

THE REVIEW OF MALAYSIA HINTERLAND AND HINTERLAND CONTAINER TRANSPORT SYSTEM CHALLENGES BY ROAD.

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Abstract: Hinterland is considered as an important element in any port network. It would determine the competitiveness of any ports. In the paper, the focus is on the local hinterland of Malaysia, where almost 50% of containers that arrives in Malaysia ports are local containers, which means it enters to the Malaysian customers. In this study, the evaluation of Malaysia hinterland has identified Greater Klang Valley as the most significance hinterland in Malaysia with an estimated 6 million TEUs of container entering and departing to/from the hinterland. With the demand is keep on increasing, hinterland container transport system by road need to ensure that it would be able to fulfill the customer's demand. Even though rail network is available, movement by road is still dominant in Malaysia container movement to the hinterland. However, two critical issues in the hinterland container transport by road has made a huge challenge for the road haulage operators to operates efficiently. The two issues are the shortage of drivers and innovative initiatives. These issues have dampened the positive progress of road haulage in Malaysia

Keywords: Hinterland, Container, Road, Drivers, Innovation

1.0 Introduction (Include Literature Review)

In the globalisation era, 80% of world's cargo volume is a seaborne trade. This has made maritime transport as an important element in the international trade. (United Nations Conference on Trade and Development - UNCTAD, 2017). Since the introduction of containerisation, the cargo volume has been increasing. Containerization and the development of road, rail and inland waterways has created an efficient integrated intermodal transport network, which enable the hinterland to be served effectively. With efficient hinterland container transport system, an excellent door-to-door services operations can be materialised. (E. Sdoukopoulosa and M Boilea , 2020)

Hinterland can be identified as a port most the effective market. It determines the interactions between customers. Hinterland also is seen asa market where ports could sels its services to the potential customers. (Slack 1993). Since a success of a port is highly depending on its hinterland, it is crucial for the hinterland serve by the ports to highly demanded. Hinterland can bee seen as an interior of the port operations. (Klink V and Den Berg V 1998). It needs to provide effective connections, fulfilling customers requirements, help to improve the productivity of a port and good rates in order to attract

main line to call to the ports (De Langen 2004). Hinterland need to efficient and support the port activity. It is so significant for the hinterland to be competitive because it would enhance the coverage of cargo movement by the ports. (McCalla and Haesendonck et al 2002). To make the hinterland more competitive, a good transport system, with a high volume corridor and the support of an inland terminal are highly recommended. This would increase the intensified port competition of the port. (Star & Black 1995). The accessibility to hinterland would make the port more attractive to the main liners thus will bring more cargo to the port.

As the global container port becomes more intense, an efficient hinterland transport system has been an important factor for the success of European ports. It created a wider coverage of hinterland for the ports to serve. (Robinson 2002). To enhance the quality of hinterland services, ports need to collaborate with the players in the hinterland in order to ensure the cargo from the hinterland will go through to its ports, hence will increase the traffic flow to the ports. (W K. Talley and M W Ng 2018)

Port will have better position to market their services when the cargo volume are consistent coming from its hinterland. With the usage of containers, it allows the cargo to travel much further to the hinterland, with the usage of intermodal transport system. This would assist the containers to be consolidated at the customers' premise thus would expand the hinterland of the ports.

Even though cost is still the main factors in choosing port of choice, hinterland connectivity has been considered as the second most important factors. Hinterland connectivity can determine the level of port competitiveness. (Parola et al 2017) So it would be critical to ensure the hinterland transport chain which consists of seaports, dry ports, intermodal carriers (road, rail and inland waterways), importers and exporters need to be capable. (W K. Talley and M W Ng 2018)

As time evolves, many changes in the trade and hinterland transport system. This has created the need for ports to ensure the hinterland connectivity to be more developed. Thus it would assist port to be a well informed. Intelligence and developed hinterland strategies. (E. Sdoukopoulos and M Boileau, 2020)

The objective of this paper is to evaluate the hinterland that serve to Malaysian Ports. This 50% local cargo that serve the local hinterland activities in Malaysia. This paper will identify the outlook of Malaysian local cargo hinterland and highlighting the challenges faces by ports in accommodating the requirements of the hinterland.

2.0 Methodology

This research focused on a qualitative research approach. The in-depth information regarding the hinterland and its transport system is required, and as suggested by Yin (2014) whenever there is lacking of information about any situation or scenario, qualitative approach was used for the study. The second objective is to obtain in-depth

information on the factors needs to be available in order to for the evaluation of hinterland volume and transport system.

