	· Travel between ROK and DPRK by affiliate persons, internal trading by the Korean race · Visitor's pass or certificate for stay and certificate for visit to DPRK required · Handled by Inter-Korean Transit Office (Ministry of Unification)
Same Procedures	· Screening, customs clearance, quarantine	

For the people of ROK to visit DPRK, it is required to obtain an approval on a visit to DPRK from the Ministry of Unification by submitting an application for the visit and then to obtain a certificate for visit to DPRK. In particular, to visit the Kaesong Industrial Complex, visitors must apply for a visitor's pass or a certificate of stay, which are certificates necessary for a visit to DPRK, on the OK System (online transit application system) operated by the Kaesong Industrial District Management Committee (KIDMAC).

Following the application, an approval for a visit to DPRK is checked on the inter-Korean exchange and cooperation system (http://www.tongtong.go.kr) of the Ministry of Unification. On the day of leaving border, visitors are to present their certificates for visit to DPRK to the Inter-Korean Transit Office, receive screening and leave the border. In DPRK, the visitors are to receive screening upon entry by presenting their visitor's pass or certificate of stay. In general, visitors can apply for a education and information program for visit to DPRK and a visitor's pass or a certificate of stay when applying for an approval on the visit to DPRK.

To visit DPRK on a car, visitors must apply for a certificate for visit to DPRK and then apply for an approval on the vehicle operation prior to submitting their transit plans. For a visit to the Kaesong Industrial Complex, an electronic vehicle operation certificate (RFID card) is issued when an application for vehicle operation is made on the inter-Korean exchange and cooperation system and screening is carried out automatically with the electronic certificate. That is, visitors on a car can swiftly pass through screening when they attach the electronic certificate (RFID card) on the front part of their vehicles.

Transit Facilities and Status

a. Transit Facilities

Following the ROK - DPRK railway and road connections, an one-stop service system was established in relation to all transit affairs including screening, customs clearance and quarantine to be carried out on people, vehicles and goods (freights) moving between ROK and DPRK by continuously expanding the related infrastructures to ensure convenience of the people visiting DPRK.

Inter-Korean Transit Office is operating Gyeongeui Line Road and Railway Transit Office in Munsan, Gyeonggi-do as a transit site for the western region to Kaesong and Pyongyang, etc. and Donghae Line Road and Railway Transit Office in Kosong, Kangwon-do as a transit site for the eastern region to Mt. Kumgang, etc.

Railway and road transit facilities for Gyeongeui Line Transit Office and Donghae Line Transit Office (including Dorasan Station and Jejin Station respectively) were completed in 2006. In addition, Gyeongeui Line Dorasan Logistics Center and Donghae Line Logistics Center were completed in December 2007 and September 2010 respectively. The scale of Inter-Korean Transit Office including Gyeongeui Line Transit Office and Donghae Line Transit Office is 675,988m^2 in site area and 51 buildings with a floor space of 86,424m^2.

For the Gyeongeui Line Transit Office in Munsan, Gyeonggi-do, road transit facilities were built for successful passage of vehicles and people in between ROK and DPRK, railway transit facilities were installed for ROK - DPRK train operation and Dorasan was opened for swift customs clearance and quarantine of goods (freight) and to supplement the insufficient logistics infrastructures in DPRK. The facility scale is 442,015m^2 in site area and 39 buildings with a floor space of 53,623m^2.

The Donghae Line Transit Office located in Kosong, Kangwon-do consists with road transit facilities, railway transit facilities and a logistics center over a site measuring

233,973 m^2. There are 12 buildings with a total floor space of 2,801 m^2.

b. Overland Route Transit Status

In 2010, 126,107 people and 81,414 vehicles traveled through the Gyeongeui overland route because the commuting traffic to and from the Kaesong Industrial Complex increased as the number of people staying within the complex decreased. As for Donghae overland route, 3,051 people and 1,027 vehicles traveled through it, which decreased from the previous year.

In 2011, the commuting traffic decreased as a result of an increase in the number of people staying in the complex for support to production activities of the tenant companies and, thus passage of people and vehicles through the Gyeongeui overland route (115,249 people, 1,414 vehicles) decreased slightly from the previous year. As for the Donghae overland route, 436 people and 198 vehicles traveled, which decreased from the previous year.

Inter-Korean Transit Office is located inside the civilian access control line. 3,834 and 6,062 people visited the office in 2010 and 2011 respectively. The visitors count is displaying an upward trend.

c. ROK - DPRK Freight Train Operation

The basic facilities for train operation between ROK and DPRK were established as the inter-Korean railway track construction on a Gyeongeui Line section (Munsan - Kaesong, 27.3km) and a Donghae Line section (Jejin - Mt. Kumgang, 25.5km) was completed at the end of December 2005. Following an agreement at the 13th meeting of the Inter-Korean Economic Cooperation Promotion Committee in April 2007, the ROK - DPRK railway pilot operation commenced on May 17, 2007. From December 11, 2007, the ROK - DPRK freight trains were operated five days a week excluding Saturdays and Sundays between Dorasan Station in ROK and Panmun Station in DPRK (departing Dorasan Station at nine in the morning, departing Panmun Station in DPRK at two in the afternoon).

In the beginning, a railway car consisting with 12 compartments (one engine car, ten freight cars and one cabin car) was used in the operation. From February 1, 2008, based on an agreement between ROK and DPRK, freight cars were operated only when freights were to be transported. When there were no freights to be transported; only the engine car and cabin car were operated. However, the freight train operation was stopped on November 28, 2008 as a result of the restriction of overland route transit by DPRK.

3.2.2 Possible solution for the bottleneck along the Korean Peninsula West Corridor 5

The current issues of ROK in relation to the ROK– DPRK Railway connected operation are as outlined below. The final destination of transportation by the ROK– DPRK railway connection is mainly in the metropolitan area and Busan Port/Gwangyang Port and therefore domestic railway transport capacity must be taken into consideration. In addition, ROK– DPRK railway connection in the metropolitan area must be via Gyeongeui Line. However, the metropolitan railway is in a radial shape stretching in all directions from downtown Seoul. Therefore, the capacity of not only Gyeongeui Line, but also Gyeongbu Line and Jungang Line is insufficient for ROK– DPRK freight transport.

In case of the Munsan – Susaek section of Gyeongeui Line, there is a possibility of its functions colliding with the metropolitan subway line functions. As for the Seoul – Siheung section of Gyeongbu Line, there are limitations in the capacity even when it is expanded through signal improvement, etc. In order to overcome the issues, the direction of metropolitan railway improvement has been set as of the following.

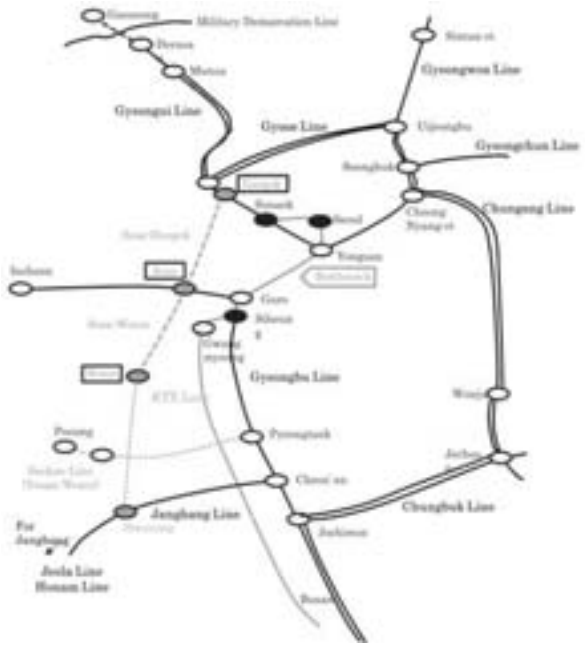
- Bypass Route in the Western Part of Metropolitan Area: Daegok – Sosa – Wonsi – Hwayang
- Bypass Route in the Eastern Part of Metropolitan Area: To use Gyeongeui/Gyeongwon Line via Chungbuk Line – Jungang Line

The Daegok – Sosa route connects Bucheon (Sosa Station, Gyeongin Line) and Ilsan (Neunggok Station, Gyeongin Line) of the currently prompted Sosa – Wonsi route in south – north direction. Linked to the Seohae railway to be built in the future (Wonsi-dong of Ansan – Hwayang and Yeosan of Chungcheongnam), it will function as an arterial railway network in preparation for the expanded exchange between ROK and DPRK. The Sosa – Wonsi route stretches from Sosa of Bucheon through Siheung to Wonsi-dong of Ansani. The route is scheduled for opening in 2015. This route starts from Sosa Station of Gyeongin Subway in Bucheon, passes through Siheung and ends at Wonsi-dong inside Banwol Industrial Complex of Ansan. A total of 12 stations will be installed along the route. After the subway line is completed, the consortium will hand over the title to the government and will recover construction cost and operating cost by operating the line for 20 years. Once the route is opened, it will bypass the metropolitan area and therefore connect between the northwestern and southwestern parts of the metropolitan area. As a result, it will not only provide traffic convenience but also significantly contribute to activating the West Coast axis development project in the future.

In case of the eastern route, it has to bypass a relatively longer distance. It requires improvement work, such as double-tracking in the single-line section. It is considered more effective to use the eastern bypass route as an alternative route in case the international logistics project in the Eurasian continent is completed in a short period of time and to encourage investment in and activation of the western bypass route in a mid to long-term.

This is a possible solution for the bottleneck along the Korean Peninsula West Corridor 5 (Figure 3.8). The solid line from Guro to Seoul in figure represents the bottleneck section. The dotted line is a railway line under construction. This line will be function as the western roundabout route for the metropolitan area. The double line is an existing route currently, and it curves around the eastern region of the metropolitan area. This eastern route travels a long distance around the region, and requires improvements such as double tracks. If the international logistics business of the Eurasia Continent is conducted in early, we can use the eastern roundabout route for short term, and invest in the western roundabout route for long-term basis.

Figure 3.8 Possible solutions for the bottleneck along the Korean Peninsula West Corridor 5



Source: Korea Railroad Research Institute

When connecting railway networks in ROK and DPRK, it will be necessary to (1) restore unconnected sections of the Donghae Line and Gyeongwon Line and (2) develop a bypass route in the metropolitan area and an alternative railway network.

3.3.4 Economic Feasibility of Automatic Variable Gauge System through LCC Analysis

One of issue in GTI region is break of gage at border crossing point (Figure 3.9). At this point, transshipment and transit including bogie change need to time consumption and cost. Variable gauge system (Figure 3.10) resolves the time and cost increasing due to transshipment and bogie change. It prevents damages of freights and provides comfortable operation service to passengers.

When the ROK – DPRK railway is connected with the continental railway, width of track will change in some borders. There will be no problems caused by transshipment when the amount of freights is small. However, when the amount of freights transported increases, it will result in bottleneck effect and therefore cause a number of problems in freight transportation. In Europe, free gauge train (FGT), which can be promptly and safely operated in areas where the width of track changes without bogie exchange or transshipment, is being operated.

Variable gauge system not only resolves the problems of time and cost increasing due to transshipment and transit, but also prevents damages to freights and provides comfortable operation service to passengers. In addition, this is an eco-friendly system more advantageous in handling hazardous and toxic freights. Moreover, using variable gauge system, additional cost for infrastructures, such as transit and bogie exchange facilities, in borders applied with different types of tracks can be reduced.

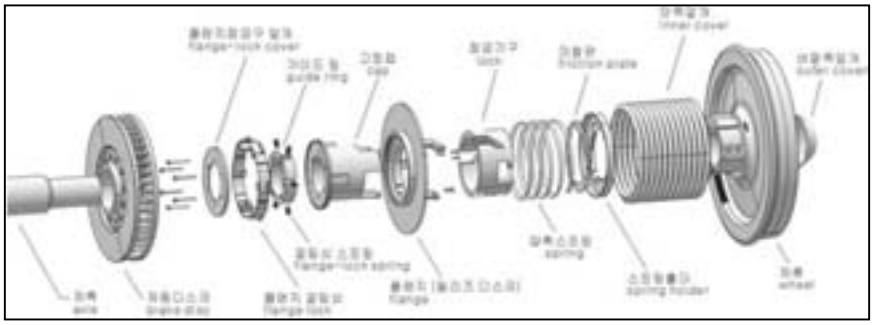
The applicable stations in the East Asian regions are as outlined below. These stations are currently using transshipment and bogie exchange facilities although the transit freight volume is increasing. Therefore, congestion is forecast to occur in these stations.

· Tumangang (DPRK/1,435mm) - Khasan (Russia/1,520 mm) Station
· Erenhot (China) - Zamin Uud (Mongolia)
· Manzhouli (China) - Zabaykalsk (Russia)
· Suifenhe (China) - Grodekovo (Russia)
· Hunchun (China) - Kraskino (Russia)
· Alashankou (Chian) - Druzhba (Kazakhstan)

This study aims at economic analysis necessary in introduction and operation of FGT in the future. For this, LCC (life cycle cost) analysis to predict the total cost incurring in the process of acquisition, operation, maintenance and disposal of FGT is conducted and

Figure 3.9 Break of gauge in GTI region

Figure 3.10 Automatic Variable Gauge Bogies



Source: Korea Railroad Research Institute

Table 3.3 Summary of LCC Analysis Results on Transport of Hazardous Materials by Transport Route and Scenario (1.2 million tons/ year)

Item	Route I TKR - TSR		Route II TKR – TSR – TMR - TSR	
	Scenario I (Bogie Exchange)	Scenario II (Variable Gauge Bogie)	Scenario I (Bogie Exchange)	Scenario II (Variable Gauge Bogie)
Freight Car Return, days	14.6	11.3	18.8	8.9
No. of Freight Cars Owned	1,106	856	1,419	670
Initial Investment Cost to Overcome Track Differences	KRW 176.6 billion	KRW 220.6 billion	KRW 236.1 billion	KRW 172.9 billion
Cost of Operation and Ownership to	KRW 304.0 billion	KRW 147.5 billion	KRW 723.3 billion	KRW 167.8 billion
Overcome Track Differences				
Total Life Cycle Cost of Transportation System	KRW 480.6 billion	KRW 368.1 billion	KRW 959.5 billion	KRW 340.7 billion
Transportation Unit Cost	KRW 13,349/ton	KRW 10,226/ton	KRW 26,653/ton	KRW 9,465/ton
Conclusion	In comparison to scenario I, transportation unit cost is reduced by approx. 23.4% in scenario II.		In comparison to scenario I, transportation unit cost is reduced by approx. 64.5% in scenario II.	

Source: Korea Railroad Research Institute

Table 3.4 Summary of LCC Analysis Results on Transport of Container by Transport Route and Scenario (100 Thousand million TEU/ year)

Item	Route I TKR - TSR		Route II TKR – TSR – TMR - TSR	
	Scenario I (Bogie Exchange)	Scenario II (Variable Gauge Bogie)	Scenario I (Bogie Exchange)	Scenario II (Variable Gauge Bogie)
Freight Car Return, days	14.9	11.6	19.1	9.2
No. of Freight Cars Owned	2,348	1,828	3,001	1,441
Initial Investment Cost to Overcome Track Differences	KRW 238.4 billion	KRW 397.2 billion	KRW 323.9 billion	KRW 313.4 billion
Cost of Operation and Ownership to Overcome Track Differences	KRW 587.6 billion	KRW 278.4 billion	KRW 1,419.7 billion	KRW 255.4 billion
Total Life Cycle Cost of Transportation System	KRW 826.0 billion	KRW 675.7 billion	KRW 1,742.6 billion	KRW 568.8 billion
Transportation Unit Cost	KRW 275,352 /TEU	KRW 225,240 /TEU	KRW 581,215 /TEU	KRW 189,607 /TEU
Conclusion	In comparison to scenario I, transportation unit cost is reduced by approx. 18.2% in scenario II.		In comparison to scenario I, transportation unit cost is reduced by approx. 67.4% in scenario II.	

Source: Korea Railroad Research Institute

therefore the feasibility of using variable gauge bogie in the Northeast Asian regions and GTI-linked zones is analyzed.

The LCC analysis of hazardous materials and container freight transport system is conducted in relation to two transport scenarios to overcome track differences.

- Scenario 1: Bogie exchange with lift jack (currently used method)
- Scenario 2: Automatic variable gauge (FGT)

Key Assumptions by Scenario:

- Freight Group and Transport Quantity:

1) Hazardous Materials (petroleum products and liquefied gas) – 1,200,000 tons/ year

2) Container – 100,000 TEU/ year

- Freight Car Loading Capacity:

1) A tank vehicle capable to load 50 tons

2) Container freight car

- Transport Distance:

1) Route I: TKR (Gyeongbu Line – Gyeongwon Line

– Pyeongla Line) - TSR

Busan – Seoul – Wonsan – Najin – Tumangang – Hasan – Khabarovsk – Chita – Ulan Ude

2) Route II: TKR (Gyeongbu Line – Gyeongwon Line – Pyeongla Line) – TSR –TMR - TSR

Busan – Seoul – Wonsan – Najin – Tumangang – Hasan – Gredekovo – Suifenhe – Manzhouli –Zabaykalsk – Chita – UlanUde

- Operation Method: Shuttle service

As a result of analysis, transport scenario II (automatic variable gauge) is found to be more economically feasible than transport scenario I (bogie exchange). The results of LCC analysis on transport scenarios by transport route and freight type are summarized as Table 3.3 and Table 3.4 (1 USD = 1200 KRW).

In the study, considering 1/2(half) operating labor cost and 20% reduction of variable gauge bogie, it is concluded that economic feasibility is higher when using variable gauge bogie.

4 Measures and Investment Program proposed to improve transport movements along the corridors (Status of ROK - DPRK & Northeast Asia Transportation Plans)

4.1 Constraints for traffic flows along the trans-GTI corridors

See Table 4.1.

4.2 Plans for Revision of the Fourth Comprehensive National Territorial Plan (2006~2020)

A. Establishing a Foundation for Formation of the Northeast Asian Development Community

To establish a foundation for formation of the Northeast Asian development community for economic integration and cooperation in Northeast Asia

- Aiming to lower development gaps between the advanced and underdeveloped regions in Northeast Asia through cooperation especially on traffic, logistics and energy fields.
- Organizing "Northeast Asian Infrastructures Development Organization (provisionally named)" and therefore promoting cooperation for infrastructures development covering a wide area

To strengthen international cooperation for implementation of an integrated traffic and logistics system in Northeast Asia

- Promoting cooperation for connection of the Trans-Korea Railway (TKR: Gyeongeui Line and Donghae Line) and trans-continental railways (TCR, TSR, TMR and TMGR)
- Promoting cooperation for connection of Asian Highway and express road networks in the Korean peninsula according to progress in relationship between ROK and DPRK

B. Expanding Exchange and Cooperation among Sub-cooperation Spheres in Northeast Asia

To implement an international labor division system and establish composite strategies in preparation for integration of regional economics, such as Korea - China - Japan FTA (Free Trade Agreement)

- Reorganizing regional industrial structures centering on competitive industries based on comparative advantages and promoting cooperation and division of roles among the three countries of Korea, China and Japan

To expand exchange and cooperation in the Pan Yellow Sea area, the Pan East Sea area and the Korea - Japan Strait area

- Preferentially strengthening industrial, logistics and tourism cooperation in Pan Yellow Sea area and Korea - Japan Strait area and cooperation among the open regions
- Strengthening industrial cooperation centering on electronic and information and communications industries for Bohai Bay of China as well as Gyeonggi-do and Incheon in the Pan Yellow Sea area
- Extensively promoting cooperation among countries in the Pan East Sea area centering on tourism, natural gas and maritime resources

To promote cooperation among local governments in the sub-spheres in response to the trends of decentralization and globalization in local areas

- Encouraging implementation of infrastructures for systems in response to each country for the fields of tariff, customs and immigration procedures and logistics service in order to promote domestic and overseas investment by establishing a network linking free economic zones
- Implementing a linked network for Incheon, Dalian and Qingdao in the Pan Yellow Sea area
- Implementing a linked network for Busan, Kitakushu and Niigata in the Pan East Sea area

C. Establishing a Peace Belt by Promoting Cooperative Projects in Borderland

To strengthen the foundation for ROK - DPRK exchange and cooperation by developing the borderland as a peace belt, a space of reconciliation and cooperation

D. Developing ROK - DPRK Cooperation for Step-by-step Development of the Special Economic Zones in DPRK

To develop special economic zones where the geo-economic potentials are high and the related infrastructures are established and therefore to promote ROK - DPRK cooperation

- Utilizing and developing Gaeseong Industrial Complex and Mt. Geumgang areas as a stage to try out reciprocal economic cooperation between ROK and DPRK

To expand traffic network and infrastructures for activation of special economic zones in DPRK

- Implementing communications network and power supply network for successful promotion of exchange and cooperation projects
- Expanding expressways, railways and ports connecting between ROK and DPRK in order to secure inland and marine traffic networks necessary in development of special economic zones

Table 4.1 Constraints along the trans-GTI corridors

	Constraint	Importance (How much it restricts the flow)	Timeframe (Reflects the Urgency)	Mitigation measures
Infrastructure				
Rail	- Missing link between ROK and DPRK	Severe	Urgent (2013-)	Reconnection of the missing link (Cheolwon – Pyeonggang & Cheolwon –Neageumgangsan; There are physically no rail.)
	- Improvement of Railway for International Logistic Service	Severe	Urgent (2013-)	Improvement of the railway section (Gaeseong - Sinuiju)
	-Modernization of DPRK's railroad for Korean Peninsula Corridors	Severe	Urgent (2017-)	In the modernization of DPRK infrastructure, low-cost and government-led pilot projects need to be implemented at the early stage and then they will be developed to the high-cost and large scale private projects that will attract the international investment. (Goseong(Gansung) – Najin, Pyeonggang -Wonsan)
	- Difference in gauges and axle load requirements	Moderate	2015-	Need to demonstration run of Automatic Variable Gauge System considering International Logistic Service
Road	- Missing link between ROK and DPRK	Severe	Urgent (2013-)	Reconnection of the missing link (No. 3 road of Cheolwon – Pyeonggang ; There are physically no road.)
	- Improvement for Logistic Service	Severe	Urgent (2013-)	Improvement of the road section(AH1 road; Gaeseong - Pyeongyang)
	-Modernization of DPRK's road for Korean Peninsula Corridors	Severe	Urgent (2017-)	In the modernization of DPRK infrastructure, low-cost and government-led pilot projects need to be implemented at the early stage and then they will be developed to the high-cost and large scale private projects that will attract the international investment. (AH1 road; Pyeonggang – Sinuiju, AH6 road; Goseong(Gansung) – Tumangang, Pyeonggang -Wonsan)
Port	-Modernization of DPRK's port for Korean Peninsula Corridors	Severe	Urgent (2013-)	In the modernization of DPRK infrastructure, low-cost and government-led pilot projects need to be implemented at the early stage and then they will be developed to the high-cost and large scale private projects that will attract the international investment. (Heaju, Nampo, Najin port rehabilitation)
BCP	Insufficient traffic network and infrastructures for activation of special economic zones in DPRK 3C Problem (Commutation, Communication and Customs)	Severe	Urgent (2013)	It is necessary to expand logistics infrastructures by stages according to the step-by-step implementation of projects in special districts for economic cooperation in the ROK - DPRK border areas and to activate the ROK - DPRK joint operation committee to increase efficiency of transit and customs-related operations.
Transport regulation	Not to join OSJD (Organization for Cooperation of Railway) in preparation for the international railway operation	Moderate	Urgent (2013)	Promoting to join OSJD with cooperation of member countries Improving laws and systems to simplify procedures in crossing borders, concluding international agreements (on routes, fares and operating conditions) and implementing railway operation by stages for successful promotion of the TKR-Trans Continental linking project

E. Implementing Integrated Infrastructures for the Korean Peninsula

To secure a foundation for expansion and further development of projects for cooperation in infrastructures development that are being currently implemented on a short-term basis

- Promoting ROK - DPRK cooperation to enhance transportation efficiency of Gyeongeui and Donghae Line railways and roads and to lower marine transportation cost between ROK and DPRK

To implement an integrated logistics network of the Korean peninsula on a mid to long-term basis that compositely links railways, roads, airports and ports between ROK and DPRK

- Implementing and modernizing cross-border railway routes
- Linking major airports, ports, arterial railways and express road networks

F. Establishing Key National Traffic Network for Half-day Life Zone

Roads

To promote balanced development of the national territory by establishing a grid-type arterial road network consisting with seven South - North axes and nine east - west axes

- Connecting areas of large traffic in between expressways and regions with express arterial road networks and implementing metropolitan belt way networks as part of arterial road networks
- Expanding expressways by stages according to priorities from the total extension of 2,923km as of 2004

To establish composite arterial road network plans comprehensively covering expressways and national roads in order to secure a foundation for long-term development of the national territory

Railways

Express railway network

- Completing stage 2 of Gyeongbu Express Railway project and building Honam Express Railway in order to encourage local development and to handle an increase of transportation demand according to the West Coast development
- Implementing an international railway transportation basis so the Korean peninsula can perform as a gateway to Asia and Europe as express railway networks are connected with TCR and TSR

To establish and promote systematic national railway network implementation plans to link express and general railway networks

Implementation of Inland Logistics Base Facilities

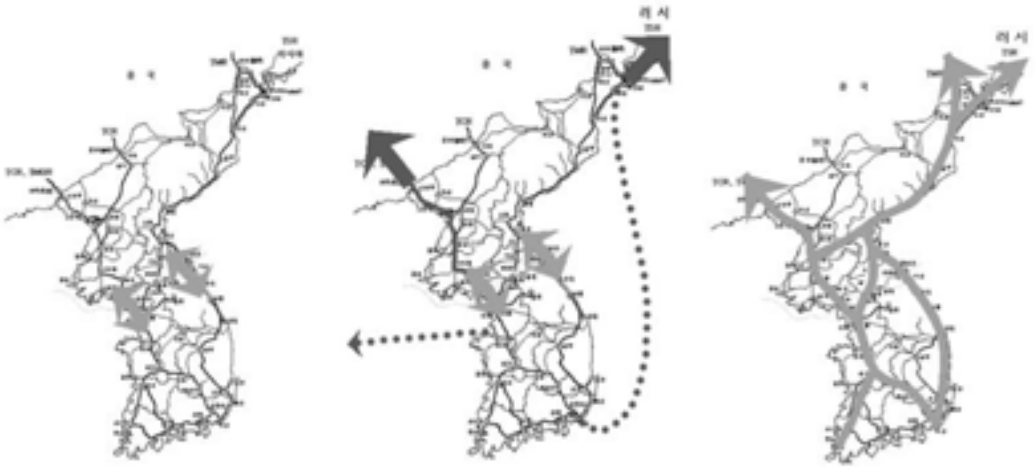
To establish inland logistics bases linked with arterial traffic facilities in order to implement an inland transport system for linked transportation between airports and ports

To expand and activate the functions of composite freight terminals and inland cargo depots (ICD) by each of the five areas nationwide

- SMA: Expanding existing facilities and establishing new logistics bases
- Busan Area: Focusing on activating functions of the facilities
- Jungbu, Yeongnam, Honam: Expanding facilities by stages and activating operation

To develop distribution and logistics complexes by region

Figure 5.1 Roadmap of Inter-Korean Transportation for ROK-DPRK Railway



Phase 1	Phase 2	Phase 3
Connection between ROK-DPRK	Improve DPRK Railroad	Modernize DPRK Railroad
Minimum maintenance of DPRK railroad → create/reinvest profits from transportation business	Improve DPRK railroad → expand transportation business, organize an international consortium	Modernize DPRK railroad to a 'new' railroad → complete Eurasia Land Bridge

5. Future Development of Trans Korean Transportation Infrastructure

The project of Trans Korean Transportation Infrastructure has a mission to restore the disconnected space of the Northeast Asia as well as to build the inter-Korean economic community.

For Korea to realize its future visions, it is important to promote spatial development of the Korean peninsula under the concept of "open territory" rather than "closed and exclusive territory". This means that the concept of national territory needs to be recognized afresh as an "open space" of exchange and cooperation rather than a physical area. If Korea and the Northeast Asia are to form a integrated economic zone in the future, one of the most fundamental conditions is none other than "mutual exchange". Trans Korean Transportation Infrastructure will also revitalize the personal and physical exchange in the territory of Northeast Asia, strengthening the connectivity with the Northeast Asia's economic zone.

For SOC development in the Korean peninsula, a step-by-step strategic approach is required where macroscopic goals are set, such as to achieve economic revitalization in DPRK, ROK - DPRK economic integration, long-term improvement of competitiveness in the Korean peninsula and cooperation for implementation of infrastructures in the Northeast Asia, and to achieve the goals accordingly.

Step one of the approach is to build local infrastructures in the ROK - DPRK border areas. At present, Gyeongeui and Donghae Line railways and roads have been completed. Step two is to expand the infrastructures according to activation of special districts in the border areas and to promote infrastructures development in preparation for the demand for traffic between DPRK and Russia, DPRK and China and through DPRK. A Eurasian logistics project is currently on the way in line with the Najin - Khasan railway renovation and it is necessary to promote additional logistics projects for Northeast Asian regions according to the renovation of Gyeongeui Line. Step three is to increase infrastructures in preparation for the demand of traffic through the Korean peninsula and inside DPRK. In the long run, it is necessary to continuously improve internal capacities of infrastructures in the Korean peninsula at the same time as linked implementation of the Eurasian infrastructures network.

Thus, the paper proposes the implementation strategy in stage for Inter-Korean railway for practical approach as the driving factor in structuring the Inter-Korean economic community and the multilateral railway cooperation. To that end, the measures to modernize the DPRK railway and create the virtuous circle of logistics industry, thereby strengthening the international logistics competition.

It's necessary to work out the phasing strategy to develop the DPRK railway network and suggest the medium & long-term road map for inter-Korean railway (Figure 5.1).

Stage 1 (inter-Korean railway connection stage) is the phase for construction of regional infrastructure at the borderland such as Gaesung and Mt Geumgang. It's the stage completed. Gyeongeui and Donghae line and overland route have been completed.

Stage 2 (DPRK railway restoration stage) is the phase for implementation of infrastructure development stage in preparation for the demand from the trans- Korea. It's the stage currently required. To accomplish the goal, the project among the two Koreas and Russia or the two Koreas and China need to be developed likes Najin-Hasan project and logistics business linking Shimyang - Pyungyang - Seoul – Busan.

Stage 3 (modernization of DPRK railroad) is the stage to improve the infrastructure (double-tracking and high-speed) in preparation for transit and potential DPRK demand. It's the stage to modernize DPRK railway system based on construction of the new line we understand. On a long-run, it's the stage requiring internal improvement for construction of infrastructure network in Northeast Asia and constant infrastructure in Korean Peninsula.

When it comes to modernization of DPRK railway, low-cost and government-led pilot projects need to be implemented at the early stage and then they will be developed to the high-cost and large scale private projects that will attract the international investment.

Moreover, as Trans Korean Transportation Infrastructure contribute to economic and security-related cooperation in Northeast Asia and cooperation in the Northeast Asia, in turn, contributes to the improvement of ROK- DPRK relationship, it will be possible to ultimately look forward to a virtuous cycle leading to unification of Korea and integration of the Northeast Asia.

GTI

大図們江地域（GTR）横断輸送回廊の現状と将来発展（韓国区間）

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（要旨）

北東アジアの国際交通・ロジスティクスシステムは、アジアハイウェー（AH）、アジア横断鉄道ネットワーク及び中国、ロシア、日本などの幹線鉄道網や地域のフィーダーロジスティクスネットワークなどによって構成される。朝鮮半島の交通・ロジスティクスシステムの基盤は、６つの結節点から構成されよう。そして、ソウルを中心として、「インチョン・西部経済圏」、「ピョンヤン・ナンポ圏」、「ウォンサン、ハムフン圏」、「東部（クムガン山）経済圏」、「プサン・ウルサン圏」及び「セマングム、モッポ圏」を連結した構造が形成されることになる。

2008年の世界経済危機はあったものの、過去９年間にわたり、韓国の貨物輸送量は増加してきた。特に、プサン港における輸出入及びトランジット貨物の輸送量が多い。インチョン、ガンヤン、ピョンテク及びムクホの各港では輸出入貨物量が重要な要素となっている。近年では韓国とロシアの間でのトランジット貨物輸送量が急増している。

インフラ能力の状況

2009年には、道路延長は2001年と比べて13,587km増加した。2009年の道路総延長は104,983kmであり、2001年からの年平均増加率は1.75％であった。高速道路は、2001年の2,637kmから2009年の3,776kmへと1.43倍になった。

鉄道に関しては、京釜高速鉄道の第１期（ソウル～テグ）が2004年に開業し、第２期（テグ～プサン）が2010年に開業した。高速鉄道は、韓国の半日生活圏の形成に寄与した。2009年の鉄道総延長は3,377.9kmであり、うち240.4kmが高速鉄道、3,137.5kmが在来鉄道である。2009年時点の複線化率は43.9％であり、毎年増加している。

2010年に全面開業した京釜高速鉄道に加え、湖南高速鉄道の建設が進められている。これは、西海岸開発に伴う輸送需要の増加への対応や地域発展の促進を目的としたものである。長期的には、中国横断鉄道（TCR）及びシベリア横断鉄道（TSR）につながる高速鉄道網を形成し、韓国が欧亜大陸のゲートウェーとなるよう、国際鉄道輸送基盤を構築する必要がある。韓国政府は、高速鉄道を在来線ネットワークと連結していく、体系的な国家鉄道網構築計画を策定済みである。

京義の鉄道、道路（京義線、国道１号線＝往復４車線）及び東海の鉄道、道路（東海線、国道７号線＝往復２車線）が韓国と北朝鮮を結んでおり、両国間の経済協力のみならず、南北間交流の活性化並びにTAR、AHとつながる交通網の構築にとっても最も重要な交通路とである。

京義、東海の鉄道、道路連結プロジェクトは、現時点で完了済みである。道路インフラの整備が先行し、2003年以降開城工業団地開発を加速し、2004年以降金剛山観光プロジェクトを促進した。道路インフラの改善により金剛山観光の観光客は年間30万人まで増加した。これは、南北インフラプロジェクトが、明らかに国境地域開発プロジェクトの促進につながった事例である。

港湾に関しては、既存港湾及び新港における貨物取扱能力やコンテナ処理能力が向上した。2009年の総貨物取扱能力及びコンテナ処理能力は、2001年と比べてそれぞれ330万トン、1,100万TEU増加した。

南北間輸送インフラのさらなる発展

南北間輸送インフラプロジェクトは、北東アジアにおける不連続空間を解消する、また南北経済共同体を構築するという使命を帯びている。

韓国が将来ビジョンを実現するにあたっては、「閉鎖的・排外的領域」コンセプトではなく「開放的領域」コンセプトの下で、朝鮮半島の空間的開発を推進することが重要である。このことは、国土についてのコンセプトを、物理的な地域というよりは交流と協力の「開かれた場」として認識し直すことが必要だということを意味している。韓国及び北東アジアが将

来的に統合経済圏を形成するとすれば、その最も根本的な条件は「相互交流」に他ならない。南北間輸送インフラは、北東アジアの経済圏との連結を強めて、北東アジアにおける人的及び物理的交流を再活性化させることになるだろう。

韓国における社会資本整備のためには、段階的戦略アプローチが必要である。その際、マクロ的な目標として、北朝鮮経済の再生や南北経済統合、朝鮮半島の競争力の長期的改善、北東アジアにおけるインフラ構築のための協力といったものを掲げ、こうした目標を実現していくことになる。

このアプローチの第一段階は、南北境界地域における局地的インフラを建設することであろう。現在、京義線、東海線の鉄道・道路が整備済みである。第二段階は、境界地域にある特別区域の活性化に応じてインフラを拡張することであり、また北朝鮮とロシア、北朝鮮と中国及び北朝鮮通過の交通需要への備えとしてインフラ整備を促進することである。現在、欧亜間のロジスティクス構築プロジェクトが、羅津～ハサン鉄道改修と併せて進められているが、このほかにも京義線改修に対応した北東アジア地域におけるロジスティクス構築プロジェクトが必要である。第三段階は、朝鮮半島を通過する交通需要及び北朝鮮内の交通需要に備えたインフラを増強することである。長期的には､ユーラシアインフラ網の構築に合わせて、朝鮮半島内のインフラ能力を継続的に高めていくことが必要である。

このように、本論文では、南北経済共同体及び多国間鉄道協力の構築の推進要素として、南北間鉄道の段階的整備戦略の現実的なアプローチを提案している。そのためには、北朝鮮の鉄道の近代化及びロジスティクス産業の創出、さらには国際ロジスティクス市場における競争力強化が必要である。

段階的な北朝鮮鉄道網整備の戦略を策定すること、及び南北間鉄道整備の中長期ロードマップを提示することが必要だ。

第一段階（南北間鉄道連結段階）は、開城、金剛山といった境界地域での地域的なインフラ建設の段階である。この段階は完了している。京義線及び東海線が完成済みである。

第二段階（北朝鮮鉄道再生段階）は、南北間輸送に備えたインフラ整備を進める段階である。これが、現在必要とされているものである。この目標を達成するためには、南北とロシア、または南北と中国が一緒になったプロジェクトを展開する必要がある。例えば、羅津～ハサンプロジェクトや瀋陽～ピョンヤン～ソウル～プサン間のロジスティクス産業といったものである。

第三段階（北朝鮮鉄道の近代化）は、トランジット輸送及び北朝鮮の潜在需要に対する備えとしてインフラの改善（複線化、高速化）を行う段階である。これは、新線建設により北朝鮮の鉄道システムの近代化を図る段階であると考えられる。長期的には、この段階では北東アジアインフラネットワーク構築及び朝鮮半島の安定的インフラ構築のために、国内インフラを改善していくことが必要となる。

北朝鮮鉄道の近代化の段階では､その初期において政府主導で低コストのパイロットプロジェクトを実施する必要があり、その後に海外からの投資を得て大規模な民間プロジェクトが展開されることになろう。

さらに、南北間輸送インフラは北東アジアにおける経済及び安全保障協力に寄与し、また北東アジアにおけるこれらの協力は韓国・北朝鮮関係の改善にも寄与することから、究極的には朝鮮半島の統一と北東アジアの統合につながる好循環を展望することが可能となろう。

［英語原稿をERINAにて翻訳］

Current Status and Future Prospects of the Trans-GTR Corridors (Segments in Russia)

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1 Introduction

GTI in its current format was established at the 8th meeting of CC in 2005 (Changchun, September 2005) where the member countries agreed to set up the GTI Common Fund, extend intergovernmental agreements, expand geographic coverage and transform TRADP into the Greater Tumen Initiative. The GTI Strategic Action Plan 2006-2015 was adopted for priority sectors (tourism, transport, energy, ecology, investments). This date has been considered as the starting point of GTI constructive activities.

The transport sector is deemed as one of the five priority areas under the GTI. In 2010, to enhance the cooperation in transport sector the GTI Transport Board, established in 2009, adopted the GTI Transport Cooperation Program 2010-2012. The top priority among the projects and activities under the Program was placed to the "Integrated Transport Infrastructure and Cross-Border Facilitation Study for the Trans-GTR Transport Corridors" ("GTI Transport Corridor Study") project.

The purpose of the GTI Transport Corridor Study is to promote development of a reliable, cost-effective and efficient integrated transport network in the GTR through planning of and support to actions to launch and develop international transport corridors in the region, and so on. All goals and objectives of this work have been stated in the Terms of Reference, but the paramount goal of GTI in this area of focus is creation of an atmosphere of real cooperation. The core idea is that all GTI member countries need GTR corridors but this idea was not explicitly highlighted and properly illustrated before.

That's why the principal task of our work was to give a broad overview of the potential for Trans-GTR corridor development that can be used in part or wholly. We have tried to show this potential for corridor development in such a way that everybody might see what they lose in the absence of these corridors. We have tried to make GTI member countries realize and feel that they really need transport corridors, that development of such corridors is beneficial for them, and that, given the potential and prospects of such corridors, any investments in their development will pay back. Only after such common understanding is in place, we may step over to the first cautious step in real cooperation.

2 Due Diligence Review of GTR Corridors

2.1 GTR Transport Corridors with Russian Segments, border crossing points and seaports under consideration (Corridor alignment)

The following zones of Russian territory with corridors segments have been considered (Figure 1-3).

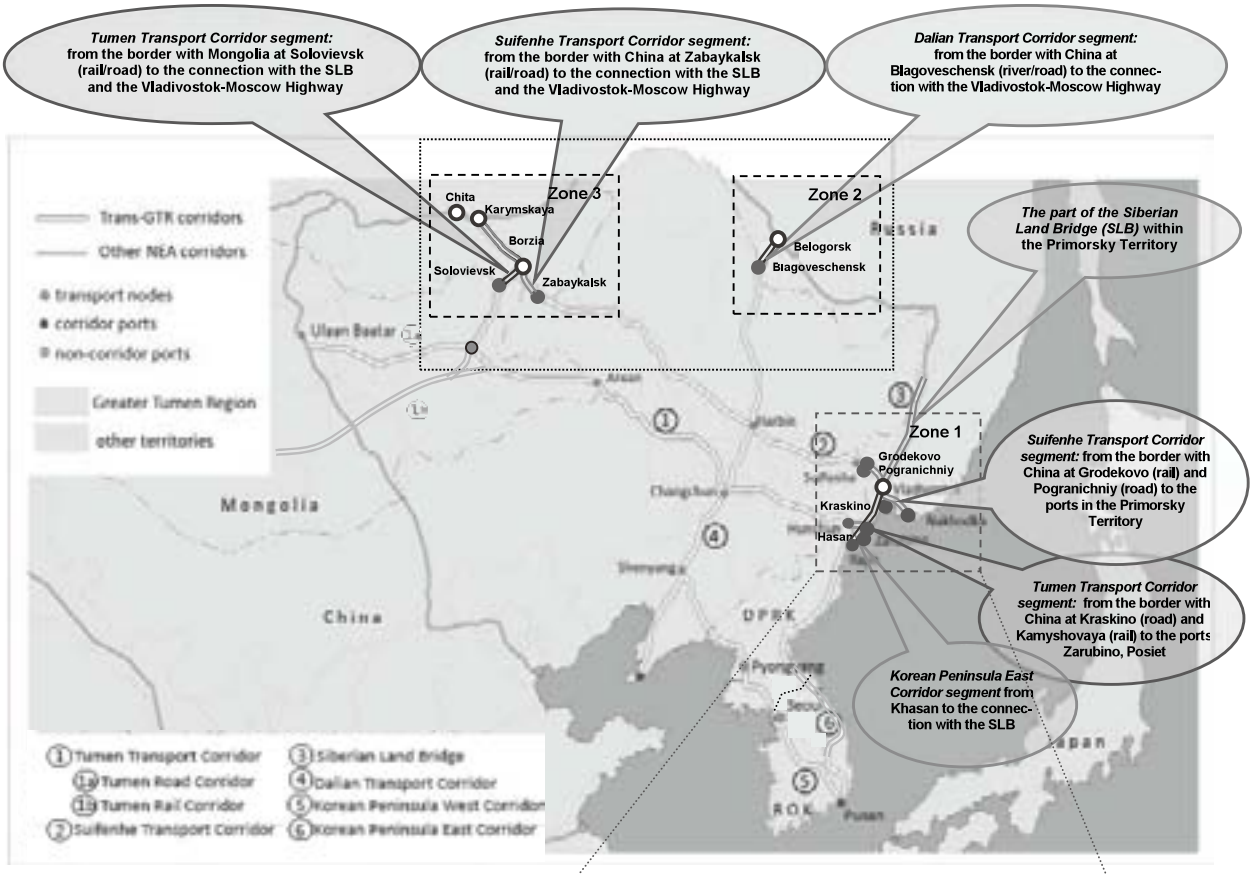
Zone 1 occupies the southern part of Primorsky Territory where the borders of Russia, China and DPRK borders meet. The Zone includes routes to the seaports on Primorsky Territory, namely:

- *Suifenhe Transport Corridor* segment: from the border with China at Grodekovo and Pogranichny (road) to the ports Vostochny, Nakhodka, Vladivostok. In Russia, this section is known as part of the International Transport Corridor (ITC) "Primorye-1" (Harbin - Mudanjiang - Suifenhe - Pogranichny (Dunin - Poltavka) - Ussuriysk - Vladivostok/Vostochny/ Nakhodka and farther sea routes);
- *Tumen Transport Corridor* segment: from the border with China at Kraskino and Kamyshovaya (rail) to the ports Zarubino and Posiet. In Russia, this section is known as part of International Transport Corridor (ITC) "Primorye-2" (Changchun - Jilin - Hunchun - Zarubino - and farther sea routes);
- The part of *the Siberian Land Bridge* within Primorsky Territory.
- *Korean Peninsula East Corridor* segment: from Khasan to the connection with the SLB.

