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Development of Evaluation Method for Possibility of Combining Delivery and Passengers Trip

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The aim of this study was to develop a methodology for evaluating the potential of freight and logistics transportation. To achieve this, the following steps were taken: First,To represent terminal traffic and home delivery trips, for which it's difficult to obtain mobility data, we used facility location and population distribution information to represent difficult-to-move people flow trips and logistics trips, as shown in Figure 1. Next,Human flow trips that could be combined with home delivery trips by freight consolidation were extracted using the Delivery Efficiency Criteria (DEC), shown in Figure 2. Then,A simulation was conducted to determine the impact on increased distance of human trips and reduced distance of home delivery trips when changing the delivery efficiency criterion, as shown in Figure 3.The evaluation showed that logistics and human flow can be improved up to a delivery efficiency criterion value of 0.8 to 1.2. However, if the delivery efficiency criterion value exceeds this range, logistics losses will increase. Therefore, selecting freight and passenger consolidation areas within this range can help maximize human flow and logistics efficiency. Using this method makes it possible to maximize human flow and logistics efficiency. Additionally, the visualization of Origin-Destination (OD) of difficult-to-move trips that have potential for freight/passenger consolidation can aid in route setting when considering the introduction of freight/passenger consolidation means of transportation.

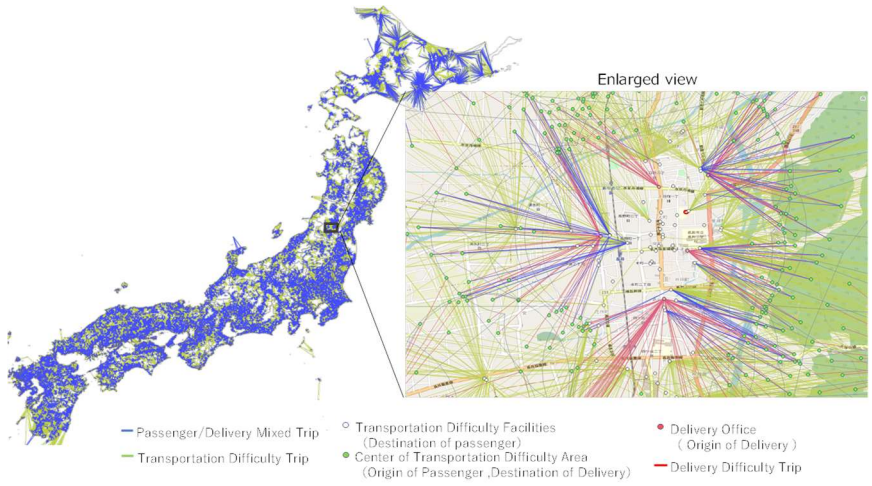

Fig.1 Distribution of difficult traffic areas

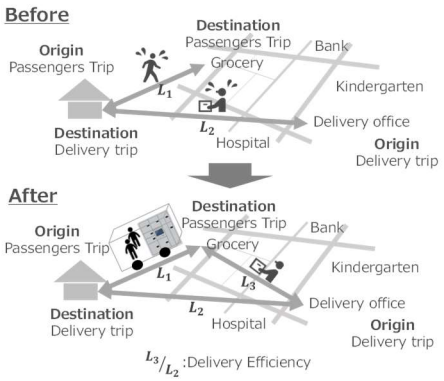

Fig.2 Definition of Delivery Efficiency

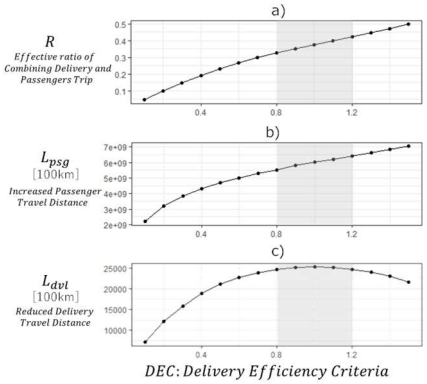

Fig.3 Distribution of difficult traffic areas