The Facilities and Infrastructure Readiness of Indonesian Shipping Company

Sita Aniisah Sholihah [a,1*], Desri Afriliani [b,2], Gena Bijaksana [c,3], Edi Abdurachman [d,4] Prasadja Ricardianto [e,5], Anton Ferdiansyah [f,6]

[abcdef] Institut Transportasi dan Logistik Trisakti, Jakarta
[1*]sitaaniisah@itltrisakti.ac.id, [2]desriafriliani31@gmail.com, [3]genabijaksana@gmail.com, [4]edia@itltrisakti.ac.id, [5r]icardianto@gmail.com, [6]antonf.jr@gmail.com

[*]corresponding e-mail

ABSTRACT

A shipping company was assigned to deliver heavy cargo owned by electric steam power plant, PLTU SUMSEL-8. The company should prepare the necessary facilities and infrastructure to ensure a smooth delivery. The research purpose is to analyze the impact of facility and infrastructure readiness on the smooth transport of heavy cargo mediated by the supervision of the shipping company. The study used a Quantitative method with data collected through Likert-scale questionnaire distributed to a sample of 30 operational employees directly involved in the task. The data analysis was conducted using Path Analysis. The result shows a positive and significant influence of facility and infrastructure readiness on the supervision provided by the company. However, there is a less significant direct influence of the facilities and infrastructure readiness of the heavy cargo smooth transportation that could be interpreted as the possibility of other factors determine the smooth transportation apart from the facilities and infrastructure readiness.

Keywords: facilities and infrastructure, electric steam power plant, readiness, heavy cargo delivery, shipping company

A. Introduction

The PLTU SUMSEL-8 electric steam power plant is a coal-fired power plant with a "mine-to-mouth" scheme parallel to the coal mine to reduce logistics costs. This power plant is planned to have a capacity of 1200 MW and will be connected to the 500 kV Sumatra transmission and the Java Sumatra High Voltage Direct Current (HVDC) transmission. The development project requires the delivery of construction goods with dimensions and tonnage relatively larger than normal size (heavy cargo). The delivery schedule for these heavy cargo items starts in early 2020 and ends in early 2021. In this case, the company was assigned to carry out logistics activities for construction goods from China to Sumsel-8 PLTU Worksite. The shipping route started from China to Patra Tani Jetty through the New Boom Port in South Sumatra, then by land to the project site in Muara Enim Regency area.

Based on the survey report from the technical meeting plan for strengthening roads and bridges on the national road, which was held because of the dispensation request by the shipping company, obstacles (Table 1) and deflections (Table 2) were found on the installed bridges and box culvert along the intended route.

E ISSN 2442-3149 | P ISSN 2355-472X
https://journal.itltrisakti.ac.id/index.php/jmtranslog

The shipping company applied to the Local Government of Prabumulih Municipality for dispensation to use a road that required special treatment. However, the mayor rejected the recommendation to pass through the inner city road for several reasons: old bridges unable to withstand heavy cargo loads, railroad tracks cutting through the road, archways and video tron limiting vehicle height, damaged sidewalks and road medians, and negative impacts on city activities. The National Road Implementation Center (BBPJN) V Palembang asked the company to calculate the road and bridge handling in detail to ensure the cargo passage's safety. After evaluation and review, the company had to fulfill BBPJNV's requirements, including alignment improvement, road widening, structural strength improvement, and traffic regulation. The company needs to prepare good facilities and infrastructure to avoid obstacles in shipping heavy cargo. In conclusion, good preparation is required to ensure the smooth delivery of cargo, given that the road and bridge infrastructure has not been tested for feasibility (Chamsudi, Rahardjo, et al., 2022; Chamsudi, Suryobuwono, et al., 2022; Irenita et al., 2022; Sitorus et al., 2021). To mitigate the risks of transporting heavy cargo, cargo handling supervisors must plan and