Interview and secondary are used as the tools to gathered the required information for the study. The main data requirements for the research are:

- a) Hinterland information on volume and commodities
- b) Challenges faces by hinterland container transport system by road

2.1 Interview

For this study, the qualitative method uses for gathering data was in-depth interview. The open-ended questions were given to the respondents and the respondents were given the opportunity to give their opinions by using their own words. (Webber & Byrd 2010). The unstructured interview method has enable the researcher to gain as much information as possible in order to fulfil the objectives. With this approach, the researcher manages to obtain very detail information on the topic. It also enables the researcher to add any relevant questions which would enhance the reliability and quality of the data collected.

The in-depth interview is a qualitative research method that uses open-ended questions to obtain the required data from the research area. It allows the respondents to provide opinions views in their own words (Webber & Byrd 2010). The interviewer is able to obtain greater depth of people thoughts and understanding through face to face or person to person discussion. With an unstructured interview approach, it helps the researchers to push the respondents to discuss much detail on the research topic. The main goal of this instrument is to explore in depth a respondent's point of view, experiences, feelings and perspectives. (Skulmoski, Hartman & Krahn 2007)

However, interview can be determine as a long process with require more time to do the analysis and evaluation. High skilled interviewr is needed in order to get a good data gathering. (Boyce & Nale 2006).

The execution of the interview process was as follows:

The researcher conducts the interview. The data obtained was given back to the respondents in order to check the consistency of the information. To select the respondents, purposive sampling was used which allowed the researcher to choose the suitable respondents in order to meet the objectives of the study. The interviews were recorded which helps to reduce misinterpreted answers. The interviews were conducted through digitals means which lasted for one hour.

2.2 Respondents profile

	Respondents	Year of Experience	Organization	Position
1	Respondent A	10	Road Haulage	Manager
2	Respondent B	15	Road Haulage	Senior Manager
3	Respondent D	19	Ports	Manager
4	Respondent E	15	Logistics Company	Executive
5	Respondent E	14	Road Haulage	Operation Manager

3.0 Discussion and Result

3.1 Overview of hinterland in Peninsular Malaysia

Malaysian ports handle transshipment and local containers (import & export). The container volume for all Malaysian ports in 2017 was 22.7 million TEUs. They are divided into three categories: import, export and transshipment. (Nasir,S 2014) Import and export containers are also known as local containers since they are entering the Malaysian hinterland. From the interview, the assumption made was that 50% of the Malaysia volume is transshipment, so the estimation for annual local container volume of Malaysia was 11.3million TEUs. In this study we shall estimate the breakdown from the annual 11.3million TEUs in the various hinterlands in Malaysia

Local cargo is the cargo that enter Malaysia through Malaysian ports. The local hinterland is served by 5 major ports throughout Peninsular Malaysia. In this paper, the best estimate on the movement of the container on the local hinterland is conducted. It would produce a scenario which enables for the reader to understand the hinterland container movement in Malaysia.

The Malaysia hinterland can be categorized into 6 regions which includes 1 regions to the East of Malaysia which consist of Sabah and Sarawak.

- Greater Klang Valley
- Klang and Port Klang
- Northern region
- Southern Region
- East Coast Region

f) East Malaysia

For each of the region, the evaluation would be based on the estimate volume, industrial areas and also commodities

a) **Greater Klang Valley.**

Greater Klang Valley is Malaysia biggest and most productive hinterland. 50% of Malaysia's exports comes from this region. There huge industrial area is located all over GKV. The location of these industrial areas can be seen in Petaling Jaya, Shah Alam, SungeiWay, Balakong, Kelana Jaya, Subang Jaya, Cheras, Batu Caves and Glenmarie Hicom Parks. The volume is estimated about 500,000 TEUs per month are generated from KV Industrial Estates. Main reasons are due to close proximity to Ports and Airports, Commercial and Administrative capitals.

Respondent C

There are easily more than 2,000 MNC are making Kuala Lumpur their regional offices, operating offices, manufacturing hubs, regional procurement and distribution centres.

Table 1 summarizes the industrial areas and the commodities in each area in the Greater Klang Valley area.