Zone 2 is the southern part of Amursky Territory, from its administrative center, Blagoveschensk, to the connection with the Moscow-Vladivostok Highway and with the SLB (is the segment of the Dalian Transport Corridor). **Zone 3** is the southern part of Zabaykalsky Territory, from the border with China at Zabaykalsk (rail/road on Suifenhe Transport Corridor) and from the border with Mongolia at Solovievsk (rail/road on Tumen Transport Corridor) to the connection with the SLB and the Vladivostok-Moscow Highway.

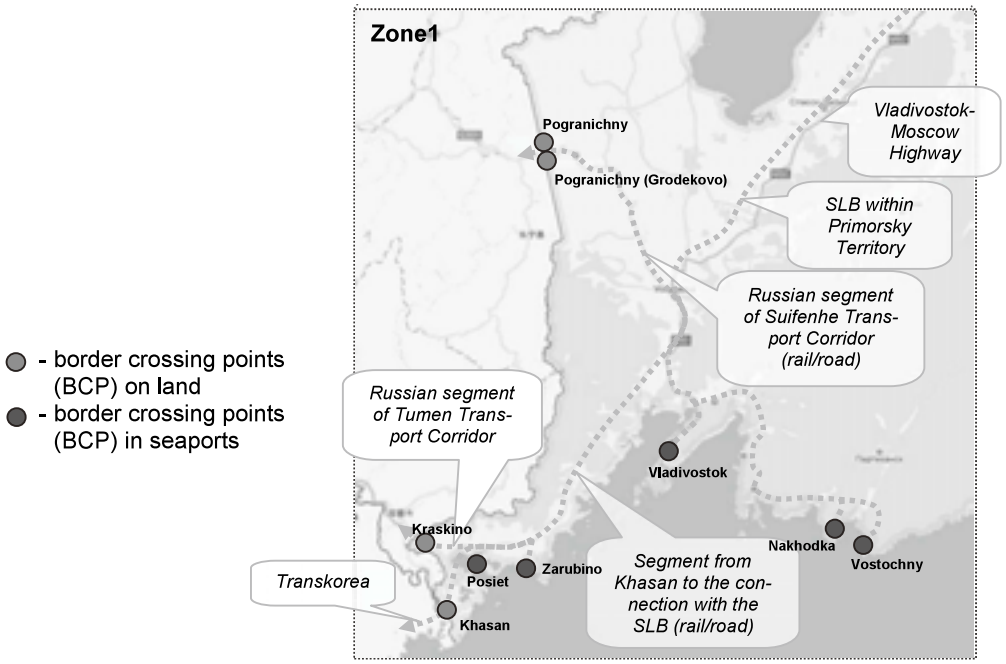
All specified transport network zones have the particular features. So Zone 1 is located close to the junction of three borders and has many crossing roads. There is one segment of the route in Zone 2 (rail and road), but border crossing point is adapted for vehicles and river ships (ferries). Zone 3 also is located close to the junction

Figure 1 Zones of Russian territory with Trans-GTR corridors segments



Source: FEMRI on the basis of GTI and other open sources

Figure 2 Zone 1 (BCP in southern part of Primorsky Territory)

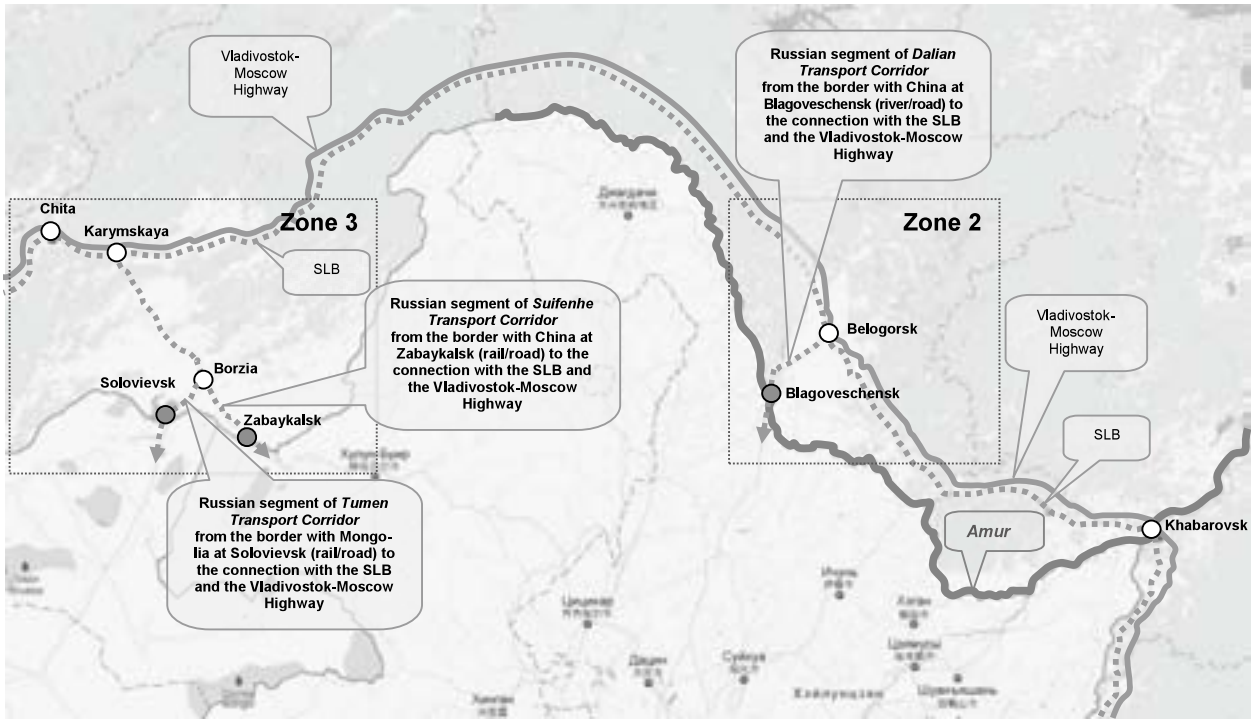


Source: FEMRI on the basis of GTI and other open sources

of three borders, but has the common main part of the route (rail and road). This paper focuses on the Zone 1.

Note. There are 5 road BCP (Markovo, Turiy Rog, Pogranichny, Poltavka, Kraskino) and 1 rail BCP (Pogranichny in Grodekovo) on the Russian-Chinese border within Primorsky Territory in accordance with Agreement between the Government of the Russian Federation and the Government of the People's Republic of China about border

Figure 3 Zone 2 (southern part of Amursky Territory) and Zone 3 (southern part of Zabaykalsky Territory)



Source: FEMRI on the basis of GTI and other open sources

crossing points on the Russian-Chinese border (Beijing, 27 January 1994). Rail BCP Makhalino established by the Order of the Russian Federation's Government No. of 1041-R of 05 July 1994 is out of operation now.

2.2 Traffic Review

2.2.1 Traffic at Land BCP

Current data on freight and passenger flows through Land BCP (rail, road) being considered are shown below (Table 1-4).

2.2.2 Cargo Turnovers in Seaports

Current data on cargo flows through seaports being considered are shown below (Figure 4-19, Table 5).

Table 1 Road BCP freight turnovers: 2007-2011 thousand tons

BCP	2007				2008				2009				2010				2011			
	Overall	Export	Import	Transit	Overall	Export	Import	Transit	Overall	Export	Import	Transit	Overall	Export	Import	Transit	Overall	Export	Import	Transit
Kraskino	73.1	14.6	19.5	39.0	72.3	17.9	28.7	25.7	83.7	36.6	17.7	29.4	93.1	67.6	8.5	17.0	76.8	56.9	19.9	0.0
Pogranichny	287.8	29.1	258.7	0.0	364.9	29.6	335.3	0.0	353.5	69.4	284.1	0.0	514.9	144.4	370.5	0.0	610.4	259.9	350.5	0.0
Blagoveschensk	396.9	139.7	257.2	0.0	342.2	67.2	275.0	0.0	191.5	44.8	146.7	0.0	177.6	25.6	152.0	0.0	231.4	10.7	220.7	0.0
Zabaykalsk	616.6	143.3	473.3	0.0	664.3	200.3	464.0	0.0	379.7	46.1	333.6	0.0	402.2	37.7	364.5	0.0	603.8	37.3	566.5	0.0
Solovievsk	0.04	0.01	0.03	0.0	0.01	0.0	0.01	0.0	0.0	0.0	0.0	0.0	0.001	0.0	0.001	0.0	0.09	0.07	0.02	0.0

Source: Estimated by FEMRI on the basis of official sources *http://www.rosgranitsa.ru; http://www.customs.ru; http://www.gks.ru; http://www.mintrans.ru/*, etc.

Table 2 Road BCP passenger turnovers: 2007-2011 thousand passengers

BCP	2007				2008				2009				2010				2011			
	Overall	Out-going	In-coming	Transit	Overall	Out-going	In-coming	Transit	Overall	Out-going	In-coming	Transit	Overall	Out-going	In-coming	Transit	Overall	Out-going	In-coming	Transit
Kraskino	170.4	87.8	82.6	-	170.6	93.4	77.2	-	170.7	89.3	81.4	-	212.5	106.0	98.2	8.3	260.7	131.4	129.3	-
Pogranichny	618.4	370.9	247.5	-	836.4	452.9	383.5	-	436.3	242.4	193.9	-	571.3	294.5	276.8	-	609.5	311.7	297.8	-
Blagoveschensk	1263.5	630.3	633.2	-	1413.3	704.8	708.5	-	867.1	432.9	434.2	-	1055.7	529.3	526.4	-	1129.5	563.5	566.0	
Zabaykalsk	2002.9	1012.8	990.1	-	1839.8	933.0	906.8	-	1184.7	599.6	585.1	-	1360.2	689.4	670.8	-	1337.6	667.8	669.8	-
Solovievsk	3.93	2.04	1.89	-	4.03	1.97	2.06	-	9.65	4.81	4.84	-	10.52	4.68	5.84	-	10.27	5.17	5.10	-

Source: Estimated by FEMRI on the basis of official sources *http://www.rosgranitsa.ru; http://www.customs.ru; http://www.gks.ru; http://www.mintrans.ru/*, etc.

Table 3 Rail BCP freight turnovers: 2007-2011 thousand tons

BCP	2007				2008				2009				2010				2011			
	Overall	Export	Import	Transit	Overall	Export	Import	Transit	Overall	Export	Import	Transit	Overall	Export	Import	Transit	Overall	Export	Import	Transit
Khasan	66.5	66.4	0.1	0.0	43.5	42.5	0.3	0.7	87.4	87.0	0.1	0.3	67.5	67.4	0.02	0.02	131.5	131.2	0.3	0.0
Pogranichny	9300.0	8820.0	479.9	0.1	8434.2	8104.3	322.9	7.0	6712.3	6561.6	150.7	0.0	6955.7	6730.2	223.0	2.5*	6337.5	5977.5	360.0	0.0
Zabaykalsk	24085.1	22221.3	1863.8	0.0	15447.3	13845.6	1601.7	0.0	20982.8	20164.6	818.2	0.0	21355.9	20245.7	1110.2	0.0	18390.3	16168.7	2221.6	0.0
Solovievsk	73.9	29.2	44.7	0.0	48.5	17.2	31.3	0.0	46.1	24.7	21.4	0.0	37.0	28.0	9.0	0.0	63.9	29.9	34.0	0.0

*Note: 2.0 thousand ton - transit via SLB, 0.5 thousand ton - transit via Primorye-1

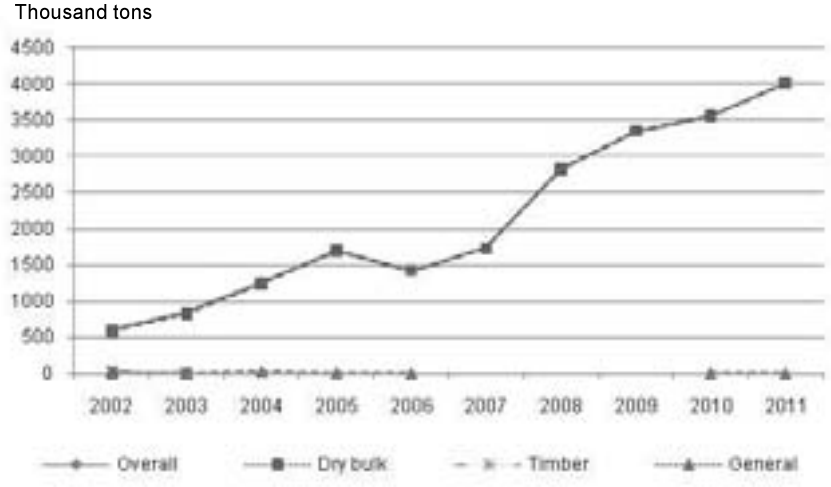
Source: Estimated by FEMRI on the basis of official sources *http://www.rosgranitsa.ru; http://www.customs.ru; http://www.gks.ru; http://www.mintrans.ru/*, etc.

Table 4 Rail BCP passenger turnovers: 2007-2011 thousand passengers

BCP	2007				2008				2009				2010				2011			
	Overall	Out-going	In-coming	Transit	Overall	Out-going	In-coming	Transit	Overall	Out-going	In-coming	Transit	Overall	Out-going	In-coming	Transit	Overall	Out-going	In-coming	Transit
Khasan	15.0	6.9	8.1	-	15.5	7.3	8.2	-	14.0	6.6	7.4	-	15.0	6.7	8.3	-	15.2	8.0	7.2	-
Pogranichny	578.3	210.3	368.0	-	699.6	254.5	445.1	-	117.9	46.5	71.4	-	162.4	70.0	92.4	-	263.9	119.3	144.6	-
Zabaykalsk	93.0	44.9	48.1	-	85.4	39.8	45.6	-	52.7	24.3	28.4	-	55.4	25.6	29.8	-	47.6	24.4	23.2	-
Solovievsk	1.37	0.68	0.69	-	0.82	0.41	0.41	-	1.10	0.55	0.55	-	0.79	0.39	0.40	-	0.92	0.46	0.46	-

Source: Estimated by FEMRI on the basis of official sources *http://www.rosgranitsa.ru; http://www.customs.ru; http://www.gks.ru; http://www.mintrans.ru/*, etc.

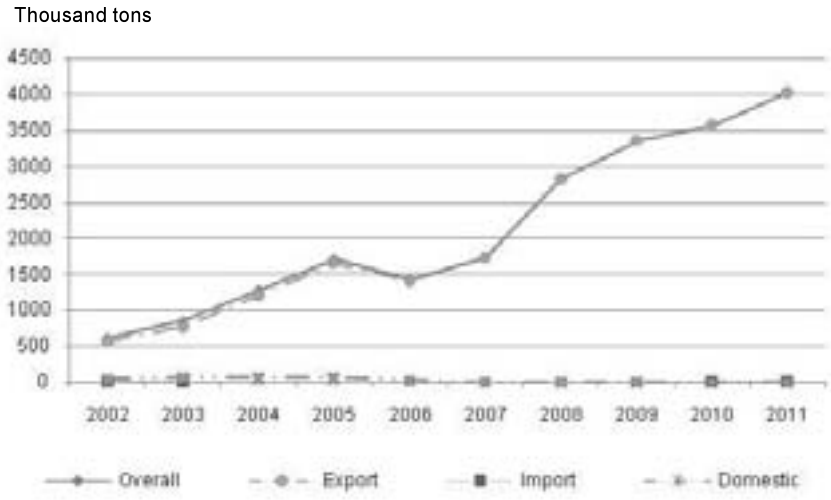
Figure 4 Seaport Posiet turnover (nomenclature)



Posiet: main cargo is coal. Growth is supported by development of port capacities.
Annual average growth rates
in 9 years – 23.2%
in 5 years – 23.0%
Timber and general cargo handling volume fell to zero (according to owner's plan).

Source: FEMRI

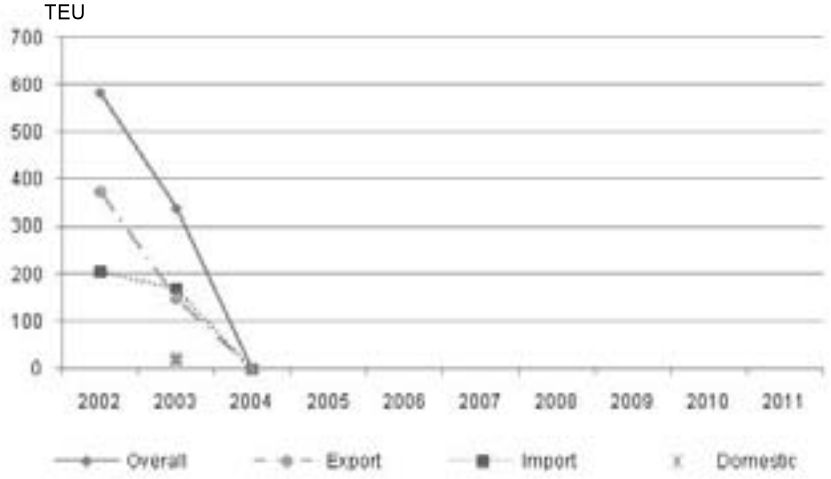
Figure 5 Seaport Posiet turnover (cargo flow directions)



Posiet: main cargo flow is export.

Source: FEMRI

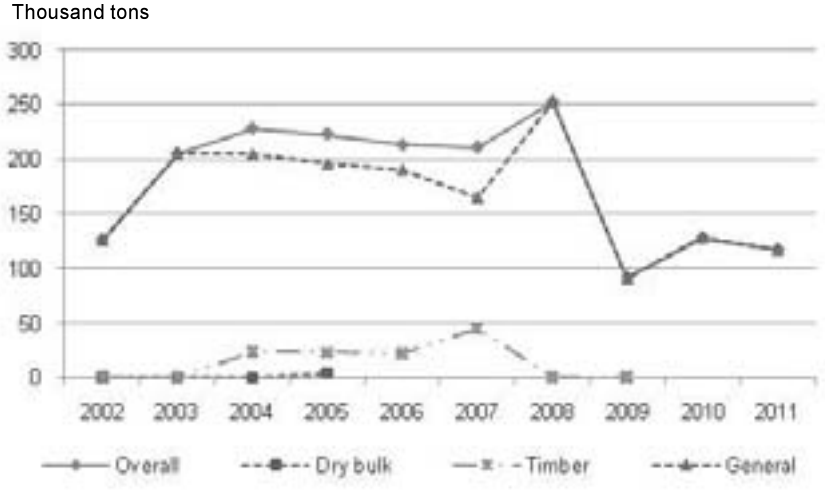
Figure 6 Seaport Posiet container turnover



Posiet: container handling volume fell to zero.

Source: FEMRI

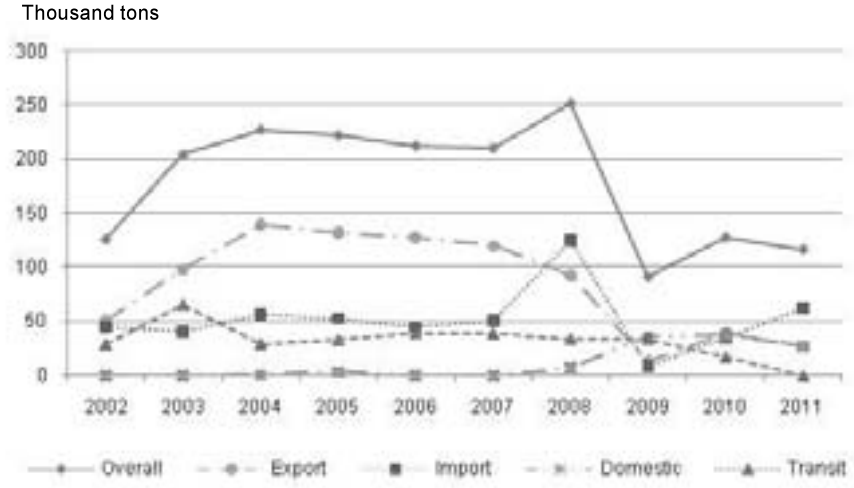
Figure 7 Seaport Zarubino turnover (nomenclature)



Zarubino: main cargo is general cargoes (metals, machinery and equipment, containers). Timber and dry bulk handling volume fell to zero. Port development is in unstable situation. Growth rates are closely to zero.

Source: FEMRI

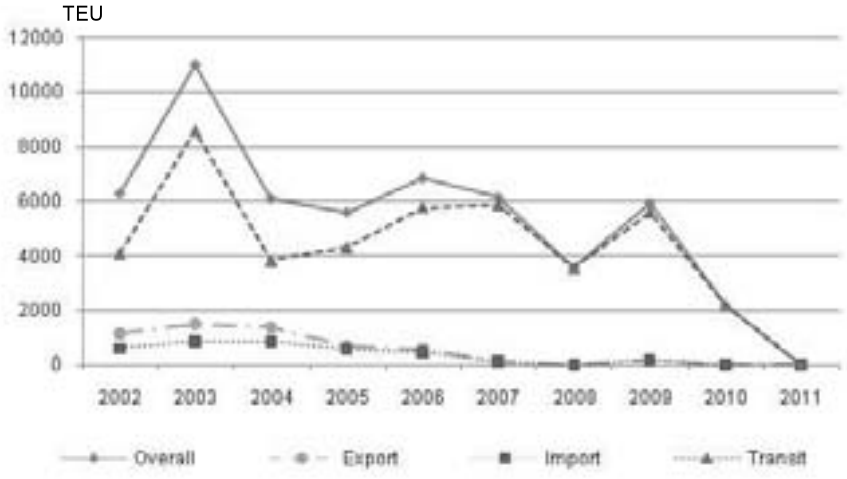
Figure 8 Seaport Zarubino turnover (cargo flow directions)



Zarubino: port handles cargo flows moving in all directions with chaotic trends - the port is looking for its own niche.
Growth rates are close to zero. This port reacted to world financial crisis (downturn in 2009) more then other ports in Primorye.

Source: FEMRI

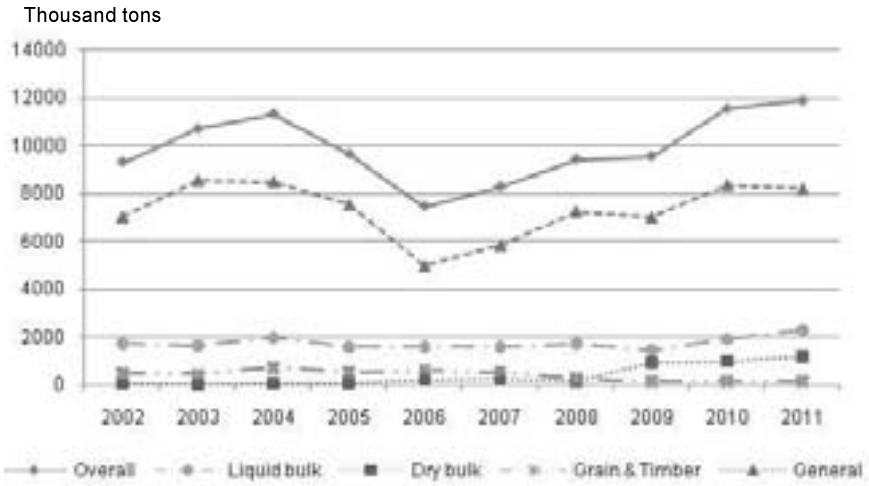
Figure 9 Seaport Zarubino container turnover



Zarubino: having no modern container equipment, port is more adapted for Ro-Ro technologies. Its main cargo base segment is transit. Growth rates are negative, but it will change after port modernization and development of its land and sea infrastructure (including sea lines).

Source: FEMRI

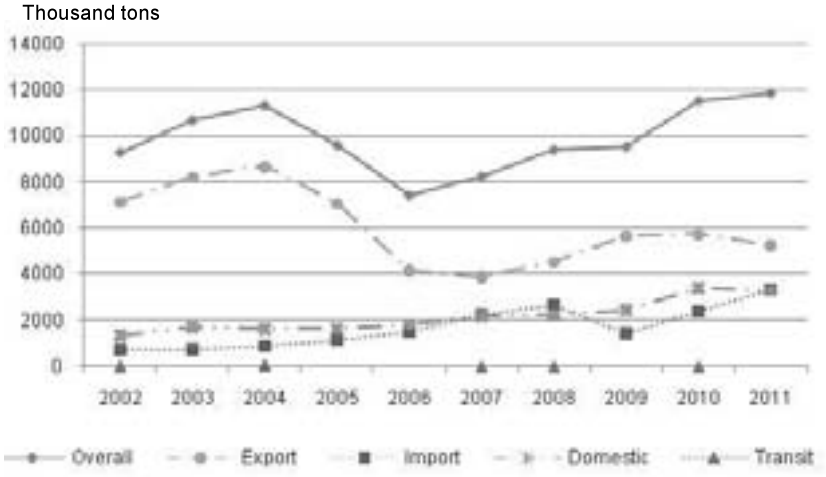
Figure 10 Seaport Vladivostok turnover (nomenclature)



Vladivostok: main cargo - the general cargoes (one half is containers). Turnovers decrease in 2005-2006 occurred with market change and rail tariffs growth that led decreasing of metals export.
Annual average growth rates
in 9 years – 2.7%
in 5 years – 9.6%

Source: FEMRI

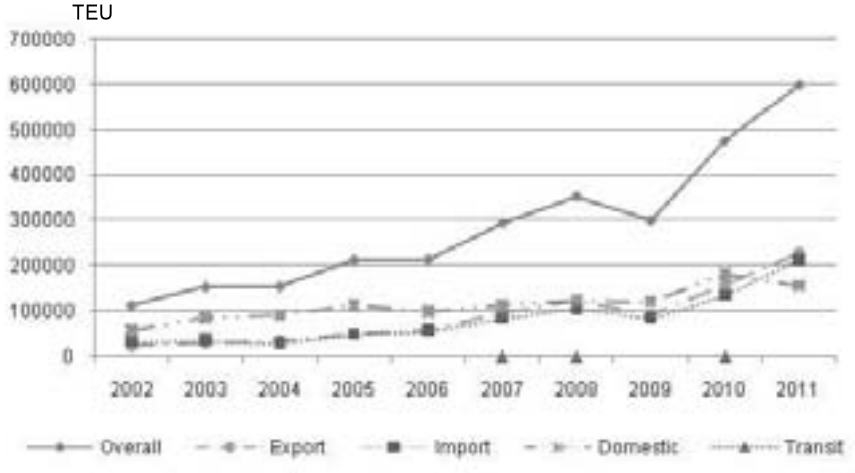
Figure 11 Seaport Vladivostok turnover (cargo flow directions)



Vladivostok: main direction is export (growth is closely to a zero), but import and domestic are increasing with high rates.

Source: FEMRI

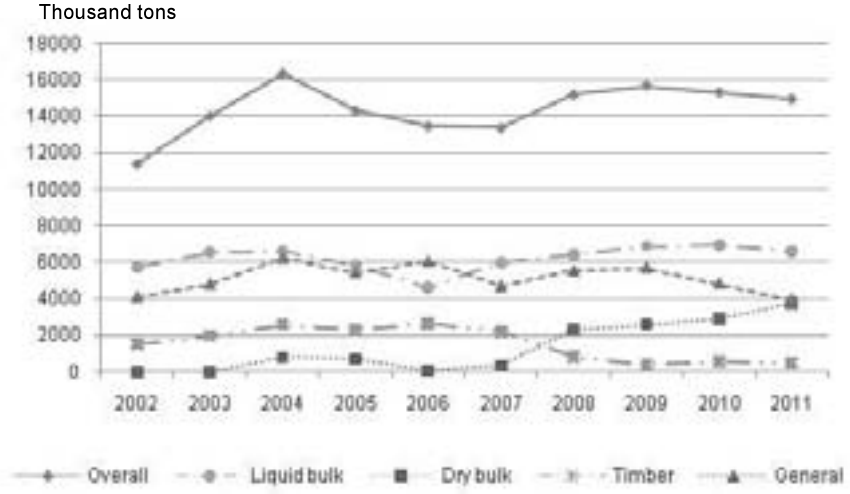
Figure 12 Seaport Vladivostok container turnover



Vladivostok: container turnover growth rates are high in all directions, including import. Fall in 2009 occurred owing to world crisis. Annual average growth rates in 9 years – 20.3%
in 5 years – 22.8%

Source: FEMRI

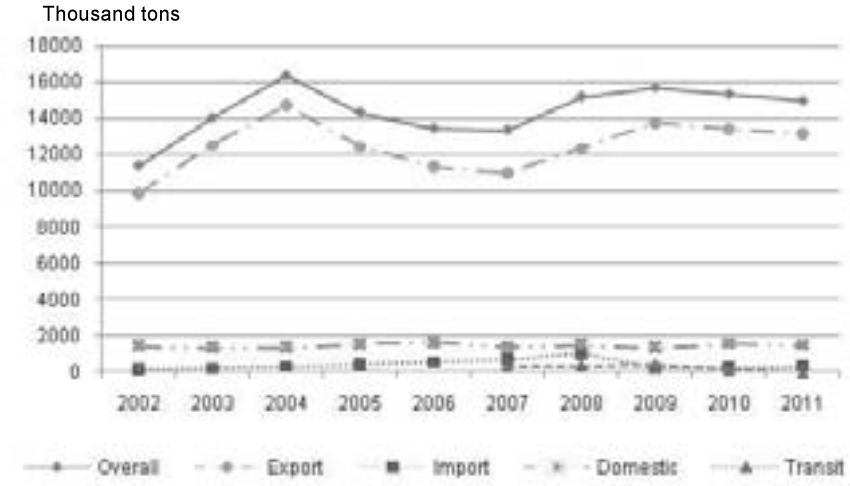
Figure 13 Seaport Nakhodka turnover (nomenclature)



Nakhodka: main cargoes - liquid bulk (oil products) and general (metals). Timber decreases occurred with the customs duties growth. Dry bulk (coal) grows according to market condition. Annual average growth rates in 9 years – 3.1%
in 5 years – 2.1%

Source: FEMRI

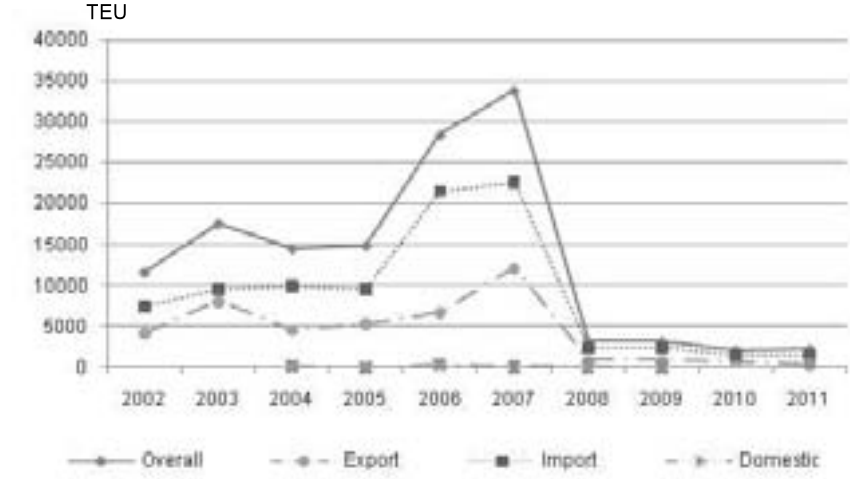
Figure 14 Seaport Nakhodka turnover (cargo flow directions)



Nakhodka: main cargo flow direction is export. Decrease in 2005-2006-2007 is connected with change in domestic transport market, world commodity markets and export policy (customs duty).

Source: FEMRI

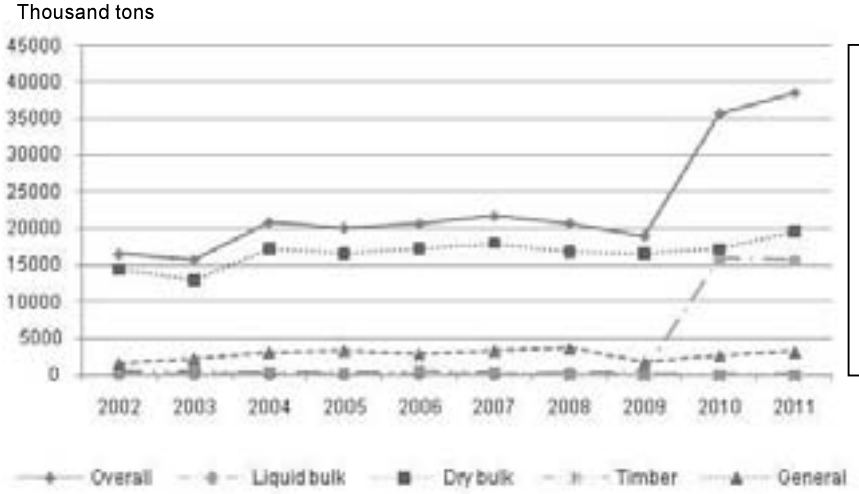
Figure 15 Seaport Nakhodka container turnover



Nakhodka: port loses competitiveness in the container market, container lines (to Vietnam etc) cease operations, and container volumes (to Japan etc) are decreasing. Port needs modernization and development of its transport infrastructure.

Source: FEMRI

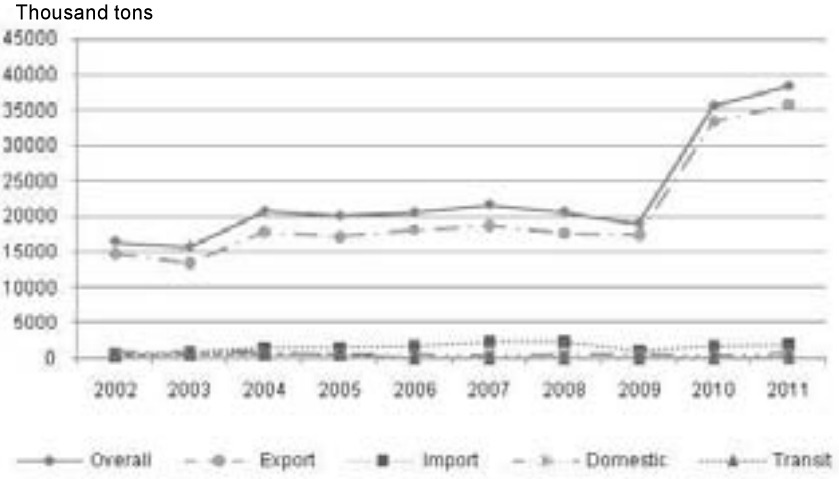
Figure 16 Seaport Vostochny turnover (nomenclature)



Vostochny: main cargoes – dry bulk (coal), liquid bulk (oil) and general (containers). Timber decreases occurred with the customs duties growth. Oil grows with start of work of new oil terminal in 2010. Coal grows according to market condition. Annual average growth rates in 9 years – 9.9%, in 5 years – 13.3%.

Source: FEMRI

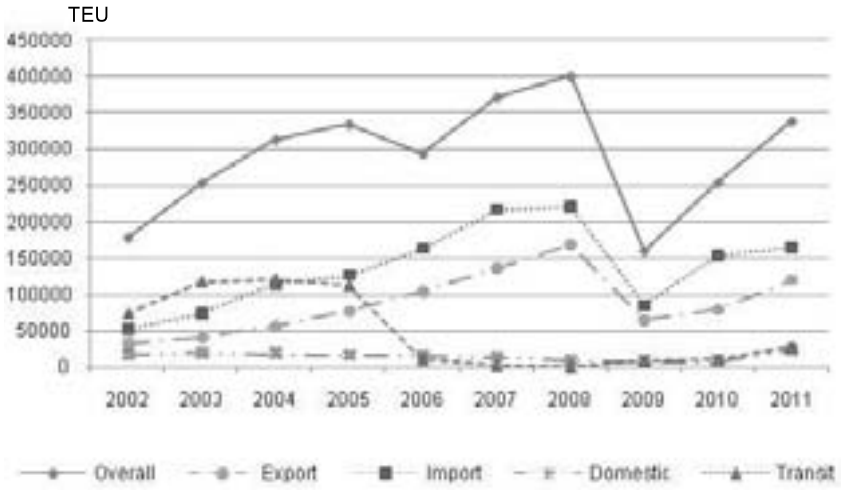
Figure 17 Seaport Vostochny turnover (cargo flow directions)



Vostochny: main cargo flow direction is export.

Source: FEMRI

Figure 18 Seaport Vostochny container turnover



Vostochny: fall in 2006 due to transit reduction and in 2009 due to world crisis. In last 2 years container growth rates are high in all directions, including transit. Annual average growth rates in 9 years – 7.4%
in 2 years – 16.2%

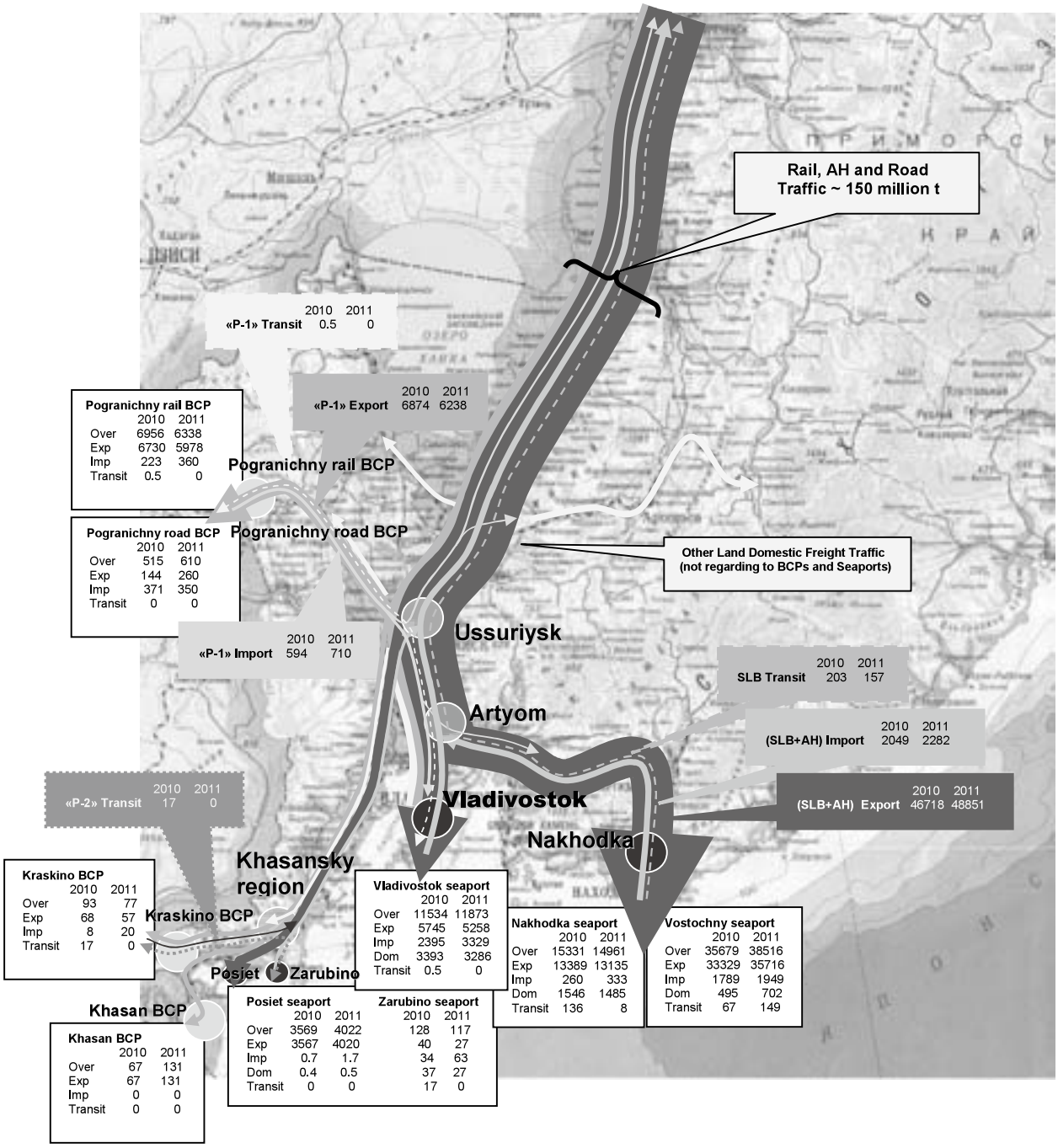
Source: FEMRI

Table 5 Seaports Container turnover (structure): 2010-2011 Thousand ton (TT)/year or TEU/year or Units/year

Seaport	2010					2011				
	Overall	Export	Import	Domestic	Transit	Overall	Export	Import	Domestic	Transit
Zarubino, TT	**17.1**	**-**	**-**	**-**	**17.1**	**-**	**-**	**-**	**-**	**-**
Zarubino, TEU	**2178**	**-**	**-**	**-**	**2178**	**-**	**-**	**-**	**-**	**-**
Loaded dry container, TT	16.4	-	-	-	16.4	-	-	-	-	-
TEU	1856	-	-	-	1856	-	-	-	-	-
20' (units)	1696	-	-	-	1696	-	-	-	-	-
40' (units)	80	-	-	-	80	-	-	-	-	-
Empty containers, overall, TT	0.7	-	-	-	0.7	-	-	-	-	-
TEU	322	-	-	-	322	-	-	-	-	-
Empty dry containers, TT	0.7	-	-	-	0.7	-	-	-	-	-
TEU	322	-	-	-	322	-	-	-	-	-
20' (units)	306	-	-	-	306	-	-	-	-	-
40' (units)	8	-	-	-	8	-	-	-	-	-
Vladivostok, TT	**3674.8**	**575.6**	**1457.9**	**1640.8**	**0.5**	**4448.0**	**811.4**	**2148.0**	**1488.6**	**-**
Vladivostok, TEU	**477401**	**159108**	**135786**	**182467**	**40**	**600417**	**228723**	**215856**	**155838**	**-**
Loaded containers, overall, TT	3205.9	279.4	1455.7	1470.3	0.5	3875.9	386.9	2145.6	1343.4	-
TEU	258054	18797	135249	103968	40	332831	26737	214746	91348	-
Loaded dry container, TT	2747.3	269.4	1245.5	1231.9	0.5	3371.4	379.5	1887.0	1104.9	-
TEU	225443	18190	117829	89384	40	296631	26195	193785	76651	-
20' (units)	85411	3424	41503	40444	40	102629	2893	62475	37261	-
40' (units)	70016	7383	38163	24470	-	97001	11651	65655	19695	-
Ref containers, TT	458.6	10.0	210.2	238.4	-	504.5	7.4	258.6	238.5	-
TEU	32611	607	17420	14584	-	36200	542	20961	14697	-
20' (units)	4611	175	724	3712	-	4270	136	423	3711	-
40' (units)	14000	216	8348	5436	-	15965	203	10269	5493	-
Empty containers, overall, TT	468.9	296.2	2.2	170.5	-	572.1	424.5	2.4	145.2	-
TEU	219347	140311	537	78499	-	267586	201986	1110	64490	-
Empty dry containers, TT	419.8	261.7	0.8	157.3	-	512.8	378.5	1.4	132.9	-
TEU	198745	124521	350	73874	-	241637	181153	612	59872	-
20' (units)	74705	42913	222	31570	-	86967	60579	512	25876	-
40' (units)	62020	40804	64	21152	-	77335	60287	50	16998	-
Empty ref containers, TT	49.1	34.5	1.4	13.2	-	59.3	46.0	1.0	12.3	-
TEU	20602	15790	187	4625	-	25949	20833	498	4618	-
20' (units)	1550	306	71	1173	-	1433	359	58	1016	-
40' (units)	9526	7742	58	1726	-	12258	10237	220	1801	-
Nakhodka, TT	**9.9**	**1.3**	**8.6**	**-**	**-**	**14.4**	**0.5**	**7.9**	**6.0**	**-**
Nakhodka, TEU	**1998**	**581**	**1417**	**-**	**-**	**2140**	**253**	**1418**	**469**	**-**
Loaded containers, overall, TT	7.8	0.0	7.8	-	-	12.8	-	7.3	5.5	-
TEU	1092	1	1091	-	-	1430	-	1190	240	-
Loaded dry container, TT	7.8	-	7.8	-	-	12.8	-	7.3	5.5	-
TEU	1092	1	1091	-	-	1430	-	1190	240	-
20' (units)	480	1	479	-	-	396	-	270	126	-
40' (units)	306	-	306	-	-	517	-	460	57	-
Empty containers, overall, TT	2.1	1.3	0.8	-	-	1.6	0.5	0.6	0.5	-
TEU	906	580	326	-	-	710	253	228	229	-
Empty dry containers, TT	2.1	1.3	0.8	-	-	1.6	0.5	0.6	0.5	-
TEU	906	580	326	-	-	710	253	228	229	-
20' (units)	28	28	-	-	-	140	21	-	119	-
40' (units)	439	276	163	-	-	285	116	114	55	-
Vostochny, TT	**2634.7**	**702.2**	**1788.4**	**77.5**	**66.6**	**3140.6**	**847.0**	**1944.1**	**200.7**	**148.8**
Vostochny, TEU	**254344**	**80465**	**153785**	**8836**	**11258**	**338752**	**120818**	**164918**	**24069**	**28947**
Loaded containers, overall, TT	2524.5	611.6	1788.1	68.2	56.6	2929.2	683.5	1943.8	175.4	126.5
TEU	200824	36418	153698	4549	6159	235430	41290	164777	11866	17497
Loaded dry container, TT	2512.4	610.7	1783.3	61.8	56.6	2916.6	681.9	1937.6	170.6	126.5
TEU	200014	36357	153369	4129	6159	234569	41178	164360	11534	17497
20' (units)	62872	11575	48129	2791	377	71895	10694	54196	6474	531
40' (units)	68571	12391	52620	669	2891	81337	15242	55082	2530	8483
Ref containers, TT	12.1	0.9	4.8	6.4	-	12.6	1.6	6.2	4.8	-
TEU	810	61	329	420	-	861	112	417	332	-
20' (units)	80	1	31	48	-	57	-	45	12	-
40' (units)	365	30	149	186	-	402	56	186	160	-
Empty containers, overall, TT	110.2	90.6	0.3	9.3	10.0	211.3	163.4	0.3	25.3	22.3
TEU	53520	44047	87	4287	5099	103286	79528	141	12167	11450
Empty dry containers, TT	109.3	89.7	0.3	9.3	10.0	210.1	162.2	0.3	25.3	22.3
TEU	53145	43672	87	4287	5099	102790	79040	141	12159	11450
20' (units)	18167	15906	87	2173	1	33404	27280	49	6057	18
40' (units)	17489	13883	-	1057	2549	34693	25880	46	3051	5716
Empty ref containers, TT	0.9	0.9	-	-	-	1.2	1.2	-	-	-
TEU	375	375	-	-	-	496	488	-	8	-
20' (units)	15	15	-	-	-	44	36	-	8	-
40' (units)	180	180	-	-	-	226	226	-	-	-

Source: FEMRI

Figure 19 Freight Traffic (rail + AH and road, thousand ton in 2010, 2011) along corridor stretches in Primorye (Zone 1)



Source: FEMRI

2.2.3 Traffic along corridor stretches (domestic and international)

Cargo flows (rounded traffic volumes by rail and road/ highway in thousand tons, 2010-2011) along corridor stretches being considered are shown on the figure below.

