CHAPTER V
CONCLUSION AND RECOMMENDATION

The railway transportation system is recognized as a highly safe mode of travel, offering low travel costs and punctuality. Additionally, it is considered a sustainable transportation system. Under ASEAN Connectivity, member countries share a key objective: linking China and ASEAN countries. Currently, known as the Belt and Road Initiative (BRI) or One Belt One Road (OBOR), is a global cooperation policy led by China. Thailand aims to advance its logistics development projects, particularly in railway transportation, to enhance nationwide connectivity and cross-border linkages. This effort seeks to establish Thailand as a regional transportation hub within ASEAN and strengthen its connections to China, a global superpower. However, Thailand still faces significant inequality issues. According to the CS Global Wealth Report in 2018, Thailand ranked as the world's third most unequal country and had the highest level of population inequality globally. One of the most pressing concerns is ensuring that the public transportation system, especially rail transport, meets the needs of the population. Recent statistics on intercity railways indicate that Thailand has railway stations in only 47 out of 77 provinces, covering just 61.04% of the country. This means that 30 provinces still lack railway access, contributing to transportation inequality. This disparity is evident in the declining number of railway passengers, a trend that continues to worsen. Data from the State Railway of Thailand in 2021 revealed an overall decline in railway passengers by 88.8%, with an average of only 138,169 passengers per day.

Recognizing the significance of these issues, this thesis contributes to addressing the challenges of analyzing transportation inequality in access to Thailand’s railway system. **The first objective of the dissertation** contributes to support the literature on spatial inequality in railway station accessibility by utilizing Geographic Information Systems (GIS) to assess disparities across different regions of Thailand. **The second objective of the dissertation** is to explore the factors influencing railway access inequality by considering all social factors contributing to this issue. This is achieved through statistical modeling, employing both Exploratory Factor Analysis (EFA) and

Confirmatory Factor Analysis (CFA). Lastly, **the third objective of the dissertation** is to examine the economic, tourism, and social impacts on Thai people's perception of the benefits of the Belt and Road Initiative (BRI). This study investigates key perception indicators and factors affecting BRI, analyzing their relationship with Thai citizens' intentions to use the China-Laos high-speed railway. The Theory of Planned Behavior (TPB) is applied as a mediating framework, with Structural Equation Modeling (SEM) used for statistical analysis of these relationships.

For this study, the research process will follow the three main objectives. The overall study framework is illustrated in **Figure 5.1**. The process begins with the first objective, which involves developing a model to analyze the accessibility of railway stations in Thailand. This aspect is studied first to understand how the current distribution of railway stations affects spatial inequality. The selected study area is Nakhon Ratchasima Province, chosen because it is the largest province in Thailand and serves as a gateway connecting the northeastern region to other parts of the country. Additionally, Nakhon Ratchasima has the highest number of railway stations in Thailand. Therefore, assessing spatial inequality is prioritized to understand disparities in railway service accessibility from a spatial perspective, which helps clearly identify the root causes of current inequality issues. Geographic Information Systems (GIS) will be applied to analyze and develop the model. The results will provide insight into the spatial inequality of access to railway stations in Thailand and offer suggestions for reducing disparities in accessibility. Once the study for Objective 1 is completed, Objective 2 focuses on developing a model to measure the factors influencing inequality in access to intercity rail transport in Thailand. This objective aims to identify which factors indicate inequality in the intercity railway system. The study area includes 33 intercity railway stations covering all regions: Central, Northern, Northeastern, Eastern, and Southern Thailand. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) will be applied to identify indicators of inequality in access to intercity rail transport and provide policy recommendations for reducing such disparities. By obtaining results from Objectives 1 and 2, the study will have a comprehensive understanding of the inequality issues in accessing the railway transport system in Thailand. This will inform policy formulation aimed at reducing disparities in railway service accessibility among the population. Finally, Objective 3 involves developing a model to analyze the relationship between factors influencing