Table 1: Greater Klang Valley hinterland

No	Industrial Park	Main Commodities
1.	Shah Alam	eGoods, Plastics and Automotive
2.	Petaling Jaya	eGoods, Beverages and General Cargo
3.	Kelana Jaya	eGoods and General Cargo
4.	Subang Jaya	eGoods and General Cargo
5.	Batu Caves	Trucks and Machinery
7.	Damansara	Machines and General Cargo
8.	Rawang	Automotive and Aeronautical
9.	Sungei Way	eGoods, Consumer Goods
10.	Balakong	Consumer Goods and Plastics
11.	Glenmarie HICOM	Automotive dan Heavy Machinery
	Total	6,000,000 TEUS

Source: This research

b) **Klang and Port Klang**

Klang is one of the biggest districts under the state of Selangor. The amount of export generated from Klang and Port Klang alone is almost similar for the whole state of Negri Sembilan. The industrial areas all over Greater Klang are Bandar Sultan Suleiman, PKFZ, Telok Gong, Pulau Indah, Tg. Harapan, Perdana Industrial

Parks, Pandamaran, Bukit Raja, Meru, Kapar and Banting. It is estimated about 600,000 TEUs per month are generated from Greater Klang Industrial Areas. Main reasons are due to close proximity to 2 ports namely Northport and Westports, Commercial and Administrative capitals. Most of these regional procurement and distribution centres are hubbing in Port Klang. Table 2 summarised the industrial areas and main commodities in this Klang and Port Klang region.

Table 2: Klang and Port Klang hinterland

No	Industrial Park	Main Commodities
1.	Bandar Sultan Seleiman	eGoods, Plastics and Automotive
2.	Tanjung Harapan	eGoods, Beverages and General Cargo
3.	Perdana	eGoods and General Cargo
4.	Pandamaran	eGoods and General Cargo
5.	Bukit Raja	Trucks and Machinery
7.	Meru	Food and General Cargo
8.	Kapar	Machines and General Cargo
9.	Banting	Automotive and Aeronautical
10.	Sungai Rasau	Consumer Goods and Plastics
	Total	600,000 TEUS

Source: This research

c) Northern .

The northern regions of Peninsular contributed about 125,000 TEUs per month with sizeable portions of the estimate is derived directly from South Thailand Cargo. Ipoh is in the heart of Perak Hinterland contributing about 21,000 TEUs per month. Main commodities from the Perak are porcelain products, agricultural produces, seafood products, food and rubber gloves.

Respondent D

“The geographical border between Penang Port and Port Klang will be Taiping. Anything North of Taiping will be exported via Penang Port while anything south will be Port Klang”

d) Southern

The south geographical border between Port Klang and Johor Ports will be Segamat. Anything north of Segamat goes through Port Klang, while anything south of Segamat goes to Johor Port. Negeri Sembilan contributed close to 60,000 TEUs per month for Port Klang and the State of Melaka contributed another 30,000 TEUs per month. The whole state of Johor is estimated to contribute at least another 1,200,000 TEUs to Malaysian throughput. About 25% of this volume is traded between Singapore whilst the remaining are exported through PTP or Pasir Gudang Port. The

main commodities from Negri Sembilan are eGoods, Garments, Particle Board and Industrial Glass products. Main Commodity from Malacca are Foods, Automotive and Furniture. As for Johor the main commodities are Chemical Products, Oleochemical products Foods, Tiles and General Cargo

e) The East Coast Region.

The East Coast Region consists of container volumes generated from Pahang, Terengganu and Kelantan. The East Coast volumes are believe to be in the volume of 40,000 TEUs monthly. The main commodities of Pahang are Furniture, Wood Products and also machineries. Terengganu would have petrochemicals & oil and gas products from ISO Tanks shipment and plastics resins while Kelantas are mostly agricultural produces and seafood

f) East Malaysia

For East Malaysia which consists of Sabah and Sarawak, the hinterland are majority served by the import cargo. The estimated container volume is between 500,000 – 550,000 TEUs annually. Almost 65% are trades from Port Klang and the remaining containers are shipped through Singapore to the rest of the world. The main commodities for export from Sarawak are pepper and forest produces while in Sabah the main exports are seafood products. Major imports at East Malaysia are consumer goods and construction goods

From the data gathered for the study, it can be concluded that the estimation distribution of 11.3 million TEUS local containers to the Malaysia hinterland is as illustrated in Table 4.

Table 3: Annual Container Volume in Malaysia's Hinterland

No	Hinterland	Region	Annual Volume in'000 TEUs
1	Greater Klang Valley	Greater Klang Valley	6,000
2.	Klang & Port Klang	Klang & Port Klang	600
3.	Penang	Northern	1,500
4.	Ipoh	Northern	250
5.	Melaka	Southern	350
6.	Seremban	Southern	190
7.	Senawang	Southern	260
8.	Nilai	Southern	250
9.	Johor	Southern	900

10.	East Coast	East Coast region	500
11.	East Malaysia	East Malaysia	500
	Total		11,300

Source: This research

3.2 Hinterland container transport connectivity

The hinterland region in Peninsular Malaysia is well connected by the road and rail system in Malaysia. Figure 1 illustrate the main and future road and rail network in Malaysia. Malaysia is well connected with the north-south highway and east coast highway. Currently the West Coast Highway is also being constructed and expected to be ready by 2023. For the rail network, the new rail network to the east is being built and expected to be completed by 2026. With this high connectivity, the road network in Malaysia has made it possible to its hinterland to be directly connected to the ports in Malaysia. Even though rail network is available, the main hinterland transport in Malaysia is still road transport. Road transport has been the backbone in ensuring containers to delivered to the respected customer. However, under the National Transport Policy 2019-2030, the government is expected to focus on rail development in order to ease the burden face by road haulage in delivering the containers.

