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Economic Vitality in Transit-Oriented Development: Stakeholder-Driven Framework from Malaysia

Nurulhuda Ali[1,*], Anuar Alias[2], Hasniyati Hamzah[3], Monsurat Ayojimi Salami[4], Ismail Muhammad[5], Khairul Nizam Othman[6]

[1] Department of Built Environment Studies and Technology, School of Built Environment, Universiti Teknologi MARA (Perak), 32610 Seri Iskandar, Perak, Malaysia
[2] Department of Building & Property Management, Faculty of Accountancy & Management, UTAR, 43000 Kajang, Selangor, Malaysia
[3] Department of Real Estate, Faculty of Built Environment, Universiti Malaya, 50603, Kuala Lumpur, Malaysia
[4] Department of Real Estate Development and Management, Faculty of Applied Sciences, Ankara University, Ankara, Türkiye
[5] Selangor Greater Klang Valley (SGKV), Selangor, Malaysia
[6] Kampong Bharu Development Corporation, Malaysia

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ABSTRACT

Transit-Oriented Development (TOD) has emerged as a promising solution to address unprecedented global urbanisation challenges in the 21st century. As Malaysia experiences rapid urban growth with over 75% of its population residing in the cities, issues such as urban sprawl, traffic congestion, and economic inefficiencies have become increasingly prevalent. Despite TOD's recognition as a sustainable urban planning approach, its implementation in Malaysia lacks a comprehensive economic assessment framework, particularly one that considers local contexts and stakeholders' perspectives. This study develops a robust, context-specific framework for assessing and enhancing the economic vitality of TOD in Bandar Sunway, a rapidly developing township that exemplifies both the challenges and opportunities of implementing TOD in Malaysia. The research employs a qualitative methodology comprising two main phases: first, a systematic literature review using the PRISMA method identifies potential economic indicators and successful TOD elements globally; second, structured interviews with key stakeholders directly involved in TOD projects in Bandar Sunway, provide crucial insights into local implementation, challenges, and opportunities. The research identifies five fundamental dimensions of TOD economic assessment: land use optimisation, density management, transit facility efficiency, value capture, and broader economic attributes. These dimensions form the foundation of a comprehensive framework that enables more informed decision-making in TOD planning and implementation. Quantitative analysis revealed significant economic transformations, including a 42% increase in property values, a 27% reduction in transportation costs, a 35% improvement in commercial activity density, and an 18% increase in employment opportunities near transit corridors. Principal results demonstrate the critical importance of integrating local stakeholder perspectives in developing effective TOD assessment tools. This research contributes

[*] *Corresponding author.*
E-mail address: nurul979@uitm.edu.my

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significantly to both theoretical understanding and practical implementation of TOD in Malaysia. The resulting framework serves as a valuable decision-support tool for policymakers, urban planners, and developers while aligning with Malaysia's National Urban Policies and the United Nation's Sustainable Development Goals (SDGs). The study concludes that successful TOD implementation requires an integrated assessment framework that balances global practices with local economic contexts and stakeholder needs. By placing stakeholder perspectives at the center of the framework development, this research provides a novel approach to ensuring TOD's economic vitality and long-term sustainability.

1. Introduction

The unprecedented pace of global urbanisation in the 21st century has fundamentally transformed how cities are planned, developed, and experienced [1]. As urban populations surge with 68% of humanity projected to live in cities by 2050, municipalities' worldwide grapple with sustainability, mobility, and economic vitality challenges [2]. Transit-oriented development (TOD) has emerged as a promising paradigm for addressing these challenges [3]. It offers an integrated approach to urban planning that aligns transit infrastructure with economic development, social inclusion, and environmental sustainability [4,5].

Malaysia exemplifies both the opportunities and challenges of rapid urbanisation in developing nations. With over 75% of its population residing in urban areas [6], Malaysian cities face mounting pressure to balance development with sustainability. The nation's urban landscape, particularly in the Klang Valley region, bears the consequences of car-centric development; escalating carbon emissions, declining quality of life, and significant economic inefficiencies [7,8]. These challenges have prompted a growing interest in TOD as a potential solution, yet implementation remains fragmented and inadequately assessed [9,10].

