

Improving the Competitiveness of Nansha Port and Actively Participating in the Construction of the Guangdong–Hong Kong–Macao Greater Bay Area

Investigation Report of Humen Ferry's East and West Coast Transition Container Vehicles*

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Abstract—This paper conducted a one-month continuous sampling survey of Humen Ferry's transitional container vehicles and found that there are more container vehicles from the east coast to the west coast than the west coast to the east coast. At present, Shenzhen Port is highly competitive, and any convenient cross-strait connectivity measures will attract the supply of west Pearl River. The representative of the first-tier freight forwarding companies on the east and west coasts of the Pearl River were selected for in-depth interviews and the reasons for the container vehicles on the west coast to go to Shenzhen Port by Humen Ferry rather than a near way. On this basis, four suggestions were put forward: it is necessary to strengthen information construction and supervision, and indeed improve customs clearance efficiency; the government's use of subsidies for large import and export cargo owners on the west coast is more effective; Guangzhou Port's inclusion of Dongguan Port is more conducive to integration Guangdong Port Resources; and there are six suggestions to enhance the construction of Nansha Port. Finally, this paper points out the direction for the next research.

Keywords—*Guangdong–Hong Kong–Macao Greater Bay Area; Nansha Port; competitiveness; investigation*

I. INTRODUCTION

At the fifth meeting of the Twelfth National People's Congress held on March 5, 2017, Premier Li Keqiang stated in the government work report that "it is a must to promote deeper cooperation between the Chinese inland and Hong Kong and Macao, study and formulate the development plan of the Guangdong-Hong Kong-Macao Greater Bay Area urban agglomeration, give full play to the unique advantages

of Hong Kong and Macao, and enhance the status and function of the country's economic development and opening up." This is the first time that the "Guangdong-Hong Kong-Macao Greater Bay Area" has been written into the Chinese national government work report, and it also marks that the Guangdong-Hong Kong-Macao Greater Bay Area is officially upgraded to a national strategy. How can Guangzhou Port actively participate in the Guangdong-Hong Kong-Macao Greater Bay cooperation and the construction of a world-class port group in the Greater Bay Area? This research, through the investigation of Humen Ferry's transitional container vehicles, hopes to make a difference and play a role in the further research.

Humen Ferry is a highway ferry on Provincial Highway 358. It provides a car ferry service that connects the Nansha District of Guangzhou to Shatian Town of Dongguan across the Pearl River. The main route runs from Nansha to Shatian Town, Dongguan City, across the Pearl River Estuary, with a total of 9 ferry terminals and 11 double-deck car ferries. Humen Ferry is the main waterway linking the east and west sides of the Pearl River. It carries a considerable number of container vehicles every day. In 2016, the average monthly number of transitional container vehicles was about 33,000. In 2017, the operating time of Humen Ferry was adjusted to 6:30-22:30. The selection of Humen Ferry transitional container vehicles for questionnaire surveys and the selection of representative samples for in-depth interviews have three meanings:

- **Objectivity:** The information of the choice of container vehicles transitioning from Humen Ferry to Guangzhou or Shenzhen ports is obtained from a perspective based on the actual logistics of this survey, which is more objective.

*Project: This article is the "Investigation Project of Humen Ferry's East-West Coast Transition Container Vehicles" in 2017 by Guangzhou Port Authority Sea Port Branch.

- **Operability:** The reason why Humen Ferry was selected instead of Humen Bridge to investigate the flow of container vehicles between east and west coast is that the average transit time of container vehicles on the ferry is about 20 minutes. The driver has sufficient time to fill in the questionnaire and the samples are concentrated.
- **Representativeness:** At present, no authority or functional department has statistics and analysis data on the container vehicles and logistics direction passing from this Humen Ferry. Through continuous investigation for a period of time, with sufficient samples and a certain degree of representativeness, this point can be used to infer the logistics situation of container vehicles transitioning from Humen Bridge and infer the overall port logistics situation.

II. RESEARCH OBJECTIVES

First, by investigating the number and flow of transitional container vehicles, it will be easier for the researchers to grasp whether the containers on the transitional coast have moved more from the east coast to the west coast or from the west coast to the east coast, and analyze the reasons for their flow;

Second, after grasping the cargo structure and the distribution of cargo owners, it can carry on the study of whether it is possible to effectively transfer some of the past containers to the local ports of Nansha to enter and exit in order to further improve the utilization of local port resources and optimize the development layout of Nansha logistics industry;

Third, the project is helpful to predict the impact of the construction of the "Shenzhen-Zhongshan Corridor" and the "Humen Second Bridge" on the container logistics industry in Guangzhou Nansha Port Area, so as to adjust the operating strategy of Nansha Port Area in a timely manner and promote the construction of Guangzhou International Shipping Center.

