



Identifying the Barriers and Drivers of Transit Oriented Development (TOD) Implementation in Southeast Asia: A Comparative Analysis of TOD Implementation and Resources and Tools by World Bank (WB) and Identified Developing Southeast Asian Countries TOD Policies

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ABSTRACT

Transit-oriented developments (TOD) have been implemented worldwide to increase population density, pedestrian-friendliness, public transportation usage, and economic growth by creating well-planned and integrated urban areas. Thus, development agencies such as the Asian Development Bank (ADB), Japan International Cooperation Agency (JICA), and World Bank, to name a few, are helping their member and borrowing countries to promote TODs by investing in mass-rapid transit and addressing financial gaps to make Southeast Asian cities liveable by 2030. Despite traffic congestion, Singapore and Malaysia successfully pioneered TOD in the region. At the same time, Thailand, Indonesia, the Philippines, and Vietnam have recently implemented national and local policies to replicate this success in their major urban centers. As borrowing members of the World Bank, these countries must adhere to the TOD Implementation Resources and Tools, a publication by the said agency that helps implement TOD. Although these nations tried to achieve similar success, they needed help implementing the reference. Hence, a Comparative Content Analysis between the TOD policies of the select Southeast Asian countries and TOD Implementation Resources and Tools was conducted where four main criteria were examined: TOD Planning, Station Area Development, Stakeholder and Community Collaboration, and Value Capture was found that Southeast Asian countries' policies must address and improve various policy barriers on transit accessibility, pedestrian-friendliness, liveable public facilities, surrounding developments, affordable housing and accessible living, mixed-uses and suitable urban forms, stakeholder and community collaboration, and value capture mechanisms, and the TOD implementation resources and tools to include in their policies on the empowerment of local culture and identity. This will help promote genius loci and esprit de corps to existing and future TODs.

1. Introduction

Prior to Peter Calthorpe's discovery of Transit-Oriented Development (TOD) in the 1980s, transport agencies in the United States were already leading efforts to promote sustainable urban environments by regulating and guiding the type and size of projects around specific mass transit hubs, such as train and bus stations. They advocated for compact, walkable developments as a means to restrict urban expansion. Consequently, there was a rise in the number of people using public mass transit, and neighbourhoods that were previously focused on cars shifted their focus to transit. Backed by academic research, this finding has motivated transportation agencies to envision the transformation of neighbourhoods surrounding significant transit hubs into TOD [6]. The concept of TOD in urban development aims to promote sustainable mobility and enhance urban density by strategically locating communities around transport hubs, taking into account the socioeconomic level and accessibility of the neighbourhood [8, 24]. The TOD concept is defined by a significant increase in the use of public transport by residents and the general public in specific TOD station areas. This increase is facilitated by the implementation of proactive and intelligent technologies and initiatives. As a result, approximately one-fifth of trips to commercial areas are made using public transport in TOD areas, which is 4.9 times higher than in the outskirts of urban areas [25,39]. The urban development concept is based on fundamental ideas that emphasise the importance of policies, actors, and institutions in ensuring successful implementation. This is achieved by promoting cooperative processes and community-led development strategies, with the aim of achieving equitable urban development [24, 28]. TODs are a concept in urban development that promotes the integration of various uses such as residential, commercial, and institutional, with a focus on enhancing walkability, increasing public transit ridership, and stimulating economic activity. This benefits both the public and private sectors through the generation of revenue and profits from sources such as fares, leases, and taxes [6]. Despite its innovative and creative nature, TOD is not a recent concept. It has been popular in both the global north and south, including regions such as the United States, Europe, and Asia-Pacific. Extensive research and practical applications have been conducted in these areas, leading to the endorsement of TOD implementation by numerous reputable organisations [8, 24]. The concept of TOD gained momentum throughout time and became widely adopted globally, leading to many interpretations and applications in numerous countries and institutions. As a result of this progress, TOD evolved from being solely a concept for neighbourhood development to becoming a concept for urban development and planning that had an impact on various geographic scales. This emphasised its significance in the establishment and expansion of nations [22].

The Asian Development Bank (ADB) has set a goal to promote the development of TODs in the Southeast Asian region. This involves investing in mass-rapid transit systems and bridging funding gaps by linking Land Value Capture (LVC) with TOD. The aim is to enhance land values and infrastructure systems, ultimately creating livable cities by the year 2030 [1]. Consequently, the ADB provided financial support for the development of railway sub-sector projects in various Southeast Asian countries through Official Development Assistance (ODA). This support included conducting a feasibility assessment and creating a detailed design for TOD [18]. Singapore was the pioneer in Southeast Asia in successfully implementing TOD by integrating urban transit development with spatial design and planning, while encountering congestion issues similar to other nations. Malaysia followed suit after Singapore [1]. The measures taken by Singapore and Malaysia were highly successful and efficient, compared to Thailand, Indonesia, and the Philippines, including their capital cities. Although these countries showed potential, they encountered obstacles in applying the TOD concept [1, 4, 22]. Attempting to replicate the strategies employed by successful nations in adopting TOD, such as Singapore and Malaysia, may appear possible but is indeed difficult. When it comes to the Netherlands, which effectively applied the TOD idea, replicating and immediately applying policies, concepts, and performance indicators to other developed countries in the global north proved to be more challenging than transferring technology, infrastructure, and equipment [37].

Therefore, the act of imitating or replicating may not be as simple and relevant as it appears, as there are other sector-specific factors to take into account before implementing a strategy.

