

# ABSTRACT

Due to the limited land resource in Taiwan, it's difficult to obtain a logistics center in city for logistics companies. The logistics company's performance and quality of services are affected by the uncertain delivery delay resulting from traffic congestion. In face of the competition of high-speed rail system in 2005, Taiwan Rail Administration (hereafter TRA) seeks opportunities to survive. TRA owns completely round-island network, facilities, exclusively right of way, and the land resource that logistics companies lack. To promote sustainable transportation policy and pursue maximizing social welfare, it's necessary and important to address the idea of "intercity intermodal logistics transportation" by integrating TRA and logistics companies together. To discuss the meaning of "intercity intermodal logistics transportation" from the results on financial and economics aspect is also important.

After explaining those issues that the stockholders of "intercity intermodal logistics transportation" concerned, the conceptual model is constructed. Employing the criteria drawn up in this study, the candidate locations of Rail Transshipment center (RTC) are prescreened initially. Given the customer's demand this study proposes two kinds of optimal location model of RTC for intercity intermodal logistics transportation based on the consideration of external cost or not.

The empirical results without the consideration of external costs show that "intercity intermodal logistics transportation" has financial profits. This empirical study uses the weighting method to find solutions. By assigning the same weights to TRA and the logistics companies, the results are as follows: Eight RTCs, namely those in Shulin, Hsinchu, Taichung, Tainan, Kaohsiung, Ilan, Hualien, and Taitung, are selected from the 16 candidate RLT locations. Through freight routes dispatching, it is found that transportation cost is lower when the shortest routes from the source point to departure RTC and from the arrival RTC to demand point are selected for transportation. The route selected is able to satisfy the customer's demand for time-sensitive delivery. In the other model when the transportation external costs are involved, the results show that "intercity intermodal logistics transportation" has economic benefit.

By comparing the results between "intercity intermodal logistics transportation" and "intercity highway logistics transportation" on finance and economic aspects, it is found that "intercity intermodal logistics transportation" has lower financial profits, but higher economic benefits than "intercity highway logistics transportation". This study finally proposes conclusions and suggestions according to the findings obtained.

**Keywords:** *intermodal logistics transportation, location selection, external cost, transshipment center, multi-objective programming.*