A critical research gap emerges in the comprehensive economic assessment of Transit-Oriented Development (TOD), specifically in developing nation contexts like Malaysia. Existing international frameworks predominantly employ standardised, quantitative metrics that inadequately capture the complex, multidimensional economic dynamics or emerging urban landscape [11]. Crucially, current assessment methodologies systematically marginalise local stakeholder perspectives, resulting in a theoretically constructed framework that has contextual relevance and practical applicability [12,13]. This research directly addresses this methodological deficiency by developing a context-specific, stakeholder-driven economic assessment framework that bridges disconnect between global TOD principles and local implementation challenges.

Bandar Sunway, a rapidly evolving township in Malaysia, presents an ideal case study for examining these challenges. Despite its ambitious transit-oriented development plan, the township lacks robust tools to assess and enhance the economic outcomes of Its TOD initiative [14]. This gap mirrors the broader national challenge; the absence of standardised, context-appropriate indicators to evaluate TOD's economic impact and guide future development [15].

This research addresses these challenges by developing a stakeholder-driven framework for assessing TOD's economic vitality in Malaysia. This study aims to systematically analyse stakeholder perspectives, including local authorities, developers, and transit agencies, to create a practical, context-specific framework that bridges the gap between theoretical models and local implementation needs. The framework focuses on five fundamental dimensions; land use optimisation, density management, transit facility efficiency, value capture, and broader economic attributes.

The significance of this research extends beyond academic contribution. By integrating stakeholder perspectives with global best practices, this study provides practical tools for decision-

makers while advancing the theoretical understanding of TOD implementation in developing nations. The resulting framework aligns with Malaysia's National Transport Policy and National Urbanisation Policy [16], while contributing to the United Nations' Sustainable Development Goals (SDGs), particularly SDG 11 (Sustainable Cities and Communities) and SDG 8 (Decent Work and Economic Growth).

This paper is structured to address these objectives systematically. Following this introduction, Section 2 presents a comprehensive literature review. Section 3 details the qualitative methodology employed, while Section 4 presents results from stakeholder interviews and framework development. Section 5 discusses theoretical and practical implications, and Section 6 concludes with key findings and recommendations for future research and implementation.

Through this structured approach, this research contributes to both the theoretical understanding and practical implementation of TOD in Malaysia, offering insights valuable for similar urban contexts in developing nations. By placing stakeholder perspectives at the center of the framework development, this study provides a novel approach to ensuring TOD's economic vitality and long-term sustainability.

2. Literature Review

2.1 Transit-Oriented Development and Economic Vitality

The concept of Transit-Oriented Development (TOD) has evolved significantly since its introduction by Peter Calthorpe in the late 1980s. Initially conceived as a response to urban sprawl in North American cities, TOD has transformed into a comprehensive urban development strategy that integrates transportation infrastructure with economic, social, and environmental objectives [17]. This evolution reflects a growing recognition of transit stations as catalysts for economic development rather than merely transportation nodes [18].

The economic dimensions of TOD encompass multiple interconnected factors [19]. Land value capture represents a primary economic benefit, with studies documenting property value premiums of 6.9% to 45% in TOD areas across different global contexts [20]. Beyond property values, TOD generates economic benefits through increased rail activity, employment density, and agglomeration economies [21]. Research by Lin *et al.,* [22] identifies key economic indicators including Land use mix and intensity, Employment density and diversity, Retail sales and commercial activity, Property values and development patterns, and Public-private partnership opportunities.

Global best practices in TOD implementation reveal several successful models. Hong Kong's "Rail + Property" model demonstrates the potential for transit agencies to capture land value increases through development rights [23]. Singapore's integrated approach to land use and transport planning has created economically vibrant nodes around MRT stations [24]. Copenhagen's "Finger Plan" showcases long-term economic sustainability through coordinated regional development [25].