Figure 1: Road and Rail system in Malaysia



3.3.1 Hinterland container transport by road

The main land transport for hinterland container movement is road. It has been the most important mode in Malaysia. The main reason for the usage of road haulage is because of its flexibility in operations. Moreover, the door-to-door transport has become the most attractive most for the movement. The efficient linkage to the ports from the most industrial areas has assisted the road haulage to be the main mode of transport. With the

increasing demand of manufacturing services has created a higher need for in hinterland container transport is increasing. Since its liberalization of the road haulage industry in 1999, the number of road haulage operator has been increasing. In 2017, the number of roads haulage that's is active is estimated around 200 companies with varies size and capacity in operation.

When the industry was liberalized in 1999, the new road haulage operators were only allowed to operate within 30km radius from the ports. This ruling was to protect the pioneer road haulage operators which could operate in the whole of peninsular Malaysia.

Respondents B

“Due to the increasing of demand of containers movement from manufacturers, the regulation was uplifted and the new operators were allowed to operates with the capacity as the pioneer road haulage operators in Malaysia.”

The road haulage industry in Malaysia is practicing a merchant haulage system. It means that the customers need to make its own arrangement for the collection and delivery of their containers. Usually, the customers make the arrangement by using a freight forwarding agent.

3.4 Hinterland container transport by road challenges in serving the hinterland

With the number of local containers entering Malaysia, the road haulage service providers need to be competitive. The haulage service providers and the government need to work together to improves the efficiency and competency level of the providers. The common problems highlighted by the respondents on the main issues in road haulage services are as follows: a) haulage operation costs keep on increasing; b) the regulation development is not in accordance with the technology development and c) no sufficient consultations with the road haulage service providers on the new ruling that would govern the industry. Thus, it has imposed numerous complaints from customers regarding delays of containers in reaching customers premises. However, for this paper, the focus is to highlight two other main challenges that also has impeded the efficiency of road haulage services for hinterland transport system in Malaysia. The two other main factors are shortage of drivers and the innovative imitative by the road haulage operators.

3.4.1 Shortage of truck drivers

To serve the hinterland, drivers has become one of the main issues for the road haulage operators. Truck drivers acts as the frontliners of the industry would be the main issues that affects the efficiency of the industry. The issue of salary has been the main factors to attract more people to work in the industry. At an average rate, a drivers would earn a basic salary of RM900 and with the the trips made, a drivers might be able to earn up to an average of RM 5000 per months.

Respondent A

“Despite being offered total remuneration up to RM3,500 a month, majority of haulage service providers are shortage between 20% to 40% of drivers. The ideal numbers of drivers is 1.5 against 1 truck.”

Based on that estimation, the three road haulage company has indicated that they are experiencing a shortage of drivers.

Respondent	No of Trucks	% shortage of drivers
Respondent A	85 Trucks	37%
Respondent B	67 Trucks	28.5%
Respondent E	45 Trucks	40%

With that estimation, road haulage Respondent are most like to face operational efficiency since drivers might not available to drive the trucks for delivery. However, salary is not the only factors that made people to maintain their jobs as drivers.

Respondents E

“Long working hours, bad scheduling, lack of effective management by operators, selective enforcement by the authority and the difficulties to get E-license for driving heavy vehicles has contributed to this problem.”

It is expected for the drivers to work long hours for them to maximize their income. Since the main income comes from the trip their made beside their salary, many hours need to be spent on the road rather than spending time with their families. The difficulty in getting the E-license has also restricted new recruitment to be made. Prior in getting the license, the applicants need to go through a rigorous training process which has been considered as too high and also must be a holder for D License for 2 years before the applicant eligible to apply for the E license. However, according to the respondents, the qualifying process is rather nit suitable since the drivers can be trained as a competent heavy vehicles' driver within 6 months.