Forth, this project will help the Guangzhou Municipal Government to issue relevant policies to support the development of containers in Nansha Port. Going global is a Chinese national development strategy. Reducing production capacity and merging to become bigger and stronger is a development opportunity. The merge of Zhoushan and Ningbo has fired the first shot of port integration in China. The Pearl River Delta's ports have undergone transitional competition and resources cannot be fully and effectively utilized. The schemes for integrating the Pearl River Delta port clusters with Guangzhou Port and Shenzhen Port as the leaders were introduced by the provincial government.

III. RESEARCH METHODS

A. Questionnaire Survey

Object and location of investigation: The object and location of investigation is the transitional container vehicle

truck drivers from Humen Ferry crossing through east coast and west coast.

Data collection method: From May 15th to June 15th, 2017, specially trained investigators conducted a continuous sampling survey for a period of one month.

Sample scale: The number of valid samples is 9843, and the sampling error is only 1% under the 95% confidence interval.

Investigation contents: the investigation contents include: investigation of the origin and destination of transportation of Humen Ferry transition container vehicles, Chinese and foreign cargo, and heavy freight containers; investigation of the freight forwarding or logistics companies and contact information of Humen Ferry transition container vehicles; to understand why they choose a certain port of the companies aimed at the cargo of Nansha Port, Shenzhen Port, and Dongguan Port.

B. In-depth Interview Method

Object and location of investigation: The object and location of investigation of this method is the first-tier freight forwarding companies on the east coast and west coast of the Pearl River, which should be established for more than 5 years.

Data collection method: According to the results of the previous questionnaire survey, the researchers selected representative companies that have business dealings in Shenzhen Port and Nansha Port. From early-June to mid-June in 2017, six targeted questionnaires were issued to conduct a one-week survey for further research. Then from late June to early July, four companies were selected for in-depth interviews for about 2-3 hours.

Investigation contents: the investigation contents include: the operating background of the respondent and the status of the recently transported cargo; the use of different ports by the respondent; and the evaluation and recommendations of the respondent on various natural and operating factors of the port.

IV. MAIN RESEARCH CONCLUSIONS

A. There Are More Humen Ferry Transition Container Vehicles from East to West than West to East

The east coast to west coast of Humen Ferry accounted for 58.34% of the total transition container vehicles; the west coast to east coast accounted for 41.66%; east coast to west coast was 16.68% higher than west coast to east coast. However, the percentage of foreign trade heavy containers from the west coast to the east coast is higher than that from the east coast to the west coast. West coast to east coast accounts for 12.27%, and east coast to west coast accounts for 11.12% (as shown in "Fig. 1").

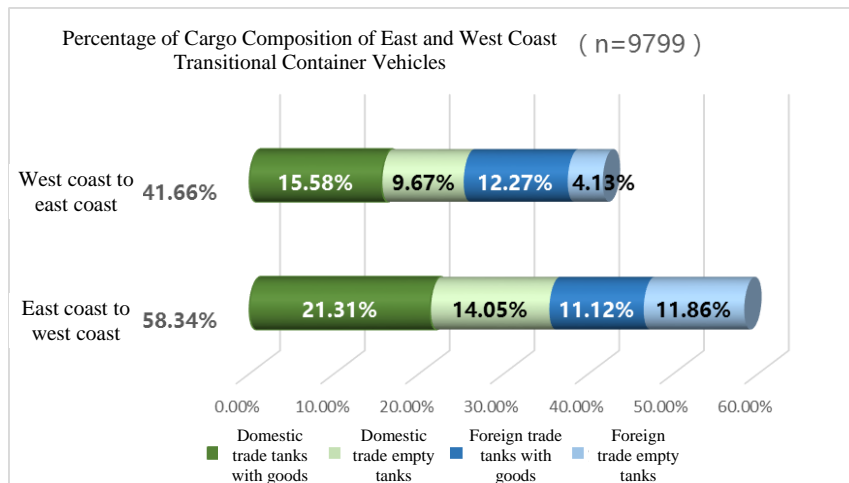


Fig. 1. Percentage of cargo composition of east and west coast transitional container vehicles.