Container trains. Regular express block trains connecting ports of Primorye Region with the western part of Russia depart from three near-port stations - Vladivostok (Vladivostok port), Nakhodka-Vostochnaya (Vostochny port), Rybniki, Nakhodka (Nakhodka port). In most cases, these trains are operated on routes delivering export-import cargoes arriving in Primorsky Region ports from Japan, ROK and China. Of land BCPs, such trains pass only via Zabaykalsk (Table 6).

Table 6 Block trains routes

Departure station	Destination station	Company	Note
Departure or destination is port railway station			
Nakhodka-Vostochnaya	Ablyk (Uzbekistan)	TransContainer	Transit
Nakhodka-Vostochnaya	Brest (Belorussia)	TransContainer	Transit
Nakhodka-Vostochnaya	Buslovskaya	TransContainer	Transit
Nakhodka-Vostochnaya	Lokot	TransContainer	Transit
Ust-Ilimsk	Vladivostok	TransContainer	Export
Kamyshta	Nakhodka-Vostochnaya	TransContainer	Export
Bratsk	Vladivostok	TransContainer	Export
Nakhodka-Vostochnaya	Moscow*	TransContainer	Import
Nakhodka-Vostochnaya	Martsevo	TransContainer	Import
Nakhodka-Vostochnaya	Vojoi	TransContainer	Import
Nakhodka-Vostochnaya	Krugloe Pole, Tikhonovo	TransContainer	Import
Nakhodka-Vostochnaya	Nizhnekamsk	TransContainer	Import
Nakhodka-Vostochnaya	Sverdlovsk (Yekaterinburg)	TransContainer	Import
Nakhodka-Vostochnaya		TransContainer	Import
Nakhodka-Vostochnaya	Cherkessk	TransContainer	Import
Nakhodka-Vostochnaya	Silikatnaya	Russkaya Troyka	Import
Moscow	Vladivostok	Russkaya Troyka	Export-import
Moscow	Vladivostok	FESCO	Export-import
Moscow	Kleshchikha (Novosibirsk)	FESCO	Export-import
Rybniki (Nakhodka)	Moscow	DVTG	Export-import
Departure or destination is railway station			
Beijing	Moscow	TransContainer	Import, via Zabaykalsk
Zabaykalsk	Brest (Belorussia)	TransContainer	Transit
Zabaykalsk	Buslovskaya	TransContainer	Transit
Zabaykalsk	Chop (Ukraine)	TransContainer	Via Zernovo, Export -import
Zabaykalsk	Martsevo	TransContainer	Export-import
Zabaykalsk	Moscow*	TransContainer	Export-import

Note: *Kuntsevo 2, Silikatnaya, Tuchkovo stations
Sources: *www.trcont.ru, www.rus-troyka.com, www.fesco.ru, www.dvtg.ru.*

Cargo and passenger shipping lines in seaports: Posiet, Zarubino, Vladivostok, Nakhodka, Vostochny. Line and tramp shipping is developed in GTI region. Tramp shipping handles a significant portion of traffic volume. Line shipping operating via Primorsky Region ports is represented by freight (container, ro-ro), freight and passenger (ferryboat) and passenger (cruising) lines (Table 7-8, Figure 20-21).

Container lines operating via Far Eastern ports are represented both by Russian and foreign carrier companies, with a number of joint services. Main lines are connected with Asia-Pacific countries.

International cruise lines[1]. Vladivostok is included in rotation ports of the following cruise lines by Princess Cruise Line, Ltd.:

- 23 day Alaksa & Far East Grand Adventure from Vancouver to Beijing;
- 19 night Alaska & Far East: Tianjin to Vancouver;
- 16 day Alaska & Far East From Whittier to Beijing;
- 32 day Alaska, Far East & China Grand Adventure from Whittier to Bangkok.

[1] Source: *www.princess.co*

Table 7 Container shipping lines via Vladivostok, Vostochny, Nakhodka, Zarubino ports

Direction	Name	Line (ports of destination)	Company
Domestic	FPKL*	Vladivostok - Petropavlovsk-Kamchatsky	FESCO, SASCO
	FML*	Vladivostok - Magadan	FESCO, SASCO
	No name	Vladivostok/Vostochny - Petropavlovsk-Kamchatsky	Kamchatka Lines
	No name	Vladivostok/Vostochny - Korsakov	Kamchatka Lines
	FKDL*	Vladivostok - Korsakov	FESCO, SASCO
	FADL*	Vladivostok - ports of Chukotka	FESCO
	No name	Vostochny - ports of Chukotka, Petropavlovsk-Kamchatsky	Transportnaya Expeditciya Plus
Republic of Korea	KSDL*	Vladivostok/Vostochny - Masan - Pusan	FESCO
	No name	Nakhodka - Pusan (Container and Ro-Ro)	SASCO
	APL ERX: Eastern Russia Express	Vladivostok/ Vostochny - Pusan	APL
	Maersk line		Maersk Sealand
	KMTC line		Korea Marine Transport
	No name	Vladivostok/Vostochny - Donghae - Pusan	Sinokor Merchant Marine Co.
	No name	Vostochny - Pusan	Rusam Shipping Co.
	No name	Vostochny - Pohang - Pusan	CK Line Co., Pan Continental Shipping Co., Korea Marine Transport
Japan	JSTL	Vostochny - ports of Japan (Kobe, Nagoya, Yokohama, Moji, Toyama)	FESCO (with O.S.K Lines and Transsib rail line)
	No name	Zarubino - Niigata - the part of transit container service Niigata - Zarubino - Hunchun	Primoravtotrans (Primortrans Japan)
	Japan Nakhodka Line	Nakhodka - Yokohama - Nagoya - Osaka - Moji	Interasia Maritime
China	FCDL	Vladivostok/Vostochny - Hong Kong - Ningbo - Shanghai	FESCO
	FCDL-North	Vladivostok/Vostochny - Xingang - Qingdao - Xiamen	FESCO
	No name	Vladivostok/Vostochny - Shanghai	SASCO
	No name	Vladivostok/Vostochny - Pusan - ports of China (Dalian, Shanghai, Hong Kong, Qingdao etc.)	APL
			CMA CGM
			Sinokor Merchant Marine Co.
			Maersk Sealand
	No name	Vostochny - Pusan - Shanghai - Ningbo - Xiamen - Cniwan	CMA CGM
Another (Vietnam, North America)	Zim container service	Vostochny - Pusan - ports of Asia	Zim
	FVDL	Vladivostok - Shanghai - Ho Chi Minh	FESCO
	Taiwan	Vladivostok/ Vostochny - Pusan - Taiwan	FESCO
	USWC	ports of North America (West coast) - Pusan -Vladivostok/ Vostochny - Korsakov/Kholmsk - Magadan - Petropavlovsk-Kamchatsky	Joint line of FESCO and American companies (with rail line to Kazakhstan)
	USEC/USGC	ports of North America (East coast) - Pusan -Vladivostok/ Vostochny - Korsakov/Kholmsk - Magadan - Petropavlovsk-Kamchatsky	Joint line of FESCO and American companies (with rail line to Kazakhstan)
	FPL - Fesco Pacific Line	Everett/Seattle - Magadan - Korsakov - Vladivostok - Petropavlovsk-Kamchatsky	Joint line of FESCO and American companies

Notes:* Name only for FESCO lines, SASCO lines without names;

Sources: *www.fesco.ru, www.vmtp.ru, www.sasco.ru, www.kamlines.ru, www.maersk.com, www.cma-cgm.com, www.apl.com, www.vscport.ru, www.ncsp.ru, www.fishport.ru, www.seaport-troitsa.ru.*

Figure 20 Regular container lines between Japan, ROK and Russia

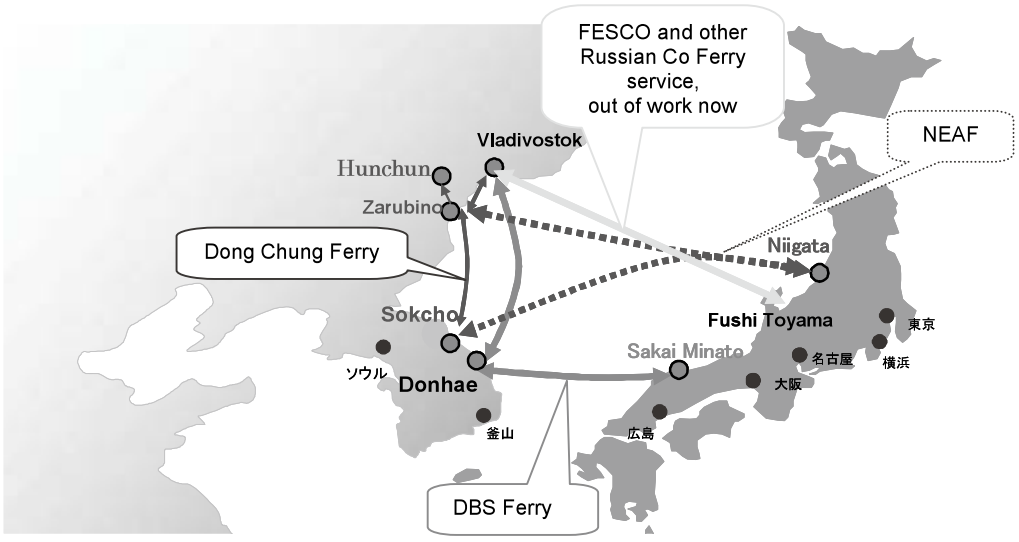
Source: ROTOBO, Japan, 2011

Table 8 Other shipping lines via Vladivostok, Zarubino ports

Direction	Name	Line (ports of destination)	Company
Republic of Korea (Japan)	Dong Chung Ferry (2 versions of cargo-passenger ferry line are out of operation)	Vladivostok - Zarubino - Sokcho (reserve direction to Niigata)	Dong Chung Ferry Co.Ltd
		Sokcho, Niigata, Zarubino (and Hunchun)	Northeast Asia Ferry Ltd (NEAF)
Japan	Fesco Ro-Ro Line	Vladivostok - port of Japan	FESCO
Another Countries	DBS Cruise Ferry Line (cargo-passenger ferry line)	Vladivostok - Donghae - Sakaiminato	DBS Cruise Ferry
	No name (Ro-Ro Service)	Vladivostok - Ulsan / Pyongtaek - Xingang / Shanghai - Mizushima / Toyohasi / Yokohama - Port Hueneme - SanDiego - Lazaro Cardenas - Grays Harbor	Siem Car Carries A.S.
	FPLR - FESCO Pacific Line RORO	Tacoma / Everett / Seattle - Magadan - Korsakov - Vladivostok - Petropavlovsk-Kamchatsky	Eukor Car Carries, Wallenius Wilhelmsen, FESCO

Sources: *www.seaport-troitsa.ru, www.fesco.ru, www.vmtp.ru, www.vscport.ru, www.siemshipping.com, www.dbsferry.com.*

Figure 21 International Ferry Service between Japan, ROK, Russia and China



Source: ERINA, NEAF, Mr. Ikuo MITSUHASHI. Presentation "Current situation and issues on the joint company called NEAF", Dec. 2010

International road transport operators in Russia are companies having appropriate permission by the Transport Ministry, transit cargoes are carried by companies having a customs carrier status (assigned by the Federal Customs Service[2]). International carriers may voluntarily join the Association of International Road Carriers. For instance, international transport operators in Primorsky Territory are JSC Favorite-Service, JSC Primoravtotrans, Berkut LLC, JSC Khabarovsk Road Cargo Enterprise (JSC KhGAK), Ussuriyskstroytrans LLC, Avtokolonna 1269 LLC, JSC Firma Mezhtorgtrans and others. There is same situation in other regions.

Land passenger transport in Primorye.

Passenger traffic with China is constituted by three main components: tourist routes (bus travels of tourist groups under cross-border exchange arrangements), regular bus lines and railway transport. The bulk of passenger flows is tourists carried by buses under orders by travel agencies - this traffic has no direct relation to corridor operation, although is partly handled by routes being considered.

Passenger bus lines between cities of China and Primorsky Territory operate the following routes in the Table 9.

Passenger railway communication with China is represented by two operational routes.

Vladivostok - Harbin route is operated by train No. 351/352 Vladivostok - Harbin two times a week. Travel time is up to one and a half days. The route is organized as follows: one wagon from Vladivostok and one wagon from Khabarovsk arrive with different trains in Ussriysk, get connected and proceed to Chinese border. There they exchange bogies for narrow gauge and proceed to Harbin. The train itself and services are antiquated. RZhD plans to replace this route by Ussuriysk - Harbin route (travel time 26 hours, sleeping cars only).

Grodekovo - Suifenhe route is operated by two trains: Russian train No. 309/310 on Russian gauge tracks (1,520 mm) and Chinese train No. 401/402 on narrow gauge tracks (1,435 mm). Trains operate every day.

There were plans to launch a new train between Vladivostok and Suifenhe in 2012. The train was to operate every day, under a convenient schedule: departure from Vladivostok at 5:00 a.m., arrival in Suifenhe at 11:00 a.m. (Chinese time), departure from China at 13:10 (Chinese time), arrival in Vladivostok at midnight local time. According to plans, customs procedures will be handled en route without stopover on the border. The train will have a capacity of about 900 people and include ten wagons of which two wagons with post delivery and luggage compartments. The idea of this train was to avoid bogie exchange for narrow gauge tracks. Fare was dependent on wagon class (international, sleeping or seating). The train was tested in December 2011. The parties have not reached necessary agreements yet, and the route is not in use as of this writing.

Passenger railway communication with DPRK is represented by train No. 652/651 Ussuriysk - Tumangan - Pyongyang operated twice a week.

2.3 Infrastructure capacity review

2.3.1 General

At the present time, ideas and strategies on development of the east of Russia are actively updated, with various transport projects being implemented in practice. In this connection, current condition of infrastructure continuously improves. This section contains general information about transport development in areas being considered.

Current condition of the transport infrastructure in the southern part of Primorsky Territory is characterized by its dynamic development toward growth of passenger and cargo flows.

Major transport projects are implemented in accordance with the sub-program "Development of Vladivostok as a center for international cooperation in APR" of the federal target program "Economic and social development of Far East and Trans-Baikal through 2013."

Table 9 International bus route schedule (Primorsky Territory)

Route No.	Description of route	Frequency, on which days
805	Vladivostok - Ussuriysk - Mudanjiang	1 trip every day
805	Ussuriysk - Mudanjiang	1 trip every day
807	Ussuriysk - Suifenhe	2 trips every day
808	Ussuriysk - Dunin	2 trips every day
810	Ussuriysk - Hunchun - Yanji	1 trip every day except Sunday
814	Ussuriysk - Mishan - Jixi	1 trip every day except Sunday
812	Vladivostok - Ussuriysk - Sosnovka - Harbin	1 trip every day except Sunday
813	Vladivostok - Ussuriysk - Poltavka - Harbin	1 trip every day except Sunday
Other cross-border routes: Pogranichny - Suifenhe, Kraskino - Hunchun, Markovo - Hulin, Turiy Rog - Mishan		

Source: collected by FEMRI on the base of official sources and websites *http://www.airagency.ru/; http://www.zolotou.com/; http://vladivostok09.ru/*

[2] Source: *www.customs.ru*

The following transport projects are in process (being completed):

- Reconstruction of Vladivostok airport;
- Construction of helipad in Russky Island;
- Construction of bridge to Russky Island over Bosfor Vostochny Strait in Vladivostok;
- Construction of bridge to over Golden Horn Bay in Vladivostok;
- Construction of highway "Novyi - De-Friz Peninsula - Sedanka - Patrocl Bay" with trestle bridge "De-Friz - Sedanka";
- Construction of highway "Patrocl Bay - bridge over Golden Hord Bay";
- Reconstruction of motor road Knevichi airport (Vladivostok) - M-60 "Ussuri" federal highway Khabarovsk - Vladivostok;
- Construction of access road to international passenger terminal in airport Knevichi;
- Reconstruction of motor road Knevichi airport - Sanatornaya station in segments of M-60 "Ussuri" highway Khabarovsk - Vladivostok;
- Reconstruction of motor road Knevichi airport - Sanatornaya station in segment of M-60 "Ussuri" highway Khabarovsk - Vladivostok;
- Reconstruction of city thoroughfare with controlled traffic in segment Sanatornaya station - bridge over Golden Horn Bay;
- "Vladivostok Seafront Façade" including port facilities and port infrastructure in Vladivostok and Russky Island, construction and reconstruction of port terminals;
- Organization of intermodal passenger traffic between Vladivostok and Knevichi airport;
- and others;

Other transport projects being implemented or discussed:

- reconstruction of ITC Primorye-1 and Primorye-2 infrastructure including road BCP, segments of roads Ussuriysk - Pogranichny, Razdolnoye - Khasan, Vladivostok - Nakhodka, detour roads around Ussuriysk and Artem;
- planning and organization of through railway route Vladivostok - Ussuriysk - Grodekovo - Suifenhe and further extension to Harbin.

2.3.2 Road network

Road classification in Russia. In accordance with the "Law on Motor Roads…"[3], motor road are grouped as follows in terms of importance and ownership:

- Federal motor roads (highways owned by Russian Federation).
- Regional and inter-municipal roads (highways owned by Russian Federation administrative regions).
- Local motor roads (municipality, city district, owned by communities).
- Private motor roads.

Motor roads are divided into pubic use and non-public use roads. Federal public use motor roads are:

1) roads (highways) connecting Moscow with capital cities of neighboring countries, with administrative centers (capitals) of Russian Federation regions;

2) roads (highways) included in the list of international motor roads (highways) according to Russian Federation's international agreements.

Toll roads. The "Law on Motor Roads…" envisions use of motor roads, wholly or partially, for payment. The following roads may be toll roads:

(a) roads built by private investors under concession agreements;

(b) federal, regional and local roads built at the cost of respective budgets.

The law makes no limitation for duration of a toll road status period.

When a motor road is announced a toll road, vehicle owners shall be alternatively provided free passage by a public use road whose length shall not exceed that of the toll road by more than three times.

Current condition of roads in Primorsky Territory. Total length of Pimorsky Territory roads exceeds 12,320 km, of which about 60% is public roads (federal - about 5%, regional and local - about 55%) and about 40% is corporate-owned.

Mean weighted traffic intensity rate in Pimorsky Territory roads is about 2000 vehicles/day. Highest intensity is observed in federal roads at approaches to Ussuriysk, Artem and Vladivostok. Transport flows reach in these areas 5-8,000 to 20-30,000 and more vehicles/day.

There are 5 automobile border crossings operating in Pimorsky Territory: Pogranichny, Poltavka, Kraskino, Turiy Rog, Markovo. 85% of road cargo flows is handled by Pogranichny and Poltavka crossings. Main international transport routes are: Pogranichny - Ussuriysk (113 km), Poltavka - Ussuriysk (76 km). These routes are handled by regional roads (category IV, with only separate segments upgraded to category II) inadequate for prospective cargo traffic volumes.

About three-fourths of regional roads had been built according to out-of-date standards. They had been designed for axle loads of up to 6 tons. Actual loads are 10-12 tons per axle in 13 tons in further prospect. Newly built and upgraded roads comply with current standards having an improved road paving of category II and above, at least 4 lanes (up to 8 lanes in segments with intensive traffic), permissible axle load of 10-13 tons, etc.

Motor road route of ITC Primorye-2 in Primorsky Territory consists of motor roads of regional and local importance (Figure 22). The road from Chinese-Russian border to Kraskino town (30 km) is a two-lane paved highway. It was not upgraded. This road extends to Slavyanka - Kraskino (55 km) road, partly upgraded before and after Slavyanka to its intersection with M-60 Ussuri road (2 to 4 lanes). The 8.3-km-long road from Posiet port to its intersection with Slavyanka - Kraskino road is a two-

[3] Federal Law No. 257-FZ of 08.11.2007 "On Motor Roads and Road Activities in Russian Federation."

lane paved highway. It is not used for cargo delivery from/to Posiet port because this port handles coal. The 12.6-km-long road from Zarubino port to its intersection with Slavyanka - Kraskino road is a two-lane paved highway. It has several overpass railway crossings. The length of existing road from the border to Zarubino is 71 km.

The above roads are capable of accommodating moderate development of international road transport. In the event of intensive development of transit freight and passenger flows (with cargo turnovers growing by an order of magnitude), they will need to be upgraded or a new road will have to be constructed in compliance with modern requirements and prospective loads. Further harmonization of roads and road use procedures is needed for integration of Russian and Chinese roads into a single transport network handling effective, fast, safe and convenient freight and passenger traffic. In addition to harmonization of trans-border procedures, issues of traffic routing and control, traffic rules, design standards, permissible axle loads, overall dimensions, etc., should also be addressed.

Motor road route of ITC Primorye-1 in Primorsky Territory consists of motor roads of federal, regional and local importance (Figure 23).

ITC Primorye-1 is considered as one of NEA prospective routes. It can be integrated into NEA transport system and is asked-for on the international transport market. ITC Primorye-1 is:

- part of Suifenhe corridor - Route No. 3 (Primorye ports - Harbin - TSR according to Corridor Vision of the NEA Economic Conference);
- part of AH6 road route (Pusan - Belarus border) according to intergovernmental agreement on Asian road network (under UN ESCAP auspices).

At the national level, ITC Primorye-1 is registered in the federal target program "Development of Russian Federation Transport System in 2010-2015" and in "Transport Strategy of Russian Federation through 2030." At the bilateral level, ITC Primorye-1 is included in the Program of Cross-Border Cooperation with China approved in 2009.

Motor road route of ITC Primorye-1 in Primorsky Territory consists of the following motor roads:

1) Ussuriysk - Pogranichny - state border;

2) Segment of M-60 "Ussuri" highway (Khabarovsk - Vladivostok), from Ussuriysk to turn to Artem, Airport;

3) Vladivostok - Nakhodka - Vostochny port.

Total length of this route passing on existing roads of Primorsky Territory is 354 km.

Ussuriysk - Pogranichny - state border is a public motor road of regional importance owned by Primorsky Territory. Its length is 113 km. The road performs the

Figure 22 Master Plan on Khasansky Region: zone with Tumen Transport Corridor segment from the border with China to the ports Zarubino and Posiet (ITC "Primorye-2")

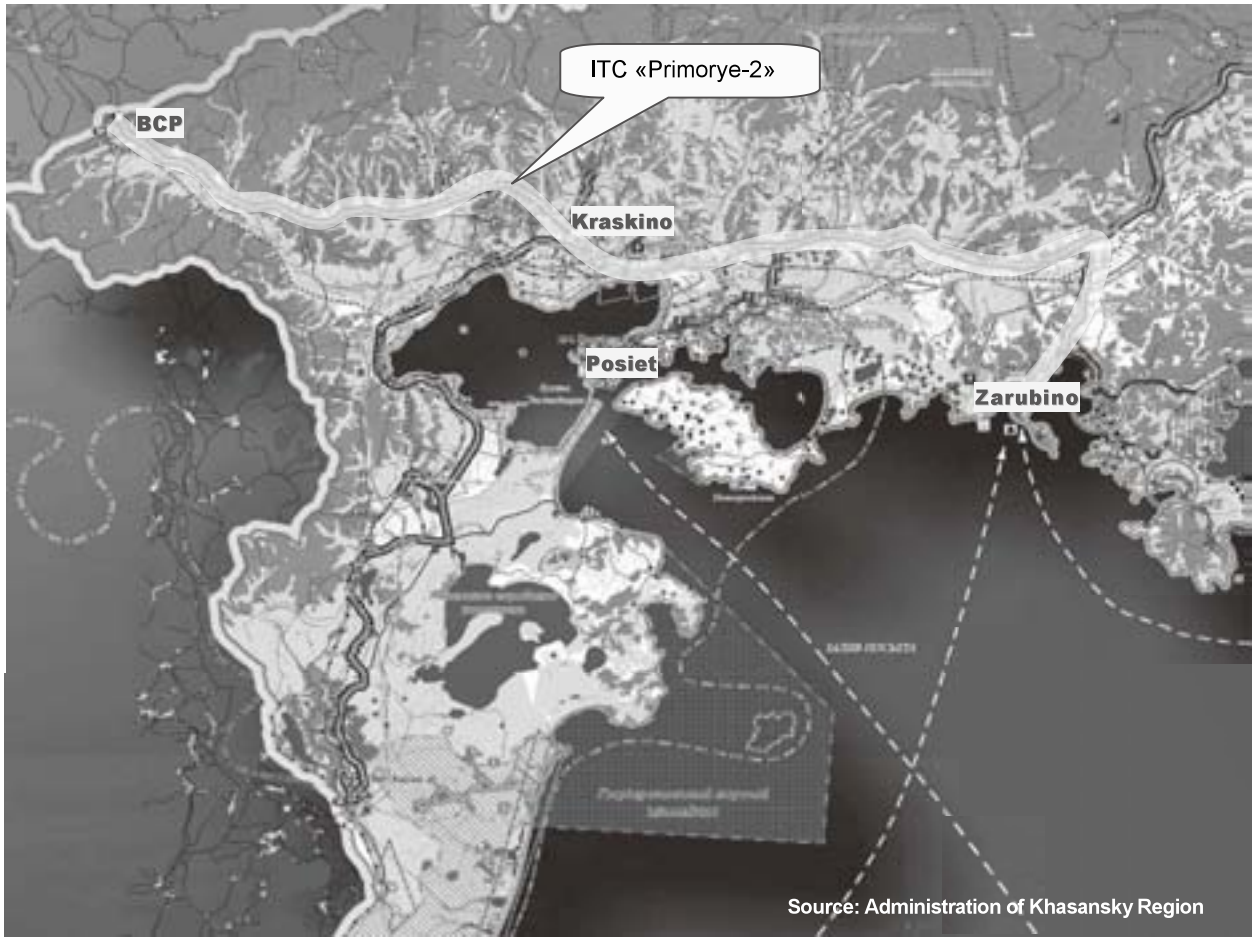


Figure 23 Map of Primorsky Territory with Suifenhe Transport Corridor segment from the border with China to the ports Vladivostok, Nakhodka and Vostochny (ITC "Primorye-1")

Source: Administration of Primorsky Territory, Khabarovsk branch of JSC "GIPRODORNII"

following functions:

- services for international road transport via Pogranichny and Poltavka automobile border crossings;
- support to transport links between near-border areas of Primorsky Territory and federal highway "Ussuri" Khabarovsk - Vladivostok;
- services for transport links of communities in Pogranichny and Oktyabrsky districts with Ussuriysk.

The road is connected with Ussuriysk - Pogranichny - state border railroad and SLB.

Traffic intensity varies from 1,000 to 12,000 vehicles per day depending on location. The greater portion of traffic is cars (up to 70%). Its disadvantage is that the road passes across communities with a total length of such segments being 16.0 km. The whole road is paved with asphalt concrete; some segments are in poor condition. In general, road condition may be characterized as subject to improvement (reconstruction) for road safety (upgrade projects are handled on a segment by segment basis). As stipulated by the Strategy of Primorsky Territory social and economic development through 2025 (approved on 20 October 2008, No. 324-KZ) this road will be completely upgraded to categories I and II by 2015.

Segment of federal highway Khabarovsk - Vladivostok (M-60 "Ussuri"). Total length of this segment is 93.5 km. "Ussuri" highway handles Primorsky Territory's road transport links with neighboring regions. "Ussuri" highway is part of AH30 route Ussuriysk - Khabarovsk - Belogorsk - Chita). In accordance with RSFSR governmental decree No. 62 of 24.12.1991 "On Approval of List of Federal Roads in RSFSR" and SNiP 2.05.-85* classification, Khabarovsk - Vladivostok road belongs to trunk federal highways intended for public use. This segment of "Ussuri" highway passes in territory of four municipalities - Mikhailovsky, Ussuriysky, Nadezhdinsky districts and Artem City. "Ussuri" highway is categorized as IV to I depending on segment, with 2 to 4 (upgraded) lanes respectively. Its technical condition needs to be improved; part of the road has been upgraded (including a new detour road around Ussuriysk, etc.).

Vladivostok - Nakhodka - Vostochny port. This road is 168.5 km long (of which 140 km is A-188 road from M-60 (Uglovoye) to Nakhodka). Different segments are categorized as IV to II, with 2 to 4 lanes respectively. The road passes across Uglovoye, Artem, Artemovsky, Shtykovo, Shkotovo, Smolyaninovo, Romanovka, Fokino, Domashlino, Dushkino, Volchanets, Novo-Litovsk communities, Nakhodka City. Total length within communities is 48 km. Vladivostok - Nakhodka road handles freight and passenger traffic. There are passenger bus stations in Artem, Shkotovo,

Fokino and Nakhodka, 62 bus stops along the road, 4 rest sites and 17 parking areas. There are filling stations, service stations, roadside catering facilities in communities and 7 highway police posts on the road.

The road is dangerous in some places: it passes across communities and has difficult meandering segments, inadequate roadway width in some places, numerous junctions. Plans on development of this road are included in the federal target program "Economic and social development of Far East and Trans-Baikal through 2013" and regional road program. It is planned that the road should be laid in bypass of communities and ensure smooth traffic at permanent high speed for shortening travel time and improvement of environmental situation in the area. To handle large-tonnage traffic, the road needs to be upgraded and paved with cement concrete material.

There are coal mining, fishing, building materials, woodworking, food processing, forestry, shipbuilding and machine manufacturing enterprises in the zone of influence. This road's zone of influence has shaped itself as a major industrial and transport center. Current traffic intensity rate is 7,000 to 20-30,000 vehicles per day.

The following problems were identified upon analysis of the current condition of ITC Primorye-1 motor roads:

1) The current condition of roads, bridges and roadside infrastructure has been improved (in some segments) but generally is not fully compliant with international traffic standards. There is demand for through routes by roads of category I-II with state-of-the-art roadside infrastructure.

2) One of main problems is road paving strength and bridge bearing capacity. Another problem is road segments and civil engineering structures not compliant with relevant requirements to public roads. Some road segments pass across communities with speed and throughput capacity limits and obstructions to traffic. Road upgrade works are in process to eliminate these problems but not completed in all route segments.

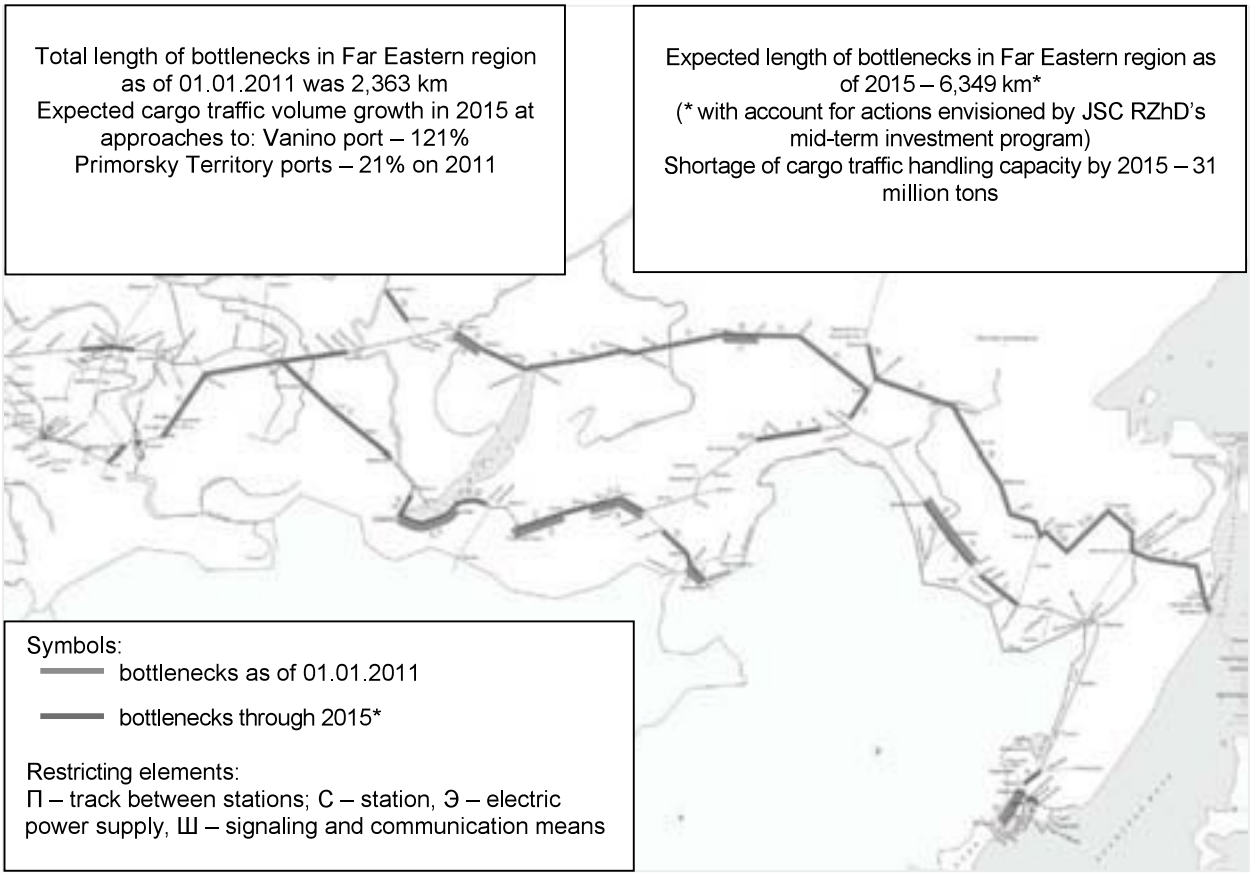
2.3.3 Rail network

Total feature of the east of Russia is bottlenecks in throughput capacity of the Far Eastern region's railway infrastructure (Figure 24).

Current condition of railway network in Primorsky Territory. The main rail line servicing Primorsky Territory is the 519-km-long segment of Trans-Siberian Railroad. Its branch lines are Uglovaya - Nakhodka, Baranovsky - Khasan, Sibirtsevo - Turiy Rog, Ussuriysk - Pogranichny accounting for 65% of total railway network length in Primorsky Territory (Figure 25). With the exception of Moscow-Vladivostok and Ussuriysk - Nakhodka railroad segments, all rail lines are single-track.

As development of foreign economic relations proceeds, railway network of Primorsky Territory becomes increasingly prospective and rapidly developing land transport mode. The main rail lines of Primorsky Territory are:

Figure 24 Bottlenecks in throughput capacity of railway infrastructure in Far Eastern region



Source: presentation by JSC RZhD "On development of railway infrastructure necessary for implementation of territorial and industrial development projects", Senior Vice President V.V. Mikhailov, 02 February 2012

- Trans-Siberian Railroad (TSR or SLB);
- Harbin - Suifenhe - Pogranichny - Ussuriysk line gathering cargo flows from Heilongjiang Province to ports of Vladivostok, Nakhodka, Vostochny or conveying them to TSR;
- Uglovaya - Nakhodka line (with access to Vostochny port);
- Baranovsky - Khasan line leading to DPRK;
- Hunchun - Kamyshovaya line, currently out of use, connecting railway networks of China and southern part of Primorsky Territory and carrying cargo flows from Jilin Province to Zarubino and Posiet ports.

Railway BCP Suifenhe - Pogranichny (Grodekovo) and Tumangan - Khasan handle cross-border goods turnover of Primorsky Territory and Khabarovsk Territory with northeastern provinces of China and DPRK.

JSC RZhD currently investigates opportunities for buildup of railway capacity in the east of Russia including Primorsky Territory (in addition to existing investment programs by RZhD).

Brief characteristic of Pogranichny (Grodekovo) - Ussuriysk - Nakhodka, Vostochny (382 km) route. This route consists of several segments described below.

Ussuriysk - Grodekovo single-track line is 97 km long, not electrified. Grodekovo station is a near-border station handling border and customs cargo inspection procedures, bogie exchange or transfer of cargoes from 1435 mm gauge to 1520 mm gauge. There are 8 stations on this line including marshalling, intermediate and cargo handling stations. Standardized length for transit freight trains is set at 53 reference wagons.

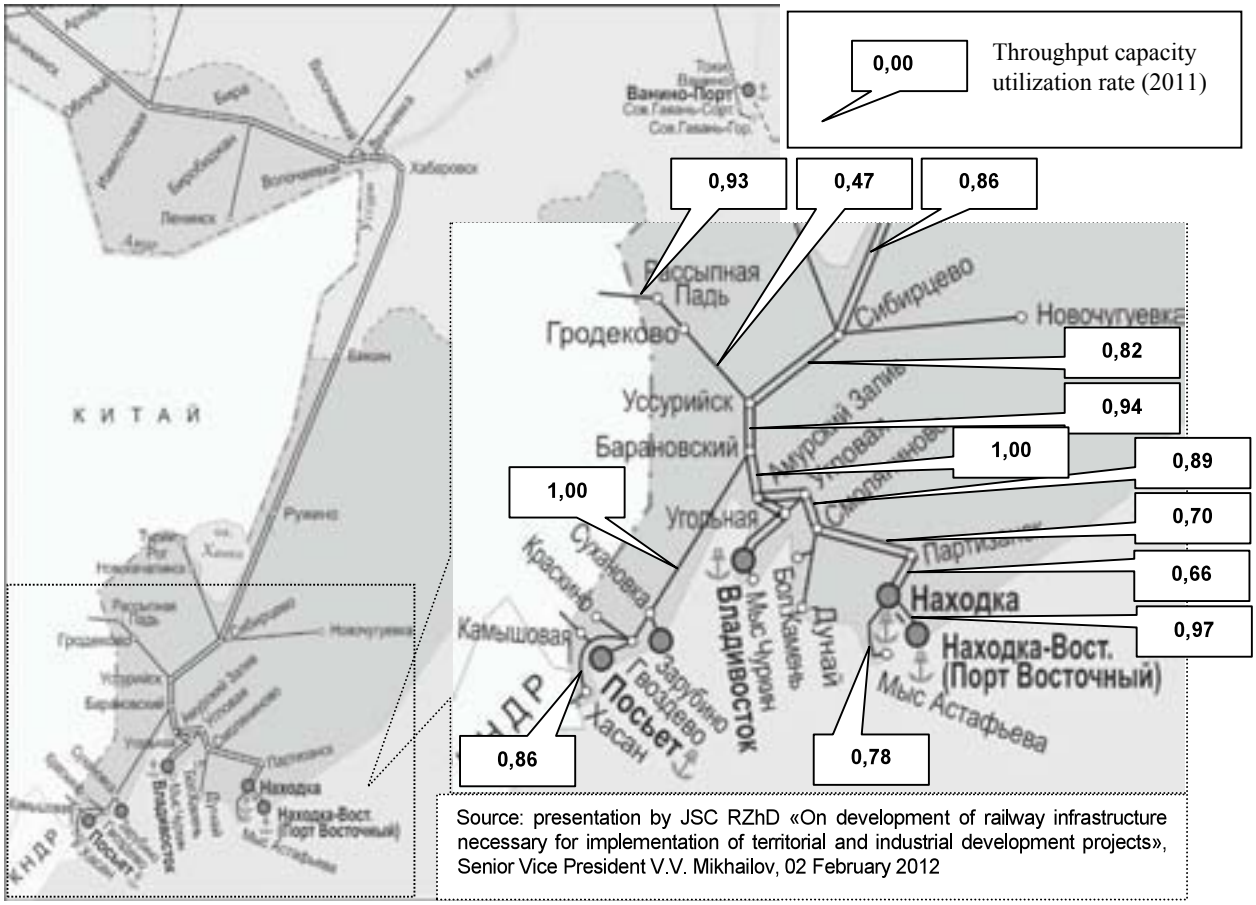
Ussuriysk - Nakhodka double-track line is 244 km long, electrified, is part of main railway route: Kuzbass - Mariyinsk - Krasnoyarsk - Taishet - Irkutsk - Karymskaya - Khabarovsk - Ugolnaya - Far Eastern transport node. There are 25 stations on this line including marshalling, intermediate and cargo handling stations. Standardized length for transit freight trains is set at 71 reference wagons.