In order to tackle the problem, Southeast Asian countries that are borrowing members of the World Bank are required to adhere to the guidelines established by the organisation when implementing the TOD concept. This involves utilising the TOD Implementation Resources and Tools, which is a guideline published by the World Bank that is grounded in peer-reviewed research and literature [13]. This guideline seeks to build TODs through the use of consistent and pre-determined procedures, policies, concepts, and standards. Nevertheless, although the guideline is easily accessible, it is difficult to adopt, and its execution may not be totally suitable for certain member nations in Southeast Asia. Therefore, this paper contends that the TOD Implementation Resources and Tools may not be entirely fit for the Southeast Asian context, and suggests using this guideline as a framework for modifying and adapting to the local context, in order to guarantee positive outcomes for stakeholders involved in TOD projects in Southeast Asia.

The assessment of TOD projects in Southeast Asia underscored the importance of taking into account the socio-cultural characteristics of the local community to ensure the success of these initiatives. Numerous TOD initiatives are unsuccessful because there is a lack of understanding of the local culture, behaviour, and attitudes. This leads to a mismatch between the goals of the project and the needs of the community [1,15]. The challenges in adopting the TOD idea to attain sustainable development encompass the lack of adequate park-and-ride facilities, high housing costs in close proximity to transit stations, and the sufficiency of public transport services [21]. Reports have highlighted the challenges faced by Southeast Asian megacities, including Bangkok, Jakarta, and Manila, when it comes to investing in mass rapid transit systems. These challenges stem from the delayed process of urbanisation in these cities in comparison to global metropolis. These cities have less extensive mass rapid transit networks and have difficulties when trying to transition from a culture that heavily relies on cars to one that prioritises public transportation. Therefore, additional research should be undertaken to enhance capacity development and address these issues [1].

Several peer-reviewed papers indicate that Brunei, Cambodia, Myanmar, Laos, and Timor-Leste do not have any TOD policies or guidelines [2, 11, 23, 27, 35, 38]. Nevertheless, a few of the above named countries are inclined to implement TOD in the future. Current publications on Cambodia explore the impact of economic globalisation, foreign direct investment (FDI), and China's Belt and Road Initiative (BRI) on the country's spatial structure and land use patterns along highways. Two impediments observed in the implementation of TODs are the expansion of development area along National Highway 4, which has stimulated commercial activity, and the clustering of population along the route. Furthermore, these factors have contributed to the spatial distribution of land use and have played a significant role in driving these changes. This information is crucial for implementing effective policies related to land use in Cambodia and other developing nations [23]. In Laos, the lack of public transport in Vientiane leads people to rely on private vehicles, creating a gap between those with lower and higher incomes. However, the construction of the Lao-Chinese High-Speed Railway (LCHSR) is currently in progress. This railway will connect Boten to a new border crossing with Thailand in the capital city. The project is expected to cost around 6 billion USD, with China providing co-financing. The LCHSR's economic impact on Laos, Thailand, and China showcases distinct benefits arising from the provision of passenger and cargo train services. Laos is expected to see substantial advantages from TODs located near railway stations [20]. Myanmar has emphasised the challenges in implementing TOD. This includes the delivery of dependable and ample energy, the growth of cities, the supply of adequate sanitation and access to clean drinking water, and the establishment of secure regional communication networks. In addition, obstacles to the development of TODs include societal variables such as congestion control systems and innovative city initiatives [2, 27]. Based on the research objectives of this study, countries that do not have a current TOD policy or guideline will not be included in the analysis. This exclusion is imperative due to the scarcity of accessible data and will be regarded as a delineation and constraint for this study paper. Nevertheless,

it is heartening to see that these nations are advancing and exerting endeavours to embrace TODs for the purpose of urban planning and development. Prioritising the resolution of the identified obstacles and catalysts for development is crucial before implementing the TOD concept, its principles, and policies in other Southeast Asian countries that are aiming for similar progress.

This research aims to assess the relevance of TOD Implementation Resources and Tools in Southeast Asian countries that have adopted TOD policies and guidelines in select countries in Southeast Asia, which include Thailand, Indonesia, Vietnam, and the Philippines. Singapore and Malaysia are not included in this context because they have already been recognised as successful countries in implementing the TOD concept [4, 18]. The system will generate a concise overview of significant topics concerning the application of TOD based on various studies and policy documents. These topics include TOD Planning, Station Area Development, Collaboration with stakeholders and the community, and Value Capture. The specified variables will serve as the control variables and will serve as foundation for comparative analysis [22] and examine the policies in the TOD Implementation Resources and Tools, and identified and published national policies and guidelines related to TODs in the selected Southeast Asian countries. The findings will contain a detailed breakdown of the outcomes obtained from this comparative analysis. The policies will undergo critique and analysis to reach a clear and concise conclusion that identifies the barriers and drivers of the policies being compared. As an outcome, this paper will identify the barriers and drivers to policy implementation of TODs in Southeast Asia, their own TOD policies, and the TOD Implementation Resources and Tools which is promoted by the World Bank in implementing TODs on the same region. This will assist policymakers in Southeast Asia in planning and incorporating TODs into their policy creation, development of applicable and relevant strategies for TOD implementation.

