

The Belt and Road and China Railway Express

Ruijiong Gao

Abstract—The Belt and Road is a national top-level Cooperation Initiative initiated by China and an initiative called for by the United Nations. China Railway Express is a project based on the Silk Road in ancient China and an important part of The Belt and Road construction. Nowadays, with the characteristics of fast transportation, low freight and high transportation safety, it has become an important way to connect the transportation and trade between China and European countries. The economic and trade relations between China and European countries are one of the most dynamic economic and trade relations in the world. With the deepening of global economy, opportunities and crises coexist. Deepening the construction of China Railway Express is of great significance to stabilizing and deepening Eurasian regional cooperation. This paper discusses the development process, development status, construction achievements, construction significance and existing problems of China Railway Express, and puts forward some suggestions on the development of China Railway Express in The Belt and Road in the future.

Index Terms—China railway express, strategy, the belt and road, the silk road.

I. INTRODUCTION

More than 2000 years ago, Zhang Qian of the Han Dynasty first opened the Silk Road, which is an economic and trade bridge connecting ancient China and Western countries. Although it has undergone several dynasty changes, its role has never stopped. At present, China's economic recovery is strong, but the problems of excess resources and resource imbalance are becoming increasingly prominent. Therefore, China needs to carry out more in-depth cooperation with other countries.

Asia and Europe belong to the same continent. Among the whole Asian and European continent, the strength of East Asian economic circle and European economic circle is the strongest. As one of the most important parts of The Belt and Road(B&R), China Railway Express (CR Express) plays a great role in maintaining and developing the economy of the whole continent. It is urgent to overcome the existing problems and pave the way for future development.

Li pointed out that in the early stage of the construction of CR Express, there was often a shortage of goods, which triggered serious malicious competition. Various regions compete with each other for supply, and merchants fight price wars one after another. Li proposed to integrate CR Express. Specifically, the government should play a guiding role in guiding the market to quickly enter a benign state of development, so as to reduce the impact of uneven resources; The General Administration of customs and China Railway

Corporation should jointly issue policies to standardize transportation prices and conditions, so as to eliminate the emergence of "price war" [1]. Chen & Shi pointed out that the freight cost of CR Express is difficult to control. European countries have a large demand for Chinese products and a large number of containers sent to Europe. However, China's insufficient demand for return freight and the European Union's implementation of a policy higher than China's railway freight rate lead to a high empty container rate caused by a large number of return empty containers. It is proposed to improve the service system and coordination mechanism of countries along the B&R and establish industrial strategic alliance, so as to enhance the ability to deal with risks and improve the level of marketization [2]. Wang pointed out the problems in CR Express: 1) the tight transport capacity of international railway transport channels and ports affects the transport efficiency. 2) Vague market positioning. 3) Logistics services are not fully market-oriented [3]. Liu pointed out that the transportation of CR Express in sections outside China is undertaken by railway companies of various countries, resulting in huge differences in service quality. China's ability to control logistics nodes along overseas road sections is insufficient and lacks comprehensive cost control ability. Put forward suggestions on strengthening the layout of important logistics nodes outside China, centralized management of CR Express, strengthening the construction of railway facilities and equipment, expanding the transportation area and types of goods [4]. By analyzing the waybill applicable to CR express, sun pointed out that it is difficult to fill in the waybill due to different formats; The waybill cannot be used as a document of title and cannot be used for L / C settlement, which cannot fully protect the rights and interests of merchants and customers, and cannot clarify the subject of transportation responsibility. Put forward the suggestion of using multimodal transport bill of lading [5].

Li made suggestions on the construction of CR Express: 1) Expand the Eurasian return market to expand the variety of CR Express freight products. 2) Optimize the market and functional positioning of CR Express, and increase the publicity of CR Express. 3) Strengthen transnational railway cooperation and improve service quality. 4) Deepen the cooperation between countries, governments and enterprises, and accelerate the technology construction process of CR Express [6]. Chi proposed three development goals for CR Express: 1) Promote the growth of regional shipments and trade volume. 2) Promote the development of regional logistics and other related industries. 3) Build a regional import and export processing and manufacturing base [7].