the Belt and Road Initiative (BRI) policy, perceived benefits, and the intention to use the China–Laos high-speed rail service among Thai citizens. This topic is studied because the BRI is a global policy by China that significantly influences international infrastructure development. As Thailand is geographically close to the China–Laos high-speed rail route, this study is crucial for understanding the public's perception of the benefits of the BRI policy. The aim is to identify the factors that influence the relationship between perceived benefits of the BRI and the intention to use the China–Laos high-speed rail service. The selected study areas are seven border checkpoints along the China–Laos high-speed rail route: Chiang Saen, Chiang Khong, Huai Kon, Phu Du, Ban Na Kraseng, Chiang Khan, and Nong Khai. Structural Equation Modeling (SEM) will be applied to identify factors affecting the BRI policy, perceived benefits, and the intention to use the high-speed rail service among Thais. This will also provide policy recommendations for aligning Thailand’s development with the BRI. Ultimately, the results of this study will yield policy recommendations both for reducing inequality in access to Thailand’s railway transport system and for aligning national development with the international BRI policy. These policies will contribute to enhancing the efficiency of Thailand's railway transportation system.

The proposed contributions are organized into four sections. The remainder of this chapter is structured as follows: Sections 5.1 to 5.3 discusses the substantive contributions of the dissertation for each objective examined in the dissertation. Lastly, Section 5.4 discusses the limitations of the dissertation and directions for future research.

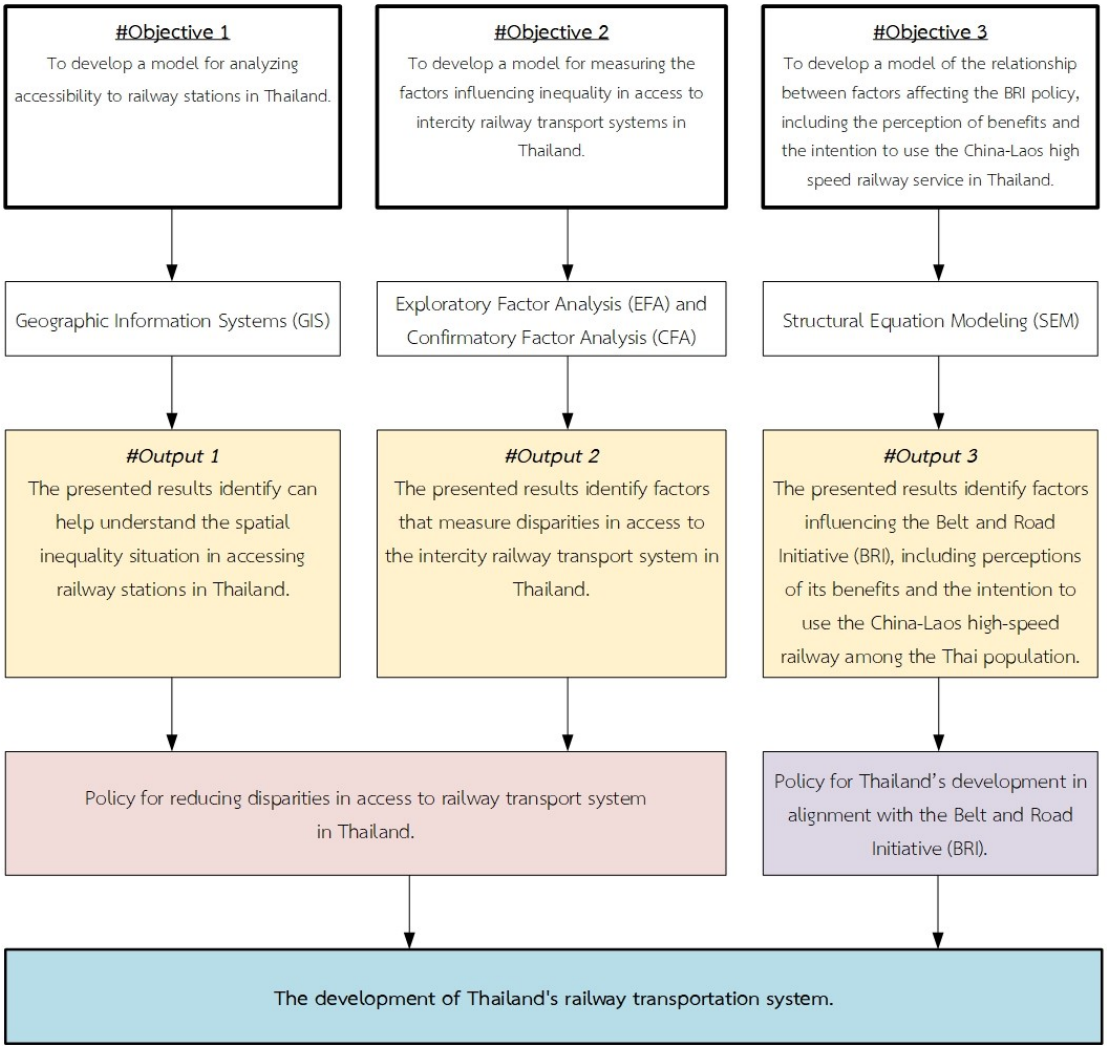


Figure 5.1 Overall Summary of Thesis Findings.