2. Methodology

The researchers will follow the methods illustrated in Figure 1. The researcher will define the fundamental benchmark criteria for analysing the dependent and independent variables, as specified in Table 1. Comparative content analysis will be used to rigorously compare the policy conditions of the independent variable, TOD Implementation Resources and Tools, with the corresponding policy conditions of the relevant nations mentioned in the introduction, such as Malaysia, Thailand, Indonesia, Vietnam, and the Philippines. The aim is to draw inferences and provide suggestions for policy formulation and decision-makers in Southeast Asia. The findings of this study will assist Southeast Asian countries in developing or revising their TOD policies and guidelines. The fundamental objective of the study is to ensure that these policies are considered acceptable and inclusive by the main stakeholders and players in the region. The baselines will consist of specific criteria that will be used as a control variable to analyse and compare the independent variable, which is the TOD Implementation Resources and Tools published by the World Bank. The dependent variables are the published TOD policies from countries such as Thailand, Philippines, Indonesia, and Vietnam, which have established TOD directives but have not yet successfully implemented the TOD concept. Based on the comparative analysis, we will form a conclusion by highlighting the barriers and drivers that influence the implementation of TOD in the aforementioned countries.

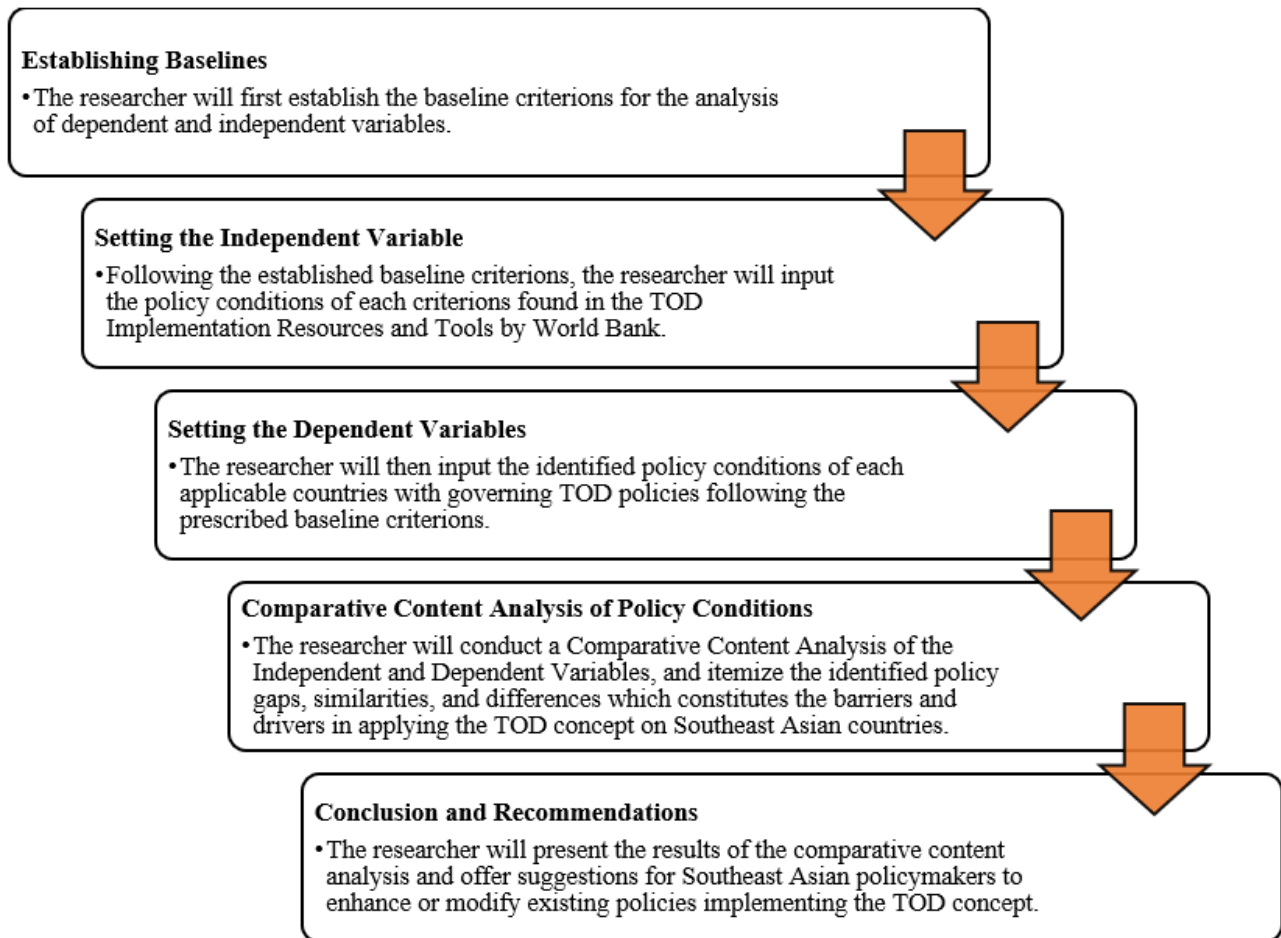


Figure 1 Methodological Framework of the Study proposed by the authors

2.1 Establishing Baselines and alignment of the Independent Variable

The key factors for implementing TOD policies can be categorised into four main fundamental criteria: TOD Planning, Station Area Development, Collaboration with Stakeholders and Community, and Value Capture [22]. The baseline criteria are derived from multiple published peer-reviewed and reputable sources, which have been collectively contextualised to provide a concise yet comprehensive summary of the issues involved in developing and implementing TOD policies. These criteria serve as the basis for the creation of the TOD Implementation Resources and Tools by the World Bank. The policy conditions, on the other hand, are based on the TOD Design Principles of the independent variable, which is the TOD Implementation Resources and Tools by World Bank. These conditions will be tailored to the baseline criteria provided in Table 1.

Table 1

Baseline Criteria and Policy Conditions from the TOD Implementation Resources and Tools by World Bank [10, 13, 33, 34, 37].