Nakhodka - Vostochny Port line is single-track, 22 km long, except Khmylovsky - Nakhodka-Vostochnaya segment (11 km) with double tracks. This line has AC electric traction and equipped with an automatic block signal system. There are 4 stations on this line, with standardized length for transit freight trains set at 71 reference wagons.

Nakhodka - Mys Astafieva line is single-track, 19 km long, electrified, with 6 stations. Standardized length for transit freight trains is set at 71 reference wagons.

Brief characteristic of Hunchun - Zarubino route. A decision on construction of Kamyshovaya - Hunchun railway border crossing between Russia and China was initiated by the administration of Primorsky Territory and Far Eastern Railways Co. in 1992. Currently, this railway

Figure 25 Railway network of Primorsky Territory, its southern part and utilization factor



border crossing is out of operation.

As far as Posiet port is concerned, it should be taken into account that this port is currently specialized in coal handling. Potential for its development is available but limited, and its owners intend to load port capacity with their own cargoes. In this connection, Posiet port gave up priority to Zarubino in development of transit traffic via ITC Primorye-2.

Zarubino port has access to national railway network via Baranovsky - Khasan line. Sukhanovka station on 161 km of this railroad is the junction of a single-track line leading to Zarubino port (Figure 26).

Total length of rail tracks in Zarubino port is 15.5 km, of which 11.0 km is access line from Sukhanovka station and 4.5 km is dockside tracks. This line is not electrified. Permitted outgoing and incoming train weight is 1,000 tons.

Port capacity development will involve development of access rail lines, dockside station and dockside tracks. Dalgiprotrans Institute worked earlier on construction of a combined gauge line from Hunchun (China) reloading station via Kamyshovaya station, Sukhanovka station directly to Zarubino port. This work was not completed, with a combined gauge line laid only to Kamyshovaya station.

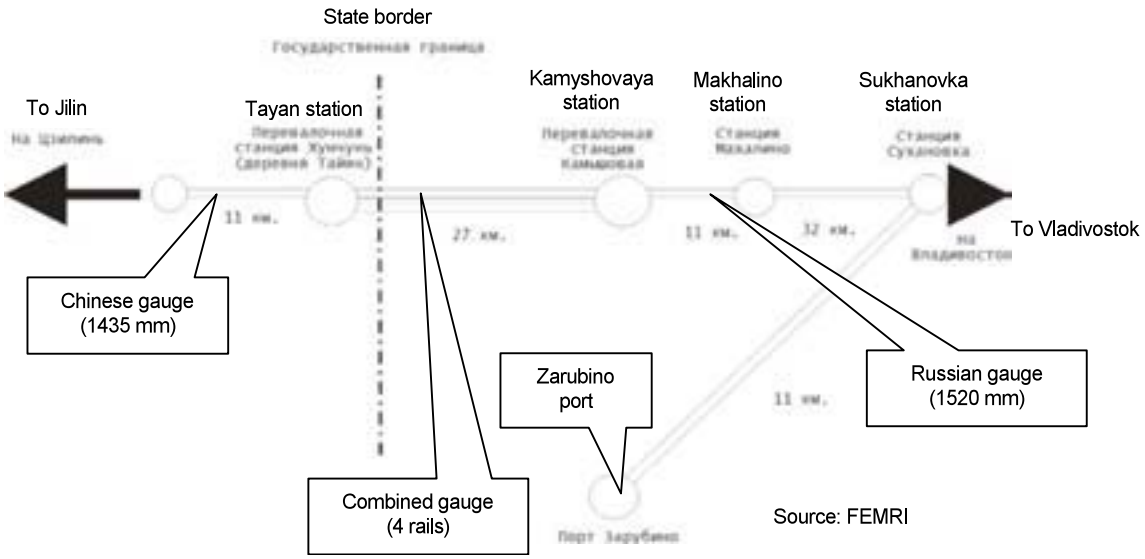
The combined gauge track consists of 4 rails which ensures handling of Chinese gauge trains (1,435 mm) and Russian gauge trains (1,520 mm) without wagon to wagon reloading or bogie exchange. This alternative (combined gauge track) is the most cost effective one for rail transportation along this route (according to estimations by transport experts from Russian and Japanese institutes).

In further prospects, all line segments and stations on Hunchun - Makhalino route will need to be developed including tracks leading to Zarubino port and dockside tracks.

Brief characteristic of route from Khasan to junction with TSR (Baranovsky - Khasan line)[4]. Khasan railway station providing access to Korean peninsula was built in 1951-1952. Baranovsky - Khasan line is 237 km long. Work is currently in process to electrify this line and build up its throughput capacity to 17 million tons/year (previous capacity was 10 million tons/year). To build up its throughput capacity, train weight should be increased to 5,200 tons. Ussuriysk - Baranovsky - Khasan line needs to be upgraded to handle prospective cargo flows after reconstruction of Tumangan - Rajin line in DPRK.

Note on Trans-Korea Railroad (East Korean Corridor). The project on reconstruction of Trans-Korea railroad and its integration with Trans-Siberian Railroad came to the fore when ROK and DPRK leaders decided at their summit held in Pyongyang in June 2000 to resume railway communication between two parts of the peninsula halted in 1953. Russian President and DPRK leader, in turn, agreed in Moscow in August 2001 to establish a new railway corridor connecting Korean Peninsula with Russia and European countries. An agreement was also signed then on cooperation between Russian Railways Co. and DPRK Railways Ministry in reconstruction of the north segment of Trans-Korea - so-called Eastern Section passing along the Eastern Sea coast and connecting with Russian railway network via Tumangan (DPRK) - Khasan (Russia) border crossing. It was decided at the trilateral meeting of railway officials from Russia, ROK and DPRK held in Vladivostok in March 2006 to start Trans-Korea reconstruction with a 54-km-long segment from Russian border station Khasan to DPRK port Rajin and construction in Rajin of a new port terminal. One year later, in May 2007, an official ceremony of Trans-Korea re-connection was held and trial traffic began across the demilitarized zone between north and south in two directions, western and eastern. In April 2008,

Figure 26 Hunchun - Zarubino railway route



[4] Sources: *http://www.gudok.ru/, http://www.lexim.ru/news/9969/, http://www.intertrans.ru/news/oao-rzhd-nachalo-rekonstruktsiyu-transkoreyskoy-zheleznoy-dorogi.html, http://www.rosgranitsa.ru/*

JSC RZhD signed an agreement with DPRK partners on establishment in Rason Special Economic Zone of a joint venture on Khasan - Rajin pilot project. This joint venture was set up under the name of RasonConTrans for 49 years. Russia's investment share is 70% and DPRK's contribution to charter capital was rights for 20 hectares of port territory (30%). Also, this JV will operate Tumangan - Rajin line on a leasehold basis.

By the end of 2011, a new 32-km-long combined gauge line (1520 mm and 1435 mm) has been laid in DPRK from Tumangan (Russian border) to Rajin, major repair of 20 km of tracks completed , number of stations reconstructed, works in tunnels continued, communication and centralized signaling trunk lines installed, drainage systems rehabilitated, etc. It is expected that in 2012 construction works will be completed and freight train traffic will open on the combine gauge line.

Russian side of the Regional Cooperation Sub-commission of the intergovernmental commission on trade, economic, scientific and technical cooperation between Russia and DPRK had its session on 6 July 2011. It was stated at the meeting that the existing multilateral freight and passenger railway border crossing Khasan (Russian Federation) - Tumangan (DPRK) is sufficient for current needs for freight and passenger transportation between Russia and DPRK. Its actual load is currently lower than its design throughput capacity.

2.3.4 Land BCP

Data on specialization (status) of BCP and cargo nomenclature (main type of cargo in the trade flows) are shown below (Table 10).

Kraskino BCP (road freight and passenger BCP, Kraskino, Khasansky District, Primorsky Territory, Russia) and neighboring Hunchun crossing point (Hunchun, Jilin Province, China) are open for international freight and passenger road transport. Kraskino crossing point is classified as multilateral, freight and passenger, permanent, road transport.

Its design throughput capacity (before 2012): freight vehicles - 48 vehicles/day (about 15,000 per year); buses - 40/day (about 12,500 per year); people - 1,440 persons/day (about 451,000 per year).

Its actual load exceeded design throughput capacity: freight vehicles - 52 vehicles/day (about 16,300 per year); buses - 48/day (about 15,000 per year); people - 1,700 persons/day (about 335,000 per year).

Being the only road BCP between Russia and Jilin Province of China, Kraskino is an important link in trade and economic cooperation between Primorsky Territory and Jilin Province and the only automobile border crossing point in ITC Primorye-2. The crossing point is located in 42 km from Russian port Posiet, in 71 km from Zarubino port, in 170 km from Vladivostok port.

Being built in early 1990s, Kraskino was incapable of effective handling of transit traffic, its buildings and facilities were incompliant with current requirements. Its throughput capacity was a serious barrier to developing dynamic of international freight and passenger transport. There were no permanent transit clearance procedures which resulted in interruptions of regular passenger traffic, etc. To eliminate these deficiencies, Kraskino crossing point is currently under reconstruction.

Construction of a modern complex of buildings and facilities is currently being completed at Kraskino BCP. The BCP being reconstructed is located in 100 meters from Russia-China border. Its design throughput capacity will be 250 vehicles per day:

- 150 freight vehicles / day;
- 50 buses / day;

Photograph 1 Baranovsky - Khasan (left line to DPRK - to Khasan), right line - to China (to Kamyshovaya, out of operation)

Source: FEMRI, 17 Mar 2012

Table 10 General Data on Specialization (status) of Land BCP and cargoes being handled

Land BCP, position, type	Cargoes nomenclature	BCP Status*
Kraskino BCP (road freight and passenger BCP)	Textiles, home appliances, mopeds, bicycles, refrigerated goods, including goods in containers	Multilateral
Khasan BCP (rail freight and passenger BCP)	Coal, fertilizers, wood, metals, foods, building cargoes, including goods in containers	Multilateral
Pogranichny BCP (road freight and passenger BCP)	Textiles, home appliances, refrigerated goods, vegetables and fruit, including goods in containers	Multilateral
Pogranichny BCP (rail freight and passenger BCP)	Metals, ore, chemical cargoes, fertilizers, grain, foods, refrigerated goods, including goods in containers	Multilateral

*Notes: **Multilateral BCP** is adapted for admission of persons, goods and vehicles of the Parties and other states (BCP is adapted for the transit). **Bilateral BCP** is adapted for admission of persons, goods and vehicles of the Parties states only (BCP isn't adapted for transit, only for import and export between two states).

Source: Collected by FEMRI on the basis of official sources *http://www.rosgranitsa.ru; http://www.customs.ru.*

- 50 cars / day.

Photograph 2 Kraskino BCP (under construction)

Source: FEMRI, 03 Feb 2012

Khasan BCP (rail freight and passenger BCP, Khasan Railway Station of Far Eastern Railroad, Khasan Railway Passenger Terminal of Regional Railway Passenger Terminals Directorate, Russia) and neighboring Tumangan (DPRK) are open for international freight and passenger transport. Khasan border crossing point is classified as railway, freight and passenger, permanent, multilateral. It operates 24 hours a day, 7 days a week.

Design throughput capacity:

Freight (out + in) - 28 trains / day (about 17 million tons / year)

Passenger (out + in) - 4 trains /day (about 120,000 passengers / year)

Pogranichny road BCP (road freight and passenger BCP, Pogranichny, Pogranichny District, Primorsky Territory, Russia) and neighboring Suifenhe border crossing point (Suifenhe, Heilongjiang Province, China) are open for international freight and passenger road transport. This border crossing point is classified as multilateral, freight and passenger, permanent, road transport.

Its design throughput capacity (before 2012): freight vehicles - 130 vehicles/day (about 41,000 per year); buses - 44/day (about 13,800 per year); people - 2,880 persons/day (about 783,000 per year).

Its actual load differs from design throughput capacity: freight vehicles - 100 vehicles/day (about 31,000 per year); buses - 60/day (about 19,000 per year); people - 3,200 persons/day (about 1 million per year).

Pogranichny is a priority BCP between Primorsky Territory and Heilongjiang Province and generally between Far East of Russia and Northeast China. It handles about half all road transport volume with China.

The condition of Pogranichny BCP was incompliant with current requirements to equipment and furnishings of buildings and facilities necessary for effective operation of a border crossing point. Its existing infrastructure was inadequate for handling clearance of vehicles and cargoes without serious delay. Waiting time was reaching 3 days. To eliminate these deficiencies, the crossing point is currently under reconstruction.

Construction of a modern complex of buildings and facilities is currently in process in immediate vicinity of the state border. This project will increase its throughput capacity to 1,300 vehicles and 4,000 passengers per day:

- 500 freight vehicles / day;
- 200 buses / day;
- 600 cars / day.

Pogranichny rail BCP (rail freight and passenger BCP, Grodekovo station, Pogranichny, Pogranichny District, Primorsky Territory, Russia) and neighboring Suifenhe border crossing point (Suifenhe, Heilongjiang Province, China) are open for international freight and passenger railway transport. This border crossing point is classified as multilateral, freight and passenger, permanent, railway transport.

Design throughput capacity:

Freight (out + in) - 32 trains / day (about 13.5 million tons at existing traffic structure and up to 33 million tons in case of full two-way load);

Passenger (out + in) - 4 trains / day (about 1,200 passengers / day or 438,000 passengers / year).

The technical condition of Pogranichny BCP is not fully compliant with requirements by governmental regulatory bodies and passengers proceeding via it. Actual traffic volumes are lower than design throughput capacity.

During freeze-up season: freight vehicles - 120 vehicles/day, passenger traffic - 300 buses/day, 7020 passengers/day.

2.3.5 Ports

General. The following port nodes in the south of Primorsky Territory are addressed in this report:

- **Khasansky transport node** which comprises Posiet port, Trinity Bay port (Zarubino) and berths in Slavyanka. Current cargo turnover is 5-10 million tons;
- **Vladivostok transport node** which comprises Vladivostok commercial sea port, Vladivostok fishing port, Vladivostok oil loading base, other berths belonging to various businesses. Current cargo turnover varies in the range of 10-12 million tons;
- **Vostochny-Nakhodka transport node** which comprises stevedoring companies in Vostochny port including Kozmino oil loading port and in Nakhodka: Nakhodka commercial sea port, Nakhodka oil loading port, Nakhodka fishing port, other berths belonging to various businesses. Current cargo turnover varies in the range of 50-54 million tons.

All ports being considered are open to international shipping and have BCPs. Data on specialization (status) of BCP and cargo nomenclature (main type of cargo in the trade flows) are shown below (Table 11).

Posiet port is located in Port-Posiet Inlet intruding into the northern shore of Novgorodskaya Inlet of Peter the Great Bay. The ice free harbor is capable of receivings ship year-round. The port is specialized in coal handling and operates cargo berths integrated into a single loading

complex. Water depth is 9.45 m in front of quayside and 9.0 m in approach channel. All berths are equipped with a universal mechanized system. A port development project is currently being completed. Its purpose is introduction of a new high productive technology for cargo handling. The project comprises two components: revamping of Posiet port and construction of an approach channel to the coal loading complex. Coal terminal turnover will grow up to 5-7 million tons a year.

Posiet port is currently developing as a specialized coal port. There are possibilities for its development but limited ones, and port owners intend to load it with in-company cargoes. Therefore, Posiet port gave up initiative in development of transit traffic via ITC Primorye-2 to Zarubino port.

Zarubino port is found near Posiet port in Trinity Bay of Posiet Bay which is, in turn, part of Peter the Great Bay. Its coastline, offshore depths, water temperature and favorable geographic position all this is optimal for

Table 11 General data on specialization (status) of Sea BCP and cargoes being handled

Sea BCP, position, type	Cargoes nomenclature	BCP Status*
Seaports (Primorsky Territory)		
Posiet port (sea freight BCP)	Coal	Multilateral
Zarubino port (sea freight and passenger BCP in the Trinity Bay Sea Port)	Machinery and equipment, metal scrap, goods in containers	Multilateral
Vladivostok port (sea freight and passenger BCP)	Oil products, metals, machinery and equipment, coal, metal scrap, wood, grain, goods in containers	Multilateral
Nakhodka port (sea freight and passenger BCP)	Oil products, metals, machinery and equipment, coal, metal scrap, wood, goods in containers	Multilateral
Vostochny port (sea freight BCP)	Coal, fertilizers, metal scrap, wood, oil, oil products, goods in containers	Multilateral

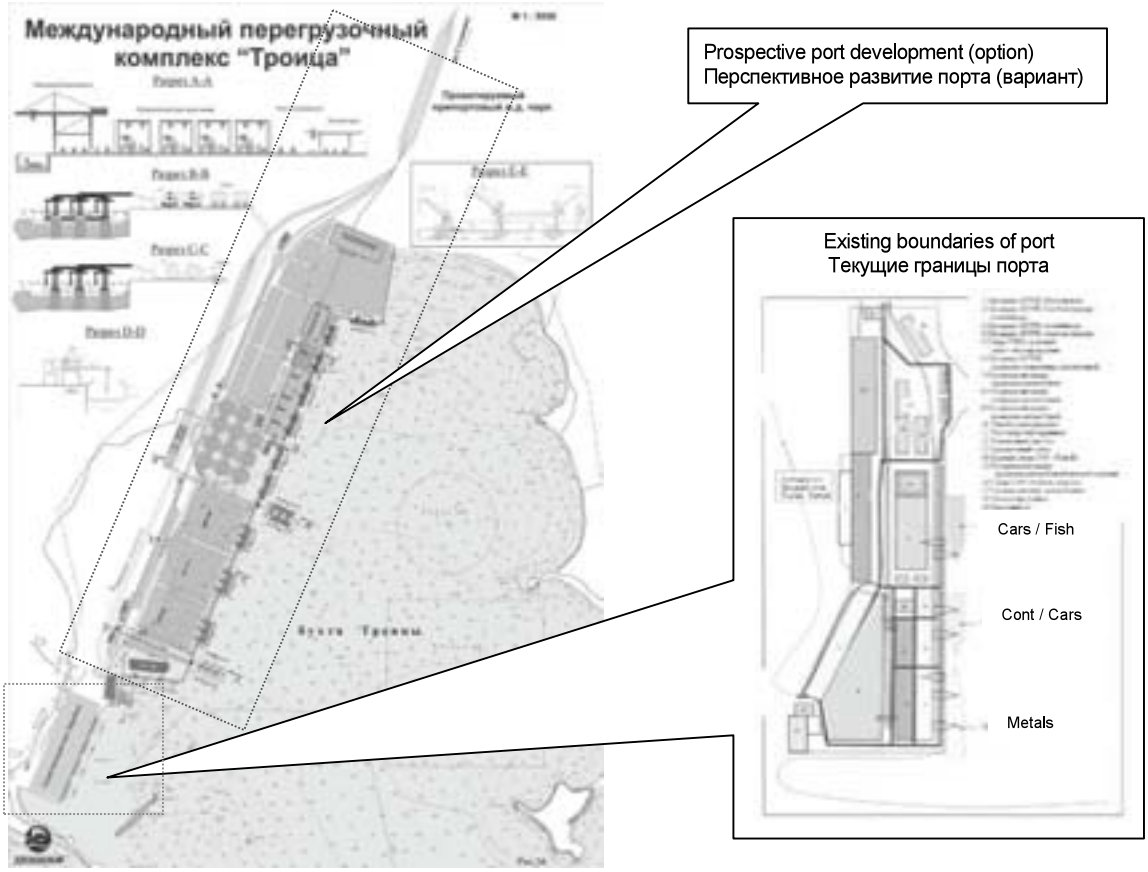
*Notes: Multilateral BCP is adapted for admission of persons, goods and vehicles of the Parties and other states (BCP is adapted for the transit).
Source: Collected by FEMRI on the basis of official sources *http://www.rosgranitsa.ru; http://www.customs.ru*

Photograph 3 Zarubino seaport (containers and cars, passenger terminal)

Source: http://seaport-troitsa.ru/

Source: FEMRI, 28 Feb 2012

Figure 27 Zarubino development projects (option)



Source: FEMRI

construction of a major ice free port. Water depths at approaches to the port are 12 to 15 meters.

Port activities are currently represented by stevedoring company JSC Trinity Bay Port and Russian-Chinese joint venture Zarubino International Port LLC. The port comprises 4 berths with a total length of 650.0 m and design cargo turnover of 1.2 million tons, with port upgrade projects being in process (for instance, a new container terminal).

There are dual prospects for Zarubino port development:

1) "small-scale" - plans and ideas by current owners in existing boundaries of Zarubino port;

2) "large-scale" - various port development alternatives within possibilities of Trinity Bay; such projects envision cargo turnover buildup to 90-100 million tons per annum, increase of container handling capacity from 2-3 to 7 million TEU/year and more (Figure 27).

Large-scale development of the port in Trinity Bay and its logistic infrastructure may become an effective pilot project aimed at promotion of international cooperation in the region. One particular feature of Zarubino port differing it from other ports of Primorsky Territory and Russian Far East should be stressed in this connection. Such ports as Nakhodka, Vostochny, Vladivostok are currently oriented at transport operations within domestic demand by Russian economy (export, import, coastal). Zarubino port is ideally suitable for development of transit transport in NEA, formation of integrated transport space and improvement of through technologies. Development of this port may support establishment of a communication site in the south of Primorsky Territory based on trade and logistics.

Vladivostok port is located in the Golden Horn Bay of Peter the Great Bay. Its ice free harbor is well sheltered against winds and waves from all directions. Due to its convenient geographic position and favorable climate, the port is navigable year-round. Limitations in its development are relevant to its location within city precincts. For instance, no development of rail tracks, near-port stations and trunk railway segment is possible due to close neighborhood of densely built-up urban areas. Furthermore, express passenger railway traffic will be introduced according to city plans which will even more restrict possibilities for port development. Its further development calls for technical modernization, relief of load on the city transport system, development of logistics and distribution terminals outside city precincts. It is not unlikely that the port will be relocated from the city in future prospect. Mean depths at approaches to port are 20-30 meters. There are more than 25 companies operating in the port. Major stevedoring companies are shown on Figure 28, and two of them are described below.

Vladivostok Commercial Sea Port (VCSP). The port comprises container terminals, car storage areas, covered

and open-air storages for other cargoes. Depths at quay are 9.75 to 15.0 m. JSC VCSP (member of FESCO Transport Group) provides services on handling of general, bulk solid, container cargoes. Its equipment is capable of lifting up to 200 tons using shore cranes at any one time.

According to JSC VCSP development strategy for 2015, projects will be handled to build up its cargo handling volume to 11.4 million tons with increased percentages of containers, motor vehicles, extra heavy and project cargoes. JSC VCSP plans include:

- buildup of container handling volume to 600,000 TEU annually due to berth re-specialization and increase of the throughput capacity of the existing container terminal;
- construction of a transport & logistics center outside city precincts;
- development of a specialized terminal for handling of motor vehicles and special equipment;
- reconstruction of bunkering oil depot;
- buildup of throughput capacity of access rail tracks and motor roads.

Vladivostok Fishing Port is a multi-purpose cargo handling complex capable of handling in addition to fish cargoes such cargoes as containers, timber, metals, fertilizer, wood pulp, fuel and lubricants, etc. Depths at quay are 9.8 to 12.4 meters.

Division of these two ports into commercial port and fishing port has lost any sense to date but still remains in names of relevant stevedoring companies.

There is a **sea passenger terminal** operating in Vladivostok which comprises a passenger border crossing point. This terminal is located downtown near the railway passenger terminal. The coastal passenger terminal is under reconstruction. Vladivostok sea passenger terminal is one of the largest in the Far East of Russia and over entire Pacific coast of Russia. It comprises a complex of facilities including a terminal building, quayside and overpass connecting it with the railway station square.

Figure 28 Vladivostok seaport (main stevedoring companies)

Source: FEMRI

Photograph 4 Vladivostok seaport: Commercial Port (upper) and Fishing Port (lower)

Source: FEMRI

Nakhodka port. Main berthing facilities of Nakhodka port are found in Nakhodka Bay (other berths in some other bays) (Figure 29). The port being ice free, navigation is year-round. Water depths at quay are 8 to 12 meters. There are many stevedoring companies operating in the port. Main ones are shown on the respective figure, and three of them are described below.

Division of ports into commercial port and fishing port has lost any sense to date but still remains in names of relevant stevedoring companies.

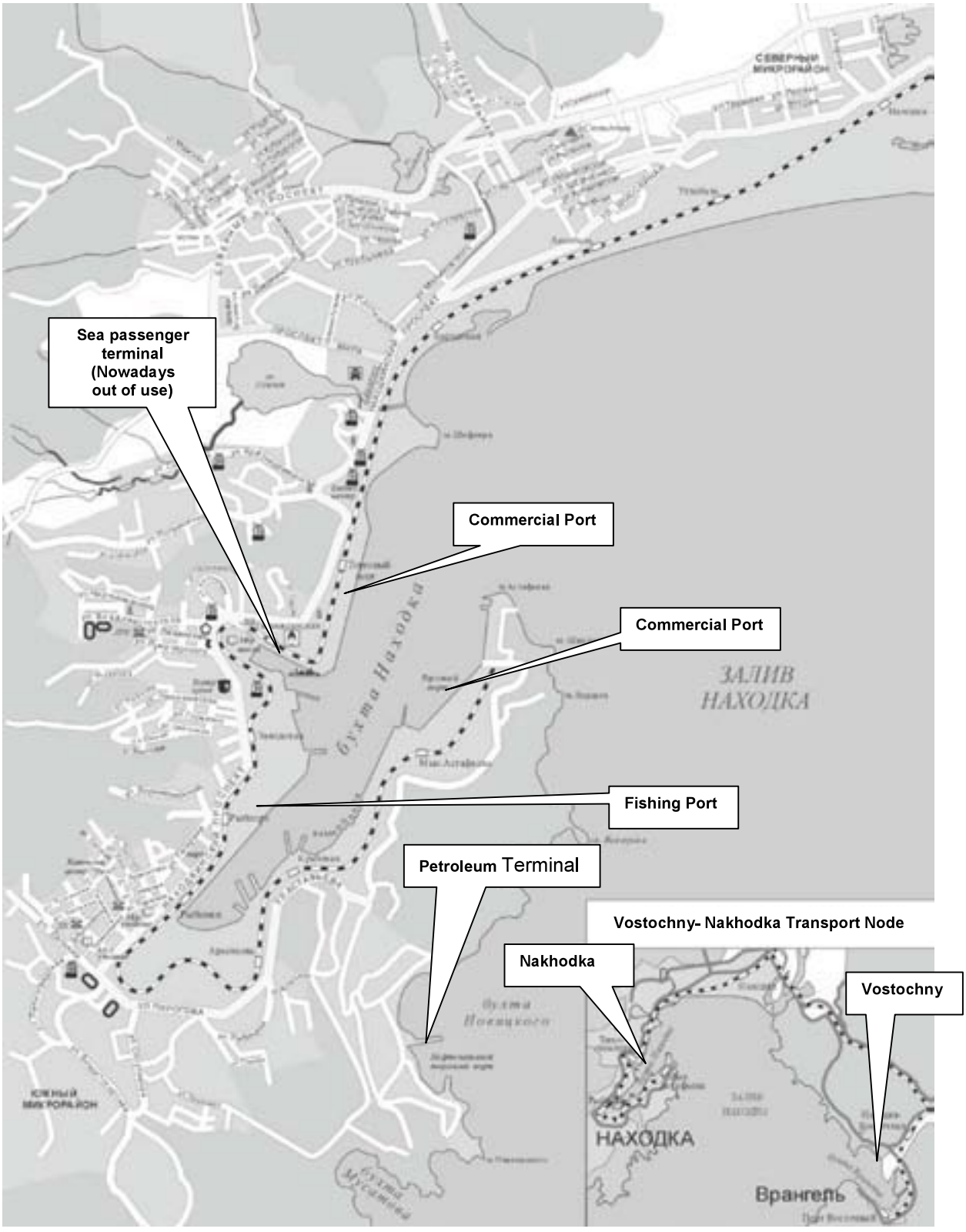
Nakhodka Commercial Sea Port (NCSP). The port is located in the northern part of Nakhodka Bay on its both shores and plays one of leading roles on the Pacific coast of Russia. It is specialized in handling of general, solid bulk, timber and metal cargoes.

Spatially, the port is divided into two areas. It comprises 22 berths with a total length of 3,560 m. Water depths at quay are 9.75-10.5 m.

Use of operating capacity: the port has a vacant throughput capacity of about 1-1.5 million tons at its current cargo turnover structure and mechanized equipment layout. Its development is possible if obsolete technologies are replaced and access rail spurs and roads are upgraded.

Nakhodka Fishing Sea Port (NFSP) is located on the shore of Nakhodka Bay west of Cape Basnina. To date, it

Figure 29 Nakhodka seaport (main stevedoring companies)



Source: FEMRI, *http://www.infokart.ru/*

Photograph 5 Nakhodka seaport

Source: FEMRI, 08 Mar 2012

has lost the status of a specifically dedicated fishing port and operates as a general-purpose port. It comprises 9 berths. Water depths at quay are sufficient to handle ships with displacements of up to 22,000 tons and loaded draft 9.0 m.

Use of operating capacity: the port has lost its turnover of fish and refrigerated cargoes. It works on reconstruction of its cargo handling complexes for handling cargoes typical of general-purpose ports. There is a project on container terminal development. After reconstruction, the port will be capable of handling about 400,000 TEU of large-tonnage containers and up to 750,000 tons of various general and refrigerated cargoes.

Nakhodka Oil Loading Port. It is located in ice free Novitskogo Inlet on the western shore of Nakhodka Bay and operates on a year-round basis. It is specialized in oil product loading. It comprises six berths, of which five ones are accommodated on both sides of a pier, water depths are 8-13.4 m.

Sea passenger terminal and berths for passenger ships in Nakhodka are currently out of use.

Vostochny port is a leading port in the Far East of Russia. It is specialized in handling of general, solid bulk, timber cargoes and large-tonnage containers. The port comprises all-purpose berths and specialized complexes for handling of coal, large-tonnage containers, mineral fertilizer, petrochemical products.

The port includes the following terminals:

- container terminal: four berths with a total length of about 1,300 m, water depths 11.5-13.0 m;
- coal terminal: includes a pier 380 m long with two berths and water depth 16.5 m which allows handling ships with carrying capacity of up to 150,000 tons. Throughput capacity of the terminal is 12 million tons of black and coking coal annually;
- timber terminal comprising two berths with water depth 11.5 m;
- mineral fertilizer terminal 215 m long, water depth 11.4 m.

In addition to specialized terminals, there are all-purpose berths in the port suitable for handling of general and solid bulk cargoes. The berthing line consists of 17 berths with a total length of about 4 km and water depths varying from 6.5 to 16.5 m. The port has capacity for development.

Special Sea Oil Port "Kozmino" was built in 2009. Design capacity: first stage - loading of 15 million tons of petroleum per year, second stage - 30 million tons of petroleum per year (planned by 2015).

2.4 Performance Review of Corridors

2.4.1 Supporting legal environment of transport movements (international treaties and agreements, domestic regulations, institutional impact)

Existing Transport Facilitation Measures and Frameworks (bilateral/ trilateral/ multilateral transport development and operation agreements and MOU). There are following intergovernmental agreements on transport in NEA with Russian Federation participation in place:

Multilateral agreements

Agreements under the UN ESCAP:

- Intergovernmental Agreement on the Asian Highway Network (was discussed and adopted in Bangkok on 18 November 2003, a signing ceremony was held in Shanghai, China, on 26 April 2004);
- Intergovernmental Agreement on the Trans-Asian Railway Network (entered into force on 11 June 2009, in Russia approved by Russian Federation Government resolution No. 1536-r of 8 November 2006);

Agreements under the Organization for Cooperation of Railways (OSJD):

- Agreement on the international cargo railway transportation (in force since 1 November 1951, as amended on 1 July 2008);
- Agreement on the international passenger railway transportation (in force since 1 November 1951,

as amended on 30 May 1999);

Agreements under the Eurasian Economic Community (EAEC):

- Customs Union agreements: since 6th July 2010 the Customs Code of the Customs Union is applied in the unified customs territory of Republic of Belarus, Republic of Kazakhstan and the Russian Federation. Later, the Kirghiz Republic has decided to join the Union.
- etc.

Bilateral agreements and programs:

- Agreement between the Government of the Russian Federation and the Government of Mongolia about border crossing points and the simplified transportation through Russian-Mongolian border (UlaanBaatar, August 10, 1994) as amended on March 5, 2007;
- Agreement between the Government of the Russian Federation and the Government of the People's Republic of China about international automobile transportation (Beijing, 18 December 1992);
- Agreement between the Government of the Russian Federation and the Government of the People's Republic of China about border crossing points on the Russian-Chinese border (Beijing, 27 January 1994);
- Agreement between the Government of the Russian Federation and the Government of the People's Republic of China about a Merchant Shipping routine on the boundary rivers and adjacent rivers and lake (Moscow, 21 December 1957);
- Agreement between Administration of Primorsky Territory of the Russian Federation and the National Government of the Heilongjiang province of the People's Republic of China about trade and economic cooperation (Hutou, 30 August, 2000);
- Agreement between Administration of Primorsky Territory of the Russian Federation and the National Government of the Jilin province of the People's Republic of China about trade and economic cooperation (Moscow, 25 February 1999);
- Program of cooperation between Far East and Eastern Siberia regions of the Russian Federation and the Northeast of the People's Republic of China (2009-2018), approved on 23 September 2009 by heads of Russia and China;
- Program of deepening of trade and economic cooperation between the Russian Federation and Japan (adopted in Tokyo on 05 September 2000);
- etc.

Joint declarations:

- The Russian-ROK joint statements (Seoul, 27 February 2001, 17 October 2006)
- The Moscow Declaration on an establishment of creative partnership between the Russian Federation and Japan of 13 November 1998.

New initiatives (under discussion):

- Draft "Agreement on Sea-land Intermodal Transportation using highways and ports and other transport infrastructures between the Government of the Russian Federation and the Government of the People's Republic of China" (being discussed since 2010 - no effective results as yet);
- Idea of the organization of Northeast Asia sea-land Intermodal Transport Cooperation between the Governments of the People's Republic of China, Japan, The Republic of Korea and Russian Federation (discussed on 20-22 December 2011 - there is a constructive Agreed Minutes of Consultation in Harbin, China).

Minutes of meetings on freight and passenger cross-border transportation

- Minutes of meetings of region transport delegations from neighboring countries on freight and passenger cross-border transportation.

Note: as part of their international transport cooperation, Russia and China hold regular meetings of Russian Minister of Transport and China Minister of Transport. Topical issues of cooperation are addressed at these meetings. For instance, the issue of permitted inland travel distance for freight vehicles in the neighboring country has been resolved by the parties on a mutually balanced basis. The particular permitted inland travel distance and requirements for cargo reloading from one party's trucks to the other party's trucks have been fixed in relevant bilateral intergovernmental agreements and in Minutes of meetings between regional-level transport authorities of neighboring countries. As of today, inland travel distance for mutual freight traffic is limited to near-border routes (between near-border cities). Reloading may be required for cargo delivery to port depending on route. Bus routes are operated at considerably longer distances. For instance, Chinese buses with Chinese drivers travel to Vladivostok and Russian buses travel to Mudanjiang or Harbin.

There are various forms of practical cooperation in NEA. On the level of economic zones and programs of transborder cooperation these forms may include establishing of joint ventures, activities of intergovernmental commissions, etc. It means that regional transport cooperation and its coordination are based on very broad international legal framework and information exchanges, on continuously strengthening trade, economic and transport relations.

Note: a Strategic Review on GTI activity and GTI project was carried out in 2011[5]. The following issues

[5] Strategic Review on Greater Tumen Initiative. GTI, Final Report, 19 September 2011

concerning transport were noted:

- GTI activity is inconspicuous among a significant number of international organizations in the region (it is necessary to develop cooperation with organizations pursuing similar goals (UN ESCAP etc) and to form GTI's own image);
- The current level of representation (Vice-Ministerial) is not enough for solving all GTI transport problems having an interministerail dimension;
- It will be better for GTI to consider changing its name (replace "Tumen" for "Northeast Asia");
- Guarantees and decrease in risks are necessary for business, for this purpose it is necessary to create conditions. Business investors will appreciate deeper involvement of federal and local government;
- Successful project is needed for demonstration to federal and local governments to gain stronger support;
- It is reasonable to start GTI sea transport activities (for example, regular shipping lines initiation, support to ferry lines etc) but discussion needed;
- In context with line ""Ideology" - "Hard" - "Soft" Projects" support to a wide range of projects should be provided. All three levels should be interconnected. For example, first level (ideology and strategy) projects attract federal government attention and encourage communication among member states, soft project level provides governments with detailed planning and implementation measures, hard project level implements particular business projects with full government support.

Russian domestic regulations and institutional impact[6]

Main regulatory documents. Operational procedures of Russian border crossing points are based on the following documents:

- Russian Federation Law "On State Border of Russian Federation" No. 4730-1 of 1 April 1993;
- Federal Law "On Procedure for Exit from Russian Federation and Entry to Russian Federation" No. 114-FZ of 15.08.1996;
- Number of executive orders by Russian Federation Government relevant to control regulations, control types, methods and application of control means at border crossings (No. 50 of 2 February 2005, No. 94 of 16 February 2008, No. 872 of 20 November 2008), "On Approval of Regulations in Establishment, Opening, Functioning (Operation), Reconstruction and Closure of Russian Federation State Border Crossing Points" No. 482 of 26.06.2008, and others;
- Directives by Russian Federation Ministry of Transport on approval of generic border crossing procedures: No. 247 of 22 December 2009 - for marine and river (lake) crossing points; No. 31 of 09 February 2010 - for railway crossing points; No. 177 of 09 October 2009 - for automobile crossing points (as amended including Directive No. 239 of 3 November 2010 on modifications in operational procedures of crossing points);
- Directive by Federal Security Service No. 305 of 17.06.2010 "On Approval of Administrative Regulations on Execution of Governmental Function of Border Control at Russian Federation State Border Crossing Points";
- Federal Law "On Amendments to Relevant Legislative Acts of Russian Federation in Connection with Transfer of Powers on Execution of Some Types of State Control to Customs Authorities of Russian Federation" No. 394-FZ of 28.12.2010;
- Other documents regulating operations of Russian border crossing points.

New Customs Code

The new Customs Code of the Customs Union (CC CU)[7] applied since 1 July 2010 has become an important factor. The establishment of the new customs union and application of the new Code is aimed at realization of economic development potential of Belarus, Kazakhstan and Russia including more efficient use of their transit potential. Published below are some excerpts relevant to organization of transit traffic via GTR corridors.

Chapter 1. General Provisions

Article 1 - Customs Regulation in Customs Union

1. Customs regulation in the customs union under the Eurasian Economic Community (hereinafter - Customs Union) is legal regulation of relations arising in connection with transfer of goods across the customs border of the Customs Union, transportation thereof via the integrated customs territory under customs control, temporary storage, customs declaration, clearance and use in accordance with customs procedures, execution of customs control, payment of tax duties, and administrative relationships between customs bodies and entities executing their right for ownership, use and disposal of above said goods.

Chapter 32 - Customs Procedures of Customs Transit

Article 215 - General Provisions on Customs Transit

1. Customs transit is a customs procedure according to which goods are transported under customs control through the customs territory of the Customs Union including territory of non-member states, from the customs body of departure to the customs body of destination without any customs duties, taxes involving prohibitions and restrictions with the exception of measures of non-tariff and technical regulation character.

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[6] Sources: *http://www.customs.ru/; http://www.mintrans.ru/; http://www.fsb.ru/; http://www.tamognia.ru/; http://www.rosgranitsa.ru/*

[7] *http://kodeks.systecs.ru/tk_ts/*

2. Customs transit procedures are applied during transportation of:

1) foreign goods from the customs body at arrival location to the customs body at departure location;

- … and so on.

Chapter 216 - Conditions of goods placement under customs transit procedures

Goods shall be placed under customs transit procedures provided that the following conditions are met:

1) goods are not prohibited for entry to the customs territory of the Customs Union and exit from this territory;

2) documents on goods are presented in confirmation that restrictions are observed in relation of goods transfer across the customs border if such transfer is permitted on show of such documents;

3) incoming goods have passed border control and governmental control of other types if goods are subject to such control in arrival location;

4) transit declaration is presented;

5) measures to secure compliance with customs transit procedures have been taken in relation to goods as per Article 217 herein;

6) goods identification is compliant with Article 109 of this Code;

7) international transport means is properly equipped in case goods are carried under customs seals.

Chapter 217 - Measures Securing Compliance with Customs Transit Procedures

1. Measures securing compliance with customs transit procedures include:

1) securing of payment of customs duties, taxes in relation of foreign goods as per Chapter 12 herein;

2) customs support;

3) establishment of a route for goods transfer.

2. Customs bodies shall not require any security for payment of customs duties, taxes stipulated in sub-item 1) of item 1 of this Article for customs transit provided that:

1) goods are declared by a customs carrier or authorized economic operator;

2) goods are transported by rail, pipeline or conveyed by electric lines;

3) international agreements require so;

4) goods are transported under customs escort;

…Routes shall be established by the customs body of departure based on information contained in transport (shipping) documents. Routes can be altered subject to written permission by the customs body of departure or any customs body en route.

Chapter 15 - General Provisions on Customs Control

Article 109 - Identification of Goods and Transport Vehicles, Rooms and Other Places

1. Goods being under customs control, transport vehicles, rooms, containers and other places where goods subject to customs control are found or may be found may be identified by customs bodies.

Identification will be made by placement of seals, numerical, alphabetic or other marking, identification signs, stamps, sample and specimen collection, detailed description of goods, production of drawings, scaled representations, photographs, illustrations, use of shipping and other documentation as well as by other methods.

… and so on.

Other improvements

Currently introduced improvements of BCP performance are based on a single-window principle. The introduction of the 'single-window' principle at the Russian state border began in 29 June 2011. According to new procedures, Russian customs authorities check themselves documents relevant to sanitary, quarantine, veterinary and quarantine phyto-sanitary control and perform transport control at automobile BCPs (for juridical persons except personal cars).

Other improvements of customs authorities performance are based on the Concept of customs clearance and control in locations in vicinity of Russian Federation state border. This Concept has been approved by a Russian Federation government executive order and applies, first of all, to road BCPs (rail, sea and airport BCPs are treated separately). **This Concept does not apply to transit.**

The Concept follows the main provisions of the International Convention on the simplification and harmonization of Customs procedures of 18 May 1973 as amended by Protocol of 26 June 1999 on preliminary information use and transmission in electronic form as well as the Framework of Standards to Secure and Facilitate Global Trade (adopted by World Customs Organization in June 2005).

