

The development of a freight distribution model for connecting inter-island freight transport

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Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=9999920530501&lokasi=lokal>

Abstrak

Inter-island freight transport costs in eastern compared to western Indonesia are relatively high, caused by operator charges for roundtrip fees. In order to make the distribution of freight efficient, the network of freight transport needs to be rationalized on a regional basis. The output from the regional model counts are few and far between in relation to intercity traffic volume data, and the disaggregate model at a regional level requires more effort in conducting travel route surveys. Therefore, aggregated analysis is preferable initially, based on the traffic volume and the commodity flow for inter-island freight transport. The accessibility and connectivity of the land use can be obtained from the freight distribution model as a measurement to evaluate different land use scenarios and also to provide feedback for land use modeling, as a parameter for freight location choice. With a freight distribution model to identify freight commodity supply and demand in a particular region, potential freight transport generation uses such variables, which consider generalized transport costs. Using the Furness and Maximum Entropy models, the results indicate that Furness model finishes in the 4th iteration and Maximum Entropy in 6th, while the negative exponential function offers the best calibrated estimation, using sea freight movement data. It was also found that the positive value of α means that any increment of travel time decreased the rate of freight flow, which mirrored the conditions in reality: the higher travel costs, the fewer the number of flows between zones. The data is analyzed in the context of modeling intra-city freight flow in the archipelagic region of northern Maluku.