Baseline Criteria	Policy Conditions from the TOD Implementation Resources and Tools by World Bank
TOD Planning	Density Optimize residential and employment densities along a transit corridor or station area to encourage walking and transit use, considering the bearing capacities of non-motorized and transit infrastructure.
	Transit Accessibility Advocate for street design that ensures safe access for all users, including pedestrians, cyclists, motorists, and transit riders, and integrate smart technologies in TOD projects to enhance public transit services.
	Pedestrian Friendliness Implement safe speed strategies, traffic demand management, and reduced parking demand to promote sustainable mobility choices and emphasize the need to create a continuous, network-like pedestrian environment that meets and exceeds accessibility guidelines and standards for all users.
Station Area Development	Connectivity to Surrounding Neighborhood Ensure the smooth integration of transit modes, systems, and routes, considering the need for efficient connections to and from the station for all users, abilities, and access modes.
	Liveable Public Space Create open spaces like amenity spaces, green spaces, playgrounds, parks, plazas, and civic squares within a five-minute walking radius, promoting congregational activities through inclusive architecture and landscaping and identifying high-risk areas for TOD projects considering climate change and environmental variations.
	Development Surrounding the Station Area Emphasize the importance of pedestrian-oriented landscaping and building design, promoting active street life and high-quality station architecture, which should be sensitive to the built context and include amenities like retail for a comfortable commuter experience.
	Affordable Housing and Accessible Living Promote the establishment of equitable Transit-Oriented Developments (TODs) by ensuring a range of housing options within a ten-minute walking distance from a transit station, which should encompass a variety of types, designs, price points, and tenures.
	Mixed Uses and Form Encourage more efficient land use patterns by providing residents with automobile-free access to recreational facilities, retail establishments, commercial and civic services, and employment.
Collaboration with Stakeholders and Community	Promote inclusive development in TODs by addressing the informal sector's policy, planning, and design needs for street vendors, settlements, and transportation services, incorporating diverse user groups like gender, age, abilities, and socio-economic segments at all stages.
Value Capture	Utilize development-based land value capture as a financial tool for upgrading infrastructure in TOD corridors and station areas while prioritizing and implementing green building practices.

Source: *The New Transit Town: Best Practices in Transit-Oriented Development; Transit Oriented Development: Making It Happen; Transforming the Urban Space through Transit Oriented Development; Is transit-oriented development (TOD) an internationally transferable policy concept?; TOD Implementation Resources and Tools*

2.2 Southeast Asian Countries, their TODs, and their Policies

Studies have revealed that the countries selected for investigation are actively adopting the TOD concept at both the national and local levels. Conversely, certain countries deliberately implement the concept on specific locations, with the deliberate goal of transforming those areas into TOD areas. This involves restricting urban planning and development policies to only apply within these designated areas of interest. The countries for discussion are shown in Table 2.

Table 2
 Implementation Level of TOD Concept as a policy in select Southeast Asian Countries

Country	National Level Implementation	Local Level Implementation
Thailand	Available	Available
Indonesia	Available	Available
Vietnam	Not Available	Available
Philippines	Available	Not Available

Source: *Transit-Oriented Development (TOD) Policy Framework of the Department of Human Settlements and Urban Development (DHSUD); JABODETABEK Urban Transportation Policy Integration Project Phase 2 in the Republic of Indonesia; Republic of Indonesia number 16 of 2017 guidelines for the development of the transit-oriented area; A Study on Transit Oriented Development in Thailand Executive Summary Report Thailand TOD Master Plan Project for Studying the Implementation of Integrated UMRT and Urban Development for Hanoi in Vietnam Final Report Main Text Part I: TOD Concept Plans*

Thailand, particularly in Bangkok, plans to improve urban accessibility and quality of life by integrating land use planning and transportation as the Ministry of Transport plans to expand the present metro lines to 464 km by 2035 and focus on improving passenger transportation services and last-mile connections. TOD is crucial for enhancing ridership and public infrastructure in Thailand. Factors affecting the development of healthy cities in suburban areas also influence TOD initiatives. The efforts of Thailand to implement the TOD concept are contextualized and summarized in their published document entitled “Study on Transit Oriented Development in Thailand Executive Summary Report Thailand TOD Master Plan” by the Ministry of Transport [16, 30]. From the National Policy, Thailand also published site-specific policies and master plans for TOD (e.g., Pattaya, Khon Khaen, Ayutthaya).

Indonesia has crafted national and provincial TOD policies by the Minister of Agraria and Spatial Planning through Regulation no. 16 of 2017. Indonesia also developed TOD guidelines and plans at the provincial level, which provided site-specific policies to implement TODs (e.g., JABODETABEK, Dukuh Atas, etc.). With MRT Jakarta being among the busiest TODs in the country, the Jakarta 2030 Regional Spatial Plan envisioned the TOD to combine residential, commercial, and public areas to integrate mass public transportation networks and lower the use of motor vehicles. However, despite the initiatives, studies suggest that the government should prioritize diversity in land-use allocation to maximize transport ridership in Jakarta. Although faced with challenges, having the said policies is already considered significant progress for Indonesia compared to other metropolitan cities worldwide [5, 14, 15, 17].

The Philippines and its Department of Human Settlements and Urban Development (DHSUD) developed a TOD Policy Framework that mandates national and local governments to include TOD into their land use strategies in building compact, mixed-use, pedestrian-friendly urban developments that encourage seamless movement of pedestrians and cars as well as provide open and green spaces and a strong sense of place. However, motherhood statements serve as the foundation of the policy framework, which needs precise implementation goals for TOD. At the local level, some cities in Metro Manila already adopted the TOD concept on their major transit stations to reduce traffic and enhance vehicular and pedestrian mobility. These local-level policies, however, encourage developers to create plans to guarantee the success of the TOD by fostering local economic growth near the transit stations, providing affordable housing, reducing traffic, and improving lifestyles. To ensure the full participation of stakeholders in the TOD planning process, a shared awareness and understanding of the TOD implementation is envisioned through awareness campaigns and institutional frameworks [9, 12].