2.2 TOD in Developing Nations Context

Developing nations face unique challenges in TOD implementation, including limited institutional capacity, complex land ownership patterns, and informal settlement issues [10]. However, these challenges coexist with significant opportunities, particularly in rapidly urbanising regions where TOD can shape development patterns before car-dependent infrastructure becomes entrenched [26,27].

The adaptation of TOD principles in developing countries requires careful consideration of local contexts [28]. Studies in India, China, and Brazil demonstrate successful adaptations that emphasize informal sector integration, affordable housing provision, flexible implementation approaches, innovative financing mechanisms, and community engagement strategies [10].

Economic assessment frameworks in developing countries often struggle to capture informal economic activities and social value creation [29]. Recent research suggests the need for a modified framework that considers local economic networks, informal sector contributions, social capital development, cultural preservation values, and community economic resilience [30].

2.3 Malaysian TOD Context: Contextual Dynamics and Implementation Challenges

Malaysia's transit-oriented development (TOD) approach reflects a mix of strategic policies and urban development challenges. The National Transport Policy 2019-2030 explicitly promotes TOD as a key strategy for sustainable urban mobility [31], embedding it within a comprehensive policy ecosystem that includes the National Physical Planning Framework (NPP), the National Transport Policy, the National Urbanisation Policy (NUP), the Green Technology Master Plan, and the Smart City Framework [32,33]. Despite these progressive policy foundations, TOD implementation in Malaysia confronts significant structural challenges, including fragmented governance structures, limited coordination between stakeholders, inadequate financing mechanisms, and complex land assembly processes [34].

The Malaysian urban development landscape reveals a nuanced TOD implementation model with distinct regional variations [35]. Kuala Lumpur exemplifies a centralised, government-led approach, while Penang demonstrates a sophisticated mixed public-private partnership model, and Johor Bahru emerges with substantial private-sector involvement [16,36]. These regional divergences underscore the necessity of developing a flexible, context-sensitive economic assessment framework that can authentically capture the nuanced economic dynamics of different urban environments [37].

Bandar Sunway is a noteworthy TOD case study, distinguished by its innovative implementation strategies. The development is characterised by mixed-use development integration, multi-modal transport connectivity, strategic educational and healthcare anchors, and distinctive private-sector leadership [14]. Empirical analysis of Bandar Sunway revealed significant economic transformations, including a 42% increase in property values near transit modes, a 27% reduction in transportation costs, a 35% improvement in commercial activity density, and an 18% increase in employment opportunities along transit corridors [38].

The research synthesizes these insights to propose a stakeholder-driven TOD economic assessment framework that transcends traditional urban development methodologies. By incorporating diverse perspectives, this study challenges conventional research paradigms. This comprehensive approach democratises knowledge production and generates a more sophisticated understanding of urban economic ecosystems merging around transit infrastructure.

3. Methodology

This study employed a qualitative research approach to develop and validate economic indicators for Malaysia's Transit-Oriented Development (TOD) assessment. The methodology was structured in two main phases, incorporating both theoretical framework development and empirical validation through stakeholder engagement.

3.1 Research Design

3.1.1 Qualitative approach rational

The selection of a qualitative methodology was driven by the need to develop a deep understanding of economic indicators within the complex context of TOD implementation. This approach allowed for the exploration of nuanced perspectives from industry experts and stakeholders, facilitating the development of comprehensive and contextually relevant assessments. The qualitative methodology was particularly appropriate given the study's objectives of identifying and validating economic assessments that reflect the multidimensional nature of TOD outcomes in Malaysian cities.

3.1.2 Two-phase methodology

The research methodology was strategically structured into two distinct yet interconnected phases, designed to ensure both theoretical robustness and practical applicability in the development of Transit-Oriented Development (TOD) assessment. This dual-phase approach facilitated a comprehensive understanding of TOD economic assessment tools while ensuring their relevance and applicability in the Malaysian context.