Briefly, its main provisions are as follows:

- Customs operations relevant to goods declaration and clearance are not performed directly at BCPs (except as provided in stipulated cases);
- as a rule, customs clearance and customs control will be performed at Customs & Logistic Terminals (CLT) in locations close to Russian Federation state border;
- Customs & Logistic Terminals will be located in customs control zones along the customs border of Russian Federation;

The Concept envisions introduction of new customs clearance technologies including:

- preliminary informing of customs authorities about goods to be imported,
- use of risk management system,
- electronic declaration procedure with an option to use the Internet network.

Improvements of customs authorities performance in sea ports are based on Russian Federation Ministry of Transport's Directive No. 239 of 3 November 2010. This directive optimizes operational procedures of sea BCPs. According to new procedures, ship inspection by a commission ceased being compulsory. Earlier, this requirement essentially slowed down ship processing in ports. No-commission ship inspection procedures have been in use since early 2011.

Furthermore, discussions are in process on new federal laws "**On Transit**", "**On Russian Federation State Border Crossing Points**", "**On Multimodal (Combined) Transport**, on amendments and alterations to the federal law "**On Transport Forwarding Activities**".

GTI activity outlook

Bottleneck in the GTR corridors development is absence of any international agreement regulating transit and its development. Such a document may be **Agreement on transit** or other document containing principles and rules on development of free trade, trading and transport infrastructure, on elimination of gaps and bottlenecks in trading and transport infrastructure of the GTI participating countries, etc.

2.4.2 Overall noted Constraints and Challenges of freight and passenger movements

Conceptual level restrictions are:

- wrong understanding of the competitive environment of Eurasian corridors constrains development of GTR regional corridors (in reality, they do not compete with Europe - Asia corridors);
- assessments of demand for GTR corridor development are underestimated because there is no actual dynamic of transit growth (this circumstance misleads many analysts);
- role of ports and possibilities of participating countries in support to sea lines (initiation of new shipping lines, support to passenger and freight & passenger ferry lines, etc.) for transit transport development are underestimated.
- and so on.

Non-physical (legal, procedural) level restrictions are:

- there is no proper coordination and interfacing between GTI member countries as yet (trans-border and through logistics is not developed, no effective mechanism is available for solving current issues, all issues are solved in other formats: bilateral relations or other international cooperation mechanisms);
- procedures for transit management and movement across state borders and via territories are not streamlined in GTR (staff at crossing points is inadequately trained for transit handling, BCPs are capable of handling exports and imports but cannot handle transit in process and procedural terms, issues of through transit via territories of neighboring countries are not fixed documentarily);
- transport & logistic services and transit procedures are still emerging in corridors, there are cases of lengthy delay of cargoes and transport vehicles, market environment is not harmonized everywhere (which affects transport tariffs, logistic services development, etc.), there are differences in trans-border procedures, etc.;
- passenger transport is loss-making in many countries, with socially important routes being subsidized. Subsidies are normally provided by local budgets and are intended for local residents. Special regulations are required to organize financial support to an international transport line, for instance, intergovernmental agreements. There are no such agreements in the region;
- competitiveness of and demand for passenger transport largely depends rather on associated procedures and expenses, e.g., compliance with visa formalities than transport tariffs and transport services. Visa free tourism exchange procedures have significantly expanded the tourism market of China and Russia. The regulation permitting tourists to stay 3 days without visa in a Russian port of call (for cruising tourist ships) also eliminated some of barriers to tourism market development, for instance in Vladivostok. Furthermore, an "open sky" procedure and visa free transit procedure are used in development of air transport and air hubs. To continue this trend, transit passenger routes (involving virtually no stay of passenger in a country) might be supported by similar visa regulations. The point of difficulty here is lack of practice in initiating and approving such simplified regulations.

Physical level restrictions are:

- different rail track gauge (Russia and Mongolia - 1520 mm, China and Korean peninsula - 1435 mm) reduces transport efficiency (either reloading or bogie exchange is needed because technologies of gauge width changing in motion have not yet reached a proper level of reliability);
- capacity for transit cargo flow handling is missing or insufficient at near-border railway stations (e.g., there are no specialized container handling stations in place, etc.), some railway segments (along corridor routes from border to ports and trunk lines) are poorly developed (lacking backup throughput capacity);
- land BCPs are insufficiently developed in terms of no-downtime criterion, predictable timing of customs clearance completion with accuracy within minutes (if no violations are found) and full satisfaction of demand. For instance, transport business representatives believe that throughput capacity of crossing points and associated transport infrastructure in Primorsky Territory is insufficient for growing freight and passenger flows. This situation may change in the latter half of 2012 when Pogranichny and Kraskino road BCPs currently being upgraded will be commissioned;
- insufficient development of some road segments for mass international transit cargo haulage (including large-tonnage containers). Roads are adapted to domestic transport traffic, pass through cities and communities, roadside services are poorly developed, backup throughout capacity is insufficient for transit traffic development and so on.

We see a situation of existing demand for corridor development but no development takes place or proceeds slowly, with corridor operations currently blocked although all existing barriers can be overcome. As a result, GTR corridors are not through and no so attractive for use. In many respects, this constrains development of ports and international shipping in the Sea of Japan / East Sea.

The main task faced by GTI is to create conditions for unblocking and development of GTR corridors. GTI activities may create conditions for establishment of an international transport network for sea-land transit traffic. That's why it is important to prove good prospects for GTR corridor development but for this purpose volumes of prospective transit and benefits to be gained by member countries through servicing such transit should be demonstrated.

2.4.3 Net Transport Costs and Time factor (including by corridor the cost/time/distance analysis)

Researches of corridors parameters are carried out on an example of some probable routes. Russian Segments of corridors were considered. Segments of corridors are chosen such that if necessary it might be possible to simulate other options of routes. Containers are most suitable cargo for transit, tariffs are given in $/TEU. Bulk cargoes (coal, ore, tariffs are given in $/ton) are also considered for cargo flow from Mongolia. The combination of the considered segments of routes and cargoes allows to model other through routes.

The analysis of Transport Costs and Time factors was carried out with the segment of cargo flows being considered not existing in reality (namely, transit which is non-existent; **transit tariffs and practices have not been established and don't exist**). It should be kept in mind that cost and time parameters for export/import and for transit can differ due to different management approaches to these transport segments. That's why tables in report show approximate data based on existing export/import tariffs and time factors. It should be kept in mind that these data are assumptions only rather than real tariffs or transit schedules. Expected tariffs in case of effective management of transit operations should be more attractive. Routes being considered are described below.

1. Route: Harbin - Pogranichny (rail/road) BCP - Vladivostok/Nakhodka/Vostochny - Niigata/Otaru
(Russian land segment and sea route: Pogranichny - Vladivostok/Nakhodka/Vostochny - Niigata/Otaru)
2. Route: Harbin - Pogranichny (rail/road) BCP - Vladivostok/Nakhodka/Vostochny - Osaka/Tokyo
(Russian land segment and sea route: Pogranichny - Vladivostok/Nakhodka/Vostochny - Osaka/Tokyo)
3. Route: Harbin - Pogranichny (rail/road) BCP - Vladivostok/Nakhodka/Vostochny - Seattle/San Francisco
(Russian land segment and sea route: Pogranichny - Vladivostok/Nakhodka/Vostochny - Seattle/San Francisco)
4. Route: Harbin - Pogranichny (rail/road) BCP - Vladivostok/Nakhodka/Vostochny - Pusan
(Russian land segment and sea route: Pogranichny - Vladivostok/Nakhodka/Vostochny - Pusan)
5. Route: Harbin - Pogranichny (rail/road) BCP - Vladivostok/Nakhodka/Vostochny - Shanghai/Fuzhou
(Russian land segment and sea route: Pogranichny - Vladivostok/Nakhodka/Vostochny - Shanghai/Fuzhou)
6. Route: Hunchun - Kraskino BCP - Zarubino - Shanghai/Fuzhou
(Russian land segment and sea route: Kraskino BCP - Zarubino - Shanghai/Fuzhou)
7. Route: Hunchun - Kraskino BCP - Zarubino - Osaka/Tokyo
(Russian land segment and sea route: Kraskino BCP - Zarubino - Osaka/Tokyo)
8. Route: Hunchun - Kraskino BCP - Zarubino - Seattle/San Francisco
(Russian land segment and sea route: Kraskino BCP - Zarubino - Seattle/San Francisco)
9. Route: Hunchun - Kraskino BCP - Zarubino - Pusan
(Russian land segment and sea route: Kraskino BCP - Zarubino - Pusan)
10. Route: Route Sainshand - Choibalsan - Solovievsk - Vostochny - Ningbo/Beilun
(Russian land segment and sea route: Option 1: Solovievsk - Vostochny (via SLB) - Ningbo/Beilun
Option 2: Solovievsk - Zabaykalsk + via STC: Pogranichny rail BCP (Grodekovo) - Vostochny - Ningbo/Beilun)
11. Route: Route Sainshand - Choibalsan - Solovievsk - Vostochny - Noshiro/Sakata
(Russian land segment and sea route: Option 1: Solovievsk - Vostochny (via SLB) - Noshiro/Sakata
Option 2: Solovievsk - Zabaykalsk + via STC: Pogranichny rail BCP (Grodekovo) - Vostochny - Noshiro/Sakata)
12. Route: Route Sainshand- Choibalsan - Solovievsk - Vostochny - San Francisco
(Russian land segment and sea route: Option 1: Solovievsk - Vostochny (via SLB) - San Francisco
Option 2: Solovievsk - Zabaykalsk + via STC: Pogranichny rail BCP (Grodekovo) - Vostochny - San Francisco, this route is presented theoretically)

3 Future Development Potential

3.1 Review of on-going/planned economic Development Projects likely to impact future traffic

3.1.1 Freight traffic related projects

At the present time, ideas and strategies on development of the east of Russia are actively updated, with various transport projects being implemented in practice. In this connection, current condition of infrastructure continuously improves. Information regarding development of considered corridors is presented in this section.

Development Guidelines

Development guidelines are represented by federal and regional strategies including the following elements:

- Formation of regional transport & logistic systems. It includes an integrated model of transport development, integration of transport & logistic systems inside the country and with its international environment. An integrated

approach envisions development of all necessary physical infrastructure facilities (Hard Projects), human resources, procedures, services and effective procurement (Soft Projects). In maritime regions, backbone points for transport & logistic system development are port nodes.

- Preparation of integrated projects on development of port transport nodes. Integrated projects facilitate harmonization of development programs on railway, road and maritime infrastructures. Thus, under orders from the Russian Federation Ministry of Transport, a "Project on integrated development of Vostochny-Nakhodka transport node" and "Master Plan on development of Vostochny-Nakhodka transport node and Primorye-1 transport corridor for 2020" have been developed.

- Integration with NEA and APR transport system should be performed in all transport areas, in all traffic modes including transit in addition to export and import.

- Optimal port development. Optimization of port development, enhancement of port efficiency and competitiveness with account for their opportunity and prospective specialization, e.g.:

- Zarubino port in capacity of a transit port might become a site for international cooperation development, center for technical, technological and human resource training of transport specialists at an international level;
- Vostochny port continues building up its involvement in servicing of Russian and international cargo flows and good movement;
- Vladivostok and Nakhodka port continue search for new development opportunities (both ports are located in downtown areas) and set new reference points in their development;
- both development of existing ports and emergence of absolutely new ports in the near future is possible in Primorsky Territory, and so on.

- Containerization is ongoing, with container turnovers through ports growing. They handle growing container numbers and growing percentages of containerized cargoes. This is important because containers can unite the region's transport systems being better suitable for transit than other cargoes;

- Use of existing legal instruments and search for new ones to raise efficiency of development. For instance, discussions are in process regarding establishment of a development corporation for East Siberia and Far East (with essentially new governance possibilities). One of options is JSC "Corporation for Siberia and Far East Development"[8]. A new federal law entitled "On Territorial Development zones in Russian Federation" was recently passed (No. 392-FZ of 3 December 2011)[9]. The law "On Special Economic Zones in Russian Federation" (No. 116-FZ of 22 July 2005 as amended)[10] has been amended and taken effect. Establishment of a system of Far Eastern special economic zones might enhance macroeconomic efficiency of development projects being currently handled.

Projects on development of ports, transport nodes and their infrastructure[11]

- Project on integrated development of Vostochny-Nakhodka transport node comprises optimal development alternatives for Nakhodka and Vostochny ports (including new oil loading port Kozmino) as well as necessary land (motor road and railway) and maritime infrastructure including development of Primorye-1 international transport corridor. Opportunities are considered for establishing a port special economic zone in Vostochny port to handle transit flows, develop services for goods movement and wholesaling. The Master Plan of development assisted in specifying the **concept of transport node and Primorye-1 transport corridor development.** Future activities include designing of transport infrastructure facilities including port and logistics terminals, railway facilities, motor roads, etc. The project takes into account possible container turnover growth to 4 million TEU/year and more. The project is updated and implemented based on available financing from budget sources and investor business plans.

- Development of Vladivostok transport node. Decisions on development of Vladivostok as a communicative site and Russian business center in Asia have been made at the governmental level. This enhances the role of Vladivostok a transport node. However, potential development of Vladivostok port is constrained by available land considerations and municipal needs. Effective movement of cargoes has to be ensured within and outside of the city. This can be achieved by construction of a complex of port and logistic terminals on vacant territories located outside city precincts. The greater portion of port capacity is currently owned by FESCO Transport Group actively expanding the geography and raising efficiency of its container lines. FESCO expands its own fleet of fitting flat cars and builds up cargo traffic volumes handled by rail and road, is involved in new prospective transport projects relevant to all transport modes including SLB. One of promising ideas is the **Dry Port Project (multi-modal transport & logistic complex** - extension of "South Primorye Terminal" project). The project has been upgraded to a capacity of about 2 million TEU/year (transit cargoes inclusive) and encompasses appropriate railway, road and warehousing development for performance segregation into two zones (in port and in dry port). Further project development is currently under discussion. Other ideas on Vladivostok port development are involved with its development outside city precincts.

- Development of Khasansky transport node (Posiet, Zarubino).

Posiet. A port development project is currently being completed. Coal terminal turnover will grow up to 5-7 million tons a year.

[8] http://vz.ru/news/2012/5/2/576988.html; http://news.rambler.ru/13236206/; http://www.zrpress.ru/zr/2012/17/52970/ и т.д.
[9] http://kremlin.ru/acts/13841
[10] http://www.consultant.ru/online/base/?req=doc;base=LAW;n=123058
[11] Source: FEMRI on the basis of open sources

Zarubino. A project has been developed on construction of cargo handling complexes comprising a container terminal for up to 1.5 million TEU/year, grain terminal for up to 5 million tons a year, coal terminal for up to 10 million tons a year, automobile terminal for up to 500,000 autos a year, passenger terminal for up to 350,000 passengers a years, rolled steel terminal for 1 million tons a year and sawn wood terminal for up to 350,000 m^3 a year. The project takes into account potential for development of ITC Primorye-2, SLB development and connection with Trans-Korea. Further project continuation is being discussed. Other alternatives for port capacity buildup are also possible.

- Development of new port capacity on new sites. The following ideas on new terminals are under consideration: various alternatives for grain loading (about 3-5 million tons a year), coal loading (about 20-40 million tons a year), other solid bulk cargoes, containers (up to 10 million TEU/year), Ro-Ro cargoes and other terminals including specialized complexes (for production and loading of petrochemical and gas processing products and other cargoes).

Ongoing projects on general development of Far Eastern region and Vladivostok

Far East and south of Primorsky Territory are on the threshold of forthcoming rapid development. The list of ongoing projects (as part of preparations for APEC Summit 2012) managed by FGU «Far Eastern Directorate of Russian Federation Regional Development Ministry»[12] counts 63 items with a total financing volume of more than 662 billion rubles. New production clusters are emerging in the south of Primorsky Territory (petrochemical, sea-related industries, shipbuilding, transport & logistics, etc.).

For instance, the following projects are under way in the cluster[13] of hydrocarbon resources transportation and high-level processing:

- East Siberia - Pacific Ocean trunk oil pipeline (transportation of 30 to 50 million tons of oil annually, throughout capacity 80 million tons of oil a year.
- Special Sea Oil Port "Kozmino", first stage - loading of 15 million t/year (in operation), second stage - 30 million t/year (planned by 2015).
- Sakhalin - Khabarovsk - Vladivostok trunk gas pipeline (completed). Transportation of 47.2 billion cubic meters of gas annually.
- Oil refinery (project schedule: 2014-2017). Processing of about 5 million tons of oil annually (capacity is on hold).
- Construction of natural gas liquefying plant (to be completed before 2015). Design capacity up to 26 billion cubic meters of gas annually.
- Construction of gas processing plants in Khasansky and Spassky Districts (to be completed before 2020).

Other projects being currently implemented are "Reconstruction of ITC Primorye-1 and Primorye-2 infrastructure including road BCPs, segments of roads Ussuriysk - Pogranichny, Razdolnoye - Khasan, Vladivostok - Nakhodka, detour roads around Ussuriysk and Artem". These actions will eliminate a significant number of bottlenecks but are unable to make the potential of corridors available in full (not sufficient to build up throughput capacity along the through route).

Other project ideas being discussed[14]

Ideas to develop Vladivostok as a scientific, industrial, commercial and transport center are being discussed as part of work on establishing a site in the south of Primorsky Territory for communication between Russia and APR nations. A significant number of previous ideas embodied in various versions of the Greater Vladivostok project are relevant to this area of focus. New ideas are based on new principles of metropolis formation including development of its external transport infrastructure comprising a major international transport node (HUB) based on a mega-port. If this project is implemented, it may bring ports of the south of Primorsky Territory into a system of ports belonging to one metropolis.

Other areas of focus include development of local export-oriented production assets, involvement in development of world trade and international transport space, development of near-border infrastructure, development of transit and foreign trade flows via sea ports, etc. The ideas under discussion include, but are not limited to:

- development of container, ferryboat, freight , freight & passenger and other sea lines;
- development of ports, port-specific land infrastructure, railways, roads, etc.;
- development of corridors, transport environment, logistic services;
- development of trade, bonded warehouses, trade chains;
- and so on, with all ideas relevant to development of transport & logistic space and any of its elements being open for consideration.

For example:

- ideas are considered on consolidation of cargo flows by various investors for optimization of parameters of port complexes being constructed;
- ideas are discussed on road development with account for their transit load (financing sources for upgrade and construction of federal roads used for international transport);
- alternatives are discussed relevant to railway development with account for transit and for use of tracks with different gauge width, etc.

One of examples is the idea to organize traffic between USA and Japan via Primorsky Territory ports (e.g., Vostochny port). At present, Japan handles all its foreign trade traffic to USA via its deepwater ports on the eastern coast. These ports are capable of receiving ocean container

[12] see http://www.ddmr.ru/

[13] Compiled from advertising materials and brochures by Administration of Primorsky Territory (2007-2011), see http://www.primorsky.ru/projects/

[14] Briefly described below are various publicly discussed ideas developed or proposed jointly by FEMRI and other Russian and NEA foreign institutions. Thus, the MEGA-City Vladivostok Project was jointly presented by Korea-Russia Association and FEMRI.

carriers. Foreign trade cargoes from Japan's western coast have to be hauled east by road. As a result, ports of Japan's western coast lose potential cargoes and the economy of the western coast develops slower. Road haulage tariffs are high in Japan. The sense of the proposed idea is to use a deepwater port in Primorsky Territory for support to foreign trade of Japan's western coast. For this purpose, feeder lines need to be organized between Japan's western coast and this port and ensure calls by ocean container carriers to this port. Feasibility of this scheme is supported by the following considerations:

- ports of Primorsky Territory (Vladivostok, Vostochny, Zarubino, etc.) are deepwater and capable of handling ocean container carriers;
- cost of ocean transport between USA and Primorsky Territory will be lower than between USA and Japan due to shorter distances: Seattle - Vostochny - 7071 km, Seattle - Kobe - 8374 km;
- cost of feeder transport and transshipment in Primorsky Territory port will be lower than that of haulage from Japan's western coast to eastern coast.

Another example is the proposed scheme of transit traffic via ITC Primorye-1 (this proposal was developed by FEMRI as part of the Project on integrated development of Vostochny-Nakhodka transport node). It is proposed to:

- segregate transit traffic from overall cargo flow (handle transit via a dedicated transit post);
- organize special transit lines at automobile border crossings and provide separate procedures, equipment and specially trained personnel (not working with export/import);
- organize required customs logistics along the corridor route including GLONASS/GPS satellite monitoring system for control of transit container movement and integrity.

Customs procedures should incorporate best world practices including:

- agreed customs control procedures (preliminary informing, electronic declaration, through bill of lading, authorized operators, etc.) including the right for inspection;
- state-of-the-art inspection equipment (inspection and screening complex);
- risk and safety management system;

Implementation of similar proposals might be organized by Rosgranitsa Federal Agency.

3.1.2 Passenger related projects

The following projects are in process (being completed):

- Reconstruction of Vladivostok airport (predicted passenger turnover by 2015 is 2.1 million persons/year) and construction of access road to terminal;
- Organization of intermodal passenger traffic between Vladivostok and Airport;
- Creation of a gambling zone closely to Vladivostok;
- Construction of helipad in Russky Island;
- Creation of Far Eastern Federal University in Vladivostok and so on.

Other projects being implemented or discussed:

- Creation of a special economic zone of tourist type in Russky Island and so on;
- Planning and organization of through railway route Vladivostok - Ussuriysk - Grodekovo - Suifenhe and further extension to Harbin.
- Development of international passenger transport and services (sea passenger lines, passenger railway transport and bus routes, construction of high-speed passenger railways, etc.)

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

4.1 Constraints for traffic flows along the trans-GTR corridors

In accordance with 1st Progress Meeting decisions, it was decided to make the reports easier to digest and more straightforward about the constraints and measures to be undertaken. In this connection, it was decided:

- to display flows along the corridors segments (existing situation 2010 and forecasted 2020) (Figure 30-31);
- to add a table of existing constraints for the traffic flows along the trans GTR corridors (Table 12).

4.2 Measures (regulations, international agreements, improved customs procedures…)

Measures intended to develop GTR corridors should be distributed between Russia, other GTI member states and GTI itself.

Relevant measures (programs) in Russia should use public-private partnership mechanisms, involve business circles, integrate different management levels with account for distribution of powers between the federal center (government, ministries and other agencies), Far Eastern Federal District and Administration of Primorsky, Amursky and Zabaykalsky Territories.

Discussions are in process on new federal laws "On Transit", "On Russian Federation State Border Crossing Points", "On Multimodal (Combined) Transport, on amendments and alterations to the federal law "On Transport Forwarding Activities".

Russia may select particular measures and such measures might be:

- issue of a document regulating basic legal provisions inside Russia relevant to transit and supporting procedures (e.g. Law on Transit or some other regulatory document) and documents regulating transport infrastructure development conditions (e.g., target-specific programs or other provisions regulating investments in infrastructure development with account for transit), etc.;
- programs (plans, master plans) on transport & logistic infrastructure development with account for required transit capacity (construction of relevant ports, roads, dry port terminals, stations, etc.);
- measures facilitating trans-border procedures and ensuring efficient performance of corridors

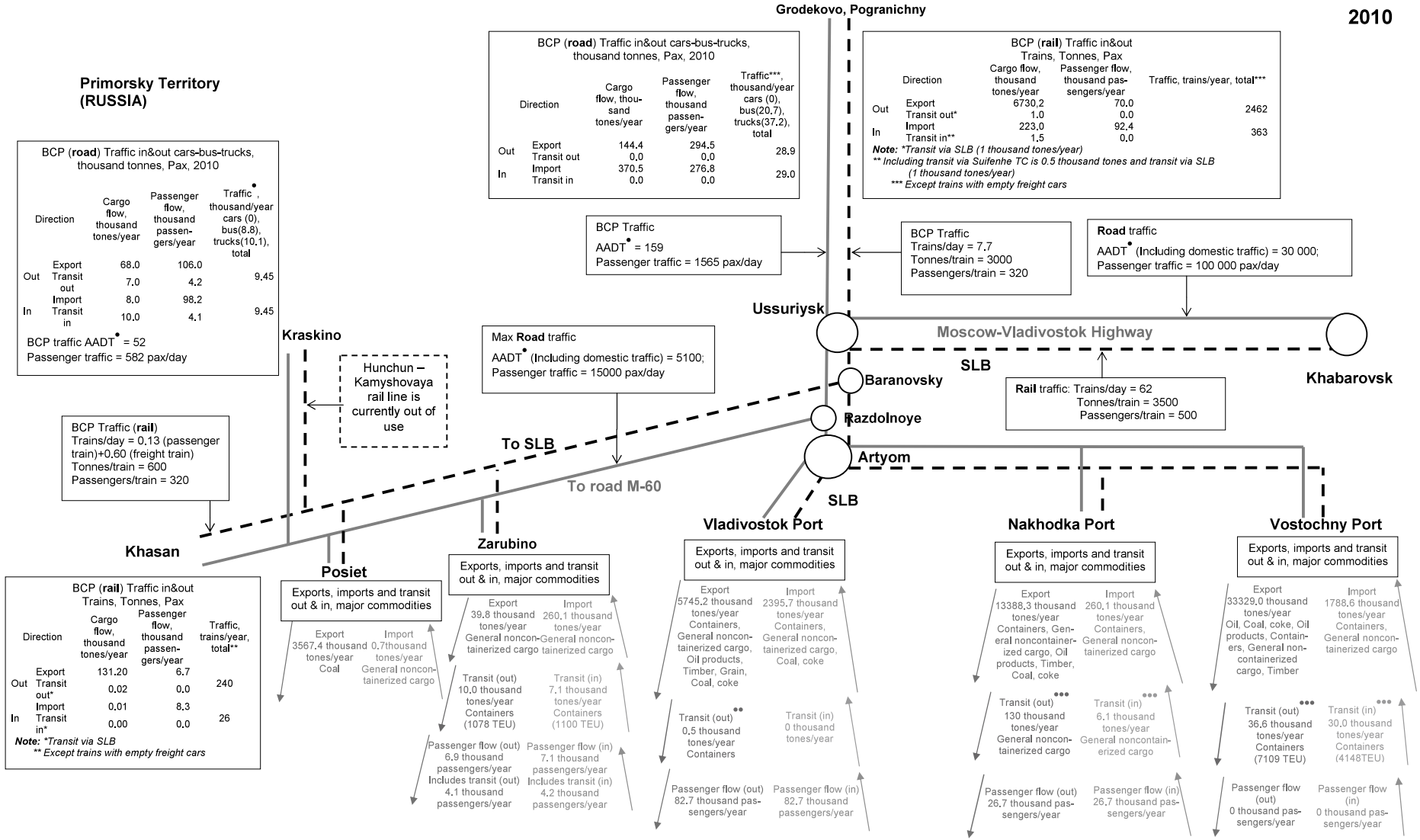
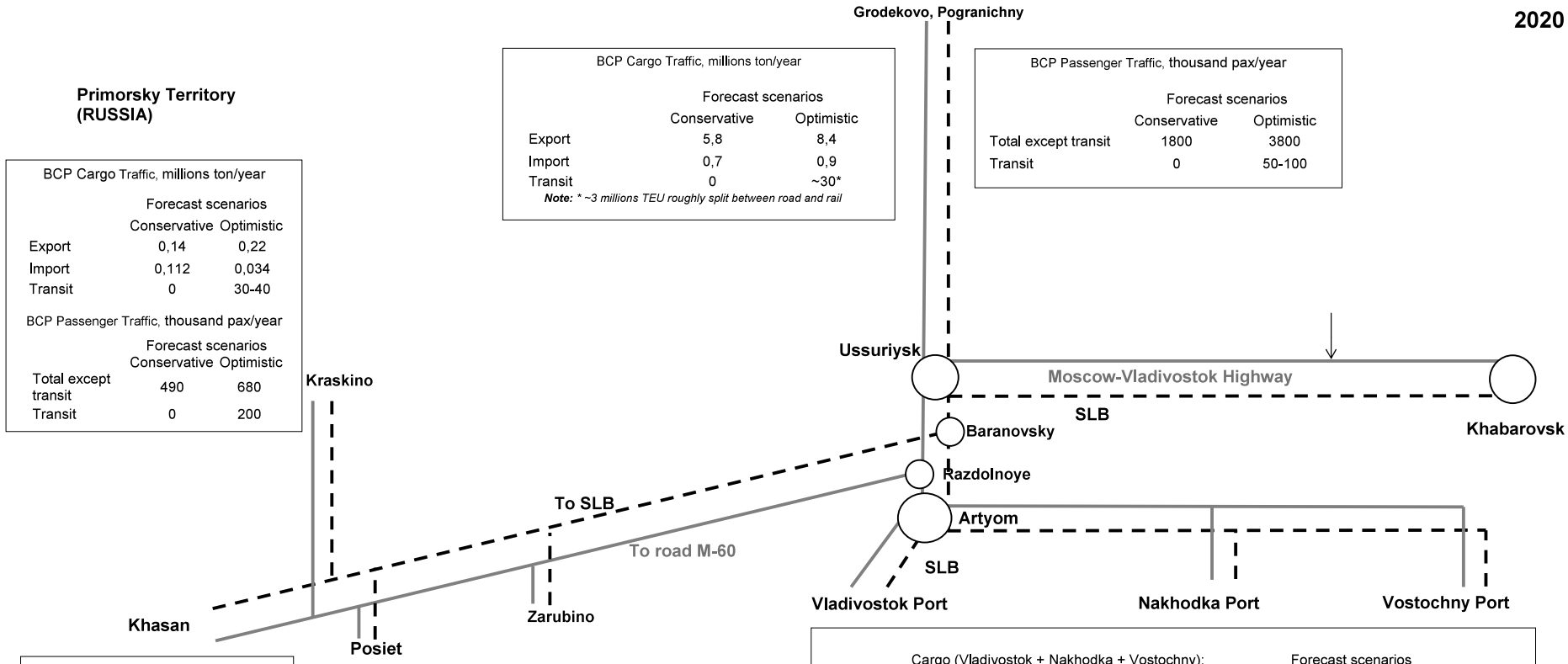


Figure 30 Freight and Passenger Flow on GTI Corridors via Primorsky territory (Suifenhe TC, Tumen TC, Korean Peninsula East TC, SLB), 2010

Source: FEMRI



BCP Cargo Traffic, millions ton/year

	Forecast scenarios	
	Conservative	Optimistic
Export	5,8	8,4
Import	0,7	0,9
Transit	0	~30*

Note: ** ~3 millions TEU roughly split between road and rail*

BCP Passenger Traffic, thousand pax/year

	Forecast scenarios	
	Conservative	Optimistic
Total except transit	1800	3800
Transit	0	50-100

BCP Cargo Traffic, millions ton/year

	Forecast scenarios	
	Conservative	Optimistic
Export	0,14	0,22
Import	0,112	0,034
Transit	0	30-40

BCP Passenger Traffic, thousand pax/year

	Forecast scenarios	
	Conservative	Optimistic
Total except transit	490	680
Transit	0	200

BCP Cargo Traffic, millions ton/year

	Forecast scenarios	
	Conservative	Optimistic
Export	0,2	5,4
Import, transit	-*	-*

Note: ** no estimates have been performed*

BCP Passenger Traffic, thousand pax/year

	Forecast scenarios	
	Conservative	Optimistic
Total except transit	15,2	50
Transit	0	50-100

Cargo (Posiet + Zarubino):	Forecast scenarios	
	Conservative	Optimistic
Export, import, domestic, millions ton/year	7	10
Transit (Zarubino only), millions ton/year	0	30-40
incuding containers, millions TEU/year	*0*	*2,5*

Passengers (Zarubino only):	Forecast scenarios	
	Conservative	Optimistic
Total except transit, thousand pax/year	0	10
Transit, thousand pax/year	0	50-100

Cargo (Vladivostok + Nakhodka + Vostochny):	Forecast scenarios	
	Conservative	Optimistic
Export, import, domestic, millions ton/year	100	116
including containers, millions *TEU/year*	*2,5*	*3,6*
Transit, millions TEU/year	0,1	3,3
including transit via SLB	*0,1*	*0,3*
via ITC "Primorye-1"	*0*	*3,0*

Passengers (Vladivostok + Nakhodka):	Forecast scenarios		
	Conservative	Optimistic	Alternative
Total except transit, thousand pax/year	226	466	545
Transit via ITC "Primorye-1", thousand pax/year	0	50-100	50-100

Note: **Posiet** port is specialized coal port with transportation via SLB

Road

Rail

Figure 31 Freight and Passenger Flow on GTI Corridors via Primorsky territory (Suifenhe TC, Tumen TC, Korean Peninsula East TC, SLB), 2020

Source: FEMRI

Table 12 Existing Constraints for traffic flows along the trans-GTR corridors

Constraints sphere	Constraints (essence)	Importance (*How much it restricts the flow*)	Timeframe (*Reflects the urgency*)	Mitigation measures
1) Tumen Transport Corridor (Russian Segment: Kraskino (road) / Makhalino (rail) BCPs - ports Posiet / Zarubino) This segment is the most suitable for transit due to proximity of land and sea BCPs. Therefore potential freight and passenger flows in this segment are directly relating to functioning of the trans-GTR corridor. Features: port Posiet is specialized for export coal with transportation via SLB railway. Port of Zarubino may be focused on work in the framework of the Tumen Transport Corridor.				
Rail	Hunchun - Makhalino railway is out of use. Different gauge width in China and in Russia	Significant	Nowadays it is possible to resume railway operations quickly Permanently	1) Use of the motor road 2) Reconstruction and resumption of railway operations in Hunchun - Makhalino - Zarubino segment 3) Construction of a rail line with combined gauge from Hunchun to Zarubino port (the segment of this road has a combined gauge)
Road	Without constraints for existing traffic flows	Without restrictions for freight flows under 400-500 thousand TEU/year and passenger flows under 2-3 million passengers/year		The construction of a new toll highway in Russian territory will be required in the future.
Ports	Posiet port (sea BCP) is specialized in coal exports. Zarubino port has a low capacity and port is not suitable for containers.	Significant	Long time	Use of Zarubino port Develop the capacity of the port of Zarubino port and construct a container terminal
Land BCP	Makhalino rail BCP is out of use.	Significant	Long time	1) Use of the motor road 2) Reconstruction and resumption of Makhalino (rail) BCP as part of Hunchun - Makhalino segment
	The old Kraskino road BCP has a low throughput capacity. The new BCP is still not completed. Without restrictions for existing traffic flows after new BCP commissioning	Old Kraskino road BCP throughput capacity is 30 thousand TEU/year and 450 thousand pax/year. New Kraskino road BCP will be completed this year - without restrictions under 100 thousand TEU/year and 500 thousand pax/year. There is an additional backup throughput capacity for cars (50 cars/day).		To complete the new road BCP construction The construction of a new BCP (specially for transit) will be required in the future.
ICD	There are no ICDs on this route.	The lack of ICDs has no constraining effects at container flows under 50-100 thousand TEU/year.		Use of the existing terminal sites in Zarubino port Construction of a container and logistic terminals in Zarubino port Development of the Zarubino port capacity will be required in the future. Possibly, ICD will be required on this route.
Transport regulation	Without constraints for road in existing situation according to valid intergovernmental agreement (on international road transportation, Beijing, 18.12.1992)	Without constraints under 100 thousand TEU/year and 0.5 million pax/year (BCP throughput capacity), possibly up to 400-500 thousand TEU/year and 2-3 million pax/year (road throughput capacity)		Possibly, new bilateral Intergovernmental Agreement will be required in the future. Possibly, Intergovernmental Multilateral Agreement for GTI countries will be required in the future.
Cross-border regulation	Cross-border procedures are not effective.	Significant	Long time	Intergovernmental Agreements are needed for GTI countries on BCPs operation modes and procedures for transit cargoes (harmonizing BCPs work in the «green window» mode with Fast track lanes).
2) Suifenhe Transport Corridor (Russian segment: Pogranichny (rail and road) BCPs - ports Vostochny, Nakhodka, Vladivostok). This segment is used for bilateral trade in small volumes but due to proximity of land and sea BCPs is the most suitable for transit. Therefore potential freight and passenger flows in this segment are directly relating to functioning of the trans-GTR corridor.				
Rail	Different gauge width in China and in Russia There are no container terminals on this railway route.	Minor for existing traffic flows (under 50 thousand TEU/year and 0.5 million pax/year) Significant in case of growth of freight and passenger flows	Permanently Long time	1) Use of the motor road 2) Construction of a rail container transshipment terminal 3) Optimization of railway logistics and maximization of the segment with combined gauge width 4) Use of new technologies, for example, Automatic Variable Gauge Bogies
Road	Constraints of road throughput capacity in some segments from Pogranichny BCP to ports Vladivostok, Nakhodka and Vostochny.	Minor for existing traffic flows (for transit under 50 thousand TEU/year and 0.5 million pax/year) Significant in case of growth of freight and passenger flows	Long time	Reconstruction of the motor road is required and construction of toll segments will be required in the future.
Ports	Vladivostok port: - without constraints for existing traffic flows - significant constraints in case of cargo flow growth (resulting from port location within city precincts); - minor restrictions in case of passenger flow growth.	Minor for existing traffic flows (for transit under 50 thousand TEU/year and 2-3 million pax/year) Significant in case of cargo flow growth Minor in case of passenger flow growth	Long time	Port development calls for port technical modernization, relief of load on the city transport system, construction and development of logistics, distribution and new port terminals outside city precincts.
	Nakhodka port: - without constraints for existing freight traffic; - constraints in case of cargo flow growth (resulting from limited railway capacity within city precincts); - Sea passenger terminal out of use.	Minor for existing traffic flows (for transit under 50 thousand TEU/year) Significant in case of cargo flow growth Significant for passenger flow	Long time	Port development calls for port technical modernization, development of capacity of railway line and road to port, relief of load on the city transport system, construction and development of container and logistics terminals.
	Vostochny port: - without constraints for existing freight traffic; - without constraints in case of cargo flow growth (construction of port terminals will be required); - there is no sea passenger terminal.	There are no restrictions for development of freight terminals of the port. No plans of sea passenger terminal is planned.	Long time	To focus passenger transit traffic on Zarubino, on Vladivostok, and on Nakhodka in the future. To focus freight transit on ports Zarubino, Nakhodka, Vostochny. Vladivostok to be involved when backup port and railway throughput capacity is available.

Constraints sphere	Constraints (essence)	Importance (*How much it restricts the flow*)	Timeframe (*Reflects the urgency*)	Mitigation measures
Land BCP	Pogranichny rail BCP: - different gauge width in China and in Russia - there is no container terminal on rail BCP - without serious restrictions for existing traffic flows - constraints in case of cargo flow growth (throughput capacity is small in segment leading to ports)	Minor for existing traffic flows (until under 50 thousand TEU/ year and 0.5 million pax/year) Significant in case of cargo and passenger flow growth	Long time	1) Joint use of the motor road and railway 2) Construction of railway container transshipment terminal for railway BCP 3) Optimization of railway logistics and maximization of the segment with combined gauge width 4) Use of new technologies, for example, Automatic Variable Gauge Bogies
	Pogranichny road BCP: - the old road BCP has a low throughput capacity; - the new BCP is still not completed; - without restrictions for existing traffic flows after new BCP commissioning	Old Pogranichny road BCP throughput capacity is 80 thousand TEU/year and 780 thousand pax/year. New Pogranichny road BCP will be completed this year - without restrictions under 340 thousand TEU/year and 2-3 million pax/year. There is an additional backup capacity for cars (600 cars / day).		To complete the new road BCP construction The construction of a new BCP (specially for transit) will be required in the future.
ICD	There are no ICDs for transit on this route.	The lack of ICDs has no constraining effects on small container flows under 50-100 thousand TEU/year.		Use of existing terminal sites in Suifenhe and in Ussuriysk Construction of a container terminal for rail and road BCPs Development of a dry port will be required in the future.
Transport regulation	Without constraints in existing situation (in accordance with valid intergovernmental agreements relevant to road and rail transportation)	Without constraints for existing traffic flows (for transit under 50 thousand TEU/year and 0.5 million pax/year - road throughput capacity)		Possibly, new bilateral Intergovernmental Agreement will be required in the future. Possibly, Intergovernmental Multilateral Agreement for GTI countries will be required in the future.
Cross-border regulation	Cross-border procedures are not effective.	Significant	Long time	Intergovernmental Agreements are needed for GTI countries on BCPs operation modes and procedures for transit cargoes (harmonizing BCPs work in the «green window» mode with Fast track lanes).
3) Korean Peninsula East Corridor (Russian segment: Khasan BCP - connection with the SLB). Existing multilateral freight and passenger railway border crossing Khasan (Russian Federation) - Tumangan (DPRK) is sufficient for current needs for freight and passenger transportation between Russia and DPRK. Its actual load is currently lower than its design throughput capacity. Work is currently in process to electrify this line and build up its throughput capacity to 17 million tons/year (previous capacity was 10 million tons/ year). To build up its throughput capacity, train weight should be increased to 5,200 tons. Ussuriysk - Baranovsky - Khasan line needs to be upgraded to handle prospective cargo flows after reconstruction of Tumangan - Rajin line in DPRK. By the end of 2011, a new 32-km-long combined gauge line (1520 mm and 1435 mm) has been laid in DPRK from Tumangan (Russian border) to Rajin, major repair of 20 km of tracks completed, a number of stations reconstructed, works in tunnels continued, communication and centralized signaling trunk lines installed, drainage systems rehabilitated, etc. It is expected that in 2012 construction works will be completed and freight train traffic will open on the combine gauge line.				
Rail Road Ports BCP ICD	Non-physical barriers No road transport in place Different gauge width in DPRK and in Russia The railway infrastructure is under reconstruction There are no ICDs on this route	Significant Physical barriers are surmountable.	Long time	To continue international cooperation for involvement of DPRK in the processes of constructive development and peaceful coexistence
Transport regulation	Without constraints for existing traffic flows and current transport situation	Situation with restrictions in future is not fully defined		Possibly, Intergovernmental Multilateral Agreement for GTI countries (including DPRK) will be required in the future.
Cross-border regulation	Cross-border procedures are not effective	Significant	Long time	Intergovernmental Agreements are needed for GTI countries on BCPs operation modes and procedures for transit cargoes (harmonizing BCPs work in the «green window» mode with Fast track lanes).

(procedures, organizational support, software, technical aspects, equipment, etc.) in the development of the procedures of the new Customs Code of the Customs Union and other applicable legislation.

Similar measures for GTI member countries might include:

- coordination of standardized regulations, procedures and documents relevant to corridor operation (e.g., through bills of loading, transit fast track lanes, etc.), possibly by means of an international agreement or international regulations, etc.;
- coordinated development of transport & logistic infrastructure;
- establishment of an effective facilitation mechanism to solve current issues of corridor development and operation (based on existing international cooperation tools, e.g., GTI), etc.;
- use of mutually beneficial (win-win) cooperation forms in development of transport infrastructure and operating environment.

For GTI:

- initiation of and support to Multilateral Intergovernmental Agreements for GTI countries;
- support to international cooperation in corridor development;
- support to effective positioning of GTR corridors;
- support to win-win cooperation patterns;
- initiation of and support to multilateral investment projects;
- establishment of an effective mechanism to solve current issues of corridor development and operation.

The main task faced by GTI is to create conditions for unblocking and development of GTR corridors.