Despite lacking a national-level policy, Vietnam has adopted the TOD concept through the guidelines published by JICA and other peer-reviewed research publications, which integrated transit stations to promote transit orientation. However, this lack of a national policy in Vietnam makes the TOD implementation exclusive to some areas (e.g., Ho Chi Minh City, Hanoi, Binh Duong, etc). For example, Ho Chi Minh City in Vietnam plans to pilot the TOD concept on the urban railway system by improving land use efficiency, reducing traffic congestion, and reducing environmental pollution. The TOD concept will be implemented in conjunction with urban planning around the stations of the urban railway line, with a proposal to pilot mechanisms and policies for development, emulating Japan's experience in successful TOD implementation. The city is currently constructing its first mass transit line and is working on analyzing and evaluating the application of TOD using the TOD-ID analysis toolset to optimize residential, business, and leisure spaces within walking distance of public transport. However, Vietnam may need to follow different routes than developed countries due to its unique political system and central-local government relationship [3, 7, 36].

2.4 Baselines and alignment of the Dependent Variable

The researcher summarized and analyzed the applicable Policy Conditions for each country using the available data, references, and reports. This analysis was based on the researcher's understanding and is presented in Table 3.

Table 3
Comparative Content Analysis of TOD Policies from World Bank and Select Southeast Asian Countries [9, 19, 26, 31, 32].

Baseline Criteria	Policy Conditions from			
	Vietnam	Thailand	Indonesia	Philippines
TOD Planning	Density Promote construction of high-rise buildings to decrease the overall construction density, allowing for the availability of urban amenities, green space, and open space.	The development density should be more significant in the surrounding areas of the primary transit node, particularly in the inner core of the TOD, than in the outer core.	Increase the level of regional development from medium intensity to high intensity to create a non-congested environment.	Achieve a High-density development in land use to create vibrant places with a critical mass of bringing more people and activities into the area.
	Transit Accessibility Ensure convenient connections with main transit options in urban areas to promote TOD and ensure multimodality through good connectivity of the metro line with existing and future public transport systems.	Railway station access plans should consider integration and future road connectivity under the Town Planning Regulation, with consultation with local administration, to avoid obstructions and promote TOD development.	Incorporate regional services and amenities into the urban spatial structure, together with parking layouts that promote the utilization of mass transportation modes.	Include rail, BRT, intermodal passenger terminals, bus interchanges, and other transportation systems.
	Pedestrian Friendliness Prioritize public spaces in building orientation and neighborhood activity, promoting infill and redevelopment along transit corridors within existing neighborhoods.	Invest in essential infrastructure like pedestrian paths, public spaces, and utilities for effective TOD development while promoting a scheme to enhance investment attractiveness.	Regulate automobile consumption and create road network systems prioritizing non-motorized transport and pedestrians, architecture promoting pedestrian movement, and efficient transportation infrastructure to ensure good accessibility and promote non-motorized users' movement.	Ensure walkable and accessible pedestrian paths, including sidewalks and crosswalks, with well-maintained streets, well-lit streets, and a welcoming environment for all pedestrians.
Station Area Development	Connectivity to Surrounding Neighborhood Enhance the connectivity of the metro line with existing and future public transport systems, thereby facilitating the development of a new town with convenient accessibility to the CBD.	Accommodate non-motorized transport and intermodal shifts, utilizing Draft TOD Design Guidelines for station improvement in the TOD Master Plan.	Structure area enhances connectivity and unity between spaces and buildings, reducing travel distance requirements.	Create seamless intermodal transport connections, providing transportation choices to different urban centers.
	Liveable Public Space Reduce the area's density and infrastructure pressure by limiting new developments to ensure green space, open spaces, and parking lots.	For essential public open spaces to ensure convenience and safety, it is crucial to consider and incorporate the demand for use in the TOD area during the design process.	Create an open space that is welcoming and comfortable for transit facility users.	Provide ample open and green spaces in TOD to encourage walking and transit trips and provide areas for physical, community, and civic activities and other recreational uses.
	Development Surrounding the Station Area Promote multi-use high-rise buildings in new urban areas near transport stations and significant transportation centers that aim to create attractive spaces for socio-economic and cultural activities in the community.	Develop and invest in businesses in the station areas to create a town and community, leading to increased ridership.	Integrate regional roles and amenities in area development with metropolitan areas' spatial structure to create a densely populated, organized region with reduced motor vehicle reliance and public transportation accessibility.	Integrate a specific locality's distinctive character of culture to create positive commuter experiences and a sense of community for residents.
	Affordable Housing and Accessible Living Relocate overcrowded city dwellers to outer areas without compromising accessibility to the city center, offering better living conditions if these areas are located near or have good UMRT station access.	Implementing affordable housing initiatives for different income levels, particularly near transit stations and affected projects, can increase the density of TODs, stimulate new commercial activities, and boost public transportation usage, ensuring the long-term viability and prosperity of TOD initiatives.	Nothing was mentioned in the national policy, but provincial policies like JABODETABEK highlighted the provision of affordable flats with a proportion of at least 25 percent of the total occupancy in the region.	Provide regulations and incentives to ensure socialized housing inclusion in TOD areas, especially for families affected by public transport infrastructure and low-income earners working in TOD areas. Lodging facilities may also be provided as an active income source for developers.
	Mixed Uses and Form Reduce private transport demand and promote public transit ridership, with stops conveniently located within walking distance by designing a compact area for mixed residential and commercial uses.	Stimulate economic activity by promoting commerce through retail establishments, accommodations, and business centers, focusing on regional hubs and TOD types, and catering to various income levels, including market-price and middle-income and low-income housing.	Develop a mix-use zone that combines integrated high-density and centralized areas, supported by an efficient mass transportation system.	Establish a mixture of residential, commercial, office, institutional, and recreational land uses, which can reduce the number of trips and trip lengths.
Collaboration with Stakeholders and Community	The Hanoi Urban Planning Institute conducts public consultations to gather stakeholder feedback on a draft Zone Plan, which is then appraised by the Hanoi Authority for Urban Planning and Architecture and approved by the Hanoi People's Committee.	Enhance cooperation in implementing the TOD master plan by educating landowners and stakeholders on effective land acquisition practices.	The National Policy does not mention community involvement in development. Still, Provincial Policies emphasize the importance of involving individuals, groups, corporations, and non-governmental organizations in the planning, development, utilization, and control stages.	Promote dialogues, consultations, seminars, and information dissemination activities for the private sector to develop a shared understanding and alignment of TOD policies.
Value Capture	Promote socio-economic development in surrounding stations, contributing to local economic development and the smart growth of urban areas to ensure the successful operation of UMRT systems and smart urban growth.	Integrate real estate development, railway, and infrastructure investment around train stations to lead to an efficient development that maximizes Land Value Capture, allowing the government to reduce ticket prices, benefitting residents.	Enhance the value and foster a favorable business environment to enhance regional spatial organization and boost regional development capabilities.	The government can use Land Value Capture (LVC) financing schemes like property tax, betterment levies, and tax increment financing to finance socialized housing and urban development projects in TOD areas.