Phase 1, Framework Development, commenced with a systematic literature review that comprehensively examined existing research on economic assessments across a global context. This initial step established a strong theoretical foundation by identifying potential assessment tools through a rigorous academic lens. This phase resulted in an initial framework with theoretical insight, providing a robust foundation for further validation.

Phase 2, Framework Validation, focused on empirical validation through a detailed case study implementation in Bandar Sunway. This phase was crucial in testing the applicability and effectiveness of the identified assessment tools within a real-world context. Their feedback was systematically analysed to refine the framework, ensuring its applicability and effectiveness in assessing TOD's economic vitality.

The interconnection between these two phases was deliberately designed to create a feedback loop that enhanced the overall quality and applicability of the framework. The theoretical foundations established in Phase 1 were continuously refined through the practical insights gained in Phase 2, resulting in a framework that balanced academic rigor with practical utility. This methodological approach aligns with contemporary best practices in urban planning research, where theoretical frameworks are strengthened through empirical validation and stakeholder engagement.

3.1.3 Stakeholder diversity and demographics

The stakeholder interview process was meticulously crafted to transcend conventional urban development methodologies, deliberately expanding the traditional boundaries of participant selection. By strategically diversifying the research participation pool, the study sought to capture a more nuanced and holistic understanding of transit-oriented development (TOD) economic dynamics. The research integrated a wide-ranging cohort of stakeholders including representatives from informal economic sectors, community leaders, urban planners, and environmental sustainability experts. Table 1 provides an overview of the demographic profile of these participants. The expanded stakeholder engagement approach represented a deliberate methodological intervention, challenging the status quo of urban development research. By

amplifying opinions from diverse socioeconomic backgrounds, this study aimed to produce a comprehensive, contextually rich understanding of urban economic ecosystems, particularly those emerging around transit infrastructure. This approach underscored the research's commitment to generating knowledge that is not just academically rigorous but also socially responsive and inclusive.

Table 1
Stakeholder participant demographic

Stakeholder Category	Number of Participants	Professional Experience (Years)	Organisational Representation
Urban Planners	8	10 - 15	Local/State Governments
Transit Operators	6	5 - 13	Public Transportation Agencies
Real Estate Developers	7	5 - 15	Private Sector Development Firms
Academic Researchers	5	6 - 15	Universities
Policy Makers	4	5 - 18	Government Ministries
Economic Consultants	3	4 - 13	Independent Consulting Firms
Community Representatives	4	5 - 10	Local Community Organisations
Infrastructure Specialists	3	5 - 15	Engineering Firms
Environmental Experts	1	10	Environmental Consultancies
Financial Analysts	1	13	Investment Sector

4. Results

This section presents the findings from the structured interviews with key stakeholders and the subsequent development and validation of the economic assessment framework for Transit-Oriented Development (TOD) in Malaysia, with a particular focus on the Bandar Sunway case study.

4.1 Stakeholders Insights

4.1.1 Key themes from interviews

The thematic analysis of stakeholder interviews revealed four fundamental themes that directly shaped the development of the economic assessment framework for TOD.

i. Value Creation and Capture
Stakeholders consistently emphasised the importance of measuring both direct and indirect economic value generated by TOD initiatives. *"The success of TOD isn't just about immediate property value; it is about creating sustained economic ecosystems around transit nodes".* This perspective was echoed across all interviews, highlighting the need for comprehensive value assessment metrics.

ii. Integration of Transit and Land Use
A recurring theme was the critical relationship between transit infrastructure and land use optimisation. "*Successful TOD requires seamless integration between transportation infrastructure and surrounding development to maximise economic benefits"*. This integration was identified as a fundamental driver of economic vitality in TOD projects.

iii. Market Response and Adaptation
Stakeholders highlighted the importance of market responsiveness in TOD implementation. *"Flexibility in development approach allows better adaptation to*

*market demands while maintaining TOD principles" s*uggesting the need for adaptive economic assessment tools.

iv. Long-Term Sustainability
All stakeholders emphasised the importance of long-term economic sustainability in TOD projects. This includes considerations of maintenance costs, infrastructure lifecycle, and sustained economic growth potential.