Container vehicles from Shenzhen Port accounted for 25.5% of the total transition vehicles, 20.1% from Shenzhen, 14.7% from Guangzhou, 11.6% from Zhongshan, 11.0%

from Nansha Port, and 6.7% from Dongguan Port, 5.9% from Dongguan, and 4.1% from other cities in the province (as shown in "Fig. 2").

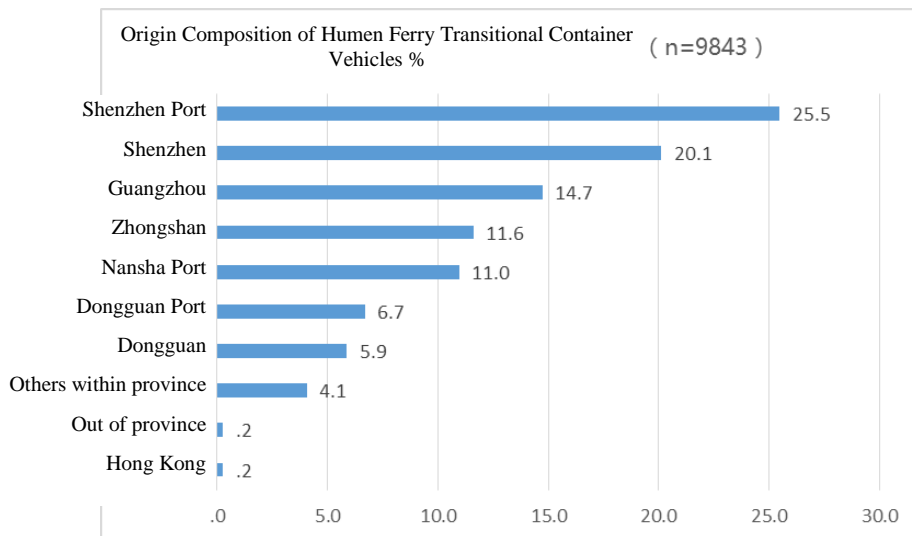


Fig. 2. Origin composition of Humen Ferry transitional container vehicles.

Container vehicles of the destination to Zhongshan accounted for 27.2% of the transition vehicles, 16.8% to Guangzhou, 14.1% to Shenzhen Port, 13.2% to Shenzhen,

9.6% to Dongguan, 7.1% to other cities in the province, 6.8% to Nansha Port, and 4.5% to Dongguan Port (as shown in "Fig. 3").

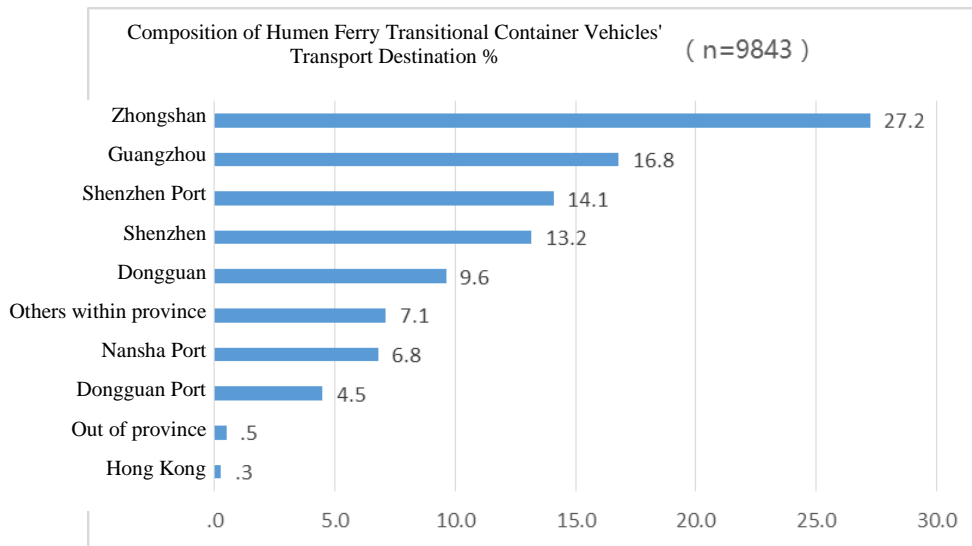


Fig. 3. Composition of Humen Ferry transitional container vehicles' transport destination.