Source: Transit-Oriented Development (TOD) Policy Framework of the Department of Human Settlements and Urban Development (DHSUD); JABODETABEK Urban Transportation Policy Integration Project Phase 2 in the Republic of Indonesia; A Study on Transit Oriented Development in Thailand Executive Summary Report Thailand; TOD Master Plan Project for Studying the Implementation of Integrated UMRT and Urban Development for Hanoi in Vietnam Final Report Main Text Part I: TOD Concept Plans; Republic of Indonesia no. 16 of 2017 guidelines for the development of TOD areas

3. Results

The researcher used the comparative content analysis method shown in Figure no. 2 to examine the similarities and distinctive positive aspects of select Southeast Asian countries, which served as the dependent variable. This analysis is then compared to the independent variable constituting the TOD Implementation Resources and Tools of the World Bank and its policies.

The table is a matrix with approximately 10 columns and 10 rows. The columns represent different countries or regions, and the rows represent various aspects of TOD implementation, such as 'Public Transport', 'Land Use', 'Housing', etc. Each cell in the matrix contains detailed text, likely extracted from policy documents, comparing the specific country's approach to the World Bank's framework. The text is dense and difficult to read in detail due to the image resolution, but it appears to be a comprehensive comparative analysis.

Figure 2 Proof of the Author creating a Matrix Table conducting Comparative Content Analysis

After a careful study, the researcher identified the barriers and drivers between these variables and produced the following findings:

3.1 Commonalities in TOD Policy of Select Southeast Asian Countries

The select Southeast Asian countries exhibit numerous commonalities in formulating their separate TOD policies. This suggests that although the Southeast Asian region is comprised of multiple countries, it exhibits significant similarities, notably in terms of policy planning and development. Based on the Baseline criteria, TOD planning policies prioritise the participation of both the public and private sectors in order to accommodate high-density and high-intensity developments. The goal is to minimise urban sprawl and alleviate congestion by providing open spaces. This approach involves constructing vertical developments and incorporating green and public spaces to facilitate public activities. Additionally, it aims to connect different transportation nodes and create walkable env Similar to TOD planning, station area development strategies emphasise the importance of establishing connections and providing easy access to major developments and transit hubs. In addition to providing public and green open spaces that can accommodate the capacity of the TOD and promote walking and pedestrian activities, there is a need to increase the density and economic activity in the immediate vicinity of the station. Affordable housing should also be provided to meet the needs of marginalised and affected groups. It is important to have a mix of different uses in the station area to improve mobility, prevent an excess of unused land, achieve balanced development, optimise population density and diversity, and maximise economic opportunities within the station area. Meanwhile, the rules on collaboration with stakeholders and the community generally pertain to involvement, communication, and cooperation specifically related to the physical planning aspects of the TOD, such as land use, zoning, and estate development. Conversely, value capture strategies seek to stimulate local economic activities and foster their growth by highlighting the significance of enterprise, profit, and money generated by development.

3.2 Extracted Unique Features and Policy Highlights for TOD of Select Southeast Asian Countries

In addition to the fundamental standards established by the TOD Implementation Resources and Tools, the chosen Southeast Asian countries also emphasised distinctive characteristics in their policies. Some sources have questionable origins, while others are reputable and offer valuable learning opportunities to improve current and future policies. These unique features, in contrast to the Independent and other Dependent variables are outstanding and exceptional to these countries' TOD policies. These can be either considered as points of possible learning or improvement. The said unique features are summarized on Table 4.

Table 4

Unique Features and Policy Highlights for TOD of Select Southeast Asian Countries [9, 19, 26, 31, 32].