Table 1 Deflection from Bridges and Box Culvert

No.	Obstacle	Deflection Happening When Cargo Pass Through (CM)	Deflection of Permission (CM)	Remarks
1	Buluh Bridge	7,768	6,667	NOT SAFE
2	Air Lubuk Raman Bridge	6,518	6,000	NOT SAFE
3	Air Dangku Bridge	10,830	4,667	NOT SAFE
4	Karang Endah 1 Bridge	1,6374	1,6667	SAFE
5	Karang Endah 2 Bridge	1,1323	1,5000	SAFE
6	Gelumbang Bridge	1,6374	1,6667	SAFE

Tabel 2 Obstacles from Jetty to Kampung Bali Junction

No.	Obstacle	KM	Type of Obstacle	Size	
				Length(M)	Width (M)
1	Buluh Bridge	8,0	Composite Steel Girder Bridge	20	6
2	Air Lubuk Raman Bridge	11,0	Concrete Girder Bridge	18	6
3	Air Dangku Bridge	17,0	Concrete Girder Bridge	14	6
4	Karang Endah 1 Bridge	37,9	Box Culvert	5	10
5	Karang Endah 2 Bridge	41,9	Box Culvert	4,5	9
6	Gelumbang Bridge	44,9	Box Culvert	5	10

oversee the handling and shipping procedures meticulously. Judging from the complexity of heavy cargo transportation activities and the interrelation of several transportation elements, researching the readiness of facilities and infrastructure in delivering special cargo with mediation supervision becomes necessary.

Some previous related studies are as follows: Pashkova et al. (2021) discussed the process of heavy cargo transportation for power plants in Russia, concluding that the main task when developing a route is to ensure cargo transportation safety. Suwal & Basnet (2021) used variables such as bridge capacity, bridge design loads, bridge supports, and heavy cargo transportation using multi-axle trailers. Hunke (2011) explained the heavy cargo shipping strategy that focuses on handling obstacles that occur during the shipping process. Other research related to heavy cargo shipping (Lu et al., 2018) states that heavy cargo transportation is generally in under close supervision. The next is research conducted by Galor & Galor (2011) explained that the existing infrastructure must be adapted to the transportation of oversized cargo by permanently making facilities for subsequent transportation. The results of the study, from various types of transportation routes impact on the smooth delivery of heavy cargo for the purpose of securing cargo.

In addition, Meng et al. (2015), using the Path Analysis method, explained that for big cargo transportation, traditional transportation schemes only consider road length, road width, and transportation costs as weighted values in the analysis, while in route selection calculations for large trucks the direction of turning at road intersections is also a factor worth considering. Other studies use path analysis on heavy cargo transportation and transportation routes, Matuszkova et al. (2018) find locations on the road that could pose safety risks and traffic flow problems. Wolnowska & Konicki (2019) used the AHP method to analyze the selection of heavy cargo transportation routes with the least negative impact on urban residents' infrastructure and quality of life.

Based on the previous research, there are rare studies to date that investigate the relationship between the impact of facility and infrastructure readiness on the smooth transportation of heavy cargo, which is mediated by the supervision of a shipping company in Indonesia. Thus, the relative novelty of the quantitative review of the substantive area of facility and infrastructure readiness and smoothness transportation of heavy cargo research, which mediated by the supervision of Logistic company, and the absence of studies examining relationships between those variables in Indonesia provided the motivation and rationale for undertaking this study.

B. Methods

The research used associative method with a quantitative approach. The sample was taken from the population that 30 operational employees involved in the heavy cargo transportation process become the respondents. The primary data was taken from the data collection method, direct observation and questionnaire using Likert scale filled in by the respondents. As for the secondary data, this research used the documentation method taken from the company documents and media news. The Independent variable (X1) used in this study is the readiness of facilities and infrastructure which conceptually is a condition experienced by the company that is ready to carry out work, in this case, facilities (vehicles) and infrastructure (ways). Operationally, the readiness of facilities and infrastructure is a condition shown based on the respondent's assessment after answering the items of the instrument of readiness of facilities and infrastructure with the dimensions of transportation mode selection and route selection. The indicators used to represent this variable indicator are transportation mode selection (Logistic Clusters, 2015) and route selection (Galor & Galor, 2011).