Comment: one of the most important problems is harmonization of legislative frameworks of Russia and China in part related to transit. Russia is trying to develop, propose and agree documents regulating transit (transit transportation). China's legislation uses the term "Sea-Land Intermodal Transportations". In Russia this term applies to transportation involving different transport modes, while transit is a special kind of transportation relevant to the

following set of terms: domestic, export, import, transit, etc.

For example, joint consultations on Northeast Asia Sea-Land Intermodal Transport Cooperation between transport officials of China, Japan, ROK and Russia were held in Harbin (December 2011). Thus, there is some work under way aimed at creation of an Agreement on Sea-Land Intermodal Freight Vehicle Transportation among the Governments of China, Japan, Republic of Korea and Russia. Perhaps, this work will be successful, but it still does not cover all issues relevant to transit. Other transport modes (railway, etc.) and other concerned parties (BCP, etc) are also involved in transit processes. Possibly, common problems should be addressed as a single set of issues. Possibly, an Intergovernmental Multilateral Agreement for GTI countries (including DPRK) on the BCPs operation modes and procedures for transit (harmonizing BCPs work in the "green window" mode with Fast track lanes) will be required in the future.

4.3 Investment Programme

4.3.1 Missing infrastructure links (BCP facilities, ports, roads, rail network)

At the present time the existing infrastructure is characterized by the following:

- There are BCPs in GTR, but compared to the potential freight base their procedures are not suited for transit, and their capacity is insufficient, which leads to the fact that there are no transit cargo flows through the corridors or they are small;
- There are sea ports in China, Republic of Korea, Russia and DPRK, but cargo and passenger flows via these ports are not fully related to the GTR corridors;
- There are land road and rail networks in place, but development of these networks takes place independently, based on needs of only some segments of the potential cargo base of the region rather than on its overall needs.

4.3.2 Capacity improvements of existing infrastructures (BCP facilities, ports, roads, rail network)

Capacity improvements of existing GTR corridors infrastructures:

1) Tumen Transport Corridor (Russian Segment: Kraskino (road) / Makhalino (rail) BCPs - ports Posiet / Zarubino).

- It is planned to reconstruct and resume operations of Hunchun - Makhalino - Zarubino segment and Makhalino rail BCP;
- It is planned to develop Zarubino port (with container and other terminals); it is possible to establish a special economic zone in the Zarubino port;
- Ongoing Posiet port development (coal terminal) is not associated with GTR corridors;
- Construction of the new Kraskino road BCP is being completed;
- Construction of a new toll highway on Russian territory will be required in the future (Kraskino road BCP - Zarubino).

2) Suifenhe Transport Corridor (Russian segment: Pogranichny (rail and road) BCPs - ports Vostochny, Nakhodka, Vladivostok).

Construction of the new Pogranichny road BCP is being completed.

The following projects are under discussion:

- Reconstruction of the highway and construction of toll road segments;
- Construction of a rail container transhipment terminal on this segment (station Grodekovo, Pogranichny rail BCP) and railway throughput capacity buildup from Pogranichny rail BCP to the ports Vladivostok, Nakhodka, Vostochny;
- Port Vladivostok development (port technical modernization, relief of load on the city transport system, construction and development of logistics, distribution and new port container and logistics terminals outside city precincts);
- Port Nakhodka development (including development of railway and road throughput capacity within city precincts);
- Port Vostochny development (including construction of new port and logistics terminals, development of railways and roads);
- Ideas of dry ports construction.

3) Korean Peninsula East Corridor (Russian segment: Khasan BCP - connection with the SLB).

- The railway infrastructure is under reconstruction. It was expected that in 2012 construction works would be completed and freight train traffic would open on the combine gauge rail line.

GTI

大図們江地域（GTR）横断輸送回廊の現状と展望（ロシア区間）

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（要旨[1]）

大図們江イニシアチブ（GTI）輸送回廊の基礎をなすことになると見込まれる貨物輸送量は、当面の間、ロシア極東地域における外国貿易量の中では無視できる程度の量である。検討されている回廊は、現時点では、貫通したものにはなっていない。今日、これらの回廊は主に様々な区間ごとの貨物を取り扱っている。

（こうした例として）ロシア領内では、次の貨物輸送をあげることができる。

・最大のもの：沿海地方港湾経由のロシアからの輸出（～6,000万トン）
・ザバイカリスク、ポグラニチヌイ他の陸上国境経由のロシアから中国への輸出（～3,000万トン）
・沿海地方港湾経由のロシアへの輸入（～600万トン）
・ザバイカリスク、ポグラニチヌイ他の陸上国境経由の中国からロシアへの輸入（～400万トン）
・SLB（シベリアランドブリッジ）経由のトランジット（15～20万トン）
・国際輸送回廊「プリモーリエ－１」経由のトランジット（５万トン）
・国際輸送回廊「プリモーリエ－２」経由のトランジット（1.5～２万トン）

全トランジット貨物量は、ロシア極東における外国貿易貨物の２％未満しか占めていない。

以下は、将来的にトランジット貨物を取り扱うことができるようになることが期待される大図們江地域（GTR）回廊がいかに機能するかについての若干の考察である。

漸進性

すべては漸進的に展開する。一度にすべてのGTR回廊が貫通したものになるとか、大陸間（アジア～欧州）貨物流動に結びつくと考えることは合理的ではない。

競争

各GTR回廊は、統合された輸送体系を構成することにより、互いに（競争というよりは）補完するものであることに留意すべきだ。このことは、GTIが個別の区間ごとの様々な貨物流動を支援しつつ地域の交通網確立を支援することの優位性となっている。

GTIと大陸間貨物流動

GTR回廊の陸上ルートのうち、SLBは（実ルート延長、国境通過点が最少である点、台車交換無し、単一オペレータといった点で）最大の大陸間ルートである。このルートへは、バイカル・アムール鉄道及び検討中のすべてのGTR回廊からのアクセスがある。その他の大陸間陸上輸送ルートは、いずれもGTR域外から中央アジア（シルクロード等）を経由している。大陸間貨物流動は、スエズ運河経由など海上ルートでも輸送されている。北極海ルートも運用が始まっており、太平洋では数多くの海上輸送航路が運航されている。

これらの（大陸間）陸上ルートのうち、GTIが対象としているのはSLBであり、しかも全体ではなく一部のみである。GTRには、大陸間航路の海上貨物を取り扱っている港あるいは取り扱うことが可能な港とつながっている。したがって、GTIの（支援活動の）地理的な範囲は、次の通りとなる。GTIは、大陸間ルートのうち一部の区間を支援するものの、GTI

[1]【訳注】英文の本文には記述が無い内容も多いが、著者が「要旨」として提出した文章を訳出した。

にとってのより適切な目的は、地域内のルートやGTR域内港湾の航路を支援することである。

これに関して言うと、GTRに関わるすべての貨物輸送流動のうち、港湾経由で陸上ルートに輸送されることになる地域内トランジット貨物流動に、最も注目すべきである。トランジット貨物流動の発展に関して、GTIが大きな貢献をなしうるのは、まさにこの部分である。

GTIと地域貨物流動

以下の貨物流動を、地域的な貨物流動と呼ぶことができよう。

・国際トランジット貨物流動のうち、地域内のもの（例えば、モンゴル～ロシア～その他の国、モンゴル～中国～その他の国、モンゴル～中国～ロシア～その他の国、中国～ロシア～中国、中国～ロシア～その他の国、朝鮮半島～ロシア～その他の国、朝鮮半島～中国～ロシア～その他の国、日本～朝鮮半島～その他の国、日本～ロシア～その他の国、日本～ロシア～中国など）

・二国間貨物流動（相当量の二国間貿易貨物として、中国～ロシア、中国～朝鮮半島、モンゴル～中国、モンゴル～ロシア、日本～ロシアなど）

・局地的な国境貿易（国境地域における少量の局地的二国間貿易）

回廊発展におけるGTIの取組の本質

GTR域内及びGTRの海港を経由する地域貫通輸送ルートを支援することが、最も明確なGTIの目的だと思われる。GTR港湾には、中国北部港湾（丹東、大連、旅順、営口）、ロシア東部（沿海地方南部）及び朝鮮半島（釜山、光陽、蔚山、温山、浦項等）が含まれる。GTIの目標や目的、これまでの経緯などから見て、GTIの運輸部門の取組をこのように捉えることが最も適切である。

この点では、GTIの運輸部門の取組は、最初の段階では地域全体のすべての貨物流動を取り扱うべきではない。それによって、他の様々な国際協力メカニズムの中でのGTIの立場が明確になり、無駄な重複を避けることになり、地域各国の取組を最適化して無用な競争を避けることにつながる。

GTR回廊発展の主な課題

1）一部の専門家は、GTR回廊を地域のものとしてではなく、大陸間の陸上輸送回廊であるとして、誤った認識を持っている。これにより、ユーラシア回廊の競争環境に関する理解が歪められ、GTR回廊の発展は不当に制限されている。

2）GTR回廊の発展可能性について論ずる際、多くの運輸部門コンサルタントや統計専門家らは、トランジット貨物流動増加の明確な傾向が無いため、開発の必要がないと考える。このような、現状把握や予測における誤りもまた、GTR回廊の発展を制限している。実際には、GTI加盟各国の経済においては回廊に対する高い需要があるが、GTR回廊が様々な理由で閉ざされていることから統計上には反映されていないのだ。

3）GTR回廊は、今日では貫通したものとなっておらず、物理的・非物理的な障壁といったいくつかの二次的な問題のため必ずしも魅力的ではない。例えば、一部区間で道路などの輸送インフラの整備水準が低い、輸送運賃が高い、国境で台車の交換が必要（一部では二回）であるといったことや国境手続きが（国ごとに）異なっていることなど全てが、これらのルートの効率性に影響を及ぼしている。結果として、全GTI加盟国及び他の国々が（得られるものを）失っている。

従って、GTIの主要な目的は、閉ざされたGTR回廊を開放するための条件を整備することであり、その基礎の上に海陸一貫輸送の国際輸送網を構築することである。

本調査プロジェクトに参加した各国専門家にとっての一義的な目標は、この地域における将来見込みうるトランジット貨物量を共同で評価することであり、それにより、GTR回廊の発展には良好な展望があることを証明することである。今日のトランジット量を基にトレンド（慣性的）アプローチをとるべきではないということを、頭に入れる必要がある。

GTIは以下の事項に注意を払うべきである。

4）海陸トランジット輸送の発展は、陸上部分だけで達成されるわけではない。最も手ごわいボトルネックは港であり、そこでは異なる輸送モードの間での相互接続が行われる。GTIが、回廊に含まれる港湾の発展を支援することに留意すべきであるという理由はここにある。港湾業務や域内港湾経由のトランジットの発展に対する支援は、今後のGTIの成功の基礎と

なる。

５）国際海上輸送の需要は、主として港湾及び陸上ルートの発展に係っている。例えば、今日の日本海航路は未発達であるが、その理由の一つはGTR回廊が機能していないことであると考えることができる。しかし、海運業自体は新規航路開設等にあたり支援を受けている。したがって、GTIによる地域の回廊に対する支援には、GTI港湾に運航する海運業者に関する課題も含められよう。それにより、次のことが可能になる。

・韓国の輸送ルートの発展可能性を広げる。
・中国、モンゴルの輸送可能性を多様化する。
・日本のGTI活動への関わりを進める。
・ロシアを国際輸送システムに統合する。
・この地域の全ての国々の競争力を強化する。　など

GTR回廊の全ての区間を同時に発展させることは不可能である。したがって、GTIとしては、成功が見込まれ、その後の地域輸送網の形成プロセスの継続につながるような区間を特定する必要がある。その出発点は、綏芬河回廊と図們江回廊の沿海地方通過区間であろう。

・「綏芬河輸送回廊」区間：中国国境のグロデコボ（鉄道）及びポグラニチヌイ（道路）から、ボストーチヌイ、ナホトカ、ウラジオストクの各港。ロシアでは、この区間は国際輸送回廊「プリモーリエ－１」（ハルビン～牡丹江～綏芬河～ポグラニチヌイ（東寧～ポルタフカ）～ウスリースク～ウラジオストク･ボストーチヌイ･ナホトカ～海上ルート）の一部とされている。
・「図們江輸送回廊」区間：中国国境のクラスキノ（道路）及びカムショーバヤ（鉄道）からザルビノ港及びポシェット港。ロシアでは、この区間は国際輸送回廊「プリモーリエ－２」（長春～吉林～琿春～ザルビノ～海上ルート）の一部とされている。

GTIは、これらの区間のインフラ整備と併せ、次のことにも配慮すべきである。

・ GTI諸国による多国間の政府間協定が求められる。政府間協定は、GTI諸国が国境検問所の運用、トランジット貨物の手続き（国境検問所におけるファスト・トラック（優先）レーンを用いた「緑窓口」の運用の調和）を行うために必要なものである。

［英語原稿をERINAにて翻訳］

GTI

Current Situation and Future Prospects of Freight Transport Infrastructure and Services between Japan and the Greater Tumen Region (GTR) [1]

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1 Introduction

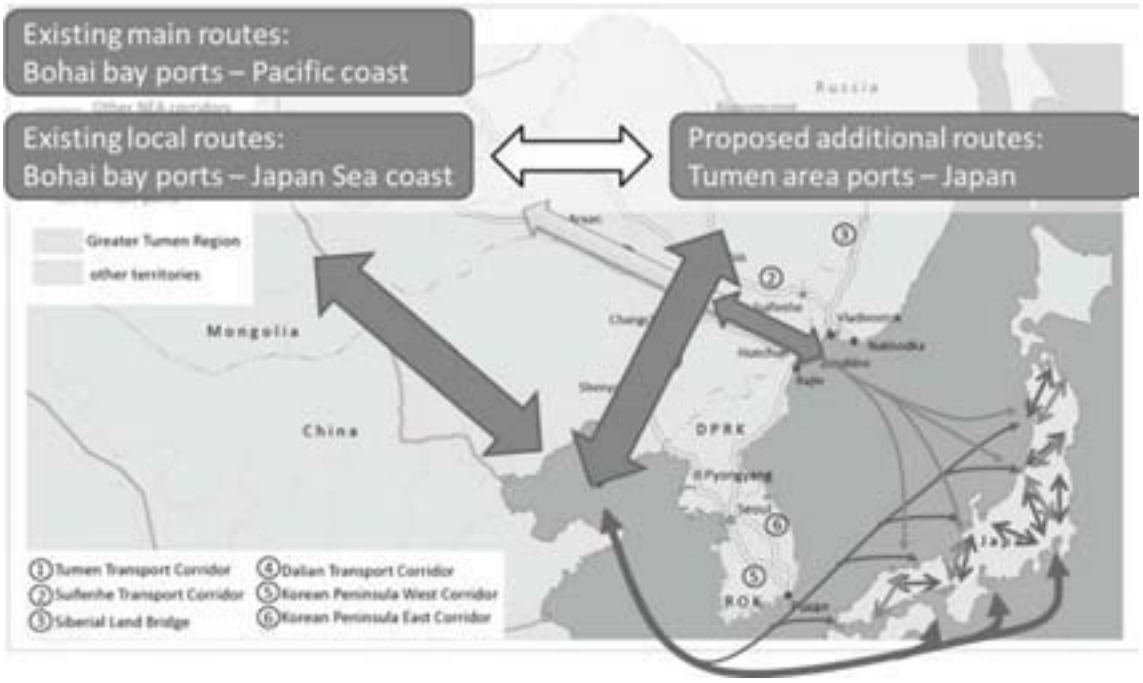
Geographically Japan is located beyond the sea, and none of the trans-GTR corridors run through its territory. At the same time, any sea routes from the GTR ports or the "exits" of the corridors should be regard as essential extensions of the corridors. Without effective connections with marine transport the corridors cannot realize their expected function. Discussing the marine segments, their first destinations are Japan and the ROK. Therefore, connectivity with Japan is among the key criteria to ensure the positive development of the trans-GTR corridors.

Nevertheless, the developments and good-functioning of corridors should have substantial impacts for Japan. The impacts might be different depending on where you are and what you do. The most significant impacts might be observed on the west coast of Japan. Currently, major amounts of freight are transported between the Bohai ports of China and the Pacific coast ports in Japan, as the bold arrows show in the diagram (Figure1-1). Smaller amounts of freight use the ports of the west coast of Japan. However, promoting the proposed corridors, namely the Tumen and Suifenhe corridors, this structure would be changed. Eastern Mongolia and Heilongjiang and Jilin provinces will be connected to Japan via ports in the Primorye region of Russia.

The same diagram suggests the reason why local societies along the west coast of Japan attach importance to cooperation and the economic development of Northeast Asia. They want to attract a certain part of the freight flows that are currently transported through the Pacific ports. It is quite a rational desire, considering the geographical situation. A cargo vessel from the Primorye ports, such as Zarubino and Vladivostok, will arrive at any port of the Japanese west coast within 2 days at maximum, performing a voyage of around 500 nautical miles.

Taking into account these circumstances, the paper put

Figure1-1: Trans-GTR corridors and Japan



Source: Author

[1] The content of the paper is based on the major outcomes of the investigative project which the GTI conducted in 2012 under the title of "Integrated Transport Infrastructure and Cross-Border Facilitation Study for the Trans-GTR Transport Corridors," in which the author participated as a national consultant.

more focuses on the west coast than the Pacific coast, even though economic activities are concentrated in the later.

2 Due Diligence Review of Transport between Japan and the GTR Region

2.1 Traffic Review

➢ Ocean freight traffic by country

MLIT conducts a nation-wide survey called the "Survey on Ports and Harbours", or "*Kowan Chosa*" in Japanese, annually. The results are published as the fundamental statistics of port activities. It contains the number of vessels calling at ports, the numbers of passengers and the volume of freight. The survey is organized in the form of reports submitted by the captain of a ship to the port management body, which are then aggregated by them for each port, and finally at the national level by Ministry of Land, Infrastructure, Transport and Tourism(MLIT).

The survey form contains such items as the port of destination/origin, the port of final unloading/ first loading, the type of cargo (container, on-chassis, or other), the classification of the commodity and the volume. Thus, if the export goods are transported to port A in country B with a transshipment at port C in country D, port A is reported as the port of the final unloading, with port C as the port of destination. The statistics submitted to MLIT, however, don't retain the port-specifying information, as MLIT requires aggregate figures by country. Consequently, the national statistics identify only country B as the country of final unloading, as well as country D as the port of destination.

Table 2.1-1 summarizes the ocean freight volume to/from Northeast Asian countries by the final unloading/first loading countries. Mongolia is not shown because it is a landlocked country without any sea ports. Most of freight traffic to/from Mongolia should be counted inclusively as a part of freight to/ from the PRC, which provides the shortest route to the sea.

Table 2.1-1 Freight Flows to/from NEA by Country (tons)

	2006	2007	2008	2009	2010
Exports	**77,834,900**	**84,540,201**	**83,805,286**	**79,800,099**	**83,667,255**
ROK	29,301,149	32,211,937	29,037,608	27,596,520	30,133,403
DPRK	139,285	18,846	8,320	2,102	2,098
PRC	43,157,600	46,222,472	47,340,040	50,792,664	50,657,664
Russia	5,236,866	6,086,946	7,419,318	1,408,813	2,874,090
Imports	**135,252,215**	**135,156,350**	**128,397,874**	**114,554,746**	**143,175,162**
ROK	26,823,450	24,398,303	24,677,815	20,518,696	25,666,821
DPRK	311,196	4,747	151,816	0	3,954
PRC	89,573,021	85,660,652	81,437,604	68,181,316	78,099,323
Russia	18,544,548	25,092,648	22,130,639	25,854,734	39,405,064

Source: MLIT "*Kowan Chosa* [Survey on Ports and Harbours]"

The year of 2009 observed a decline both in exports and imports, which is explained by the world financial crisis. The largest partner is the PRC. While freight shipped to China has demonstrated an increasing trend, inbound freight to Japan shows negative dynamics. The dynamics for the ROK are relatively insignificant compared to the other countries. With regard to exports to Russia, a change of customs tariff on used cars affected the situation greatly in 2009, reducing the number of exported used cars almost ten-fold compared to 2008. Expansion of imports from Russia was caused by the completion of the East Siberia-Pacific Ocean crude oil pipeline and an LNG plant on Sakhalin Island. The former enabled the export of crude oil extracted in the Siberian region to Japan. Although trade with the DPRK has been restricted in recent years and no trade was fixed in the trade statistics, freight turnovers were recorded. In fact, two records in the dataset were proved to be incorrect while double-checking the data. Therefore, there might be other incorrect records that should be counted for other countries, not for the DPRK. In any case, the volume is too small to distort the overall structure at the regional scale.

➢ Estimates by region

Even though Table 2.2.1-1 gives an overview of freight traffic within the Northeast Asian region, it is not sufficient for detailed analysis of freight flows with the GTR. This section tries to estimate the freight volume for Mongolia, Northeast China and the Russian Far East.

Assuming that transit freight with third countries other than Mongolia is small enough, the freight is divided up proportionally for the PRC and Mongolia using the ratio of the trade of Japan with both countries in terms of the value for each year (Table 2.1-2 and Table 2.1-3). Also freight volumes to/from the three Northeastern provinces (Liaoning, Jilin and Heilongjiang) are estimates, calculated by the share of these provinces in the PRC's trade with Japan in 2010.

Table 2.1-2 Estimated Freight to the PRC and Mongolia

	Unit	2006	2007	2008	2009	2010
Japan-PRC Freight (O)	tons	43,157,600	46,222,472	47,340,040	50,792,664	50,657,664
Japan-PRC Trade (A)	Mil. Yen	10,794	12,839	12,950	10,236	13,086
Japan-Mongolia Trade (B)	Mil. Yen	12	18	24	10	14
Mongolia/PRC Ratio (C)=(B)/((A)+(B))		0.00114	0.00141	0.00184	0.00097	0.00107
Northeast Provinces		0.050	0.050	0.050	0.050	0.050
Ratio* (D)						
Final destinations						
Mongolia (E)=(O)*(C)	**tons**	**49,326**	**65,080**	**86,984**	**49,264**	**54,029**
PRC (F)=(O)–(E)	**tons**	**43,108,274**	**46,157,392**	**47,253,056**	**50,743,400**	**50,603,635**
Incl. Northeast Provinces (F)*(D)	**tons**	**2,155,414**	**2,307,870**	**2,362,653**	**2,537,170**	**2,530,182**

* Proportion of Liaoning, Jilin and Heilongjiang provinces in the PRC's trade with Japan in 2010. (Source: ZHU, Yonghao, "Trade and Investment Relations between the Three Provinces of China's Northeast and Japan" [in Japanese], *ERINA Report* No. 106, July 2012)

Table 2.1-3 Estimated Freight from the PRC and Mongolia

	Unit	2006	2007	2008	2009	2010
PRC-Japan Freight (O)	tons	89,573,021	85,660,652	81,437,604	68,181,316	78,099,323
PRC-Japan Trade (A)	Mil. Yen	13,784	15,035	14,830	11,436	13,413
Japan-Mongolia Trade (B)	Mil. Yen	1	2	4	1	2
Mongolia/PRC Ratio (C)= (B)/((A)+(B))		0.00007	0.00013	0.00025	0.00006	0.00015
Northeast Provinces Ratio* (D)		0.088	0.088	0.088	0.088	0.088
Origins						
Mongolia (E)=(O)*(C)	**tons**	**6,353**	**10,856**	**20,602**	**4,044**	**11,698**
PRC (F)=(O)–(E)	**tons**	**89,566,668**	**85,649,796**	**81,417,002**	**68,177,272**	**78,087,625**
Incl. Northeast Provinces (F)*(D)	**tons**	**7,881,867**	**7,537,182**	**7,164,696**	**5,999,600**	**6,871,711**

* Proportion of Liaoning, Jilin and Heilongjiang provinces in the PRC's trade with Japan in 2010. (Source: ZHU, Yonghao, "Trade and Investment Relations between the Three Provinces of China's Northeast and Japan" [in Japanese], *ERINA Report* No. 106, July 2012)

An assumption in the estimation of the regional distribution of Russia is that trading goods between the Russian Far East and Japan are carried either by direct shipping or transshipment via the PRC or ROK. Freight transshipped via other countries in Asia, and Europe, etc., is assumed as trade with European Russia. Due to the rough assumptions, the terms of "Far East" and "European" Russia should be interpreted as the eastern and western territories of Russia without strict definition of the dividing line between them. The results are presented in Table 2.1-4, which suggest that the majority of the bilateral trade may be attributed to eastern Russia.

Table 2.1-4 Freight Volume Transported to/from Russian Ports (tons)

	2006	2007	2008	2009	2010
Japan-Russia					
"Far East"	5,118,060	5,910,235	7,100,932	1,266,189	2,441,286
"Europe"	118,806	176,711	318,386	108,711	432,804
Total	5,236,866	6,086,946	7,419,318	1,374,900	2,874,090
Russia-Japan					
"Far East"	18,504,022	24,841,006	21,990,876	25,666,728	39,214,749
"Europe"	40,526	251,642	139,763	188,006	190,315
Total	18,544,548	25,092,648	22,130,639	25,854,734	39,405,064

Source: MLIT "*Kowan Chosa* [Survey on Ports and Harbours]"

Resulting from the estimates, the freight flows to/from the GTR are summarized as Table 2.1-5.

Table 2.1-5 Freight Flows to/from the GTR (tons)

	2006	2007	2008	2009	2010
Exports	**36,763,234**	**40,513,968**	**38,596,497**	**31,451,245**	**35,160,998**
ROK	29,301,149	32,211,937	29,037,608	27,596,520	30,133,403
DPRK	139,285	18,846	8,320	2,102	2,098
NE China	2,155,414	2,307,870	2,362,653	2,537,170	2,530,182
Mongolia	49,326	65,080	86,984	49,264	54,029
Russian FE	5,118,060	5,910,235	7,100,932	1,266,189	2,441,286
Imports	**53,526,888**	**56,792,094**	**54,005,805**	**52,189,068**	**71,768,933**
ROK	26,823,450	24,398,303	24,677,815	20,518,696	25,666,821
DPRK	311,196	4,747	151,816	0	3,954
NE China	7,881,867	7,537,182	7,164,696	5,999,600	6,871,711
Mongolia	6,353	10,856	20,602	4,044	11,698
Russian FE	18,504,022	24,841,006	21,990,876	25,666,728	39,214,749

Source: Author

➢ Estimated freight flows to/from Northeast China (port-to-port statistics)

As mentioned before, the statistics on freight published by MLIT identify destinations and origins by country, not by port. Meanwhile, some port management bodies or local governments release data broken-down by port. Although some statistics don't cover all ports, but only major ports, such as the top ten destinations/origins, they help to investigate certain topics.

In this section, the author attempted to estimate the freight volume between Japan and Northeast China. For this purpose, statistics for ten major ports are used. Seven of them are located in the central Pacific area and the other three are located on the west coast (Table 2.1-6). They altogether cover three quarters of Japan's freight flow to/from the PRC, with 69.5% of exports and 77.7% of imports. Therefore, one can expect to obtain a general outline of the freight flow by analyzing their statistics.

Table 2.1-6 Freight Volume of Selected Major Ports to/from the PRC (2010, tons)

	Exports	Imports	Total
Chiba	1,980,700	1,235,730	3,216,430
Tokyo	4,450,082	11,915,073	16,365,155
Yokohama	9,583,431	9,770,240	19,353,671
Kawasaki	1,418,548	531,050	1,949,598
Nagoya	6,793,800	10,408,852	17,202,652
Osaka	2,717,768	13,141,609	15,859,377
Kobe	4,429,393	5,445,145	9,874,538
Pacific Majors	**31,373,722**	**52,447,699**	**83,821,421**
Niigata	251,523	976,163	1,227,686
Kitakyushu	1,586,038	2,747,820	4,333,858
Hakata	2,049,275	3,156,171	5,205,446
West Coast Majors	3,886,836	6,880,154	10,766,990
Total	**35,260,558**	**59,327,853**	**94,588,411**
Japan Total	**50,714,880**	**76,342,778**	**127,057,658**
(Share)	69.5%	77.7%	74.4%

Source: Statistical data for each port

For the purpose of estimation, the three Liaoning ports of Dalian, Yingkou and Dandong are selected, taking that they represent Northeastern China. Table 2.1-7 suggests that the total amount of export freight from the selected ports to Northeastern China may have been approximately 1.6 million tons in 2010, considering unreported data. Assuming the same proportion (around 5% of the total exports to the PRC) for all the ports of Japan together, an estimated export freight volume can be calculated of 2.5 million tons.

Table 2.1-7 Exports from Selected Ports to Northeast China (2010, tons)

	PRC	Dalian	Yingkou	Dandong	Sub-total	(%)
Chiba	1,980,700	30,343	7,315	7,903	45,561	2.30%
Tokyo	4,450,082	218,244	30	n.a	218,274	4.90%
Yokohama	7,999,847	289,181	6,888	n.a	296,069	3.70%
Kawasaki	1,418,548	4,787	1,966	n.a	6,753	0.48%
Nagoya	6,262,758	435,290	n.a	n.a	435,290	6.95%
Osaka	2,717,212	104,076	n.a	n.a	104,076	3.83%
Kobe	4,429,393	232,432	0	0	232,432	5.25%
Pacific Coast	**29,258,540**	**1,314,353**	**-**	**-**	**1,338,455**	**4.57%**
Niigata	372,478	12,289	366	0	12,655	3.40%
Kitakyushu	1,586,038	89,545	0	0	89,545	5.65%
Hakata	2,007,232	121,721	n.a	n.a	121,721	6.06%
West Coast	**3,965,748**	**223,555**	**-**	**-**	**223,921**	**5.65%**
Sub-total	**33,224,288**	**1,537,908**	**-**	**-**	**1,562,376**	**4.70%**

* "n.a." refers to either absence of traffic at all or insignificant figures disregarded for publication.
Source: Statistical data for each port

In the case of imports from Northeast China, the share is assumed at around 8%, and the estimated volume amounts to 6.1 million tons (Table 2.1-8).

Table 2.1-8 Imports of Selected Ports from Northeast China (2010, tons)

	PRC	Dalian	Yingkou	Dandong	Sub-total	(%)
Chiba	1,235,730	511,401	73,623	27,637	612,661	49.58%
Tokyo	11,915,073	949,796	17,228	n.a	967,024	8.12%
Yokohama	8,141,726	506,418	8,299	n.a	514,717	6.32%
Kawasaki	531,050	29,561	n.a	n.a	29,561	5.57%
Nagoya	10,371,688	757,905	n.a	n.a	757,905	7.31%
Osaka	13,140,592	866,280	n.a	n.a	866,280	6.59%
Kobe	5,396,130	431,260	0	0	431,260	7.99%
Pacific Coast	**49,496,259**	**3,541,220**			**3,566,747**	**7.21%**
Niigata	1,381,602	234,244	3,460	0	237,704	17.20%
Kitakyushu	2,747,820	228,199	35,217	2,500	265,916	9.68%
Hakata	3,302,259	347,032	1,985	n.a	349,017	10.57%
West Coast	**7,431,681**	**809,475**			**852,637**	**11.47%**
Sub-total	**56,927,940**	**4,350,695**			**4,419,384**	**7.76%**

* "n.a." refers to either absence of traffic at all or insignificant figures disregarded for publication.
Source: Statistical data for each port

➢ International container freight

There were 63 ports handling international ISO containers in Japan in 2010. The non-profit organization the Port and Harbour Modernization Promotion Council of Japan publishes statistics on the numbers of international containers handled at the ports, aggregating the statistics gathered from each port authority's local government. A shortcoming of the statistics is that they don't contain data broken-down by country of origin/destination.

The five largest container handling ports are Tokyo, Yokohama, Nagoya, Osaka and Kobe, where annual throughput is around 2 million TEU or higher (Table 2.1-9).

Table 2.1-9 Containers Handled at the Five Largest Ports (TEU, incl. empty)

	Tokyo	Yokohama	Nagoya	Osaka	Kobe	Others	Total
2008	3,727,302	3,203,871	2,630,524	1,950,008	2,040,285	3,605,427	17,157,417
2009	3,381,498	2,555,236	2,051,769	1,843,069	1,772,904	3,152,088	14,756,564
2010	3,816,104	2,975,273	2,394,630	1,980,021	2,017,957	3,669,515	16,853,500

Source: Port and Harbour Modernization Promotion Council of Japan

There are 13 ports located on the west coast of Honshu Island and the north of Kyushu Island at which container vessels call regularly (from Akita in the north to Hakata in south, Figure 2.1-1). Among them the ports of Hakata and Kitakyushu, which are in the north of Kyushu Island, are the largest, handling 541,000 TEU and 331,000 TEU in 2010, respectively. The largest on the west coast of Honshu Island is Niigata Port.

Figure 2.1-1: Container Handling Ports on Japan's West Coast

Source: Author

Table 2.1-10: Containers Handled at the West Coast Ports (TEU, loaded only, 2010)

Rank in Japan	Port	TEU (Loaded only)
6	Hakata	541,343
8	Kitakyushu	330,536
12	Niigata	120,512
16	Shimonoseki	55,256
20	Fushiki-Toyama	47,407
21	Akita	34,196
22	Kanazawa	32,353
34	Sakaiminato	17,774
35	Naoetsu	17,360
37	Tsuruga	15,319
50	Sakata	5,486
53	Maizuru	4,103
59	Hamada	2,216

Source: Port and Harbour Modernization Promotion Council of Japan

2.2 Infrastructure Capacity Review

2.2.1 Shipping Lines' Capacity

The GTR is connected with Japan, the ROK and other APR countries by marine transport. Focusing on the west coast of Japan, this section reviews the regular shipping services. Even though tramper services also play a significant role in transportation, in particular of bulk and liquid cargoes, their capacity is not discussed in this section, because their services are elastic enough to meet the demands once freight volume is specified. Thus, regular shipping services for general public users are the main topics of the section. Meanwhile, focus is placed on the shipping lines that transport container freight.

The reviewed shipping lines are as follows:

- Japan Trans-Siberia Line (JTSL)
- Sinokor Line
- Busan transshipment services
- DBS Cruise Ferry
- Niigata Zarubino Line

Shipping routes between Japan and Bohai ports (Dalian, Yingkou, and Dandong, etc) are excluded from the scope of the review, because there is highly-developed market competition and it seems that shipping companies are always ready to increase their capacity in response to demand growth.

➢ Japan Trans-Siberia Line (JTSL)

MOL, a Japanese shipping company, and FESCO, a Russian shipping company, jointly provide regular container transport services. There are "direct" and "transshipment" routes.

The former route operates a container vessel "VEGA DAVOS (698 TEU)" to call at the Japanese ports of Yokohama, Nagoya, Kobe, Kitakyushu (Moji), Toyama and the Russian ports of Vostochny and Vladivostok once every two weeks (Figure 2.2-1). The ultimate annual capacity of the shipping line can be calculated as a product of the vessel's capacity and number of voyages, while disregarding the factors of weather conditions, the need for technical maintenance, the dead capacity caused by the container inventory, and so on. Assuming that the vessel would perform 26 voyages per year, the capacity of this route is approximately 18,000 TEU one-way.

Figure 2.2-1 JTSL Direct Service

Source: Author

Along with direct shipping, the companies offer a transport service with transshipment at the Port of Busan. There are existing shipping routes operated by themselves and partner shipping companies between Japan and Busan, as well as between Busan and the Russian ports of Vladivostok and Vostochny. Connecting at Busan, they enable the transportation of containers between Japan and Russia. Thus, the companies improve the service quality in terms of frequency. Before they started the transshipment service, many shippers' clients had claimed that the direct

Figure 2.2-2 JTSL Transshipment Service

* The direct service ports also have transshipment services, although they are not shown on the map.
Source: FESCO (http://www.fesco.ru/clients/container/line/jtsl/) 2012.10.28

service of calling at the ports once every two weeks didn't satisfy their needs. In addition, the transshipment widens the geographic coverage on the Japanese side, collaborating with shipping companies working in the market of Japan-Busan container transportation (Figure 2.2-2).

FESCO put the container vessels "KAPITAN AFANASYEV" (1,748 TEU) and "SCIO SUN" (1,752 TEU) onto the shipping routes Vladivostok-Busan and Vostochny-Busan, respectively. Weekly voyages totaling 52 per year enable the transport of 182,000 TEU annually. This is the maximum capacity of the service for this section of the routes. In fact, however, they carry a certain amount of bilateral trade goods between Russia and the ROK, as well as those transshipped at Busan to/from third countries. The bilateral trade between Russia and Japan seems to occupy a minor portion of the total cargo carried by the two vessels, even though it is difficult to identify exact freight volumes by direction. Thus it is even more difficult, or practically impossible, to identify the capacities for each direction, because the vessels don't have any physical systems or mechanisms discriminating containers in terms of their origins and destinations.

The same can be said for the section between Busan and Japan. The situation is more complicated, because there is an even greater variety of vessels depending on the ports served. One key factor in the context of the report is that the overall capacity between Busan and Japan is quite large, which enables us to assume that the capacity in the section between Russia (Primorye) and Busan determines the total capacity of the transshipment service.

The author suggests a simple assumption that 10% of the maximum capacity of the Russia-Busan segment would be the capacity of the transshipment service. Considering the purpose of the report is to obtain an elementary overall understanding of the situation, it may not be justified to investigate further details of the capacity issues by employing more complicated assumptions. In this case, the combined capacity would reach 36,000 TEU, including the direct service capacity.

➢ Sinokor Line

An ROK shipping company, Sinokor Merchant Marine, has developed a regular container transport network in East Asia. After years of experience in transporting container freight between Japan and the Far East of Russia with transshipment at Busan, it started a non-transshipment service between Japan and Vladivostok in August 2012. The ports called at include the four west coast ports of Akita, Niigata, Naoetsu and Toyama (Figure 2.2-3). After departing the last port, Toyama, container vessels head to Vladivostok via Busan. The standard transport time between the Japanese ports and Vladivostok is 5-7 days, both for exports and imports.

The advantages of the new shipping line are less transport time, ensured transport time and less risk of damage. First, total transport time is reduced by eliminating transshipment operations and the waiting time for connection. Second, there is no risk of time loss at Busan, which is sometimes observed in the case of transshipment services. If the connecting vessel is overbooked, containers are stored at the container terminals of Busan until the next available vessel picks them up. The new service is able to avoid this kind of wasted time. Third, elimination of trans-loading operations for transshipment reduces the risk of physical damage from shock for the goods carried. Thus, the four west coast ports gained certain advantages with regard to container transport to the Russian Far East, compared to other Japanese ports where the shipping company continues to offer the Busan transshipment service.

The two container vessels "SINOKOR TOKYO" (834 TEU) and "GOLDEN WING" (656 TEU) have been put into operation. As the rotation along the route takes two weeks, the operation of the two vessels enables calling at each port once a week. If both vessels perform 26 voyages per year the annual total capacity is 38,740 TEU. There is, however, the same problem as in the case of the JTSL transshipment service. The capacity is not dedicated to bilateral trade between Russia and Japan only.

Just for simplification, the same assumption of 10 percent can be employed in this case as well. Thus, the annual capacity is suggested to be about 4,000 TEU.

➢ Busan transshipment services

Many other shipping companies also offer container transport services with transshipment at Busan Port. Among them are American President Lines (APL), CK Line, Dong Young, Hyundai Merchant Marine (HMM), Korea Marine Transport (KMTC), and Maersk, etc. Some of them operate routes both between Japan and Busan as well as between Busan and Vladivostok/Vostochny. The others operate only one segment and use their partners' shipping services in the other segment to organize the connecting transport.

Identification of capacity is more difficult than in the cases that were reviewed above, because some services use segments of the transcontinental trunk lines or intra-Asian multi-destination lines, which use large-scale vessels. In addition, some shipping companies charter slots of the other companies' vessels. Due to these difficulties, a quantitative

Figure 2.2-3 Sinokor Line

Source: Author

estimate of capacity cannot be conducted.

➢ DBS Cruise Ferry

A unique ferry route is operated by the Korean shipping company DBS Cruise Ferry. A ferry boat "Eastern Dream" (130 TEU) connects Sakai and Vladivostok in 2 days via Donghae (ROK) on a weekly basis(Figure 2.2-4). In terms of containers, the annual capacity is 6,760 TEU over 52 voyages. As is the case with the other above-mentioned shipping routes, the entire capacity is not able to be offered for the through freight between Vladivostok and Sakai. The Tottori Prefectural government officials suggested that there is a large amount of cargo in the Vladivostok-Donghae segment and very little available capacity. A conservative figure of 300 TEU can be taken as a possible rough estimate.

Punctuality, as well as short transit time, is among the advantages of the ferry route. The nature of regular ferry services requires the shipping company to keep to the announced schedule, particularly for passengers' convenience. In the words of Sakai port officials, overnight delays occur just a few times per year. Another specific feature is RO-RO cargo handling. It doesn't need heavy duty container cranes for the loading/unloading of containers on the one hand. On the other hand, it enables transportation of non-containerized general cargo, which provides local SMEs with opportunities to ship their small-lot trading goods at an appropriate cost.

Tottori Prefecture supports this route, as it should promote the port and local economy of Sakaiminato City and Tottori Prefecture. The prefecture, together with local municipalities, provides subsidies to the shipping company. The maximum amount of subsidy is 1.5 million yen (approx. US$20,000) for each call at Sakai port.

Figure 2.2-4 DBS Cruise Ferry

Source: Author

➢ Niigata-Zarubino line

There is another unique transportation route, connecting Niigata and Zarubino(Figure 2.2-5). Its most remarkable feature is that it targets dealing with trade cargo between Japan and Northeast China through the gate-city of Hunchun, Jilin Province. Multimodal transport is arranged for shippers, issuing a multimodal B/L, or so-called thru-B/L, covering land transport between Zarubino and Hunchun.

It is an ad-hoc on-demand service so far. A general cargo vessel "Teddy Bear", which usually runs between Nakhodka and Niigata, Naoetsu and some other Japanese ports according to shippers' requests, is arranged to call at Zarubino when needed. The route was opened in summer 2011 by a Japanese shipping company, Iino Koun, and then, from August 2012, a Russian transport company, "Primoravtotrans", has operated the route.

According to the promotion material of Niigata Prefecture, "Teddy Bear" is capable of transporting 65 TEU of containers. Assuming that there are none of the technical constraints mentioned below and it performs a voyage (one-way) in three days, the annual capacity could reach almost 4,000 TEU over 61 voyages in a year.

In practice, however, there are several constrains. The vessel is rather small and hardly keeps schedules under severe weather conditions. Meanwhile, lack of a heavy-load STS crane at Zarubino port makes container operation at the port significantly time-consuming, which should affect the shipping schedule when freight turnover grows.

The technical constraint of the loading/unloading operation is a significant problem even under the current minimum volume of freight. In fact, 40-foot containers as well as full-loaded 20-foot containers are not able to be handled at the port. A possible solution is to change the ship to a RO-RO ship, which doesn't need cranes. Despite the sincere efforts of related organizations, a suitable vessel has not been found so far. Another solution is to install one or more cranes at the berth, which requires more investment and time to realize. Once they are installed, however, the opportunity to develop shipping routes will be broadened.

Figure 2.2-5 Niigata-Zarubino Line

Source: Author

➢ Wrapping-up comments

There are several types of shipping routes between the ports of Primorye and Japan, including the west coast. According to the rough estimation argued above, there is a certain amount of capacity as shown in Table 2.2-1. It seems that the current capacity meets the current demand in terms of volume. One problem is the quality of service in terms of transportation time, frequency, punctuality, and cargo damage risks, as well as costs. This issue is argued later in the section reviewing time and cost factors.