B. Shenzhen Port Is Relatively More Competitive

Container vehicles which destination or origin is Shenzhen Port account for 39.56% of Humen Ferry's total transitional container vehicles, and container vehicles whose destination or origin is Guangzhou Port account for 17.6% of Humen Ferry's total transition container vehicles. The origin is that the container vehicles of Dongguan Port account for

11.16% of the total transitional container vehicles of Humen Ferry (as shown in "Fig. 4"). The percentage of vehicles transitioning from Humen Bridge can also be roughly inferred. The above data shows that Shenzhen Port is more competitive. Under the current circumstances, any convenient cross-strait connectivity measures will attract the supply of west Pearl River.

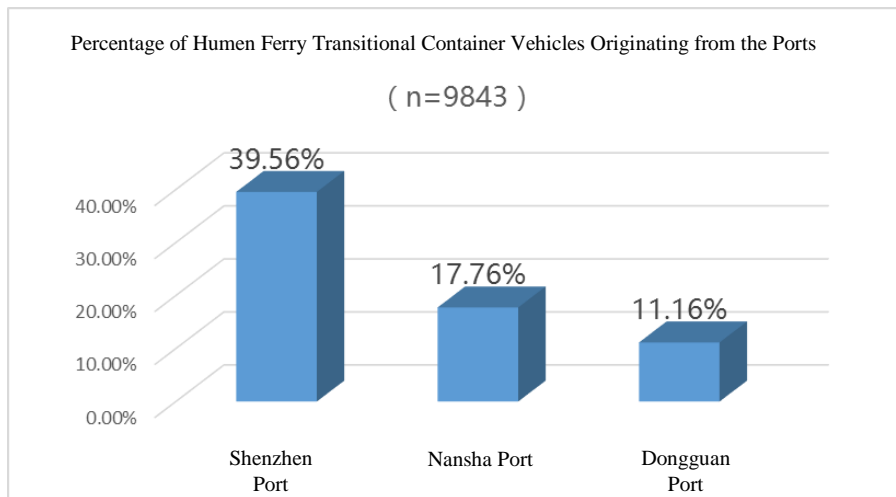


Fig. 4. Percentage of Humen Ferry transition container vehicles originating from the ports.

Why should container vehicles on the west coast go from Humen Ferry to Shenzhen Port instead of Nansha Port? The results of the questionnaire survey on the reasons for the selected port show that the score of Shenzhen Port is higher than that of Guangzhou Port in the evaluation of the two

indicators of lowest total cost and long-term cooperation contract (see "Fig. 5"). Therefore, the choice of Shenzhen Port is more because of the total transportation cost and the long-term cooperation agreement with Shenzhen Port.

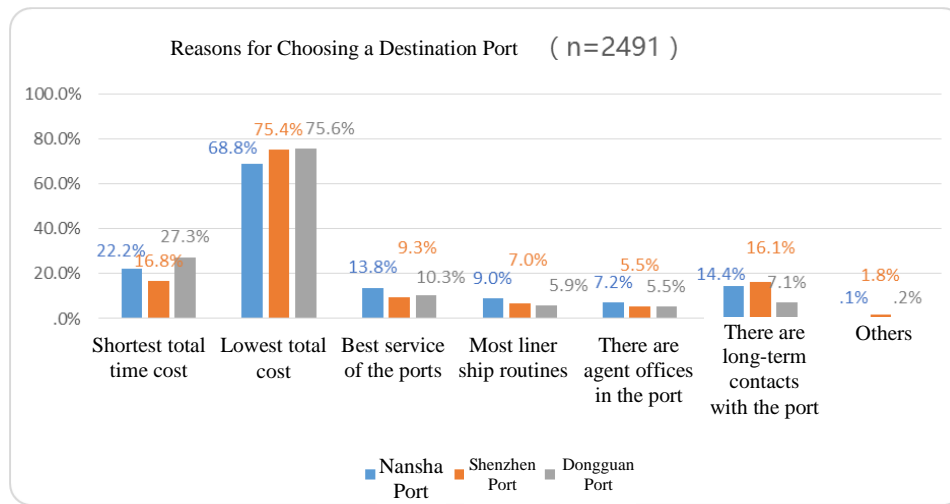


Fig. 5. Reasons for choosing a destination port.