The second variable (X2) is supervision,

E ISSN 2442-3149 | P ISSN 2355-472X
https://journal.itltrisakti.ac.id/index.php/jmtranslog

which determines performance criteria in the information feedback system design plan, compares actual performance with the requirements given, determines whether any deviations have occurred, and ensures that all company resources are used effectively to achieve company goals. This variable explains whether the activity has been carried out effectively or not based on the respondent's assessment after answering the items of the supervision instrument. The indicators are Standardization, Work implementation process, and Evaluation (Wolnoska, 2019).

The dependent variable (Y) is smooth delivery, which is a condition that can cause the implementation to be carried out properly and maximally, and operationally means a situation that is shown based on the respondent's assessment after answering the smoothness instrument items that measure the level of management and time or according to (Lu, 2018) smooth delivery refers to the preparation of shipping logistics goods from the warehouse to the destination according to the requirements of handling goods in order to reach the specified target in a timely manner. The indicators in this variable are timeliness, completeness of ordering and shipping documents, and the condition of the goods when received properly at the destination (Nasution, 2015). Associative method research is a type of research that tries to find out how certain variables affect others using hypothesis testing. The data analysis technique used is Path Analysis with the IBM SPSS application. According to Pashkova (2021), testing the significance of indirect effects can be done by utilizing SPSS and SAS macros that work by testing the significance of indirect effects with the normal theory approach and bootstrap approach to get the confidence range of the relationship between variables.

Figure 1 below shows the direct and indirect effects of variables X1 to Y mediated through supervision (X2).

C. Results and Discussion

1 Direct Effect of Readiness of Facilities and Infrastructure (X1) on Supervision (X2)

Based on Figure 1, path “a” is the effect of X1 to X2, as in the software result the output of the path coefficient “a” there is an effect of 0.4991, and it is considered significant because the $p_{\text{-value}}$ (0.0056) is below 5%. In the implementation, it uses multi-axle facilities to transport heavy cargo so that the cargo load is divided into masses with axle lines that meet the standards on the highway. Route planning carried out by the company to be passed by vehicles carrying oversized cargo must take into account: The width of the road traveled, Bend radius, Road Signs and Poles, Bridge, Permissible Road Surface Load, Electricity Poles, and Ongoing Road Repair. The

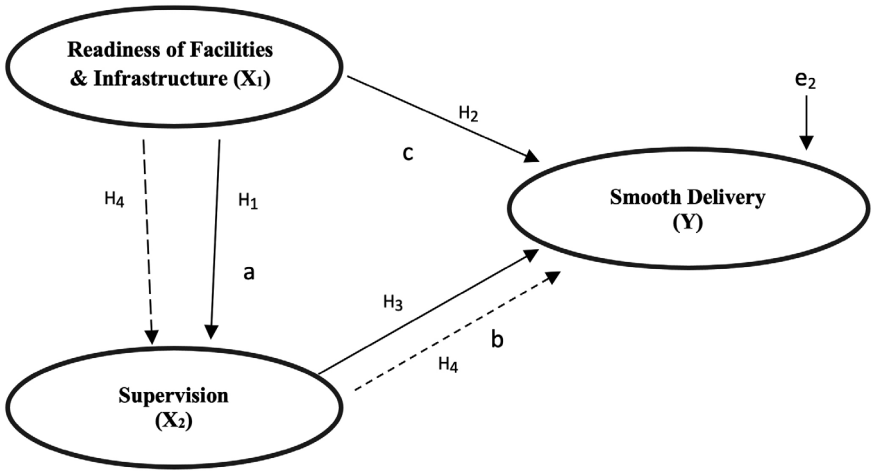

Figure 1 Research Conceptual Model

readiness of facilities and infrastructure in this case is as follows: conducting surveys on roads that will be passed by heavy cargo transport; supervising roads and bridges that require repairs; and supervising during heavy cargo transport both lashing, stopping places, and routes that will be passed. Overall, based on the results of hypothesis testing that has been carried out, it shows that there is or there is an influence caused by 0.4991 and significant because the level of p (0.0056) <0.05 so that it directly affects the readiness of facilities and infrastructure on supervision by the company.