Taking The Silk Road, B&R as the background and CR Express as the main research object, this paper explores its essence, past and current situation, and discusses how CR Express should develop better.

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Ruijiong Gao is with Yuci Longhu School, Jinzhong, Shanxi 030600, China (e-mail: 2794271605@qq.com).

II. THE SILK ROAD AND THE BELT AND ROAD

A. Introduction of the Silk Road and the Belt and Road

The Silk Road is essentially a commercial road connecting ancient China and the West. With the development of the times, the silk road has become the general name of all political, economic and cultural exchanges between ancient China and the West. The Silk Road on land originated in the Western Han Dynasty (202 BC-8 AD). Starting from Chang'an (now Xi'an City, Shaanxi Province), it extends from Gansu, Xinjiang and other places to central and West Asia, connects Mediterranean countries and ends in Rome, with a total length of 6440 km. The Silk Road on sea was formed in the Qin and Han Dynasties, developed from the Three Kingdoms to the Sui Dynasty, and flourished in the Tang, Song, Yuan and Ming Dynasties. It is mainly centered on the South China Sea, also known as the Silk Road on South China Sea. It is the oldest known maritime route [8].

The Belt and Road (the Silk Road Economic Belt and the 21st century Maritime Silk Road) (B&R) is a national top-level Cooperation Initiative, which aims to borrow the historical symbol of the Silk Road, take peaceful development as the foundation, and actively build a community of interests, destiny and responsibility with countries along the line with political mutual trust, economic integration and cultural tolerance: On September 7, 2013, President Xi Jinping of the People's Republic of China delivered a speech at Nazarbayev University in Kazakhstan, proposing the strategic concept of building the Silk Road Economic Belt; When visiting the Association of Southeast Asian Nations-ASEAN in October of the same year, he proposed the strategic concept of building the 21st-Century Maritime Silk Road [9].

TABLE I: CONSTRUCTION ACHIEVEMENT

Time	Program
2013	China-Pakistan Economic Corridor
2015	Eurasian Economic Union
2015	The Asian Infrastructure Investment Bank
2016	China-Laos Railway
2016	Addis Ababa-Djibouti Railway
2017	Mombasa-Nairobi Standard Gauge Railway
2018	Karot Hydropower Station
2021	Jakarta-Bandung High-speed Railway

B. Significance of the Silk Road and the Belt and Road

The Silk Road spirit of "peaceful cooperation, openness and inclusiveness, mutual learning, mutual benefit and win-win" is a historical wealth shared by mankind. With the deepening of world economic globalization and the coexistence of opportunities and crises, China has the largest foreign exchange reserves and seeks to work with countries around the world to meet economic challenges for mutual benefit and win-win results.

Relying on the Silk Road, B&R adheres to the principles of joint consultation, co construction and sharing: Based on the

basic principles of international relations of equality, mutual benefit and mutual respect and guided by openness, countries and regions integrate their advantages in production capacity, technology, capital and experience, and strengthen cooperation not limited to infrastructure, economic cooperation, people to people and cultural cooperation and environmental cooperation. Build all-round and multi-level cooperation to promote the healthy flow of resources and the healthy development of the market. Committed to building a more equal and balanced new partnership for global development; Committed to safeguarding the world free trade system and an open world economy; Committed to building a community with a shared future for mankind; Committed to laying a solid foundation for the long-term and stable development of the world economy [10], [11]. It has brought new ideas, new paths and new directions to international cooperation in the 21st century. This is a breakthrough in making the global governance system more fair and equitable [12].

Dominique de Villepin, former Prime Minister of France, said that B&R construction is very important and is a bridge and link for people of all countries in politics, economy and culture. Historian Peter Frankopan said in THE SILK ROADS: THE Extraordinary History That Created Your World: "The silk road has shaped the world of the past, even the world of today, and will shape the world of the future" [13].