5.1 Summary of the first objective

The first objective of the dissertation is to develop an analytical model for assessing railway station accessibility in Thailand by applying Geographic Information Systems (GIS). This study fills a gap in the literature by evaluating disparities in railway station accessibility, focusing on Nakhon Ratchasima province, the largest province in Thailand. This research examines key issues affecting inequality and assesses disparities in railway station accessibility in remote areas at the local level. The GIS model is employed to design an approach for analyzing travel time to railway stations based on actual road networks. Additionally, a sub-district-level spatial analysis is conducted to identify areas with limited access to railway stations within Nakhon Ratchasima province.

The key findings of the dissertation reveal inequalities in railway station accessibility, identifying certain areas as having significantly lower access opportunities. These areas are considered disadvantaged in terms of railway station accessibility. Additionally, the results rank different areas based on their accessibility to railway stations, from the fastest to the slowest access times within the study area. The findings indicate that districts with higher population density have better access to railway stations than those with lower population density, leading to disparities in accessibility. To address this inequality, the study proposes a solution by integrating bus transportation with railway stations to enhance accessibility and reduce existing disparities. This recommendation can be beneficial for government agencies and railway planners in designing strategies and policies to improve equitable access to rail transportation services effectively.

5.2 Summary of the second objective

The second objective of the dissertation is to develop a measurement model for factors influencing disparities in access to intercity railway transportation in Thailand by applying Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). This study fills a gap in the literature by examining the factors contributing to disparities in intercity railway accessibility. It addresses key issues of inequality based on a multidimensional perspective, including cultural inequality, spatial inequality, social inequality, political inequality, knowledge inequality, economic inequality, and environmental inequality.

The key findings of the dissertation reveal that all 37 observed variables in the model contribute to identifying disparities in railway accessibility. The seven factors—cultural inequality, spatial inequality, social inequality, political inequality, knowledge inequality, economic inequality, and environmental inequality—are statistically significant at the 0.001 level. Furthermore, the model demonstrates high reliability in measuring railway accessibility inequality. The results indicate that cultural inequality is the most influential factor contributing to disparities in railway access, followed by economic inequality, social inequality, knowledge inequality, political inequality, spatial inequality, and environmental inequality. Additionally, this study proposes policy recommendations to address and reduce railway accessibility disparities across all seven dimensions. These findings provide valuable insights for relevant

organizations, such as the State Railway of Thailand and the Department of Rail Transport, helping them better understand the actual needs of railway users. This, in turn, enables more effective railway development planning and policy formulation to reduce accessibility disparities, ultimately fostering a more equitable society in the future.

5.3 Summary of the third objective

The third objective of the dissertation is to develop a model that examines the relationships between factors influencing the BRI policy, including the perception of benefits and the intention to use the China-Laos high-speed rail service among people in Thailand, by applying Structural Equation Modeling (SEM). This study fills a gap in the literature by exploring indicators of benefit perception using the concept of Perception. It also investigates the factors influencing BRI and analyzes the relationship between BRI's impact factors and the intention of Thai people to use the China-Laos high-speed railway service, using the Theory of Planned Behavior (TPB) as a framework. This research addresses key issues regarding public perception and the factors affecting BRI, including foreign direct investment, tourism, employment, education, living standards and social relations, international relations, economy, logistics, and transportation. Additionally, the study presents several important findings that can lead to the creation of policies that align with Thailand's context and respond to global changes brought about by the BRI policy.