According to some literatures, it is explained that this approach with preparations can be considered advantageous, especially for transportation companies that use a large fleet of vehicles and transport cargo on the same or similar routes. There is a direct influence of the readiness of facilities and infrastructure on the supervision carried out by the company. Research conducted by Vlkovsky et al. (2019) concluded that the type of transportation route (not only roads but also terrain), especially in the case of low-grade roads, it is generally assumed that large shocks will occur even though the transportation speed is much lower. Failure can result in cargo being dislodged and cause traffic accidents, loss of property, and even lives. For this reason, the readiness of facilities and infrastructure is very significant in supervising such shipments. In a study conducted by Vlkovsky et al. (2019), said that specifically for transportation companies that use large vehicle fleets and transport cargo on the same or similar routes, the approach can be considered beneficial. Also, for specific shipments (e.g. road type, vehicle, cargo), this can significantly increase the security of that shipment. As a practical matter, the former evaluation of shipments can only be based on experimentally measured data (acceleration coefficient values) if the transport parameters are similar, as evidenced by the high correlation coefficient.

Moreover, specific shipments (e.g., type of road, vehicle, cargo) can significantly increase the safety of such shipments. As a practical matter, the evaluation of past shipments can only be based on experimentally measured data (acceleration coefficient values) if the transport parameters are similar, as evidenced by the high correlation coefficient used. More complicated work with inertial forces is unnecessary; therefore, a worker with only basic knowledge of cargo securing (driver, loading team worker, etc.) can enter the process. In this case, the shipping company makes a plan and standard operating procedure that will be a reference in heavy cargo shipping activities, which the operational team will carry out by supervising and securing cargo for drivers and loading team workers.

The company makes plans and standard operating procedures that will become a reference in heavy cargo delivery activities

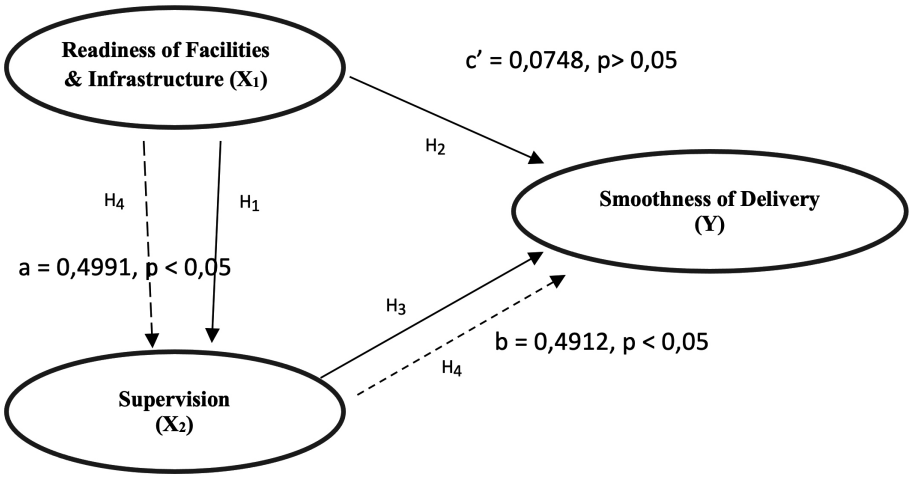

Figure 2 Macro Process Test Results

E ISSN 2442-3149 | P ISSN 2355-472X
https://journal.itltrisakti.ac.id/index.php/jmtranslog

which will be carried out by the operational team by supervising and securing the cargo, both drivers and loading team workers. The company has prepared the following facilities and infrastructure: Conducting surveys on roads that will be traversed by heavy cargo transport, conducting surveillance on roads and bridges that require repair, and carrying out supervision during heavy cargo transport, be it lashing, stopping points, and the route to be followed.