Identified SEA Country	Extracted Unique Policy Feature/s
Indonesia	Highlights the priority to regulate privately owned vehicles in identified TOD areas and reduce the dependence of stakeholders to usage of private cars
Vietnam	Highlights the prioritization of both the establishment of new developments and the rejuvenation of existing ones with equal importance
	Highlights the restriction of new construction in order to protect green and public spaces
	Highlights the relocation of urban residents in Vietnam to areas outside the city while ensuring convenient access to transport hubs by maintaining the accessibility of important transport stations in order to safeguard the well-being of the stakeholders
	Highlights enhancing the local identity and culture in the places where TOD stations will be situated
Philippines	Highlights the emphasis on the integration of institutional and recreational purposes to offer comprehensive mixed-use activities.
	Highlights the emphasis on the involvement of the private sector, but lacks underscoring on the collaboration with stakeholders and the community which is also important to achieve an inclusive TOD.
Thailand	Highlights pursuing the implementation of mixed-income housing. Additionally, the country is contemplating utilising the generated profits to provide subsidies aimed at reducing transportation expenses for its citizens.

Source: Transit-Oriented Development (TOD) Policy Framework of the Department of Human Settlements and Urban Development (DHSUD); JABODETABEK Urban Transportation Policy Integration Project Phase 2 in the Republic of Indonesia; A Study on Transit Oriented Development in Thailand Executive Summary Report Thailand; TOD Master Plan Project for Studying the Implementation of Integrated UMRT and Urban Development for Hanoi in Vietnam Final Report Main Text Part I: TOD Concept Plans; Republic of Indonesia no. 16 of 2017 guidelines for the development of TOD areas

3.3 Identified Barriers between TOD Implementation Resources and Tools and Select Southeast Asian Country TOD Policies

The author found barriers to Transit Accessibility, Pedestrian-friendliness, Liveable Public Space, the station area's development, Affordable housing and accessible living, Mixed-use and form, Collaboration with stakeholders and community, and Value Capture. These barriers are summarized on Table 5.

Table 5

Identified Barriers between TOD Implementation Resources and Tools by World Bank, and available TOD Policies of the select Southeast Asian Countries [9, 13, 19, 26, 31, 32].

Baseline Criterion		Identified Barrier for TOD Implementation
T O D P l a n n i n g	Transit Accessibility	There is a lack of comprehensiveness in the concept of transit accessibility. Policies should be more inclusive, encompassing public motorized transportation and safe non-motorized and active transportation, supported by SMART systems.
	Pedestrian-friendliness	Except for Indonesia, one of the policy barriers is the need for more dialogue regarding restricting private car parking and similar amenities, which discourages using single-occupancy vehicles and obstructs the promotion of sustainable transportation alternatives. A policy primarily focused on motorized transportation is further hampered by the necessity for provisions on safe speeds and traffic demand management for cars.
S t a t i o n A r e a D e v e l o p m e n t	Liveable Public Spaces	The policy lacks sufficient details regarding the green and public open spaces, which are crucial for understanding their importance and relevance to the TOD. Specifically, information about their size, potential contributions to public safety, disaster risk reduction, climate change mitigation, and cultural significance must be included.
	Development Surrounding the Station Area	The policy regarding developments in the station area needs to align with its stated objectives. While the select Southeast Asian countries prioritize densification, culture, and identity, they lack the landscaping and good architecture necessary to create a high-quality environment. It is essential to acknowledge that the World Bank and its guidelines should consider the importance of culture and identity when formulating policies regarding the surrounding environment. This approach prevents the creation of standardized developments and instead encourages the creation of distinct and independent developments with unique characteristics and development directions. The TOD Implementation Resources and Tools should prioritize empowering culture and identity to promote Genius Loci and Esprit de Corps.
	Affordable Housing and Accessible Living	Except for Thailand, the restriction on the affordable housing policy is primarily due to the emphasis on catering to the needs of the socialized and marginalized sector. While the current policy is commendable, Southeast

		<p>Asian countries must broaden their perspective on mixed-income housing to achieve inclusive development. This means considering different income levels and implementing plans to finance or subsidize low-income and socialized housing. The TOD will thus be able to serve a more extensive and varied population without driving out underprivileged people from the community or fostering exclusive gentrification. The concept of offering affordable housing is commendable. However, the primary concern is devising a sustainable approach to maintain it. Regarding housing, the TOD should determine its population and density limits to effectively manage the stakeholders involved in the development. This will prevent it from negatively impacting other TODs with their population and development areas. Therefore, Vietnam's policy suggests that relocating excess population to TOD station areas with lower population density and good access to public transportation is a viable strategy. This would provide stakeholders with a high-quality living environment. Essentially, Mixed-income housing is beneficial, but it is essential to set a limit or boundary to prevent uneven distribution of people and development densities along railway alignments comprising various TODs.</p>
	<p>Mixed-uses and Form</p>	<p>The policy on mixed-use needs more diversity in its application. The combination of residential and commercial elements exclusively defines mixed-use. Further exploration should be undertaken to expand the range of uses in mixed-use developments, including incorporating institutional, cultural, and recreational components. This will contribute to the creation of a more holistic and comprehensive development.</p>
	<p>Collaboration with Stakeholders and Community</p>	<p>The policies in various Southeast Asian countries prioritize managing land use, zoning, and estate matters in the public and private sectors. The analysis's exclusion of the informal sector compromises the policy's efficacy in lowering poverty and inclusiveness. Expanding the public participation policy should include a broader range of demographic profiles, such as gender, age, ability, income level, and other pertinent considerations. To attain inclusive development, it is imperative to establish more comprehensive and precise policies concerning engagement with stakeholders. These policies should cater to the requirements of even the most susceptible segments of society.</p>
	<p>Value Capture</p>	<p>The value capture strategies in select Southeast Asian countries focus on benefiting from various development sources. Still, they need to fully incorporate and emphasize the complete cycle and concept of Land Value Capture. This concept not only involves initial investments but also reinvestments to ensure the creation of sustainable land value and appraisal. This entails reinvesting in infrastructure enhancement, green building and infrastructure integration, service improvement, and utility upgrading.</p>