The key findings of the dissertation reveal that Perceived Emotional is identified as the most significant factor affecting the perception of benefits from the BRI, followed by Perceived Cultural, Perceived Service, and Perceived Benefits Product in that order. These results indicate that the components have relatively high weights, demonstrating that the domain is highly reliable. Furthermore, regarding the factors influencing the perception of BRI benefits, the results show a positive relationship with the attitudes of Thai people. Specifically, when Thai people perceive the benefits of BRI, it strengthens their positive attitude toward the China-Laos high-speed railway. This positive attitude helps them recognize the importance of the BRI railway routes. The study further elaborates on the crucial role of the BRI policy, with the results reflecting that six factors—foreign direct investment, tourism, employment, living standards and social conditions, economy, and logistics and transportation—are

viewed as positive influences on the perception of BRI benefits among Thai people. On the other hand, education shows a negative relationship with the perception of BRI benefits, possibly because the educational benefits are not seen as directly impactful to Thailand. Lastly, the findings reveal the intention of Thai people to use the China-Laos high-speed railway service, showing a positive relationship between perceived benefits, attitudes, and subjective norms with the intention to use the service. This indicates that the Structural Equation Model used in this study accurately examines the relationships between factors, effectively reflecting Thai people's views on the BRI policy. The study also provides policy recommendations across six dimensions, which can guide policymakers in shaping national-level strategies. The Ministry of Foreign Affairs can apply policies to develop foreign direct investment, while the Ministry of Tourism can implement policies for tourism development. The Ministry of Labour can focus on employment-related policies, and the Ministry of Transport (including the Department of Highways, Department of Rail Transport, and State Railway of Thailand) can apply policies to improve living standards, social conditions, and logistics and transportation. Additionally, the Office of the National Economic and Social Development Council can implement policies focused on economic development. These policies will help align Thailand’s national development plans with global cooperation frameworks like the BRI, ensuring maximum benefits for the Thai population in all dimensions.

5.4 Limitations and Recommendations

For the first objective, this study has certain limitations. Specifically, the study assessed access to railway stations via the road network, using only main highways and rural roads as the study’s focus. Due to data constraints in the study area, it was not possible to consider routes covering local roads, which means the analysis did not include all possible access routes to railway stations. Therefore, future research should incorporate data from other road networks, such as local roads and expressways, to offer a more comprehensive assessment of accessibility and better reflect the true level of inequality in access to railway stations across all routes. Moreover, future studies should consider adopting new techniques, such as leveraging big data from various sources. This would help improve the assessment of access and provide more effective planning for infrastructure development, ultimately contributing to reducing

social inequality in the future. Such an approach would be beneficial for policy planning and addressing disparities in railway access, benefiting all stakeholders involved in the nation's development. Lastly, future studies should also consider the travel behavior of railway users who reach the stations by alternative modes of travel, such as pedestrian. An example of relevant research is the study by Olszewski and Sony in 2005, which investigated the factors influencing passengers' decisions to walk to rail transit systems. A key finding from this study revealed that the walking distance to a railway station should not exceed 600 meters. However, if future studies in Thailand incorporate this issue for further investigation, it could lead to a more comprehensive analysis of people’s travel behavior and potentially result in new findings that would be beneficial for analyzing access to railway stations.

For the limitations of the second objective, this study focused only on the perspectives of railway passengers and did not include users of other forms of public transportation. Additionally, passengers under the age of 18 were excluded, as they are considered minors and may not fully express their views or attitudes regarding inequalities in access. As a result, the study may not fully capture the perspectives of younger age groups on access inequalities. Furthermore, this research only considered railway access inequalities within Thailand. Future studies should include respondents under the age of 18 to provide a more comprehensive understanding of the opinions and perspectives of younger railway users. Researchers in future studies should adjust the survey questions to be age-appropriate for respondents. Moreover, this study can be extended to other developing countries, where railway access inequality remains a significant issue. Conducting research in such countries could provide valuable insights and new findings from various perspectives, contributing to the global understanding of transportation inequality and providing actionable data for future policymakers.

For the limitations of the third objective, this study focuses only on the perception of benefits related to the BRI from the perspective of Thai people living in border provinces along the BRI route. Therefore, future studies should expand to include other regions across Thailand. This could provide additional insights into varying opinions influenced by the different contexts of various areas in the country. Additionally, this study used only the Theory of Planned Behavior (TPB) and the Perception concept for analysis. Future research could build upon this by incorporating other theories, such as the Technology Acceptance Model (TAM) or the Unified Theory

of Acceptance and Use of Technology (UTAUT), to develop new frameworks for further studies. Moreover, this research can be extended to countries along the BRI route to gather more in-depth insights and discover new findings from various perspectives. This would contribute to a broader understanding of the BRI's impacts and further enhance the research on its benefits across different regions.