Table 2.2-1 Estimated Capacity of Shipping Routes

	Capacity (TEU/year)	Comments
JTSL Direct	18,000	
JTSL Transshipment	18,000	About 10% of Russia-Busan segment capacity
Sinokor	4,000	About 10% of Russia-Busan segment capacity
DBS Cruise Ferry	300	About 5% of total capacity
Niigata-Zarubino	4,000	

Source: Author

Another potential problem is the uncertainty in the capability to meet future demand growth, even though one can expect that there will always be some shipping companies ready to launch new shipping lines or increase existing capacity when new trade flows come into reality.

2.2.2 Ports

Japan relies on marine transport to move the majority of the goods essential for its inhabitants' daily lives, and about 99.7% of all goods involved in foreign trade pass through Japan's ports and harbors. Marine transport accounts for 38.7% of all domestic cargo distribution on a ton-kilometer basis.

There are about a thousand ports across the country (Table 2.2-2). As of 31 March 2011, there were 23 "Designated Major Ports" in Japan. These are further divided into two categories; Strategic International Ports and Core International Ports. The Strategic International Ports are the ports in Tokyo, Yokohama, Kawasaki, Osaka and Kobe. The Japanese government is going to develop them as international container traffic hubs in east and west Japan. There are 5 Core International Ports along the west coast: from north to south, Niigata, Fushiki-Toyama, Shimonoseki, Kitakyushu, and Hakata.

Table 2.2-2 Number of Ports by Category (as of April 2012)

Category	Number
Strategic International Ports	5
Core International Ports	18
Major Ports	103
Local Ports	809
(incl. Harbors of Refuge)	(35)
Article 56 Ports	61
Total	996

Notes: Harbors of Refuge: The main purpose of these harbors is to allow small vessels to anchor during heavy windstorms or rainstorms. Established by government decree, they are not intended for the loading and unloading of cargo or passengers.
Article 56 Ports: These ports have been decreed by the prefectural governor as marine districts without any district boundaries, in order to ensure the absolute minimum necessary regulation, and have been set aside for use as ports in the future.
Source: MLIT

As mentioned above, there are 13 ports that accommodate regular container shipping services along the west coast of Honshu (the main) Island and the north of Kyushu Island. Because of their geographic position, they can be regarded as principal candidates for the target ports of the Trans-GTR corridors. Therefore, the outlines of their infrastructure development are summarized as follows:

➢ Port of Akita

Akita Port is located in Akita City, Akita Prefecture. There are 26 public berths with a depth of 4.5 to 13 meters, and 11 private berths.

Container loading is conducted at the Ohama and Gaiko terminals. The port handled 49,264 TEU (including empty containers) in 2010.

Table 2.2-3 Outline of Container Terminals at Akita Port

	Gaiko	Ohama
Depth (m)	-13	-10
Length (m)	270	185
Area (sq. m)	19,200	38,900
STS Crane Type	Container handling gantry	Tire-mounted mobile crane
Number of Cranes	2	1

➢ Port of Sakata

Sakata Port is located in Sakata City, Yamagata Prefecture.

Container loading is done at the multipurpose international terminal. The port handled 7,202 TEU (including empty containers) in 2010.

Table 2.2-4 Outline of Container Terminal of Sakata Port

Depth (m)	-13
Length (m)	280
Area (sq. m)	42,500
STS Crane Type	Container handling gantry
Number of Cranes	2

➢ Port of Niigata

Niigata Port is divided into the West Port and the East Port. The historical West Port is located in Niigata City, and the East Port sits astride Niigata City and the town of Seiro.

The container terminal is located in the East Port. The port handled 162,641 TEU in 2010. Construction on Berth No. 4 of the terminal was started in 2009 as a response to the rapid increase in container cargo. Use began on a 120m section of this berth in 2010, but as of June 2012 the full 250m berth is now being used as originally planned. Also, the overhaul of the container yard inside the terminal is advancing, and it will have the ability to handle 224,000 TEU annually. However, the amount of cargo handled in 2011 was 204,960 TEU, so there will not be much excess capacity. Therefore Niigata Prefecture is examining other ways to expand its terminal.

Table 2.2-5 Outline of Container Terminal of Niigata Port

Berth	No. 2	No. 3	No. 4
Depth (m)	-10	-12 (-14)	-12 (-14)
Length (m)	185	350	120 (250)
Area (sq. m)	274,880		
STS Crane Type	Container handling gantry	Container handling gantry	
Number of Cranes	1	2	

Note: Numbers in parenthesis are planned capacity.

➢ Port of Naoetsu

Naoetsu Port located in Joetsu City is the second largest port in Niigata Prefecture.

Container loading is performed at Berth No. 4 of the East Wharf. In 2010 it handled 23,338 TEU.

Table 2.2-6 Outline of Container Terminal of Naoetsu Port

Depth (m)	-10
Length (m)	200
Area (sq. m)	53,000
STS Crane Type	Container handling gantry
Number of Cranes	1

➢ Port of Fushiki-Toyama

Fushiki-Toyama Port is located in Toyama Prefecture. The port is divided amongst three areas: the Fushiki District, the Toyama District, and the Shinminato District.

Container loading/unloading operations are carried out at the multipurpose international terminal in the Shinminato District. As a response to the increase in container numbers, 2010 saw an additional gantry crane, with two gantry cranes currently in operation. The port handled 64,266 TEU in 2010.

Table 2.2-7 Outline of Container Terminal of Fushiki-Toyama Port

Depth (m)	-12 (-14)
Length (m)	333
Area (sq. m)	104,000
STS Crane Type	Container handling gantry
Number of Cranes	2

Note: Numbers in parenthesis are projected.

➢ Port of Kanazawa

Kanazawa Port is located in Kanazawa City, Ishikawa Prefecture.

Container loading is performed at Gokuden Wharf. It is a general purpose wharf, so other items besides containers, such as steel, are also dealt with at this location. The port handled 40,299 TEU in 2010. As a response to the increase in container numbers, the port authority is proceeding with the installation of a transfer crane in the terminal that is expected to be completed sometime in 2012. Handling capacity will increase up to 56,900 TEU annually.

Table 2.2-8 Outline of Container Terminal of Kanazawa Port

Depth (m)	-10
Length (m)	540
Area (sq. m)	-
STS Crane Type	Container handling gantry
Number of Cranes	1

➢ Port of Tsuruga

Tsuruga Port is located in Tsuruga City, Fukui Prefecture.

Container loading is mostly being conducted at the multipurpose international terminal in the Maruyama-South District. The remaining containers carried by RO-RO boats are handled in the Kawasaki-Matsue District. The port handled 18,973 TEU in total for 2010.

Table 2.2-9 Outline of Container Terminals of Tsuruga Port

	Maruyama-South	Kawasaki-Matsue
Depth (m)	-14	-10
Length (m)	280	370
Area (sq. m)	52,000	N.A
STS Crane Type	Container handling gantry	None
Number of Cranes	1	None

➢ Port of Maizuru

Maizuru Port is located in Maizuru City, Kyoto Prefecture. Most domestic cargo is handled at the East Port while international cargo is mainly handled at the West Port.

Container loading is performed at International Berth No.1 located at the East wharf. The port handled 5,645 TEU in 2010.

Table 2.2-10 Outline of Container Terminal of Maizuru Port

Depth (m)	-14
Length (m)	280
Area (sq. m)	59,000
STS Crane Type	Container handling gantry
Number of Cranes	1

➢ Port of Sakai

Sakai Port is located in Sakaiminato City, Tottori Prefecture, but as it is close to Shimane Prefecture it is managed by the Port Authority Association established jointly by Tottori and Shimane Prefectures.

Container loading is done mostly at the international container terminal. In addition, DBS Cruise Ferry, an ROK shipping company, has been conducting a regular ferry service from Sakaiminato-Donghae (ROK)-Vladivostok since July 2009. Containers are also handled at this ferry terminal. The port handled 25,757 TEU in total for 2010.

Table 2.2-11 Outline of (Container) Terminals of Sakai Port

	Int'l Container Terminal	Int'l Ferry Terminal
Depth (m)	-13 (-14)	
Length (m)	280	
Area (sq. m)	54,400	N.A
STS Crane Type	Container handling gantry	None
Number of Cranes	1	None

Note: Numbers in parenthesis are projected.

➢ Port of Hamada

Hamada Port is located in Hamada City, Shimane Prefecture.

Container loading is performed at the Fukui No. 4 wharf. The port handled 3,233 TEU in 2010.

Table 2.2-12 Outline of Container Terminal of Hamada Port

Depth (m)	-7.5
Length (m)	130
Area (sq. m)	16,000
STS Crane Type	Multipurpose
Number of Cranes	1

Note: Numbers in parenthesis are projected.

➢ Port of Shimonoseki

Shimonoseki Port is located in Shimonoseki City, Yamaguchi Prefecture. It faces the Kanmon Strait that lies between Honshu and Kyushu Islands.

The port has two container terminals; the Hananocho Wharf and the Shinko (new port) Wharf. In addition, its unique characteristic is its position as Japan's largest commuter ferry terminal. There are two regular services to the ROK and another two routes to China, resulting in 13 ferries each week. Hosoe Wharf, where the international regular ferries moor, has an area of 170,000 square meters. In total there are five berths which include two berths that each have a depth of 10m (total length 370m), two berths that each have a depth of 7.5m (total length 260m), and the remaining berth that is 5.5m in depth (total length 213m). The port handled 82,436 TEU carried by container vessels and ferries in 2010.

Table 2.2-13 Outline of Container Terminals of Shimonoseki Port

	Hananocho Wharf	Shinko (new port) Wharf
Depth (m)	-10	-12
Length (m)	370	300
Area (sq. m)	45,000	72,000
STS Crane Type	Container handling gantry	Multipurpose jib crane
Number of Cranes	1	1

➢ Port of Kitakyushu

Kitakyushu Port is located in Kitakyushu City, Fukuoka Prefecture at the northernmost tip of Kyushu Island.

The port has three terminals. The newest, Hibiki container terminal, which is equipped with 15-meter-depth berths and long-reach cranes, can accommodate large-size container vessels. The port handled 405,804 TEU in 2010.

Table 2.2-14 Outline of Container Terminals of Kitakyushu Port

	Tachiura No. 1 CT	Tachiura No. 2 CT	Hibiki CT	
Number of Berths	2	3	2	2
Depth (m)	-12	-10	-15	-10
Total length (m)	620	555	700	340
Area (sq. m)	161,500	161,547	385,100	
STS Crane Type	Container handling gantry	Container handling gantry	Container handling gantry	
Number of Cranes	4	3	3	

➢ Port of Hakata

Hakata Port is located in Fukuoka City, Fukuoka Prefecture.

Owing to its establishment in 1997, Hakata Port has a short history as a container port compared to others. While this may be so, recent years have seen a substantial increase in container cargo and the port has become the sixth largest port in Japan in terms of the number of containers handled.

Hakata Port has two modern container terminals: Kashii Park Port CT and Island City CT. The former was opened in 1997. The latter started operations at Berth No.1 in 2003 and has been expanding its capacity since. It is equipped with advanced energy-saving technologies and ICT. In addition to the regular container services, Hakata Port has a ferry route to Busan and a RO-RO boat service to Shanghai. The "Shanghai Super Express Service" by RO-RO ship can connect Hakata Port with Shanghai in only 28 hours, which gives it the characteristic of being faster than the usual container route and cheaper than air delivery.

Table 2.2-15 Outline of Container Terminals of Hakata Port

	Kashii Park Port CT	Island City CT
Number of Berths	2	2
Depth (m)	-13	-14 and -15
Length (m)	600	680
Area (sq. m)	223,195	284,000
STS Crane Type	Container handling gantry	Container handling gantry
Number of Cranes	4	5

➢ Total container handling capacity of the west coast ports

Most Japanese port management bodies do not announce their handling capacity. Therefore, the author would suggest simplified estimates considering the number of berths and cranes, as presented in Table 2.2-16. Under this assumption, the total annual capacity is calculated as approximately 2.7 million TEU.

Table 2.2-16 Container Terminals Capacity Estimates

Ports	Estimated Annual Capacity
Kitakyushu, Hakata	1,000,000 TEU
Niigata	200,000 TEU
Akita, Fushiki-Toyama, Shimonoseki	100,000 TEU
Sakata	50,000 TEU
Naoetsu, Kanazawa, Tsuruga, Maizuru, Sakai, Hamada	30,000 TEU

Source: Author

2.2.3 Road Network

The road network in Japan has developed very rapidly since the 1970s. The total length of public roads in Japan amounted to 1.2 million km as of April 2009. Public roads are classified into four categories according to the Road Act (Table 2.2-17).

Table 2.2-17 Types of Public Road in Japan

		Managing Body	Funding Body	Length in Operation (km)
National Expressways		MLIT	Expressway companies *	7,642
Ordinary National Highways	Specified Sections (Ministerial Highways)	MLIT	MLIT	22,874
	Non-Specified Sections (Subsidized Highways)	Prefecture (Designated City)	MLIT, Prefecture (Designated City)	31,916
Prefectural Roads		Prefecture (Designated City)	Prefecture (Designated City)	129,377
Municipal Roads		Municipality	Municipality	1,016,058

* Some sections of expressway are constructed by funding of MLIT or prefecture (designated city) in accordance with the national plan for expressway construction.
Source: Various materials of MLIT

The Japanese government is developing a national network of "arterial high-standard highways", which comprises the entire national expressway network and parts of the national highways. The total length of planned expressways is 11,520 km, of which 7,642 km are in operation and about 1,800 km are under construction (including at the design stage). The some 2,000 km remaining are to be developed in the future. MLIT has a plan for the development of ordinary national motorways, which compose parts of the arterial high-standard highways network, and at the same time, parts of the ordinary national highways, in terms of legal status in accordance with the Road Act. The total planned length of the ordinary national motor ways is 2,480 km. Although the network connects metropolitan areas and major cities across the country, there are still many missing links along the routes connecting local cities and substitute routes in the case of great disasters.

The designed maximum speed of the expressways is 100km/h on most sections or 80km/h on some sections. They are designed as roads of four lanes or more, while some sections have been put into operation as two-lane roads for the time being.

For the purpose of facilitating international business and trade, MLIT is running projects for the improvement of road access to major ports and airports and also the elimination of physical bottlenecks for ISO container transport. MLIT has selected 71 major ports and airports that should have quick access to the expressways. As a result of the development of access roads, 51 of the selected ports and airports can be reached from the nearest expressway interchanges in ten minutes as of March 2009.

As the technical standard for road structure had developed earlier than the implementation of the ISO containers, even expressways and highways have many sections where full-load containers and/or high-cube containers are not allowed to be transported. Shippers have to divide their freight into smaller units or take a detour, which burdens them with additional costs. To improve the situation, in 2008 MLIT designated the trunk-road network with a total length of 29,000 km that should enable transport of ISO containers by semi-trailer trucks of 44 tons in weight and 4.1m in height. There were 47 sections (560km) of bottlenecks at that time and MLIT has continued to eliminate these bottlenecks.

2.2.4 Rail Network

In 1987, the government privatized Japanese National Railways and split it up into six regional passenger rail companies and one national freight service company. The total operational length of the six JR passenger companies was 20,010.6 km as of March 2007. In addition to the JR companies, there were 92 private, 40 semi-governmental (third sector), and 11 public regional passenger railway operators in Japan, as of July 2007.

Japan Freight Railway Company is one of the seven companies established as a result of the national railway reform in 1987 and the only company specializing in freight. It doesn't own railway infrastructure, except for some sections with a total length of 44.8 km, and operates freight trains utilizing the railway networks owned by the six regional passenger companies or the other JR group companies.

The company covers the whole territory of Japan and the total length of its operations are over 8,000 km (Table 2.2-18).

Table 2.2-18 Outline of Japan Freight Railway Company

Number of Lines			77
Operation Length (km)			8,337.50
Number of Stations			253
Number of Trains			581 / day
Train-kilometers			about 219,000 km / day
Volume of Annual Traffic in 2009 (Tonnage: thousand tons / ton-km: millions of ton-km)			Total Tonnage: 31,050
			Total Ton-km: 20,400
Cars	Locomotives	Electric	490
		Diesel	227
	Electric Multiple Units		42
	Freight Wagons	JR for Containers	8,033
		JR for Others	533
		Private	2,588
12ft Containers	JR ownership		62,592 units
	Private		18,730 units
Loading Equipment		Top Lifters	72 units
		Fork-Lifts	440 units

As of 1 April 2010
Source: http://www.jrfreight.co.jp/english/corporate/overview.html

Although the company is expanding container cargo transport, that doesn't mean it plays a significant role in international trade. The company employs its own original container standard. The 12 ft container or "JR container" is much smaller than the ISO containers (Table 2.2-19). They are circulated exclusively within Japanese territory, except for a very limited commercial use to the ROK and some recent experimental shipments to China and Russia.

Table 2.2-19 Specifications of the Standard JR Container

Inside Measurement (mm)	L 3,642 x W 2,275 x H 2,252
Capacity (volume, cubic meters)	18.7
Capacity (weight, kg)	5,000

Source: http://www.jrfreight.co.jp/transport/container/index.html

Reasons why the ISO containers are generally transported by semi-trailer, not by railways, are:

1) No Japanese port has direct railway access to its container terminals;

2) Truck transportation is suitable for door-to-door delivery;

3) There are small-diameter tunnels that do not allow the high-cube ('9.6) containers to pass through.

Recently, however, rail transport is being reevaluated in the context of reducing CO_2 emissions. As explained later, there are several attempts to increase the usage of railways for ISO container transport.

2.3 Performance Review of Non-Physical Infrastructure

2.3.1 Supporting the Legal Environment of Transport Movements

➢ Legal environment for transport business

In the field of international marine transport business, Japan utilizes the "Act on International Carriage of Goods by Sea", which conforms to the "Hague-Visby Rules". Consequently, Japan's export and import goods by sea are carried under the "Hague-Visby Rules". In other words, the legal environment is harmonized with international rules and practices.

Domestic land transportation business is regulated under several laws, like the "Road Transportation Act", the "Act on Service of Cargo Transportation by Automobiles", the "Railway Business Act", the "Port Transport Business Act", and others. Those who want to do their business in any of these fields should obtain the respective license or approval, or should notify the respective authority in accordance with each of the Acts.

Japan has not joined the Convention on the Contract for the International Carriage of Goods by Road (CMR) and the Convention concerning International Carriage by Rail (COTIF). The main reason is the geographic situation of the country, which doesn't have any land-surface (road and railway) connections with neighboring countries. Taking this into account, one can understand that there are no significant problems in business practices even without the conventions.

The "Cargo Forwarder Service Act" is applicable to both domestic and international forwarding services that employ actual carriers' rail/truck/ocean/port transportation services to fulfill transportation contracts with clients (shippers). In practice, multimodal transport services can be understood as an advanced form of forwarding services. Many major Japanese forwarders provide international multimodal transport services. From this viewpoint, it can be said that the law governs multimodal transport business in Japan.

Meanwhile, because the draft international convention on multimodal transport proposed by UNCTAD in 1980 has not gained support from many countries, there are no international conventions in the field. Many Japanese international forwarders employ the standardized terms and conditions of the multimodal transport bill of lading developed by the Japan International Freight Forwarders Association (1993).

➢ Shipping services regulations (between Japan and Russia)

There is an old agreement between Japan and Russia from the Soviet era, which stipulates the procedure for opening new shipping lines between the two countries. It states that the name of the shipping company that plans to start a new line should be notified through a designated organization. They are MOL on the Japanese side and FESCO on the Russian side.

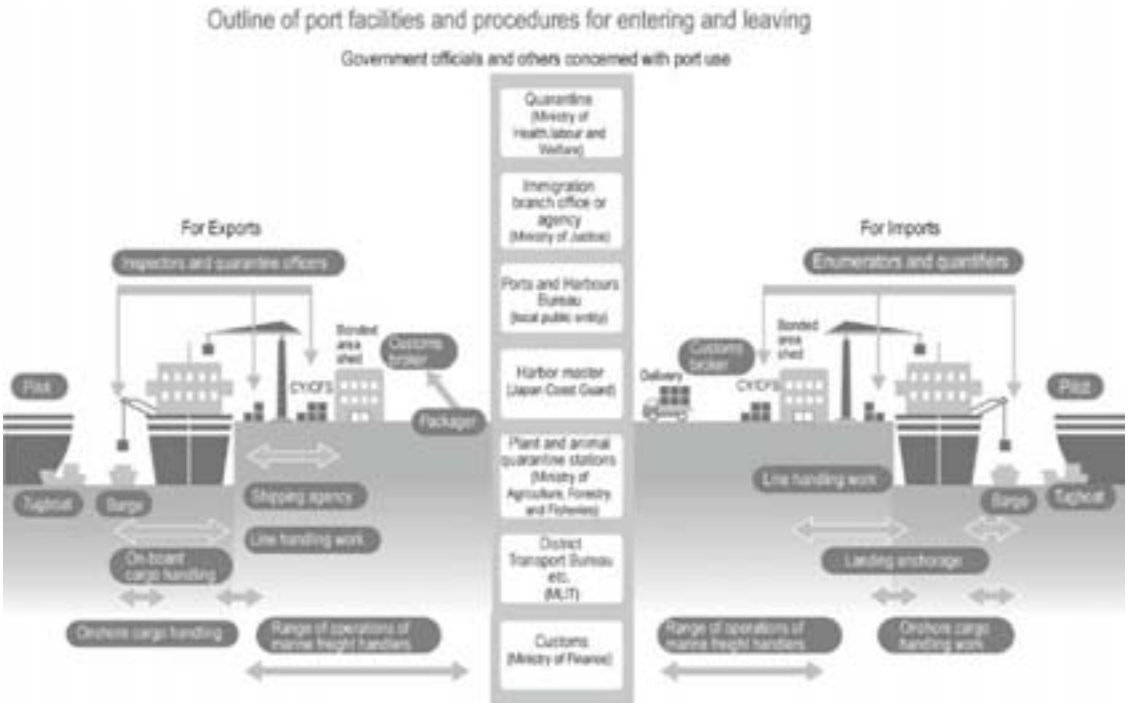
It is difficult to evaluate how much the agreement restricts new companies entering the market. Some people suggest that it practically closes the door of the market, in particular for regular shipping lines of full-container vessels. On the other hand, shipping companies of third

Table 2.3-1 Authorities Executing Control and Management at Ports and Harbors

Activity	Responsible Government Agency	Laws and Regulations
Navigation safety and systematic maintenance of port facilities	Port Master (MLIT, Coast Guard)	Harbor Regulation Law
Regulation of port transportation, supervision (sales registration, fee forwarding, etc.)	District Transport Bureau (MLIT)	Port Transportation Business Law
Supervision of coastal warehouse industry, Supervision of maritime service industry		Warehousing Law, Marine Transportation Law
Licensing and supervision of the piloting profession		Pilotage Law
Regulation of duties, tonnage taxes, special tonnage taxes,* other assessments, levies, and bonded areas	Customs (Ministry of Finance)	Customs Law
Approval of imported and exported goods	Regional Bureau of Trade and Industry (METI)	Foreign Exchange and Foreign Trade Control Law
Inspection and quarantine of imported and exported animals	Animal Quarantine Office (Ministry of Agriculture, Forestry and Fisheries)	Livestock Infectious Diseases Prevention Law
Inspection and control of imported and exported plants	Plant Quarantine Office (Ministry of Agriculture, Forestry and Fisheries)	Plant Quarantine Law
Control of Immigration and Emigration	Immigration Office (Ministry of Justice)	Immigration-Control and Refugee-Recognition Act
Port quarantine of seamen and passengers	Quarantine Office (Ministry of Health, Labour and Welfare)	Quarantine Law

Source: MLIT

Figure 2.3-1 Outline of Port Facilities and Procedures for Entering and Leaving



Source: MLIT

countries like the ROK are able to enter without any specific requirements. The case of the DBS Cruise Ferry and Sinokor direct services are the most outstanding examples.

➢ Authorities executing control and management of business activities at ports and harbors

Ports are subject to a variety of activities, including maritime transport, shipping, and marine services. An interconnected network of various administrative organizations manages port-related social and economic activities (Table 2.3-1 and Figure 2.3-1). Roughly speaking, MLIT controls business activities related to transportation, while other ministries control international trade. In addition to those functions stated in the table, the development and maintenance of port facilities like quay

walls are the responsibility of MLIT and the Port Management Body.

2.3.2 Net Transport Costs and Time Factors

A characteristic of marine transport is its flexibility in service performance, in terms of routes, frequency, and capacity, etc. In fact, there are a variety of freight transport services between Japan and the GTR. This section, in attempting to examine the costs and the time factors, summarizes the existing marine transport services between Japan and the GTR. It should be noted that shipping companies stop, change and (re)start their businesses in specific directions or routes so frequently that the following content may become out of date even in the very near future.

Another difficulty is that transportation fees fluctuate dynamically, as the market situations change. Also, transportation companies sometimes offer significant discounts to constant and sizeable clients. With regard to transportation fees, consequently, the figures presented in this section may not reflect the real picture of the market.

➢ Japan Trans-Siberia Line (JTSL)

MOL and FESCO jointly operate this service, which includes direct shipments and transshipments at Busan port.

The standard shipping time of the direct routes varies from 1 to 8 days (westbound) and from 4 to 12 days (eastbound) depending on the origin and destination ports (Table 2.3-2). The transshipment service takes a longer time in general, although it depends on the origin/ destination. At best, one could assume that it takes approximately a week when the shipping schedules of both legs match in the optimal way. On the other hand, there are some risks of accidents that leave containers stored at Busan port for a few weeks due to congestion or other factors.

Table 2.3-2 Standard Shipping Time of JTSL Direct Service (days)

	Yokohama	Nagoya	Kobe	Moji	Toyama
To Vostochny (westbound)	6	5	4	3	1
From Vostochny (eastbound)	7	8	9	10	12
To Vladivostok (westbound)	8	7	6	5	3
From Vladivostok (eastbound)	4	5	6	7	9

Source: Trans-Russia Agency Japan Co., Ltd.

According to the publicized tariff applicable from 1 August to 30 September 2012, the westbound freight charge is US$1,085-US$1,315 for a 20-foot dry container with non-dangerous cargo and US$2,080-US$2,510 for a 40-foot container including BAF. At the same time eastbound charges are less expensive: US$695-US$815 and US$1,380-US$1,630, respectively. In addition, there are additional costs such as THC at both ends.

➢ Sinokor Line

According to the press release announcing the launching of non-transshipment transportation, it takes 5-7 days between Vladivostok and the Japanese west coast ports (Table 2.3-3). Even though it takes more time than the possible direct shipping from the west coast ports to Vladivostok without any port calls on the way, which would take just 1-2 days, the transport time is almost in the same range as the JTSL direct shipping for the major Pacific ports of Yokohama, Nagoya and Kobe.

Table 2.3-3 Standard Shipping Time of Sinokor Direct Service (days)

	Akita	Niigata	Naoetsu	Fushiki-Toyama
To Vladivostok (westbound)	7	6	5	5
From Vladivostok (eastbound)	5	6	7	7

Source: Sinokor Seihon Co., Ltd.

➢ Busan transshipment services

In general, it takes more than a week from the loading port to the final destination port. Thus, in terms of time, it is not as competitive as the aforementioned lines. Extremely chaotic situations were observed in the spring-summer of 2012, when delays stretched to more than a few weeks in the worst cases and some shippers had to take another more expensive direct route.

As almost all Japanese container ports have regular shipping lines to Busan, it is a practical option to use the nearest port in order to minimize the land transportation costs to the port. This means that the transshipment services may be more attractive in terms of total transportation costs for the customers-shippers located far from the ports that offer the above-mentioned direct transport services. In some ports shippers can enjoy a higher frequency of services than direct shipping, which is another advantage.

➢ DBS Cruise Ferry

This company offers one of the fastest delivery times between Primorye and Japan. It takes just two days in both directions.

The Tottori Prefectural government publicizes a standard freight tariff, while the shipping company is ready to negotiate on the actual transport fee.

Table 2.3-4 Standard Freight Tariff of DBS Ferry (US dollars)

	Dry Container			Ref. Container	
	20 ft	40 ft	40 ft HC	20 ft	40 ft
From Sakai to Vladivostok	$1,100	$1,900	$1,900	$2,500	$3,900
From Vladivostok to Sakai	$850	$1,450	$1,450	$2,000	$3,900

Source: Tottori Prefectural government

➢ Niigata-Zarubino Line

The transportation time varies from 2 days to 5-6 days depending on port rotation, because sometimes the vessel calls at Nakhodka, Naoetsu or other ports on the way, subject to clients' requests. But, even in these cases, it is competitive in terms of delivery speed.

As mentioned above, this line cannot accept 40-foot containers due to the limited handling capacity at Zarubino

port. The through-transportation fee for a 20-foot container is set at around $1,250, including land transportation between Hunchun and Zarubino. This is a special rate for the promotion of the new route, supported by subsidies from the Niigata Prefectural government.

➢ Overall review of the shipping routes between Japan and Primorye

While some shipping companies publicize freight tariffs, the actual market prices may differ. Table 2.3-5 summarizes interviews with small-scale Japanese exporters to Russia who mainly use Yokohama port. They say the fees are higher if they use local ports. Compared to other intra-Asian shipping fees, like the Japan-Dalian route as discussed below, the fees are much more expensive.

In terms of technical criteria like transport time, frequency, punctuality and capacity, each route has its advantages and weaknesses, as presented in Table 2.3-6. In general, it should be noted that there is still much room for improvement in the shipping services.

Table 2.3-5 Freight Charges of Regular Container Services (US dollars)

	20 ft	40 ft
Busan Transhipment	Approx. $850	Approx. $1,400
Direct	Approx. $1,300	Approx. $2,000

Source: Interviews with exporters in 2012

Table 2.3-6 Technical Parameters of Shipping Routes

	Transport Time	Frequency	Punctuality	Damage Risk
JTSL Direct	Moderate / Worse	Worse	Moderate	Moderate
JTSL Direct (Export from Toyama)	Better	Worse	Moderate	Moderate
JTSL Transshipment	Worse	Moderate	Moderate	Worse
Sinokor Direct Service	Moderate	Moderate	Moderate	Moderate
DBS Cruise Ferry	Better	Moderate	Better	Better
Niigata-Zarubino Line	Better	Worse	Worse	Moderate
Other Busan Transshipment Services	Worse	Moderate	?	Worse

Source: Author

Under these circumstances, exporters select a route considering the trade-off of the time and costs. One key factor is the inland transportation costs in Japan. For example, one-way truckage of a 20-foot container from Niigata to Tokyo/Yokohama (350-400km) may cost around US$1,500. This is an estimate for occasional transport and there should be substantial discounts for constant clients depending on their shipping volume. Nevertheless, shippers have a strong incentive to shorten the inland transportation distance.

Another factor is the sensitivity of transported items to physical shocks at the transloading operations. Highly delicate goods tend to be transported without transshipment in order to reduce the risk of physical damage.

➢ Ocean freight tariffs and shipping time between Japan and Dalian

Market competition in Japan-China container transport is considerably fierce. People in the forwarding companies have suggested that the current standard transportation fee from major Japanese ports to Dalian port is around US$200 per 20-foot container. In practice there are additional charges, such as terminal handling charges, bunker (fuel) surcharges, and others. The total fee could be estimated roughly as US$400 or thereabouts. In the case of importing from China, they say that the ocean freight fee might be almost zero or even negative, which means shipping companies collect surcharges only partially.

At the same time, the transport time between Dalian and major Japanese ports is usually less than a week. Many shipping companies offer weekly or more frequent services. Meanwhile, well-developed systems of transport services ensure a sufficiently stable safe delivery of freight. Conservative shippers prefer the proved services that have been improved through years of practice in dealing with the various requirements from shippers.

Thus, the shipping routes between Japan and Dalian are more competitive than those between Japan and Primorye. In addition, expensive inland transport costs make it unfeasible that Japanese Pacific coast shippers trading with Northeast China would shift their transport route to the proposed route that goes across Japanese territory to the west coast and then across the sea to the GTI ports in Russia. The author sees a strong need for comprehensive measures to improve the competitiveness of the Tumen and Suifenhe corridors, as well as their extension to the sea and Japan.

2.4 Physical and Non-Physical Constraints

2.4.1 Constraints in the Marine Section and Japan

Summaries of the reviews of infrastructure capacity and performance constraints in the area of marine transport and Japan's inland transport are presented in Table 2.4-1.

2.4.2 Constraints in the Continental Sections

As the constraints in the continental sections are thoroughly reviewed in the other country reports, the constraints presented in Table 2.4-2 are supplements to them. The two issues are revealed from interviews with Japanese shippers and forwarders, and represent external views.

In fact, the issue of the double cross-checks at the Chinese-Russian border as well as the Russian ports may not be recognized as problematic if they are viewed from the viewpoint of each country's normal cross-border control. The respective authorities should control cross-border transport according to the regulations, which they actually conduct. However, it certainly degrades the competitiveness of the routes against the Dalian corridors in terms of direct and indirect costs, including the costs for preparing the necessary documents.

The second problem deepens the first one. Officials at the borders do not have enough experience to deal with transit cargo going through the routes. The Japanese forwarders and shippers complained that too many documents and explanatory materials are required when they try to ship specific goods for the first time. The situation improves when they ship the same goods the

Table 2.4-1 Constraints along the Trans-GTR Corridors

	Constraint	Importance (How much it restricts the flow)	Timeframe (Reflects the urgency)	Mitigation Measures
1) Tumen Transport Corridor, 2) Suifenhe Transport Corridor and 3) Siberian Land Bridge				
For the section of shipping routes across the sea to the Japanese west coast				
Infrastructure				
Vessels	- Inadequate vessel operating between Zarubino and Niigata	Significant	Urgent	Replacement with a larger RO-RO type vessel
Transport Regulation	- Regulated opportunities to start a new regular service	Less	Mid-term	Removal or amendment of the Japan-Russia Agreements of Marine Shipping
Cross-Border Regulation	- Embargo on trade with the DPRK	Significant	Long-term	Removal of the embargo
Cost and Time Factors	- Expensive transport fees	Significant	Urgent	Promotion & marketing to realize economies of scale
	- Under-developed shipping services (directions, frequency, punctuality, etc.)	Moderate	Urgent	Support to the operating companies to encourage further development
For the section of land transport across Japanese territory (between the west coast and the Pacific coast)				
Infrastructure				
Rail	- No on-dock railways	Less	Mid-term	Construction of rail access to ports
	- Small diameter tunnels	Less	Mid-term	Introduction of low floor wagons
Road	- Limited height and axle load sections	Less	Mid-term	Reconstruction
Ports	- Limited capacity of cargo handling	Less	Long-term	Construction of new berths and/or introduction of cargo handling equipment
Transport Regulation	- Strict regulation on usage of foreign vehicles	Less	Long-term	Realization of mutual access of trailer chassis
Cost and Time Factors	- Expensive transport fees	Significant	Urgent	Promotion & marketing to realize economies of scale

Source: Author

Table 2.4-2 Constraints in the China-Russia-Sea Section

	Constraint	Importance (How much it restricts the flow)	Timeframe (Reflects the urgency)	Mitigation Measures
1) Tumen Transport Corridor and 2) Suifenhe Transport Corridor				
For the section of China-Russia-Sea				
Cost and Time Factors	- Double cross-border checks at the Chinese-Russian border and the Russian ports	Significant	Urgent	Introduction of simplified scheme for transit cargo
	- Less efficient implementation of regulations	Moderate	Urgent	Capacity building and routinization of transit practices

Source: Author

second time. However, if they want to transport other items they have to suffer the same problem.

3 Measures and Investment Programme Proposed to Improve Transport Movements along the Corridors

3.1 Measures

3.1.1 Legal Environment

In the short term, the current Japanese legal environment can properly accommodate expected freight traffic. A potential challenge might be the lack of the legal base for usage of foreign vehicles for inland transportation in its territory. In that case, amendments of the Road Transportation Vehicle Act and participation in the CMR convention should be considered, which will make Japan a virtual continental country connected by roads instead of marine transport.

It should not be an urgent issue while Japan continues to be an island country as it is presently. It will become a serious problem when there will be many more special traffic demands that require direct transport without any transloading from one semi-trailer truck to another. Such cargo might be super-precision machines, delicate live vegetables, fruit and fish, all of which are vulnerable to shocks during the lift-on/off transloading operation at ports. Currently, in order to ease the damage they usually need special treatment in terms of packing and harnessing, which burdens shippers with additional costs. Direct transport without transloading will improve this problem. On the other hand, the inventory costs of trailer trucks will increase if they go beyond the sea. Therefore, the through-operation of trailers is not necessarily the most efficient solution. It requires more in-depth studies on traffic demands, the requirements of transport quality, and the costs of trans-ocean trailer operations, etc.

3.1.2 Designation of "Base Ports"

In 2010, MLIT announced its intention to select several base ports on the west coast for enhanced development. Although there are skeptical views on the expected outcomes and effectiveness of the policy, its outline is reviewed in this section as below.

The main purpose of the initiative at its initial stage was to strengthen the international competitiveness of all the west coast ports, while taking into consideration the economic development of the countries on the other side of the sea, as well as clarifying the roles of each port and promoting mutual cooperation among them; this will eventually contribute to the economic development of the west coast region. In the meantime, the Great East Japan Earthquake occurred in March 2011 and added another purpose of building a strong distribution network against a disaster, while securing an alternate function for the Pacific coast ports, as well as to strengthen their own disaster prevention function.

The selection was conducted for each of the port functions specified by MLIT. In fact, there were six key functions or cargo items specified: namely international container port, international ferry and/or RO-RO, regular international passenger lines, international cruise, timber, and finally "other cargo." The port management bodies of the Core International Ports and the Major Ports, which are 26 in total, from Wakkanai in the north to Nagasaki in the south, were eligible to submit applications, which were to include future visions and measures to enhance one of the listed functions. If they considered that their port has good

Table 3.1-1 "Base Ports" of the Japanese West Coast

Comprehensive Base Ports (5 ports)	
	Niigata, Fushiki-Toyama, Shimonoseki, Kitakyushu and Hakata
Base Ports (19 ports, 28 plans)	
International containers (10 ports, 9 plans)	Hakata port, Kitakyushu and Shimonoseki ports, Niigata port, Fushiki-Toyama port, Akita port, Imari port, Sakaiminato port, Maizuru port, and Kanazawa port
International ferry and/or International RO-RO (7 ports, 6 groups)	Hakata port, Tsuruga port, Kitakyushu and Shimonoseki ports, Wakkanai port, Fushiki-Toyama port, and Maizuru port
Regular international passenger lines (5 ports, 3 groups)	Hakata port, Kitakyushu and Shimonoseki ports, and Nagasaki and Sasebo ports
International cruise (fixed cruise) (2 ports)	Hakata port and Nagasaki port
International cruise (hinterland tourism cruise) (5 ports, 3 groups)	Otaru, Fushiki-Toyama and Maizuru ports, Kanazawa port and Sakaiminato port
Timber (2 ports)	Sakai port and Hamada port
LNG (3 ports, 2 groups)	Naoetsu and Niigata ports, and Ishikariwan-New port
Goods for recycling (1 port)	Sakata port
Base Formation Promotion Ports (4 ports, 4 plans)	
	Rumoi port (timber), Noshiro port (goods for recycling), Nanao port (timber), Karatsu port (international cruise (hinterland tourism cruise))

Source: MLIT

Figure 3.1-1 "Base Ports" of the Japanese West Coast

Source: Author

prospects for handling cargo not specified in the above-mentioned functions, they could choose the sixth function of "other cargo," identifying the cargo item. MLIT allowed the port management bodies to apply jointly with other eligible ports, establishing an alliance and developing a plan together.

Among the 26 eligible ports, 23 ports submitted application documents to MLIT in the summer of 2011. The screening committee established by MLIT reviewed the submitted plans and selected 5 Comprehensive Base Ports, 19 Base Ports with 28 plans, and 4 Base Formation Promotion Ports (Table 3.1-1, Figure 3.1-1).

As a result all the 23 ports that submitted an application were approved as Base Ports or Base Formation Promotion Ports. In fact, not all the plans of all the ports were endorsed. For example, Sakata port submitted two plans for "international container port" and "other cargo (goods for recycling)" and received an approval for the plan for "goods for recycling" only. In addition, the 4 Base Formation Promotion Ports can be regarded as semi-base ports, which don't fulfill all the criteria for a Base Port but should be treated honorably, considering some other factors.

One year has passed since the results were publicized in November 2011. Any significant measures have not been observed, however, to promote the proposed plans. There are disappointed sentiments in the local societies which supported MLIT's initiatives, because MLIT has not and will likely not allocate special resources, in particular financial ones, to realize the plans that they approved.

The weak support was predicted in advance, however. As mentioned before, all applicants won the status of Base Port or Semi-Base Port, which means that the screening process was rather mild. This fact, in turn, suggests that MLIT doesn't have a strong intention to differentiate its support to specific ports.

In the end the west coast ports should still continue to develop and promote projects mainly by their own resources, while cherishing the slight expectation for financial and other sorts of support from the central government in future.

3.1.3 Experimental Shipments

Aiming at the promotion of new shipping routes to the Russian Far Eastern ports, the local governments of the Japanese west coast are implementing various measures. Among those are experimental shipments of containers to/from the Northeast provinces of China. In this section, we focus on two examples as follows.

➢ Transport experiment by Niigata Prefecture

In October 2010, Niigata Prefecture carried out a multimodal container transport experiment. This transport experiment selected China's Northeast region as the point of origin for cargo. Usually export goods from the city of Harbin in Heilongjiang Province to the port in Niigata are

transported through Dalian port, which is a transport distance of roughly 3,000 km. This experiment of sending cargo from Northeast China across the Russian border, through Zarubino Port and finally connecting to Niigata Port yields a shortcut that results in a 40%, or roughly 1,300 km, reduction of this transport distance (Figure 3.1-2).

For this experiment the prefecture chose household goods as well as clothing. The household goods departed from Harbin for Jilin Province's Hunchun City, where they were loaded into a 20-foot container. The clothing was produced and packed in Hunchun. These two 20-foot containers cleared the customs of China and Russia at the BCP, and were then sent by truck to Zarubino Port. From Zarubino to Niigata, the cargo was sent by a chartered cargo ship that usually calls at Nakhodka Port. From Niigata Port, the cargo was transported to Japanese domestic destination points by the use of trains amongst other methods.

Activities such as freight transport, loading operations and inspections took a total of 6 days. Compared to the Dalian route which takes over 10 days for work operations, the route through Zarubino Port definitely has predominance. However, this 6-day period doesn't include waiting and other lost time. Consequently, it should be regarded as an idealistic amount of time for extremely rationalized operations and circumstances.

As far as transport costs are concerned, this particular experimental route was comparatively expensive. Compared to the Dalian route where multiple firms are in direct competition, this experimental route cost around 100,000 yen more per TEU.

The customs procedures were smooth for the most part. Yet during the Zarubino to Niigata Port leg, one portion of the cargo still took over ten hours. The reason was because it was the first inspection for these particular goods. With continued use of the route, we expect the amount of time taken will become much less.

Several problems came to our attention when trying to construct a full-fledged distribution route, as follows:

- When preparing schedules for land and sea transport, it will be necessary to coordinate them to establish a service that has no waiting;
- It is necessary to secure a sufficient cargo amount to create similar fees to the Dalian Port route and reduce land transport costs;
- It should be considered whether to improve or replace the crane at Zarubino Port, or use a RO-RO ship or ferry;
- The Chinese customs seal is invalid in Russia, and Russian customs operates with its own separate container seal. Since the Chinese seal potentially might be broken in Russia, no forwarder can guarantee the safety of the cargo and issue a through B/L. This becomes problematic for shippers.