3.4 Identified Drivers between TOD Implementation Resources and Tools and Select Southeast Asian Country TOD Policies

By doing a thorough examination of policies from various countries and the available TOD Implementation Resources and Tools, it is evident that certain factors are reinforcing each other, and there are specific areas of expertise that select Southeast Asian countries can use as a starting point to introduce the TOD concept in their own countries. The information is condensed on Table 6.

Table 6

Identified Drivers between TOD Implementation Resources and Tools by World Bank, and available TOD Policies of the select Southeast Asian Countries [9, 13, 19, 26, 31, 32].

Baseline Criterion		Identified Barrier for TOD Implementation
TO D Pla nni ng	Density	Both policies support the need for a high-density and intensity TOD along the transit corridor to restrict urban sprawl and provide ample public open and green spaces for non-motorized transportation.
Stat ion Are a Dev elop men t	Connectivity to surrounding neighborhood	There are no barriers to policies regarding connectivity to the surrounding neighborhood. Instead, the policies focus on promoting accessibility to significant developments and various modes of transportation, such as primary and secondary options, to facilitate multi- and intermodality.
	Development Surrounding the Station Area	Both policies focus on implementing and promoting green and accessible public areas.

4. Conclusions and Recommendations

The completeness of the selected countries is not the issue regarding the barriers and drivers of TOD implementation in Southeast Asia. However, the issue lies in the compliance, relevance, and context of the crafted policies for each established criterion for a successful TOD of the said countries. To summarize, TOD Planning Policies concerning Density, Transit Accessibility, and Pedestrian-friendliness advocate for a high-density, high-intensity TOD along transit corridors to limit urban sprawl and provide public open spaces for non-motorized transportation. However, there is a lack of comprehensiveness in transit accessibility. Policies should be more inclusive, encompassing public motorized, safe, non-motorized, and active transportation supported by SMART systems.

For Station Area Development, which includes Connectivity to Surrounding Neighborhoods, Livable Public Space, Development Surrounding the Station Area, Affordable Housing and Accessible Living, and Mixed uses and form, The policies advocating for connectivity to surrounding neighborhoods and establishing green public spaces in TOD are need to be more detailed, underscoring additional information regarding their dimensions, potential impact on public safety, reduction of disaster risks, mitigation of climate change, and cultural importance. The policies also need to include the goal of achieving exceptional landscaping and architecture, which should be further elaborated and is essential for creating a high-quality environment. There is also a need to expand affordable housing policies to include a broader and more diverse population while ensuring that marginalized individuals are not forced out of development. It is also recommended that the potential benefits of incorporating a mixed-income approach in housing development be examined because this housing typology fosters inclusivity and, with the development of appropriate financial tools such as cross-

financing and community mortgage programs, it also contributes to the long-term economic sustainability of housing projects. While mixed-income housing can have advantages, it is crucial in the TOD policies to establish population-carrying capacities to avoid uneven distribution of people and development densities along the railway alignment.

On the other hand, the policy regarding mixed-use developments should be broader and diverse in its implementation. This should involve integrating institutional, cultural, and recreational uses in its mix to achieve a more comprehensive and balanced development rather than simply focusing on balancing residential and commercial uses. The World Bank could also benefit from the Southeast Asian countries' emphasis on culture and identity in policymaking related to the TOD to encourage distinct TODs with unique features and characteristics. Hence, the TOD Implementation Resources and Tools as a universal guide for creating TODs should include and empower culture and identity to promote a *genius loci* and *esprit de corps* while avoiding generic and templated developments.

In collaboration with stakeholders and the community, policies should prioritize addressing various cross-sectoral issues besides land and development and ensure all members of the majority and minority of the population are well-represented. To enhance cooperation, it is imperative to expand the demographic profile of individuals engaged in the process, encompassing not only stakeholders but also the diverse members of the community. It is also crucial to incorporate the informal sector into the collaboration between the public and private sectors, which is why the select countries should have included it in their policies because aside from inclusivity issues, the informal sector is still tributary to the economic growth of the neighborhood where TODs will be situated.

Regarding value capture, certain Southeast Asian countries prioritize investment policies but overlook the crucial aspect of reinvesting these profits to enhance and advance development, which is the fundamental principle of land value capture. The economy's cyclical nature will be maintained with reinvestment, resulting in economic leakage. However, reinvesting to preserve the economy's cyclical nature is merely the initial measure to guarantee financial sustainability. Another crucial factor is determining the optimum reinvestment strategy to maintain the cyclical economy. The course of time is constantly changing, giving rise to specific phenomena. Therefore, it is essential for policies regarding value capture to be resilient and updated with these changes. This phenomenon can be observed in value capture, where a linear economy is nearing its obsolescence. Adopting the concept of a circular economy is essential to achieve economic sustainability and stability. This means implementing green and sustainable ideas in the policymaking process, reducing waste, improving infrastructure and utilities, and a positive loop that continuously reinforces the economy and all its aspects cyclically. By implementing such policies, the TOD can be ensured to have long-term implications.

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