III. CHINA RAILWAY EXPRESS

A. Operation Status of the China Railway Express

China Railway Express (CR Express), which was put into operation on March 19, 2011, refers to the container international railway intermodal train between China and Europe and countries along the B&R line according to the fixed frequency and railway line. Layout of West, middle and east lines of CR Express: the west channel exits through Alashankou(khorgas), the middle channel exits through Erenhot, and the east channel exits through Manchuria (Suifen River) [14]. CR Express has unique advantages over air and sea transportation in terms of transportation time, transportation volume, transportation price and safety. At present, the average transportation time is one third of that of sea transportation, and the average transportation price is one fifth of that of air transportation. Moreover, compared with sea transportation and air transportation, it has strong stability, fixed departure time and is not affected by the bad weather caused by train outage. CR Express is more and more favored by the international market, and more and more countries have joined it, which fills the gap of international logistics to a certain extent. This provides great support for the construction of B&R.

TABLE II: A COMPARISON OF THE THREE MODES OF TRANSPORT

Item	Air transport	Sea transport	Land transport (CR Express)
Transportation time	Low	High	Middle
Freight	High	Low	Middle
Traffic	Low	High	Middle
Security	High	Low	High

TABLE III: OPERATION ROUTES OF THE CHINA RAILWAY EXPRESS

Place of origin and destination	Detailed route	Run away	Transportation time
Chongqing ~ Duisburg	Exit from Alashankou port, via Kazakhstan, Russia, Belarus, Poland to Duisburg, Germany.	About 11,000 kilometers.	About 15 days.
Changsha ~ Duisburg	Implement "One Main and Two Auxiliary" operation route. One Main: exit from Alashankou port, via Kazakhstan, Russia, Belarus, Poland, to Duisburg, Germany. Two Auxiliary: 1. Leave China via Khorgos port and arrive at Tashkent, Uzbekistan; 2. Exit from Erenhot (or Manchuria) port to Moscow, Russia.	One Main: 11808 kilometers. Two Auxiliary: 1. 6,146 kilometers ; 2. 8,047 or 10,090 kilometers.	One Main: About 18 days. Two Auxiliary: 1. About 13 days; 2. About 15 days.
Wuhan ~ Poland/Czechoslovakia	Exit from Alashankou port, via Kazakhstan, Russia, Belarus to Poland, Czechoslovakia.	About 10,700 kilometers.	About 15 days.
Chengdu ~ Lodz	Exit from Alashankou port, via Kazakhstan, Russia, Belarus, to Lodz, Poland.	9965 kilometers.	About 14 days.
Zhengzhou ~ Hamburg	Exit from Alashankou port, via Kazakhstan, Russia, Belarus, Poland, to Hamburg, Germany.	10245 kilometers.	About 15 days.
Lanzhou ~ Hamburg	Exit from Alashankou port, via Kazakhstan, Russia, Belarus, Poland, to Hamburg, Germany.	8027 kilometers.	About 15 days.
Baoding ~ Minsk	Exit from Manchuria port, via Russia, to Minsk, Belarus.	About 9,500 kilometers.	About 13 days.
Urumqi ~ Duisburg	Exit from Alashankou port, via Kazakhstan, Russia, Poland, to Duisburg, Germany.	About 8,000 kilometers.	About 10 days.
Xi 'an ~ Warsaw	Exit from Alashankou port, via Kazakhstan, Russia, Belarus, to Warsaw, Poland.	9048 kilometers.	About 12 days.
Tangshan ~ Antwerp	Exit from Alashankou port, via Kazakhstan, Russia, Belarus, Poland, Germany, Antwerp, Belgium.	About 11,000 kilometers.	About 16 days.
Hefei ~ Almaty/Hamburg	1. Leave almaty, Kazakhstan via Alashan Pass; 2. Exit from Alashankou Port, via Kazakhstan, Russia, Belarus, Poland, to Hamburg, Germany.	1. 4,954 kilometers ; 2. About 11,000 kilometers.	1. About 9 days. 2. About 15 days.
Qingdao ~ Moscow	Exit from Manchuria port to Moscow, Russia.	About 7,900 kilometers.	About 22 days.

B. The Past and Future Development of China Railway Express

The freight data of China Europe railway shows its development degree and development status. According To

sum up, CR Express was opened on March 19, 2011. Before 2018, CR Express experienced a period of slow development; After 2018, CR Express has ushered in a stage of rapid development.