➢ Transport experiment by Tottori Prefecture

In order to promote the DBS Cruise Ferry, Tottori Prefecture is advancing the cultivation of China's Northeast market.

The shipping route is operated by the DBS Cruise Ferry Company (ROK). With a ship called "Eastern Dream", the ferry handles approximately 480 passengers, or around 130 TEU if converted to container freight. The ferry

Figure 3.1-2 International Transport Experiment Integrated Map

Source: Niigata Prefectural government

started running in July of 2009. The Sakaiminato Port-Donghae City (ROK)-Vladivostok route does one complete round trip each week. From the beginning it was expected that operating the ferry with enough passengers or cargo onboard would be difficult, so both the Japan side and the ROK side are finding ways to support this operating route. In Japan, Tottori Prefecture and the Council of Cities of the Nakaumi Area have cooperated by subsidizing the operating costs by 10%, an allowance of up to 1,500,000 yen per voyage. From its inception this program was planned for three years until June 2012. However, it was extended for another year and the necessary money has been appropriated into the FY 2012 budget.

From factors such as the stabilization of ferry operations and its punctuality, the reputation of its shipping company and the amount of cargo handled has gradually increased. The amount of cargo handled at Sakaiminato Port went from 4,320 tons in 2010 to 6,278 tons in 2011 (a 45% increase from the previous year). However, this amount only comprises 17.3% of the cargo weight travelling on this sea route, and as such is a small amount.

Peculiarly, the amount of cargo from Russia is small, so Tottori Prefecture anticipates cargo originating from the Northeast region of China. As part of this area, they conducted trial transport experiments utilizing wooden chopstick imports from Heilongjiang Province and exhibition imports/exports from Jilin Province. They used the transit transport route that connected Vladivostok Port with Suifenhe City. In addition to the 6,500,000 yen (1,300,000 yen x 5 trips) allocated in the 2012 budget for conducting these trials, they also created a subsidy system to support the continued use of these routes shortly after.

3.2 Infrastructure Development

From a practical point of view Japan does not have any completely missing links of transport, including international container transport, as shippers and carriers are able to find an appropriate port with proper access to the road network to reach not only major metropolitan areas but also rural towns across the country. A problem is time and the costs of transportation. As mentioned in the chapter on infrastructure review, MLIT continues to improve road access to major ports and to eliminate bottlenecks where fully-loaded containers and/or high-cube containers cannot pass. These efforts should result in the reduction of transport time and costs within Japan. Another problem is network redundancy in case of a natural disaster. In this regard MLIT promotes improvement measures, as mentioned in the chapter on infrastructure review.

With regard to railway transport, however, almost all Japanese ports lack direct rail access to wharfs. This is because railways have become less competitive than truck transport in recent decades in Japan and there is no strong need to have railway links to ports. As mentioned above, the share of railways in freight turnover (ton-km) occupies about 4% and its share is merely 1% in terms of freight tonnage. Only limited numbers of port-side large-scale factories working on imported raw materials still keep railway access in order to ship their products to the domestic market.

A limited number of ports, however, are located in proximity to railway freight stations, where international containers can be transported at rational costs between them. Among those are the ports of Kitakyushu and Hakata. Because of their geographical location midway between East Asia and the capital metropolitan area of Tokyo, costs and time for the short drayage can be compensated by the benefit of express freight trains, which run more than a thousand kilometers in about 20 hours to/from Tokyo. Thus, the intermodal transport service connecting the "Shanghai Super Express" and the JR container freight train is exploring a niche market that is less expensive than aviation transport and has faster delivery than conventional container ships.

While no Japanese port has direct rail access to its container terminals, Niigata prefectural government is studying the feasibility of extending a branch track into the container terminal at the Niigata East Port. The plan was approved by the National Transport Policy Council. Among challenges in its realization are the uncertainty of cargo owners' attitudes to the changes in transport mode and route from current motor transport to railways, the physical constraints of some tunnels which high-cube containers (height = 9.6ft) cannot go through, and the limited space and capacity of the terminal in the port itself.

Niigata port is expanding its container terminal. A new berth (L=250m, D=−12) will be put into operation at the end of June. It is expected to reduce container ships' berth wait time drastically, which happened a recorded 100 times in 2010. The handling capacity will become 224,000 TEU/year. Considering the growing container turnover, the terminal needs further expansion. The port authority is drafting a plan of reconstruction reclaiming a part of the waterways and converting an existing wharf to a specialized container wharf. It should be finalized within the Niigata government, which then needs an endorsement by the national Council for Ports and Harbours before its implementation.

Akita port just opened a new container terminal in April 2012. Its handling capacity is now 70,000 TEU/year. The terminal area is 11.3ha, with a berth 270m long (D=−13). There is a plan for a second stage development, expanding the capacity up to 100,000 TEU/year.

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GTI

日本と大図們江地域（GTR）との間の輸送インフラとサービスの現状と展望

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（要旨）

地理的に、日本は大図們江地域（GTR）からは海を隔てて離れており、国内にはGTR横断輸送回廊は通っていない。その意味では、日本との関係においてGTR回廊を検討する意味はあまりなさそうである。

しかしながら、GTRの港湾からの海上航路は、GTR輸送回廊にとって不可欠の延長部分であるという点に留意する必要がある。この海上ルートが有効に活用されない限りは、GTR輸送回廊に期待される機能が完全に発揮されることはない。その際、海上ルートの第一義的な目的地は日本及び韓国である。したがって、日本との接続は、GTR輸送回廊が発展していくためのカギを握っていることになる。

また、輸送回廊の整備、発展の影響は、GTR自体のみならず、日本にも及ぶ。とはいえ、その影響は地域・立場によって異なる。最も影響を受けるのは、日本海側の地方だ。今日、日本と中国東北部との間の海上貨物輸送の大部分は、太平洋側の主要港と渤海湾内の港湾との間で輸送されている。これに対して、日本海側の港湾では少量の貨物を扱っているに過ぎない。しかしながら、図們江輸送回廊や綏芬河輸送回廊の整備が進めば、この構造が変化することになろう。モンゴル東部や黒龍江省、吉林省と日本とがロシア沿海地方の港湾を経由して結ばれることになる。

こうした新たな物流ルートが構築されることにより、現在、太平洋側の港湾を利用して輸送されている貨物の一部が、日本海側の港湾経由にシフトする可能性がある。日本海側の各地では、こうした貨物のシフトを期待している。沿海地方の港湾から日本海側の港湾までは、大体900～1,000㎞程度であり、２日以内で航行することができる。

以上を踏まえ、日本では主に日本海側、GTR地域では主に中国東北部及びロシア沿海地方に重点を置きつつ、貨物量、ハード・ソフトのインフラの状況と制約、物流改善につながる取り組みなどを整理した。

貨物量の現状

日本と北東アジア諸国との間の海上輸送貨物量は、全体としては増加傾向を示してきているものの、国別、輸出入別には様々な要因による増減がある。主要港の仕向･仕出港別貨物量統計（2010年）に基づき、日本と遼寧省の港湾（大連、営口、丹東）との間の貨物量を推計したところ、日本からの輸出は250万トン、輸入は610万トンとの結果となった。

輸送能力（インフラ）

日本とロシア沿海地方の港湾との間のコンテナ輸送に関して、年間の輸送キャパシティを大雑把に試算したところ、40,000TEU以上あるとの結論になった。

本州の日本海側及び北部九州には、計13のコンテナ取扱港湾がある。このうち、比較的大規模なコンテナターミナルを持つのは、北九州港（９バース）、博多港（４バース）である。これに続くのは新潟港（３バース）であり、そのほかは１～２バースの専用ふ頭または多目的ふ頭を持つのみである。

ソフトインフラ

日本は島国であり、陸上での国際輸送に関わる条約（道路輸送のCMR条約、鉄道輸送のCOTIF条約）には加盟していない。海上輸送については、ヘーグ・ルールの改正議定書に対応している。ソ連時代に締結された日ソ海運協定のため、日ロ間の新規定期航路の開設が事実上閉ざされているとの指摘もある。また、北朝鮮に対する制裁として、輸出入禁止措置が取られている。

日本とロシア沿海地方との間のコンテナ航路の所要日数は、一般に１日～２週間弱程度である。ただし、釜山積替えサー

ビスの場合、釜山で大幅な遅れが発生することもある。運賃は、20フィートコンテナ１本あたり約700ドル～1,300ドル程度の範囲である。サービスにより、頻度、定時性などのサービスレベルに差がある。

主な制約事項

新潟～ザルビノルートの船がRORO船でないこと、日本と沿海地方との間の海上運賃が高いこと、日本国内の陸上輸送運賃が高いことなどが、GTR輸送回廊との間の海上輸送の増加を制約している。

GTR輸送回廊の物流改善につながる取組

日本政府は、日本海側拠点港を指定して、各港における拠点性を高める取り組みを支援することとしている。19港が拠点港（うち５港が総合的拠点港）に、４港が拠点化形成促進港に選定されている。

新潟県、鳥取県では、沿海地方港湾を経由した陸海複合一貫輸送を実施している。いずれもコンテナ輸送を中心に行った。今後、コストを下げていく必要があるなどの課題が指摘されている。

国内輸送インフラでは、港湾への道路、鉄道のアクセスを向上させるための事業が実施、検討されている。また、港湾におけるコンテナ取扱能力向上の取組も行われている。

北東アジア動向分析

中国

2012年の中国経済、8%割れも安定成長持続

国家統計局は２月22日、「2012年国民経済・社会発展統計公報」を発表した。それによれば、2012年の国内総生産（GDP）は前年比実質7.8％増の51兆9,322億元となった（表１）。四半期別のGDP成長率では、第１四半期が同8.1％増、第２四半期が同7.6％増、第３四半期が同7.4％増、第４四半期が同7.9％増となった。通年では13年ぶりに８％を割り込んだが、堅調で安定的な成長を持続している。GDPに占める第１次産業の割合が同10.1％、第２次産業が同45.3％、第３次産業が同44.6％となった。第３次産業の割合は持続的に増加しており、来年には第２次産業を上回る可能性がある。

2012年の全社会固定資産投資額は前年比20.3％増（実質伸び率は19.0％増）の37兆4,676億元となった。うち、固定資産投資額（農家除く）は同20.6％増の36兆4,835億元、農家による固定資産投資額は同8.3％増の9,841億元となった。農家の固定資産投資額の伸び率は同7.0ポイント下回った。固定資産投資額（農家除く）を産業別でみると、製造業は同22.0％増の12兆4,971億元、全体の34.3%を占めた。不動産業は同22.1％増の９兆2,357億元、全体の25.3%を占めた。製造業と不動産業の成長は固定資産投資の拡大を牽引した。

2012年の工業企業付加価値額は前年比7.9％増の19兆9,860億元となり、うち一定規模以上工業企業（年間売上高2,000万元以上）の付加価値増加率は同10.0％増となった。一定規模以上工業企業の付加価値増加率では、国有及び国有持株企業は同6.4％増、集団企業は同7.1％増、株式企業は同11.8％増、外資系企業は同6.3％増、私営企業は同14.6％増となり、全体で安定した増加率で推移している。

個人消費の動向を示す2012年の社会消費品小売総額は21兆307億元、前年比14.3％増（実質伸び率は12.1％増）となった。うち、小売業が18兆6,859億元（同14.4％増）、飲食業が２兆3,448億元（同13.6％増）となった。都市部の社会消費品小売総額は同14.3％増の18兆2,414億元、農村部は同14.5％増の２兆7,893億元となった。一定規模以上の小売業では、自動車関連の販売額は同7.3％増、金・銀・宝石類は同16.0％増、家具類は同27.0％増、建築及び内装材料類は同24.6％増となり、居住に関連する分野が伸びた。

2012年の消費者物価指数（CPI）上昇率は前年比プラス2.6％となり、中国政府が設定した目標（４％）より大きく下回った。製品別でみると、食品（同4.8％上昇）、タバコ・酒類（同2.9％上昇）、衣類（同3.1％上昇）、居住関連（同2.1％上昇）と全体で緩やかな上昇傾向が見られた。ただし、食品価格の上昇率が大きく、都市部では5.1％に達した。都市住民の生活は大きな影響を受けた。

2012年の貿易額は前年比6.2％増の３兆8,668億ドルとなった。輸出は同7.9％増の２兆489億ドル、輸入は同4.3％増の１兆8,178億ドル、輸出入とも増加率が鈍化した。貿易収支の黒字額は2,311億ドル、前年度より762億ドル増加した。外資導入状況については、2012年の新規認可件数（銀行・証券業除く）は前年比10.1％減の２万4,925件で、対中直接投資額（実行ベース）は同3.7％減の1,117億ドルだった。うち製造業は同6.2％減の488.7億ドル、不動産業は同10.3％減の241.2億ドルとなった。製造業と不動産業は対中直接投資額（実行ベース）の65.3％を占めた。

中国経済の安定成長への道のり

温家宝首相は３月５日に任期中最後の政府活動報告を行い、2013年の成長目標を公表した。GDP成長率が前年比7.5％前後、消費者物価指数（CPI）上昇率が同3.5％前後、都市部新規雇用者数が900万人以上、都市部登録失業率が4.6％以下とした。消費者物価指数上昇率の目標を2012年の４％から3.5％に引き下げたが、ほかの項目について去年同様の目標を設定した（表２）。

2012年には、GDPは7.5％増の目標に対して実際の成長率が7.8％となり、中国経済は安定成長に向けて進み始めた。固定資産投資、工業企業付加価値額、個人消費、貿易等の指標は、2011年と比べて増加率が低下したものの、堅調に推移している。特に、消費者物価指数の上昇率は2011年の5.4％から2012年の2.6％に下がり、物価上昇による国民生活への影響はある程度抑えられた。中国経済は、９～10％前後の高度成長から７～８％前後の安定成長に切り替えようとしている。

しかしながら、不安要因も数多く存在している。例えば、国際経済情勢の変化による貿易・外資導入への影響、過度な財政出動や金融緩和による急激な物価上昇、地方政府の債務リスク、国有企業の経営不振、沿海地域における産業構造の転換の遅れ等が挙げられる。中央政府は今後も難しい経済運営の舵取りを強いられる。

（ERINA調査研究部研究員　穆尭芋）

表１　中国のマクロ経済指標

	単位	2003年	2004年	2005年	2006年	2007年	2008年	2009年	2010年	2011年	2012年
実質GDP成長率	%	10.0	10.1	11.3	12.7	14.2	9.6	9.2	10.4	9.3	7.8
工業総生産伸び率（付加価値額）	%	17.0	16.7	16.4	16.6	18.5	12.9	11.0	15.7	10.7	7.9
固定資産投資伸び率	%	27.7	26.8	26.0	23.9	24.8	25.9	30.1	23.8	23.6	20.3
社会消費品小売総額伸び率	%	9.1	13.3	12.9	13.7	16.8	21.6	15.5	18.3	17.1	14.3
消費価格上昇率	%	1.2	3.9	1.8	1.5	4.8	5.9	▲ 0.7	3.3	5.4	2.6
輸出入収支	億ドル	255	321	1,020	1,775	2,618	2,981	1,961	1,831	1,551	2,311
輸出伸び率	%	34.6	35.4	28.4	27.2	25.7	17.5	▲ 16.0	31.3	20.3	7.9
輸入伸び率	%	39.8	36.0	17.6	19.9	20.8	18.5	▲ 11.2	38.7	24.9	4.3
直接投資額伸び率（実行ベース）	%	1.4	13.3	▲ 0.5	4.5	18.6	23.6	▲ 2.6	17.4	9.7	▲ 3.7
外貨準備高	億ドル	4,033	6,099	8,189	10,663	15,282	19,460	23,992	28,473	31,811	33,116

（注）
・前年比。
・工業総生産伸び率は国有企業及び年間売上高500万元以上の非国有企業の合計のみ。2011年からは年間売上高2,000万元以上の企業の合計である。
・2011年から、固定資産投資額の統計対象は計画投資額が50万元以上から500万元以上に引き上げた。また、都市部と農村部を統合し、「固定資産投資（農家除く）」として統計している。農家の固定資産投資については別途集計している。
・外貨準備高は各年末の数値。
・2006年以降の直接投資には、銀行・証券業を除く。
・2009年の実質GDP成長率は、中国国家統計局が2011年1月10日に発表した数値。2010年の実質GDP成長率は、中国国家統計局が 2011年9月7日に発表した数値。2011年の実質GDP成長率は、中国国家統計局が2012年9月5日に発表した数値。
（出所）中国国家統計局の資料より作成

表２　近年中国政府が掲げた主要な経済目標と達成状況

年度	国務院政府活動報告公表期日	GDP成長率（%）		消費者物価指数(CPI)上昇率(%)		都市部新規雇用者数（万人）		都市部登録失業率（%）	
		目標	実績	目標	実績	目標	実績	目標	実績
2002	2002年3月5日	−	9.1	−	▲ 0.8	−	840	−	4.0
2003	2003年3月5日	7	10.0	−	1.2	−	859	−	4.3
2004	2004年3月5日	7	10.1	−	3.9	900	980	−	4.2
2005	2005年3月5日	8	11.3	4	1.8	900	970	4.6	4.2
2006	2006年3月5日	8	12.7	3	1.5	900	1,184	4.6	4.1
2007	2007年3月5日	8	14.2	3	4.8	900	1,204	4.6	4.0
2008	2008年3月5日	8	9.6	4.8	5.9	1,000	1,113	4.5	4.2
2009	2009年3月5日	8	9.2	4	▲ 0.7	900	1,102	4.6	4.3
2010	2010年3月5日	8	10.4	3	3.3	900	1,168	4.6	4.1
2011	2011年3月5日	8	9.2	4	5.4	900	1,221	4.6	4.1
2012	2012年3月5日	7.5	7.8	4	2.6	900	1,266	4.6	4.1
2013	2013年3月5日	7.5	−	3.5	−	900	−	4.6	−

（注）国務院政府活動報告各年版、国民経済・社会発展統計公報各年版に基づき、筆者作成。
GDP成長率の実績は国家統計局の各種公表資料に基づき、確定値・修正値を使用している。

ロシア

成長の勢いは弱まる

2012年の実質GDP成長率（１次速報）は前年比3.4％となり、過去２年間の成長率を下回って、減速傾向が明らかになってきた。ロシア経済のけん引力であるエネルギー資源輸出の伸びが小さくなっていることが大きな要因と思われる。

2012年のロシアの輸出総額（税関統計ベース）は、5,247億ルーブルで、対前年比1.6％増の微増にとどまった。エネルギー資源に大きく依存した輸出構造は変わらず、主な輸出品目は原油（輸出総額の34.5％）、石油製品（同19.7％）、天然ガス（同12.0％）などである。これに石炭、電力などを加えたエネルギー類全体で、70.4％を占めた。この中で、原油、天然ガスの輸出額は減少した。いずれも輸出量が減少したことが要因である。例えば、ロシア原油の指標価格であるUralsの2012年の平均価格は１バレル110.5ドルで、前年（109.3ドル）をわずかに上回ったのに対して、輸出量は1.8％減少したため、結果として輸出額が0.5％減少した。天然ガスの減少幅はより大きく、輸出量で4.3％、輸出額で1.8％、それぞれ減少した。主として西欧向けの天然ガス輸出が減少した。欧州経済が不安定であったことに加えて、欧州が供給源の多様化を図ったことも影響している。

外需の力が弱い中、内需の役割が相対的に大きくなっている。しかしながら、小売売上高や固定資本投資はともに、前年よりも成長率を下げており、盤石ではない。リーマンショック以前の消費ブームのような状況とは様相が異なっている。また、ロシア中央銀行が９月に政策金利を0.25％引き上げて8.25％にしたことが、投資意欲を冷やした面もある。さらに、農業生産面では、前年が著しい豊作であったことの反動も現れた。こうしたことから、経済成長率は年後半に減速した。

複雑化する天然ガス輸出をめぐる状況

2013年２月13日、プーチン大統領が出席して、「エネルギー産業の発展と環境保全に関する委員会」が開催された。席上、プーチン大統領は、現在はガスプロム社が独占している天然ガス輸出のうち、液化天然ガス（LNG）輸出を段階的に自由化することを検討するよう述べた。また、ロスネフチ社のセーチン会長は、サハリンや北極海での天然ガスを輸出することを念頭に置いていることを発言した。

ロスネフチは、子会社を通じて、サハリン１プロジェクトに参加している。同プロジェクトには、日本のSODECO、アメリカのエクソンモービル、インドのONGCも参加しているが、天然ガスの輸出は実現していない。かつては、北海道経由で本州までのパイプライン建設が検討されたり、その後大陸経由で中国へのパイプライン輸出なども検討されたりしたが、いずれも実現していない。現在では、サハリン～ハバロフスク～ウラジオストクパイプラインを通じて、国内供給がなされているのみである。

最近では、SODECOを構成する伊藤忠商事や石油資源開発などがガスプロムと共同で、ウラジオストクLNG基地の共同FSを実施する動きもあった。このプロジェクトが実現すれば、サハリン１の天然ガスがウラジオストクからLNGで輸出されるものと想定されていたが、上記のセーチン氏の発言からすれば、ロスネフチが主導して別途LNG輸出を行う可能性も出てきたと言える。同じ２月13日には、ロスネフチとエクソンモービルがLNGプロジェクトの実現可能性について共同で検討することなども含めた覚書を交わした。

サハリン州行政府は、プリゴロドノエにあるLNG基地の拡張を要請している。さらには、パイプライン方式が最も経済的だとの意見は日本国内にも根強くあり、天然ガスを誰がどのような形で輸出するのかを巡る状況は複雑化してきている。

欧州でのエネルギー供給源多様化という構造変化が進む中、欧州景気が回復しても、欧州向けの輸出量が伸びていくかは予断を許さない。勢い、アジア向けの輸出に力が入る。状況は複雑化しているが、ロシア側各社が競って売り込みをかけてくるような状況は、日本にとって有利な条件を引き出すための好環境とも言える。

（ERINA調査研究部主任研究員　新井洋史）

（対前年同期比）

	2006	2007	2008	2009	2010	2011	2012	2012							2013
								1Q	2Q	3Q	4Q	10月	11月	12月	1月
実質GDP	8.2	8.5	5.2	▲ 7.8	4.3	4.3	*3.4*	4.9	4.0	2.9	—	—	—	—	—
固定資本投資	16.7	22.7	9.9	▲ 16.2	6.0	8.3	*6.7*	16.6	10.2	7.3	*1.3*	*4.9*	*1.2*	▲ *0.7*	—
鉱工業生産高	6.3	6.8	0.6	▲ 9.3	8.2	4.7	2.6	4.0	2.3	2.5	1.7	1.8	1.9	1.4	▲ 0.8
小売売上高	14.1	16.1	13.5	▲ 4.9	6.3	7.0	5.9	7.6	7.0	4.8	4.5	4.0	4.4	5.0	3.5
実質可処分所得	13.5	12.1	2.3	2.1	4.2	*0.8*	*4.2*	*1.6*	*4.1*	*4.6*	*5.6*	*3.4*	*7.8*	*5.6*	*0.7*
消費者物価*	9.0	11.9	13.3	8.8	8.8	6.1	6.6	1.5	3.2	5.2	6.6	5.6	6.0	6.6	1.0
工業生産者物価*	10.4	25.1	▲7.0	13.9	16.7	12.0	5.1	3.0	0.4	9.4	5.1	7.6	6.3	5.1	▲ 0.4
輸出額（十億ドル）**	301.2	351.9	467.6	301.8	397.1	516.7	524.7	131.5	129.9	125.0	138.4	46.2	45.1	47.1	—
輸入額（十億ドル）**	137.8	199.7	267.1	167.5	228.9	305.8	312.6	68.5	76.8	81.4	85.9	29.8	27.8	28.3	—

*前年12月比。
**税関統計ベース。
***斜体は暫定（推計）値。
出所：『ロシアの社会経済情勢（2013年１月号）』ほか、ロシア連邦国家統計庁発行統計資料

モンゴル

モンゴル経済の成長のペースは2012年に入り鈍化した。しかし、世界で最も成長率の高いグループに属していることに変わりはない。全ての経済活動､特にサービス部門は、前年よりも拡大している。登録失業者数は減少している。インフレ率は引き続き前年比二桁の上昇であった。拡張的財政政策の結果、国家財政収支の赤字は拡大し、対外債務も増加した。貿易収支の赤字も史上最大を記録した。

マクロ経済指標

2012年後半の経済成長の低下により、2012年の経済成長率は12.3％となり、2011年の17.5％から低下した。各四半期の成長率は前年同期比で、第１四半期14.6％、第２四半期14.4％、第３四半期10.5％、第４四半期10.6％となった。この動きは部門別では、主に建設業と、小売・卸、金融、宿泊・飲食などのサービス部門の成長率の低下によるものである。需要項目別に見ると最終消費は前年を上回る伸びを記録したが、固定資本形成の伸びが前年を大きく下回った。固定資本形成の伸びは2011年に70％であったが、2012年には24％に低下した。

2012年の鉱工業生産額は前年比7.2％増となったが、過去３年間では最低であった。2012年の鉱業の生産額は前年比7.3増％、製造業は8.1増％、公益事業（電力・熱供給・水道）は4.3％増であった。鉱業品の生産高は、石炭とモリブデンを除いて前年を上回った。牛馬肉製品､カシミア、羊毛･羊皮製品を除く、主要製造業品の生産額は増加した。2013年１月の鉱工業生産額は、食品、軽工業、金属の生産増加によって、前年同期比16.1％と拡大した。

2012年末の登録失業者数は35,776人で、７か月連続の減少を記録している。登録失業者の62.2％は15～34歳であった。

労働省によれば、2012年に54,695人分の雇用機会が新たに創出された。2012年には61,500人が新たに登録失業者となり、35,300人が就職し、また10,600人が不活発な求職活動によって登録から外れている。

2012年の消費者物価上昇率は前年比14.3％で、引き続き二桁の水準にある。消費者物価指数を部門別に見ると、通信・郵便サービスを除く全ての部門において前年比で上昇している。消費者物価指数の構成品目の29.3％を占める食品・非アルコール飲料は前年比17.5％上昇した。最も上昇率が高かったのは、タバコ・アルコール飲料の54.4％で、レストラン・ホテル・寮サービスが23％で次いでいる。

2012年の平均対米ドル為替レートは１ドル＝1,359トゥグルグで、前年同期から9.2％減価した。しかし実質ベースでは5.1％増価している。

拡張的財政政策により、2012年の国家財政収支は１兆1,630億トゥグルグの赤字となった。これはGDPの8.3％に相当する。資本支出は増加し、その財政に占めるシェアは前年の19.6％から23.0％に拡大した。また2012年には政府の対外債務に関わる金利支払いが､前年の3.4倍に拡大した。

外国貿易

大規模鉱山開発などに使用される機械設備の輸入の増大により、2012年の貿易収支は24億ドルの赤字となった。2012年の輸出は前年比5.5％、金額にして44億ドル減少し、輸入は同2.1％、金額にして65億ドル増加した。輸出減少の主な原因は、石炭及び銅精鉱の輸出が、数量及び価格の両面で低下したことである。全輸出に占める鉱業品の割合は、2011年の90％から2012年には91％に上昇した。

通貨及び金融

2012年末の貨幣供給量（M2）は7.6兆トゥグルグで、前年同期を18.8％上回った。内訳は国内通貨貯蓄預金が45.8％、外貨貯蓄預金が18.8％、国内通貨要求払い預金が16.2％、外貨要求払い預金が11.3％、現金が7.9％であった。

2012年末において融資残高は７兆トゥグルグで、前年同期を23.9％上回った。不良債権額は融資全体の4.2％であり、経済活動の改善を受けて前年同期の5.8％から低下している。

（ERINA調査研究部主任研究員　Sh. エンクバヤル）

	2009年	2010年	2011年	2012年	2012年1Q	2012年2Q	2012年3Q	2012年4Q	2012年12月	2013年1月
実質GDP成長率（対前年同期比：%）	▲ 1.3	6.4	17.5	12.3	14.6	14.4	10.5	10.6	−	−
鉱工業生産額（対前年同期比：%）	▲ 3.3	10.0	9.7	7.2	8.9	8.6	2.2	9.2	6.9	16.1
消費者物価上昇率(対前年同期比：%)	4.2	13.0	10.2	14.3	12.6	15.4	14.7	14.5	14.0	13.0
登録失業者(千人)	38.1	38.3	57.2	35.8	50.1	47.5	44.1	35.8	35.8	37.2
対ドル為替レート（トゥグルグ）	1,437	1,356	1,244	1,359	1,356	1,320	1,368	1,393	1,396	1,393
貿易収支（百万USドル）	▲ 229	▲ 292	▲ 1,747	19	▲ 580	▲ 480	▲ 954	19	19	20
輸出(百万USドル)	1,885	2,909	4,780	24	878	1,375	979	24	24	27
輸入(百万USドル)	2,138	3,200	6,527	4	1,458	1,855	1,933	4	4	4
国家財政収支(十億トゥグルグ)	▲ 329	2	▲ 632	▲ 2,354	▲ 56	▲ 519	17	▲ 340	▲ 115	▲ 217
国内貨物輸送（百万トンキロ）	8,981	12,125	16,337	4,385	3,533	4,004	4,115	1,153	355	282
国内鉄道貨物輸送（百万トンキロ）	7,817	10,287	11,382	6,739	2,995	3,055	3,045	1,493	470	498
成畜死亡数（千頭）	1,733	10,320	651	▲ 1,163	258	248	22	▲ 605	▲ 456	▲ 79

（注）消費者物価上昇率、登録失業者数は期末値、為替レートは期中平均値。
（出所）モンゴル国家統計局『モンゴル統計年鑑』、『モンゴル統計月報』各号 ほか

韓国

マクロ経済動向と展望

韓国銀行（中央銀行）が１月24日に公表した2012年の実質GDPの成長率は2.0％で、前年の3.6％を下回り、リーマン・ショック直後の2009年以来の低成長となった。需要項目別に見ると内需では、最終消費支出は2.2％で前年と同じであった。固定資本形成は▲1.3％で前年の▲1.1％から低下し、その内訳では設備投資が▲1.8％で、前年の3.7％からマイナスに転じている。また、外需の財・サービスの輸出は3.7％で、前年の9.5％から大きく低下した。

2012年第４四半期の成長率は、季節調整値で前期比0.4％（年率換算1.6％）で前期の同0.1％から上昇した。需要項目別に見ると内需では、最終消費支出は同0.4％で前期の0.7％から低下した。固定資本形成は同▲2.0％で前期の▲1.7％から低下している。また、外需の財・サービスの輸出は3.7％で、前年の9.5％から大きく低下した。

2012年の鉱工業生産指数は▲1.3％と前年に続きマイナスとなった。2012年第４四半期の伸び率は、季節調整値で前期比▲2.9％で、前期の同▲2.2％からさらに低下した。月次では、2012年12月は前期比1.6％であったが、2013年１月は同▲1.5％となっている。

2012年の失業率は、3.2％で前年の3.4％からは低下している。

2012年の貿易収支（IMF方式）は、38.3億ドルの黒字で、前年の31.7億ドルを上回っている。

2012年の対ドル為替レートは１ドル＝1,127ウォンで、前年の同1,108ウォンからは若干減価している。月次では、2012年12月は同1,078ウォン、2013年１月は同1,067ウォン、２月は同1,086ウォンと年前半とウォン高で推移している。

2012年の消費者物価上昇率は2.2％で、前年の4.0％から低下している。また、2012年の生産者物価上昇率は0.7％で、前年の6.7％から大幅に低下した。

韓国銀行は１月11日に経済見通しを発表し、2013年の成長率を2.8％と予測している。これは昨年10月に発表した3.2％を0.4ポイント下回る数字である。2013年の成長率を需要項目別に見ると、内需は民間消費が2.8％、設備投資が2.7％、建設投資は2.5％となっている。外需である輸出は5.5％としている。また、消費者物価上昇率は2.5％としている。失業率は3.3％とほぼ横ばいとしているが、雇用者数の増加は今年の44万人から、30万人に減少するとしている。2012年に続き２％台の成長に止まるという見通しは、４％程度と見られる韓国の潜在成長率を下回り、深刻な経済状況が長期化することとなる。

朴槿恵政権の発足と組閣の難航

２月25日に朴槿恵氏が大統領に就任した。韓国史上初の女性大統領である。また故朴正熙大統領を父に持ち、やはり史上初めて親子二代で大統領を務めることとなる。

しかし新政権は発足早々に、人事問題で立ち往生している。政権発足翌日の２月26日に、検事出身の鄭烘原首相が国会の同意を得て任命されたが、その他の閣僚は現時点（３月７日）においても任命されていない。この主な原因は新政権の構想に合わせて政府組織を改編する、政府組織法の改正が実現していないためである。

一例として、新政権は新たな経済成長を目指す目玉として、科学技術政策と情報通信分野を一元的に担う未来創造科学部の新設を予定していた。しかし、放送分野に対する規制機能をこれまでの放送通信委員会から移管することについて、放送の公平性の維持など点で、野党から強い反対が出されている。同部の長官に予定されていたITベンチャー企業家の金鐘勲氏は、任命の見通しが立たないため就任を辞退するという事態に至っている。

経済政策分野に関連する組織改編ではこの他に、経済政策担当の副首相ポストの復活が予定されている。副首相は企画財政部長官（日本の財務大臣に相当）が兼任し、新たに設けられる経済関係長官会議を主催する。新設の未来科学部長官もこの会議のメンバーとなることが予定されている。副首相には政府系シンクタンク、韓国開発研究院（KDI）院長で経済学者の玄旿錫氏が候補として指名されているが、他の人事同様、凍結状態となっており、新たな経済政策を担う司令塔の稼働は不透明な状況にある。

（ERINA調査研究部主任研究員　中島朋義）

	2008年	2009年	2010年	2011年	2012年	12年1-3月	4-6月	7-9月	10-12月	12年12月	13年1月	2月
実質国内総生産（%）	2.3	0.3	6.3	3.6	2.0	0.9	0.3	0.1	0.4	—	—	—
最終消費支出（%）	2.0	1.2	4.1	2.2	2.2	1.5	0.2	0.7	0.4	—	—	—
固定資本形成（%）	▲ 1.9	▲ 1.0	5.8	▲ 1.1	▲ 1.3	3.2	▲ 2.9	▲ 1.7	▲ 2.0	—	—	—
鉱工業生産指数（%）	3.4	▲ 0.1	19.5	5.9	0.8	2.2	▲ 0.1	▲ 2.2	▲ 2.9	1.6	▲ 1.5	—
失業率（%）	3.2	3.6	3.7	3.4	3.2	3.5	3.3	3.1	3.0	3.0	3.2	—
貿易収支（百万USドル）	5,170	37,866	40,083	31,660	38,338	2,612	8,521	13,341	13,864	1,917	2,597	—
輸出（百万USドル）	422,007	363,534	466,384	555,214	547,870	134,846	140,130	133,125	139,768	44,875	45,681	—
輸入（百万USドル）	435,275	323,085	425,212	524,413	519,584	133,671	130,431	125,652	129,831	43,069	45,205	—
為替レート（ウォン/USドル）	1,103	1,276	1,156	1,108	1,127	1,131	1,152	1,133	1,090	1,076	1,067	1,086
生産者物価（%）	8.5	▲ 0.2	3.8	6.7	0.7	2.9	0.9	▲ 0.2	▲ 0.9	▲ 1.2	▲ 1.6	—
消費者物価（%）	4.7	2.8	3.0	4.0	2.2	3.0	2.4	1.6	1.7	1.4	1.5	1.4
株価指数（1980.1.4：100）	1,124	1,683	2,051	1,826	1,997	2,014	1,854	1,996	1,997	1,997	1,962	2,026

（注）国内総生産、最終消費支出、固定資本形成、鉱工業生産指数は前期比伸び率、生産者物価、消費者物価は前年同期比伸び率、株価指数は期末値
国内総生産、最終消費支出、固定資本形成、鉱工業生産指数、失業率は季節調整値
国内総生産、最終消費支出、固定資本形成、生産者物価は2005年基準、消費者物価は2010年基準
貿易収支はIMF方式、輸出入は通関ベース
（出所）韓国銀行、統計庁他

朝鮮民主主義人民共和国（北朝鮮）

内閣拡大会議開催

2012年１月19日発『朝鮮中央通信』によると、同日付政府機関紙『民主朝鮮』が内閣拡大会議を報じたと報道した。会議には、崔永林総理をはじめ内閣メンバーが参加した。オブザーバーとして、内閣直属機関の幹部と管理局長、道、市、郡人民委員会委員長、道農村経理委員会委員長、道地区計画委員会委員長、道食料日用工業管理局局長、重要工場、企業所の支配人が参加した。

同会議では、昨年の人民経済計画遂行状況が総括され、金正恩第１書記が新年の辞で提示した課題を貫徹するための対策について討議され、また石炭工業と金属工業を掌握し、人民経済の先行部門（石炭、電力、金属工業、鉄道運輸）と基礎工業部門を盛り立て、すでに築かれた経済的土台に依拠して生産と建設で飛躍をもたらすことで、経済強国建設と人民生活の向上において転換的局面を開いていくことが、今年の内閣の中心課題であると指摘し、その実行のための課題と方途が提示された、と報じられている。

朝鮮労働党第４回細胞書記大会が平壌で開催

2013年１月28～29日、平壌で朝鮮労働党第４回細胞書記大会が開催された。金正恩第１書記が開会の辞と２日目に演説を行った。2013年１月31日付『朝鮮新報』は「大会では、新たな時代のニーズと情勢に合わせて、党の末端機関である党細胞の機能と役割を高め、全党を強化し、軍と人民を強盛国家建設へ動員する上での問題が討議された」と報じている。

熙川発電所第２段階着工式開催

2013年１月30日発『朝鮮中央通信』によれば、同日、熙川発電所第２段階の着工式が平安北道香山郡で行われた。着工式には崔永林総理、朝鮮労働党の金己男書記、郭範基部長、盧斗哲内閣副総理兼国家計画委員会委員長をはじめとする中央と地方の幹部、建設に動員された幹部と建設者、香山郡内の勤労者が参加した。

同工事は故金正日総書記の遺勲であり、金正恩第１書記が推進する「崇高な大自然改造事業」であると位置づけられている。

南北経済協力の動向

⑴南北交易額

韓国・統一省が2012年の南北交易額を発表した。南北関係の悪化を受けて、委託加工貿易はゼロ、一般貿易も微々たる金額となり、南北交易がほとんど開城工業地区との取引となった。表１のとおり、2012年の南北交易は、19億7,110万ドル（約1,833億円）となり、金額的には11年より増加し、単年度では過去最高となった。

⑵人的交流

観光を除く南北間の往来を見ると、表２のとおり、南から北への訪問が12万360人北から南への訪問はゼロであった。11年と比較すると４％弱増加した。

（ERINA調査研究部長・主任研究員　三村光弘）

（表１）1989～2012年の南北交易統計

（単位：1,000米ドル）

年度	搬入			搬出			合計
	計	うち委託加工	うち開城工業団地	計	うち委託加工	うち開城工業団地	
1989	18,655	0	0	69	0	0	18,724
1990	12,278	0	0	1,188	0	0	13,466
1991	105,719	0	0	5,547	0	0	111,266
1992	162,863	638	0	10,563	200	0	173,426
1993	178,167	2,985	0	8,425	4,023	0	186,592
1994	176,298	14,321	0	18,249	11,343	0	194,547
1995	222,855	21,174	0	64,436	24,718	0	287,291
1996	182,400	36,238	0	69,639	38,164	0	252,039
1997	193,069	42,894	0	115,270	36,175	0	308,339
1998	92,264	41,371	0	129,679	29,617	0	221,943
1999	121,604	53,736	0	211,832	45,883	0	333,437
2000	152,373	71,966	0	272,775	57,224	0	425,148
2001	176,170	72,579	0	226,787	52,345	0	402,957
2002	271,575	102,789	0	370,155	68,388	0	641,730
2003	289,252	111,639	0	434,965	73,370	0	724,217
2004	258,039	107,746	52	439,001	68,213	41,634	697,040
2005	340,281	131,226	19,794	715,472	78,503	156,943	1,055,754
2006	519,539	159,387	75,943	830,200	93,571	222,853	1,349,739
2007	765,346	204,519	101,179	1,032,550	125,393	339,498	1,797,896
2008	932,250	257,345	290,103	888,117	150,965	518,342	1,820,366
2009	934,251	254,044	417,935	744,830	155,670	522,617	1,679,082
2010	1,043,928	222,505	705,268	868,321	95,054	737,588	1,912,249
2011	913,663	3,704	908,935	800,192	0	788,698	1,713,855
2012	1,073,952	0	1,073,128	897,153	0	892,976	1,971,105

（出所）韓国・統一省『南北交流協力動向』2012年１～12月号

（表２）2006～12年の南北間の人的交流統計（観光を除く）

（単位：人）

年	南→北	北→南	合計
2006	100,838	870	101,708
2007	158,170	1,044	159,214
2008	186,443	332	186,775
2009	120,616	246	120,862
2010	130,119	132	130,251
2011	116,047	14	116,061
2012	120,360	0	120,360
累計	932,593	2,638	935,231

（出所）韓国・統一省『南北交流協力動向』2012年12月号

研究所だより

職員の異動

＜採用＞

平成25年４月１日付

総務部総務課事務員　谷朝子

平成25年４月11日付

経済交流部部長代理　酒見健之

理事会の開催

平成25年３月27日㈬　新潟万代島ビルディング

セミナーの開催

▽平成24年度第５回賛助会セミナー

平成25年３月１日㈮　朱鷺メッセ中会議室

「ロシアにおけるトヨタ―リーマンショック、その後」

【講師】

株式会社国際経済研究所取締役・理事・主席研究員

トヨタ自動車株式会社 海外渉外部主査

西谷公明氏

▽中国ビジネス特別セミナー

平成25年３月８日㈮　ホテルオークラ新潟

主催：ERINA、ジェトロ新潟

共催：新潟県、新潟市、新潟県日中友好協会

〈プログラム〉

第１部

丹羽宇一郎前中国大使講演会

「経済人として見る日中関係の過去・現在・未来」

講師：丹羽宇一郎氏

第２部

ERINA「中国に進出した県内企業の最近の動向調査」報告

講師：ERINA経済交流部長　佐藤尚

▽2013 ERINA Policy Proposal Seminar

「北東アジア新時代」への道のり

平成25年４月10日㈬　都道府県会館会議室

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イベントの開催

▽2013北東アジア経済発展国際会議イン新潟

平成25年３月18日㈪～19日㈫

会　場：朱鷺メッセ

主　催：北東アジア経済発展国際会議実行委員会

（新潟県、新潟市、ERINA）

参加者：のべ250名

６カ国（中国、日本、モンゴル、韓国、ロシア、米国）

▽2013北東アジア経済発展国際会議イン新潟関連行事

貿易・産業協力振興財団助成事業

「図們江輸送回廊・綏芬河輸送回廊の新商流」

平成25年３月18日㈪

会　場：朱鷺メッセ 中会議室

編　集　後　記

北東アジア各地への出張の際に、インチョン空港で乗り継ぐことが多い。たまに乗継時間が短くて汗をかくことがある。ある時、前の便が遅れて、新潟への帰国便に駆け込んだことがあった。席に座ってひとまず汗をぬぐったのだが、新潟空港に着いた時に問題が発覚した。預けた荷物がインチョンに残っているとのことだった。

ヒトとモノの自由な移動を目指して、長年、北東アジアの輸送問題を取り上げてきたが、体感的にはヒトの移動に比べてモノの改善は歩みが遅いように思う。自分で走ることができ、時には怒りの声を上げるヒトと、足もなく口もないモノとの違いだろう。

モノの「声」を代弁することを続けていきたい。（A）

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（お願い）

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