In the in-depth interviews, it is focused on understanding the reasons why freight forwarding companies chose Shenzhen Port, which mainly has the following three aspects:

First, port selection is generally based on customer needs, and freight forwarding companies have the right to choose ports only under certain conditions. When a customer chooses a port, generally, the seller or buyer chooses the port according to the international conventions and related regulations on the signed trade terms, and generally prefers FOB price, and the buyer's foreign company specifies the loading port. Due to factors such as port reputation and inertial thinking, most foreign companies have designated Shenzhen Yantian Port and Shekou Port. Large foreign shipping companies charge lower freight rates for imported foreign companies in terms of freight rates, and then pass on the high document surcharges and seal fees (such as a seal of 60 yuan) for Chinese export companies in disguise to pass on the freight that should be borne by the buyer. This is very bad for the development of Chinese export enterprises. Some freight forwarding companies report that such cases of shipping agents or shipping companies have arbitrarily charged additional fees in Guangzhou Port, but not in Yantian Port. It is suggested that the government management agencies should strictly investigate and crack down on arbitrary charges, and more importantly, speed up the establishment of shipping electronic trading platforms to make prices transparent.

Second, in terms of shipping routes, due to the advantages of Yantian Port in international shipping routes, the cargo export is less affected by shipping routes and the cost of returning to the container is lower. Some routes in Nansha Port, especially the small port routes, have no direct routes, so that the cargo containers need to be re-ported or re-loaded, causing some shippers to increase their costs (Same factors, some Chinese trade containers in the eastern part of the Pearl River Delta are also shipped out by Nansha Port) Therefore, sellers other than the FOB model, considering

efficiency issues, choose to go to Yantian Port. Especially on holidays, cargo owners are more willing to choose Yantian or Shekou Port, because these two ports are open 365 days a year, and customs clearance is very convenient. However, customs at all ports in the Guangzhou area are closed on weekends (closed Saturday afternoon and Sunday all day), which affects normal customs clearance. The customs environment determines the cargo flow, and improving the customs environment is the key.

According to the comparison of the international routes of Nansha Port, Yantian Port and Shekou Port in September 2017, there were 79 international routes in Nansha Port, 81 in Yantian Port, and 106 in Shekou Port (see "Table. I"). Yantian Port has a significant advantage in the number of North American routes and European routes. Yantian Port also has more Central and South American and Australian routes than Nansha Port. Nansha Port has an absolute advantage in the number of Middle East routes and African routes. Shekou Port has absolute advantages on Asian routes, and also has significant advantages on Mediterranean and Red Sea routes. The arrival dates of the more competitive European, North American and Asian routes were selected for comparison. The estimated time of arrival of Nansha Port's shipping routes is concentrated in 3-4 days in a week while Yantian Port and Shekou Port were daily. This would make the cargo owners or freight forwarding companies think that Nansha Port's shipping routes are much less than Yantian Port. It is suggested to further study the route needs of major import and export companies in west Pearl River and readjust the planning of international routes. At the same time, the number of liner ships and the supply structure are the relationship between chickens and eggs, which are mutually reinforcing. Therefore, if the government takes the lead in building the supply structure and the flow of goods, the corresponding number of liners will increase.

TABLE I. COMPARISON OF LINER SHIPS INTERNATIONAL ROUTES BETWEEN NANSHA PORT, YANTIAN PORT AND SHEKOU PORT (SEPTEMBER 2017)

International Routes	Europe	North America	Central and South America	the Middle East	Africa	Asia	Australia	Mediterranean	the Red Sea	Total
Nansha Port	13	8	1	15	22	19	1	0	0	79
Yantian Port	23	30	4	1	0	20	3	0	0	81
Shekou Port	3	2	2	11	3	74	4	4	3	106

Third, Guangzhou Port Group has room for further improvement and improvement in marketing and services, in-depth understanding of the needs of large shippers, and proactively do marketing activities for shippers, put the needs of major customers first, focus on serving the large import and export enterprises in the west coast, and improve the overall image and service level of Nansha Port.

C. Strengthening Information Construction and Supervision Has Indeed Improved Customs Clearance Efficiency

The speed of customs clearance is also a factor that companies pay close attention to when choosing a port. In terms of informatization construction, Guangzhou is guided by the needs of enterprises and has developed a "single window" around the three basic elements of "one platform, one delivery, and one standard". At present, cargo declaration, transportation vehicle declaration, and cross-border construction have been completed. The 16 major business functions such as e-commerce, information inquiry, and manifest declaration cover 21 departments such as customs, inspection and quarantine, border inspection, maritime affairs, and port affairs. They serve a wide range of international trade enterprises and are at the forefront of the country.