Overall, based on the results of the hypothesis testing that has been carried out, it shows that there is or is an effect of 0.4991 and it is significant because the level of p (0.0056) <0.05 so that it directly affects the readiness of facilities and infrastructure for supervision by the company.

2 Direct Effect of Readiness of Facilities and Infrastructure (X1) on Smooth Delivery (Y)

From the result, we can conclude that Path c' is the direct effect of X1 to Y. The path coefficient c' is 0.0748 and at the p level (0.4681) >0.05, which means that although there is a direct effect of the readiness of facilities and infrastructure on the smooth delivery, the value is not very significant. In this case, the company has successfully obtained permission from the relevant government regarding heavy cargo shipping activities, and there is an insignificant influence arising from the readiness of facilities and infrastructure, namely the weather when shipping heavy cargo, which causes the road to becoming slippery so that supervisors must pay more attention to safety elements in shipping so that it slightly hampers the smooth delivery of heavy cargo. Overall, based on the results of hypothesis testing that has been carried out, it shows that there is or was an influence caused by the readiness of facilities and infrastructure of 0.0748 and is not significant at the p level (0.4681) >0.05 on the smooth delivery. There is a direct influence of the readiness of facilities and infrastructure on the smoothness of delivery. Based on research conducted by Petraška et al. (2018) formulated 11 criteria with individual sub-criteria, which define the process of heavy cargo transportation, evaluate the parameters of routes, types of transportation, and transport vehicles. These factors make assessing all heavy cargo transportation processes possible in a common system for smooth and timely delivery. Petraška et. al. (2018) provides criteria for ensuring proper delivery of oversized/heavy cargo as follows: restrictions on the characteristics of road criteria, radius of road bends, transportation corridors on road sections, constraints due to bridges/dams along the route, route length, the need for transshipment development sites, construction of goods storage areas, legal requirements issues (including environmental), time lost due to traffic intensity on the analyzed road sections, seasonal influences on freight transport possibilities, experience in heavy cargo transportation. In this case the company has succeeded in obtaining permission from the government regarding heavy cargo shipping activities and there is an insignificant influence arising from the readiness of facilities and infrastructure, namely the weather when shipping heavy cargo causes the road to become slippery so that supervisors pay more attention to the safety element in shipping so that it slightly hampers the smooth delivery of heavy cargo.

Overall, based on the results of the hypothesis testing that has been carried out, it shows that there is or is an influence arising from the readiness of facilities and infrastructure of 0.0748 and is not significant at the level of p (0.4681) > 0.05 on the smooth delivery.

3 Direct Effect of Supervision (X2) on Smooth Delivery (Y)

Path b, which is the effect of X2 to Y has a path coefficient of 0.4912 and is significant at the level of p (0.00) < 0.05 because paths *a* and *b* are significant, we can conclude that there is a mediating role in the structure Baron & Kenny (1986). Because the company realizes and

understands that heavy cargo requires special attention, it requires maximum supervision and must ensure safety and security during its journey. Among them are checking the lashing periodically and checking the security and safety of the travel route. In this case, the operational team in the field always monitors the work and movement of heavy cargo shipments, reporting activities and events to management so that they can be evaluated for input in future activities. Overall, based on the results of hypothesis testing that has been carried out, it shows that there is or was an influence caused by supervision of 0.4912 and significant at the level of p (0.00) < 0.05 on the smooth delivery. There is an influence of supervision on the smooth delivery. According to Macioszek (2019), in the case of oversized cargo shipments, it is required to use the services of supervisory specialists from the company and supervisors from the police to ensure proper travel arrangements and direct supervision of vehicle travel both during travel and during stops. Therefore, supervisors are obliged to ensure maximum safety and minimize road hazards.