3.4.2 Innovative initiative

The current business model would require companies to adapt to the latest technology in order to assist the road haulage Respondent to operate more effectively. However, with the perception that technology is expensive, many road haulage operators do not see the new innovative technology as a tool to enhance its operations capability. Only huge organization that have invested in the latest technology in their daily operations. With the lacking of technology investment, it has limited the capability of the haulage companies to fully utilized the transport movement, poor depot management and lack of capability to match between demand with the availability of supply. With the trend of e-commerce keep on high demand, the needs of just in time delivery, tracing of services requires special focus during operations. That is why most of the road haulage operator employs

a less information technology investment which focusing on track and trace. Its usually use to monitor customer container movement.

Respondent B

“There’s a dire need for the industry to establish local and national freight data program that ultimately will enhance capabilities of haulage service providers and increase quality of goods vehicles drivers”.

So, the urge for the road haulage operators to enhance expertise and capabilities providing general haulage data to its members to enable better planning and resource utilization for haulage operation. The road haulage operator is lacking in terms of electronic commercial vehicle operations system (ECVO). Tis latest technology consists of several new approaches which would help the road haulage operators to operates in more efficient manner. Some of the suggested system gathered from the respondents are: a) automatic identification technology; b) automates the regulatory interaction between road haulage operators with government agencies; c) electronic screening at weighing station and point of entry; d) safety information exchange to reduce any risk and e) freight and fleet management system for real time communication.

Respondent B

“Investing in these technologies would enable the road haulage operators to reduce its operations cost and increase the service level in the future”

The technology is also expected to enhance its communication with the customers, hence will be able to position the road haulage operator in a more competitive position to increase its market share in the industry. Monitoring and conveying information to the drivers can be executed efficiently and it would reduce the risk of providing inaccurate information to the drivers which could jeopardize the service level of the road haulage operators.

4.0 Conclusion

Peninsular Malaysia hinterland consists of varoius products mixed. With the hinterland is rapidly developed, ports would need to enhance its service level to ensure that containers can be delivered to the respective customer accordingly. The new trend of e-commerce business has aggressively pus the hinterland container transport by road to be more reliable and efficient. However, if the two issues discussed in this paper, which are the shortage of drivers and innovative imitative, not being taken seriously, it would dampen the road haulage industry as a whole.

References

Boyce, C. and Neale, P. (2006) Conducting In-Depth Interview: A Guide for Designing and Conducting In-Depth Interviews for Evaluation Input. Pathfinder International Tool Series, Monitoring and Evaluation-2

De Langen, P. and Chouly, A., (2004), Hinterland access regimes in seaports. European Journal of Transport and Infrastructure Research, 4(4), 361–380

Eleftherios Sdoukopoulosa,,*, Maria Boile (2020) Port-hinterland concept evolution: A critical review Journal of Transport Geography 86 pp 1-11

Gretchen R. Webber and Stephanie Byrd. In-Depth Interviews. Sloan Work-Family Research Network.(n.d.) http://wfnetwork.bc.edu/encyclopedia_entry.php?id=16783&area=All .2010

Haezendonck E & Notteboom T. (2 The competitive Advantage of Seaports, in : M. Huybrechts, H. Meersman E. Van de Voorde, E Van Hooydonk , A. Verbeke and W. Winkelmans (Eds) Port competitiveness: an economic and legal analysis of the factors determining the competitiveness of seaports: Antwerp:De Boeck. 2002

McCalla, R. J. Global change, local pain: intermodal seaport terminals and their service areas. IN: Journal of Transport Geography, v.7, p. 247-254, 1999

Nasir, Shahrin (2014) Intermodal container transport logistics to andfrom Malaysian ports: Evaluation of Customer requirements and environmental effects. Doctoral thesis, Stockholm: KTH Royal Institute of Technology

Parola, F., Risitano, M., Ferretti, M., Panetti, E., 2017. The drivers of port competitiveness: a critical review. Transp. Rev. 37, 116–138

Robinson, R. (2002), ‘Ports as elements in value-driven chain systems: the new paradigm’, Maritime Policy and Management, 29:3, 241-255.

Slack, B. (1993). Pawns in the game: ports in a global transportation system. Growth and Change, v. 24, p.379-388,

Skulmoski G J, Hartman F T and Krahn J (2007) The Delphi Method for Graduate Research Journal of Information Technology Education Volume 6, pp 1- 19

United Nations Conference on Trade and Development - UNCTAD, 2017. Review of Maritime Transport 2017. New York, US and Geneva, Switzerland: United Nations

Van Klink HA, Van Den Berg GC. Gateways and intermodalism. *Journal of Transport Geography*. 1998; 6, 1–9.

Wayne K. Talley, ManWo Ng (2018), *Transportation Research Part E* 113 pp 94-98

Yin Robert K (2017) *Case Study Research and Applications: Design and Methods*. Sage Publication

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