Regarding the single window business of Nansha Port, three of the companies interviewed in this in-depth interview have not heard of it. (The enterprises that have not heard of the single window are because the customs clearance is entrusted to the customs clearance company. The customs clearance company did not tell them who cleared the customs), one respondent from a company said that it is currently in the probation stage, because the single window only submits the information for one-time submission, and the background is still distributed to various departments for approval, and the stay time of the cargo ship in port has not changed much.

The construction of the single window is very good in functional design, but it is hoped that it will be truly implemented so that customers can really solve problems in the single window without having to deal with it in the systems of various port departments. It will be necessary to encourage port units (port authority, one customs clearance, three inspections), terminals, shipping agents and freight forwarders, and trade businesses to use the "information platform" for office work and operations, improve port customs clearance and operation efficiency, and truly realize an online "single window". It is recommended that the local government establish a neutral information system to objectively detect the stay time of cars, ships, cargoes, and people in the port. At the same time, the monitoring data

must be real-time and open. It can be compared and inquired that the use of the "single window" to improve the efficiency of customs clearance can enable all users of the platform and social media to understand in time, and play a positive role in promoting and promoting the image of the international port of Guangzhou Port.

D. The Government's Subsidies Are More Effective for Large Importers and Exporters in the West Coast

According to the results of deep visits, the current government subsidy for Guangzhou Port is for shipping companies, and the subsidy for Yantian Port is for barges, 50 yuan per container. The subsidy for Shanghai Yangshan Port is for drivers. The freight forwarding companies surveyed believed that the subsidized shipping company in Guangzhou Port was invalid because the shipping company came in and the shipping company was not important; and the subsidy had little effect on the shipping company. Therefore, direct subsidies to large cargo owners are more effective. Many cargo owners previously used Yantian Port or FOB buyers to designate Yantian Port because of its many routes. It is recommended to first find the large consignor of import and export trade covered by the hinterland of Guangzhou Port, and then the Guangzhou Port Group or the Foreign Trade Department should organize some high-level seminars to promote it. If at the time of signing the contract, a container in Nansha Port is designated to subsidize 50 yuan per container, at the same time, some green passages can be opened for large cargo owners to improve their clearance efficiency. This will not only attract large cargo owners to Nansha Port, but also reduce the cost of exporting enterprises and promote the development of exporting enterprises. According to further investigations, it was learned that the subsidies of Guangzhou Port this year, in addition to shipping routes, also rewarded the consignors. The implementation of this policy measure was in line with the recommendations of the deep visits, but the freight forwarders were not aware of this in the deep visits. Therefore, Nansha Port also needs to take the initiative to do a good job of marketing and publicity work, not only to use subsidies on the blade, but also to let more large shippers and freight forwarders know this favorable policy measure, and to continue to follow the feedback and suggestions of shippers too adjust and improve policies so that it can attract more large cargo owners to choose Nansha Port. At the same time, irregular charges will be rectified, and a regional shipping information platform will be established.

E. Guangzhou Port's Inclusion of Dongguan Port Is More Conducive to the Integration of Guangdong Port Resources

First, Dongguan Port has a strong container production volume. The direct economic hinterland of Dongguan Port is the Dongguan area. The annual container production volume exceeds 10 million equivalent units, which is sufficient to support the throughput of a port shipping center. From the perspective of channel management rights, Dongguan Port should be under the jurisdiction of Guangzhou Port. Ships from Dongguan Port have always used the sea lanes of Guangzhou Port. Guangzhou Port and Dongguan Port are just like Zhoushan, Ningbo, Zhejiang. In terms of business and safety, the total score is reasonable.

Second, Dongguan Port can meet the shoreline needs of Guangzhou Port. The main business terminal and bonded logistics of Dongguan Port Affairs Group have a total coastline of more than 2,000 meters. Through the adjustment of shipping routes and multi-point docking, land transportation has been reduced to meet the needs of the Guangzhou Port Group's Huangpu Old Port business relocation to Dongguan Port.

Third, Chang'an Port Area of Dongguan Port is the only deep water port area. From the perspective of complementary advantages, Dongguan Port should be under the jurisdiction of Guangzhou Port, because Dongguan Port and Shenzhen Port are both deep-water ports, and being placed in Shenzhen does not give play to its competitive advantages. For the Guangzhou Port Group, after the completion of the Nansha Phase IV, the capacity of the West Bank can meet the needs of the West Bank; and the high-quality shoreline resources of the Chang'an Port Area will meet the long-term development requirements of the port coastline, especially development demand of the east coast.