TABLE IV: CHINA RAILWAY EXPRESS [15]-[19]

	Time	Bank number
Period of slow development	Since the opening of the bank until the end of June 2018	About 9,000 columns in total
Period of slow development	Since the opening of the bank until April 2019	Total 14,691 columns
	Since the opening of the bank until the end of October 2019	A total of about 20,000 columns
	In 2020, the year	Total 12,406 columns
	Since the opening of the bank until the end of June 2021	A total of about 40,000 columns
In the first eight months of 2021, a total of 10,030 lines were opened, two months ahead of 2020 to achieve the annual opening of more than 10,000 lines.		

1) The problem of scramble for resources

At the beginning of the establishment of CR Express, the Chinese government provided a large number of subsidies for merchants to participate in the construction of CR Express. In order to enjoy the dividend and seize the market, a large number of Chinese businesses, on the one hand, vie to build railway lines and compete for goods sources, resulting in the same or similar starting points, goods sources and destinations of many railway lines, wasting resources; On the other hand, foreign companies are allowed to raise transport prices at will, even at a loss, further leading to a waste of resources.

In the early days, CR Express could rely on government subsidies to a large extent. If the government did not provide subsidies, its cost would be twice that of sea land intermodal transport. A large number of subsidies are not fully utilized, which not only increases the financial burden of the government, but also intensifies the vicious competition to a certain extent. However, all negative effects are not enough

to eliminate the decisive role of the "subsidy policy" in the foundation of CR Express. It is this seemingly unreasonable policy that lays the foundation for the rapid development of CR Express after 2018. At the same time, the seemingly irrational behavior of a large number of Chinese businesses also reflects their support for national construction and high trust in the government.

2) The problem of heavy container rate

The difference between demand and policy leads to the problem of high empty container rate. First, different countries or regions implement different transport price policies. The European Union implements higher transportation prices than China. It is cost-effective to ship goods from China to the European Union, but it is not cost-effective to ship goods from the European Union to China [2].

Second, "made in China" is well-known all over the world. Many European countries and regions have a large demand for Chinese goods, while the demand for European products

in China is mostly precision instruments, with few categories. CR Express before 2018 often goes to Europe with full cargo, but because there is no return cargo, the unloaded containers have to be sold locally at a low price. The scarcity of return goods is not only due to the small demand for European goods in China, but also reflected in the fact that Europe is not familiar with CR Express to a certain extent. This exacerbates the scarcity of return goods. Finally, shipping costs were significantly reduced at that time. These three factors directly exacerbate the problem of high "empty container return rate" and indirectly increase the difficulty of CR Express in reducing transportation costs. After 2018, the problem of empty container rate has been greatly improved. More and more goods of the same volume are transported out of the games, but in most cases, the return goods are less than the goods sent to Europe. For the return goods, compared with the goods sent to Europe, even if it is only a few percentage points lower, the actual volume of goods is huge. In this regard, on the one hand, CR Express should integrate CR Express again to minimize the waste of resources. On the other hand, CR Express should actively expand the varieties of imported goods from Europe to the Asian market, and find supply channels for all kinds of mass goods and minority goods, so as to expand the scope of commodity selection in China and create more commodity demand. In addition, CR Express needs to strengthen its publicity around the world. Especially in Europe. Let people all over the world know the market positioning of CR Express, let more overseas merchants participate and optimize the construction of CR Express. On this basis, give play to the guiding role of the government and the decisive role of the market, and cooperate with the General Administration of customs and China Railway Corporation to carry out standardized operation, so as to ensure the healthy development of CR Express [1].

3) The problem of port capacity

After 2018, CR Express has developed too fast, and congestion at transportation ports in some countries has occurred from time to time. First, the level of economic development in various regions of Eurasia is uneven. The economic development level of the eastern and western regions is high, and the economic development of the central region is relatively backward. Second, under COVID-19, shipping and air transport have been affected to varying degrees. With the global logistics blocked and Global trade shrinking, CR Express makes full use of the unique advantages of international railway intermodal transport to and from many countries, which not only makes up for the demand of international logistics transportation, but also increases the throughput of transportation ports in various countries. China's Alashankou, Manchuria and Erenhot ports often operate at full capacity. There are even large delays, such as the train needs to be booked one month in advance and leave one month later [20].