The company realizes and understands that heavy cargo is cargo that requires special attention so it requires maximum supervision to ensure safety and security during the trip. Among them are checking lashing periodically, checking the security and safety of the route to be traversed. In this case the operational team in the field always monitors the work and movement of heavy cargo shipments, reports activities and incidents to management so that they can be evaluated for input in further activities.

Overall, based on the results of the hypothesis testing that has been carried out, it shows that there is or is an influence arising from supervision of 0.4912 and is significant at the p (0.00) level < 0.05 on the smooth delivery.

4 Indirect Effect of Readiness of Facilities and Infrastructure (X1) on Smooth Delivery (Y) mediated by Supervision (X2)

To analyze whether there is a mediating effect or not by looking at the output in the indirect effect of X on Y. The table explains that the indirect coefficient is 0.2451 (the same as path a * b). Next, the Confidence Interval (CI) of the bootstrap results reads BootLLCI (lower level for CI) is 0.0654 and BootULCI (upper level for CI) is 0.4350. The BootLLCI and BootULCI ranges do not include the value of zero (0), so it can be concluded that there is a significant estimated and mediating effect. Effect size can be seen from the standardized coefficient of the indirect effect of X to Y, which is 0.3466. From the above analysis results, the bootstrap unstandardized indirect effect value is 0.2451, and the 95% confidence interval (CI) ranges from 0.0654 to 0.4350. Since zero is not included in the 95% confidence interval range, it can be concluded that facilities and infrastructure readiness significantly indirectly affect smooth delivery mediated by supervision. The significance test of the mediation effect for the mediation model with one mediator variable with Baron & Kenny (1986) approach in this study shows the results of c' is not significant and c'< c, then the X2 variable mediates perfectly.

There is an indirect effect of the readiness of facilities and infrastructure on the smooth delivery mediated by supervision by the shipping company. Danil (2017) explains that in most cases, the appropriate type of truck is a flat-bed platform, open flat, or lowboy to ensure the delivery of abnormal cargo by road. When carrying odd cargo, it is necessary to develop special procedures to maintain the safety of oversized or overweight freight that requires special attention. Therefore, a professional team of specialists must ensure proper cargo securing. In relation to route planning, there are at least four things that must be considered by Ihs et al. (2009): mapping process (map analysis, defining infrastructure boundaries, entering boundaries on the map, data collection), route guidance (developing possible routes based on the collected data, route selection

E ISSN 2442-3149 | P ISSN 2355-472X
https://journal.itltrisakti.ac.id/index.php/jmtranslog

criteria based on both in terms of lowest fuel consumption, smallest environmental effects, safety issues, lowest infrastructure damage effects, quality of roads traveled, so that later the most optimal route can be selected (lowest total cost as a result of the combination of the criteria mentioned above). In addition to these two things (mapping process and route guidance), the next two things are driving process support systems such as: truck location tracking, accumulation of data about the situation on the route, driver notifications, safe speed for certain road sections, warnings about sharp turns, speed limits, recommended speed according to slope risk or skew risk for trucks with large cargo, notifications about strong winds and narrow roads, as well as recommended route options, and the last is Critical infrastructure (critical infrastructure such as bridges and tunnels, so it is necessary to use "what-if" scenario management in case of unexpected situations).

Overall, based on the results of hypothesis testing, it can be concluded that there is a significant indirect effect of 0.2451 from the readiness of facilities and infrastructure on the smooth delivery mediated by supervision by the shipping company. Supervision has the effect of mediating the readiness of facilities and infrastructure for smooth delivery because the company activities always carry out planning, monitoring, and evaluate every activity in the field from route selection, modes used, and permits for each activity so that shipments become smooth and not hampered to their destination.