Forth, from the perspective of administrative divisions, Shenzhen is a special economic zone and Guangzhou is the capital city of Guangdong Province. Therefore, the jurisdiction of Dongguan Port under the jurisdiction of Guangzhou Port is more conducive to the resources integration of Pearl River Delta ports with Guangzhou Port in the west and Shenzhen Port in the east.

F. Six Suggestions for the Operation and Development of Nansha Port

In order to retain the supply of goods, Nansha Port tries to retain it with interests. Therefore, there are four forms of cooperation, but it is far from enough. From the composition of shareholders, it can be known that it is only government-level interests. For Nansha Port to strengthen its own competitiveness, it can be considered from the following six aspects:

- Expanding new functions and services in the bonded area. It is suggested to add some operational services to improve the investment environment. For example, people can use the import and export management rights of some institutions to provide import and export agency services for trading companies in the

bonded area at lower prices and faster services. At the party's 19th National Congress, General Secretary Xi Jinping emphasized the need to give the free trade pilot zone greater reform autonomy and explore the construction of a free trade port. Innovate foreign investment methods, promote international capacity cooperation, form a global network of trade, investment and financing, production and services, and accelerate the cultivation of new advantages in international economic cooperation and competition.

- It is a must to implement the construction of smart ports, and urging port units (Port Authority, First Customs, and Three Inspections), terminals, shipping agents and freight forwarders, and trade businesses to use the "information platform" for office work and operations, to improve port customs clearance and operational efficiency. The "single window" on the Internet need to be realized and the collected information need to be used to create an information processing platform through various information collection devices for real-time processing to ensure smooth traffic and reduce costs.
- It is necessary to carry out the west Pearl River strategy, and strengthen cooperation with cities on the west bank of the Pearl River to jointly accelerate the pace of infrastructure construction and multimodal transport in Nansha Port.
- It will be of great significance to strengthen the port's own marketing level. Only by focusing on grasping the customer's supply chain needs and providing customers with personalized logistics services, can the port companies' service capabilities and competitiveness be more effectively enhanced.
- In conjunction with other strategic investors, it will be important to actively carry out overseas investment and transnational business operations, and build a global terminal operator with international competitiveness.
- Through the division of labor and coordination with Shenzhen Port, the rational allocation of regional resources will be realized and the overall competitiveness of the Pearl River Delta ports will be improved.

V. CONCLUSION

The object of this questionnaire survey is the drivers of Humen Ferry's transitional container vehicles. The survey has a statistical basis for the flow and composition of the cargo. However, the driver's choice and evaluation of the port have certain limitations. Representatives of the four freight forwarding companies were conducted for the in-depth interviews to understand the customer's needs in port selection and some key determinants. However, the following three aspects require further in-depth research:

- In the previous survey, the cargo owner has a great decision-making power on the choice of the port.

Therefore, it is necessary to further collect the information of large enterprises in the west Pearl River hinterland to establish a database, investigate and understand its import and export business, and the personalized needs of shipping ports. Forms of government subsidies, policies and services will enable it to choose Nansha Port in its import and export business. At the same time, it is necessary to further investigate the composition of its comprehensive logistics costs and study the links in which it can reduce its logistics costs. It is also necessary to investigate the port transportation needs of Chinese and foreign trade goods to understand the differences in demand, making policies and measures more targeted.

- It will be a conduct of investigation and understanding about the situation of arbitrary charges by shipping agents, freight forwarders or shipping companies in Guangzhou Port, and the specific links and forms of arbitrary charges. Whether there is a phenomenon in which the sea freight fee is transferred to Chinese exporting companies. If the phenomenon exists, it will not only greatly reduce the competitiveness of Guangzhou Port, but also seriously affect the international competitiveness of exporting companies. On this basis, further research on how to rectify and avoid such situations need to be implemented.
- It is recommended that the local government establish a neutral information system to objectively detect the stay time of cars, ships, cargoes, and people in the port. At the same time, the monitoring data should be real-time and open. All of these results should have access to be compared and inquired by public. The results of using "single window" to improve the efficiency of customs clearance can enable all users of the platform and social media to know in time, and play a positive role in promoting the image of Guangzhou Port's international port.

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