Relevant departments should accelerate the construction of relevant facilities, reasonably increase capital investment by using financial institutions such as the Silk Road Fund and the Asian infrastructure investment bank, and focus on accelerating the incremental construction of new railway lines and the expansion of port construction. On the one hand, speed up the entry and exit speed of various trains to solve the

current dilemma of "port congestion"; On the other hand, expand the radiation scope of CR Express and seek greater development. Finally, through other construction projects such as B&R, deepen cooperation with countries around the world, strengthen the technical construction of the new Eurasian Continental Bridge and related CR Express, and improve the hardware facilities along the line.

4) The problem of transportation conditions

Information retrieval, multimodal transport, cargo storage, cargo distribution and cargo transshipment are essential steps in the transportation process. The transportation of CR Express takes the form of responsibility of countries along the line, which has attracted a large number of international merchants, but also weakened the control ability of CR Express in warehousing and distribution at overseas logistics nodes [4]. Moreover, due to different infrastructure conditions in various countries, the service quality of CR Express is directly different. To some extent, this limits the development of CR Express in a better direction. Accelerate the construction of information platform, get through the data of all parties, and provide more convenient operation methods for the majority of participants on the basis of accurate and efficient recording of each piece of information. Accelerating the further construction of logistics nodes can optimize the layout of logistics warehousing, improve the ability of merchants to control goods, improve the ability to deal with emergencies under different conditions, and improve the service quality.

5) The problem of regulation and policy

Different countries implement different gauge standards. Most of CR Express needs to undergo two or more rail changes during transportation, which is a factor seriously affecting its transportation timeliness. Since 2018, this situation has improved. There is no need to change tracks to some countries, such as Britain, Ukraine, Germany, Hungary and so on. For example, the "Chang'an" train of CR Express from Xi'an, China to Mannheim, Germany, and from Bavaria, Germany to Chengdu, China does not need to go through formalities at the corresponding border station. This saves time cost, labor cost and material cost to a great extent [21]-[25].

Different countries implement different import and export commodity restrictions and different customs inspection procedures. We should further improve the coordination mechanism and establish a system of enterprises, industries, countries and enterprises, industries and enterprises, focusing on Asia Europe meeting, Shanghai Cooperation Organization, Boao Forum for Asia, belt and road forum for international cooperation. In this way, we can coordinate policies of all parties and effectively solve the visualization obstacles of information, promote the improvement of transportation timeliness, operation cost and service quality of CR Express, realize the interconnection of capital, technology, services and data, and build the transportation, industry and logistics pattern of Asia Europe. It can not only promote the economic development of all participants, but also improve the ability to deal with risks.

IV. CONCLUSION

After a bumpy and slow development period, CR Express

gradually opened the market and ushered in a period of rapid development. Among them, the problem of competing for resources has been solved, and government subsidies have been reduced year by year; The problem of empty container rate has undergone earth shaking changes, and the good situation that the volume of goods sent to Europe is equal to that of return goods is gradually increasing; The expansion and construction of transportation ports depends on the actual development of CR Express. Increasing the number of CR Express is a good way to increase revenue and reduce expenses; The optimization of relevant regulations and policies for CR Express transportation and the solution of major problems are inseparable from the joint efforts of all parties. In the process of construction, CR Express not only strengthened the Silk Road spirit of "peaceful cooperation, openness and inclusiveness, mutual learning, mutual benefit and win-win", but also followed the B&R principle of "joint discussion, joint construction and sharing". It plays an important role in China EU trade and is an important achievement of B&R.

According to the improvement and solution of the above five problems, actively explore new development opportunities and obstacles. The steady development of CR Express is an important measure to maintain the global free trade system and B&R open world economy.

CONFLICT OF INTEREST

The author declares no conflict of interest.

AUTHOR CONTRIBUTIONS

The content of each part of the full text was completed by Ruijiong Gao.

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Ruijiong Gao was born in Shanxi on October 31, 2003.

He was a high school student when he wrote this article. He previously published an article entitled: *The theory and development of business ecosystems*.