D. Conclusion

Based on research findings, it is recommended that the shipping company should prioritize the readiness of facilities and infrastructure to improve supervision and ensure the smooth delivery of heavy cargo. Although there is a distinction result with previous research from Pashkova et al. (2021) which stated choosing facility or vehicle and ensuring safety related to infrastructure play an important role in transporting heavy cargo, in this research although there is an effect however is not significant. Meantime another variable, supervision, shows the same result from study of Macioszek (2019), therefore it is recommended that the company should continue to conduct surveys on the road traversed by heavy cargo transport, supervise roads and bridges that require repairs, and supervise during heavy cargo transport both lashing, stopping places, and routes to be passed. Additionally, the company should maintain maximum supervision to ensure safety and security during the trip. It is also important to note that the indirect effect of facility and infrastructure readiness on smooth delivery is perfectly mediated by supervision. Therefore, the shipping company should continue to plan, monitor, and evaluate every activity in the field from route selection, modes used, and permits for each movement to ensure smooth and not hampered shipments to their destination.

While the research findings suggest a significant impact of the readiness of facilities and infrastructure on supervision and its indirect effect on the smooth delivery of heavy cargo, it is essential to consider the broader context of previous studies on the same topic. Previous research has indicated that the readiness of facilities and infrastructure alone may not be the sole determining factor for the smooth transportation of heavy cargo. They have highlighted the significance of various other factors that can be contributed, such as efficient logistic planning, skilled manpower, effective coordination among stakeholders, and timely communication. These factors have been found to influence the timely and secure transportation of heavy cargo substantially. Additionally, previous research has identified that external factors, including regulatory compliance, government policies, and road conditions, can significantly impact the smoothness of heavy cargo transportation. Adverse weather conditions, inadequate road infrastructure, and bureaucratic processes can lead to delays and disruptions in the delivery

process, irrespective readiness of facilities and infrastructure or the level of supervision.

Therefore, while the readiness of facilities and infrastructure and supervision may play important roles, it is crucial to consider a holistic approach when addressing the smooth transportation of heavy cargo. These include incorporating expert best practices, focusing on logistic planning, manpower training, stakeholder collaboration, and mitigating external factors beyond the company's control. Considering these broader aspects, we can enhance our ability to ensure the smooth and efficient delivery of heavy cargo.

E. References

Baron, R. M., & Kenny, D. A. (1986). The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182. https://doi.org/https://doi.org/10.1037/0022-3514.51.6.1173

Chamsudi, D. H. M., Rahardjo, S., Ferdiansyah, A., & Mirad, M. F. (2022). The Effectiveness Of Truck Lossing Control On The Container Delivery Ontime Performance To Reduce The Lead Time Of Delivery Activities At Nilam Terminal Tanjung Perak Port, Surabaya. *Advances in Transportation and Logistics Research*, *5*, 894–901.

Chamsudi, D. H. M., Suryobuwono, A. A., Situmorang, J. K., Antonius, S., Firmansyah, I., & Parlindungan, P. (2022). Analisis Jalur Pengadaan Material Dan Anggaran Pada Ketepatan Waktu Pelaksanaan Proyek Pembangunan Jalan Tol Kunciran-Batuceper-Cengkareng Terhadap Kinerja Proyek. *Jurnal Sistem Transportasi & Logistik*, *2*(1), 14–20.

Danil, F. (2017). *Organization of the Delivery of Oversized Cargo From Finland to Kazakhstan Thesis Title Organization of the Delivery of Oversized Cargo Commissioned by* (Issue April). South-Eastern Finland University of Applied Sciences.

Galor, W., & Galor, A. (2011). Oversize Cargo Transport in the Polish Part of South Baltic Region. *Journal of KONES Powertrain and Transport*, *18*(3).

Hunke, K. (2011). *Oversize Transport Strategy for the Region Mecklenburg-Vorpommern*. Wismar Business School.

Ihs, A., Omasits, D., & Lindberg, G. (2009). Heavyroute-Intelligent Route Guidance for Heavy Vehicles. *Proceedings of the International Conference on Heavy Vehicles*,335–348.https://doi.org/https://doi.org/10.1002/9781118557464.ch26

Irenita, N., Sholihah, S. A., Raga, P., Samosir, F., & Zahran, E. M. M. (2022). The Application Of Queuing Theory In Optimizing Ship Service Performance By Increasing The Number Of Port Dock Units. *Advances in Transportation and Logistics Research*, *5*, 96–116.

Logistic Clusters. (2015). *Logistics Operational Guide: Modes of Transport*. WFP.

Lu, P., Zhou, Y., Yu, H., & Wu, H. (2018). Discussion of Load Combination Parameters for Heavy. *2018 7th International Conference on Energy and Environmental Protection*, (pp. 74-77).

Macioszek, E. (2019). Conditions of Oversize Cargo Transport. *Scientific Journal of Silesian University of Technology. Series Transport*, *102*, 109–117. https://doi.org/10.20858/sjsutst.2019.102.9

Matuszkova, R., Heczko, M., Cepil, J., & Radimsky, M. (2018). Issues of using Longer Heavier Vehicles on Roads. *IOP Conference Series: Materials Science and Engineering*, (Vol. 317, No. 1, 012040).

Meng, L., Hu, Z., Huang, C., Zhang, W., & Jia, T. (2015). Optimized route selection method based on the turns of road intersections: A case study on oversized cargo transportation.

E ISSN 2442-3149 | P ISSN 2355-472X
https://journal.itltrisakti.ac.id/index.php/jmtranslog

ISPRS International Journal of Geo-Information, *4*(4), 2428–2445. https://doi.org/10.3390/ijgi4042428

Mockler, R. J. (1972). *The Management Control Process* (1st ed.). Appleton Century Crofts.

Nasution, M. N. (2015). *Manajemen Transportasi*. Bogor: Ghalia Indonesia.

Pardede, P. M. (2007). *Manajemen Produksi dan Operasi: Teori, Model, dan Kebijakan* (Ed. Revisi). Andi Publisher.

Pashkova, T., Filippova, N., & Pozdnyak, A. (2021). International Transportation of Heavy and Oversized Cargo: Example of Haulage of Components of Wind Power Plant. *World of Transport and Transportation*, *19*(1), 156–173. https://doi.org/DOI: https://doi.org/10.30932/1992-3252-2021-19-1-156-173

Petraška, A., Čižiuniene, K., Prentkovskis, O., & Jarašuniene, A. (2018). Methodology of selection of heavy and oversized freight transportation system. *Transport and Telecommunication*, *19*(1), 45–58. https://doi.org/10.2478/ttj-2018-0005

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717–731.

Sitorus, M. R., Herdian, T., & Lambert, F. (2021). Tingkat Kesesuaian Kinerja dan Harapan Pelanggan pada Terminal Peti Kemas Tanjung Priok. *Jurnal Manajemen Bisnis Transportasi Dan Logistik*, *7*(1).

Suwal, R., & Basnet, A. (2021). Heavy Cargo Transportation Through The Highway Bridges in Nepal. *International Journal of Advances in Engineering Research (IJAER)*, *22*(2), 1–12.

Vlkovsky, M., Binar, T., Svarc, J., Nemec, P., & Bucsuhazy, K. (2019). Impact of shocks on cargo securing during the road transport. *IOP Conference Series: Materials Science and Engineering*, *603*(3). https://doi.org/10.1088/1757-899X/603/3/032045

Wolnowska, A. E., & Konicki, W. (2019). Multi-criterial analysis of oversize cargo transport through the city, using the AHP method. *Transportation Research Procedia*, *39*(2018), 614–623. https://doi.org/10.1016/j.trpro.2019.06.063