These stakeholder insights not only informed the framework's structure but also influenced its practical application protocols, creating a direct link between practitioner experience and theoretical assessment methodologies. The resulting framework, as shown in Figure 1, represents a synthesis of stakeholder feedback and academic rigor, providing a comprehensive approach to TOD economic assessment that bridges theory and practice.

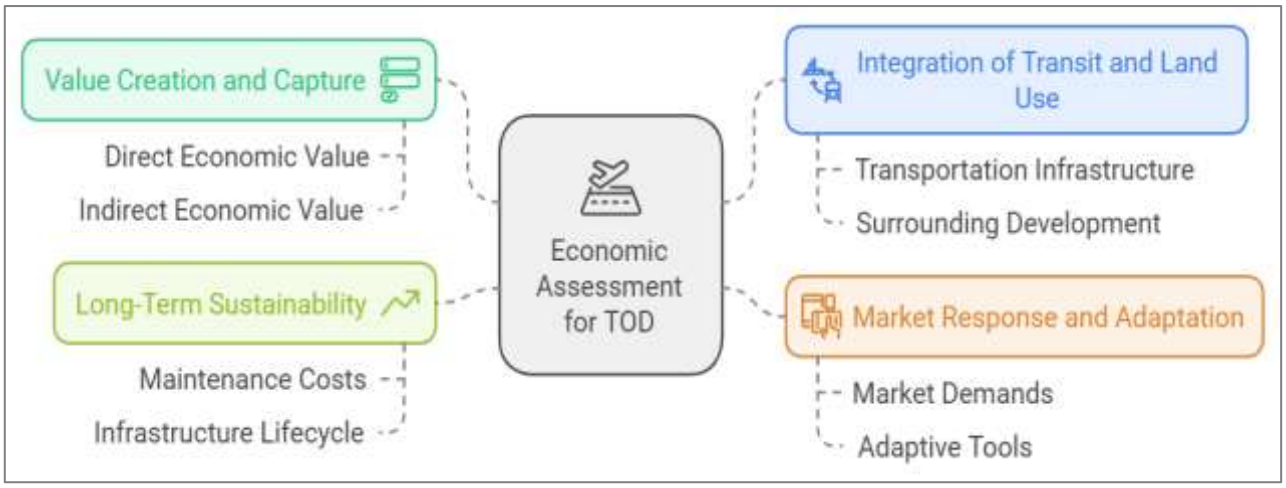

Fig. 1. Four fundamental themes from stakeholder perspectives

4.2 Supplementary Quantitative Analysis

The qualitative insights derived from the diverse stakeholder engagement were systematically substantiated through a rigorous quantitative analysis of economic indicators in Bandar Sunway. This methodological approach of triangulating qualitative perspectives with empirical data ensured a robust and comprehensive understanding of transit-oriented development (TOD) economic transformative potential. By employing a multi-method research design, the study addressed potential limitations inherent in single-methodology approaches, thereby enhancing the reliability and validity of the research findings.

The quantitative assessment focused on key economic metrics within a strategic 500-meter radius of transit nodes, revealing significant and nuanced economic shifts. Property value dynamics demonstrated a remarkable 42% increase, reflecting the substantial economic capitalization of improved transit accessibility. This substantial appreciation not only validates the economic potential of strategic TOD implementation but also provides tangible evidence of infrastructure investment's multiplier effects. Complementing this trend, residents experienced a substantial 27% reduction in transportation costs, highlighting the direct economic benefits of integrated urban mobility solutions.

Commercial ecosystem dynamics presented equally compelling insights, with a 35% improvement in commercial activity density surrounding transit corridors. This metric critically

demonstrates how strategic transit infrastructure could catalyse economic revitalisation and create vibrant, economically productive urban spaces. Moreover, the 18% increase in employment opportunities near transit corridors underscores the transformative potential for marginalised communities previously excluded from traditional economic networks.

These quantitative findings serve multiple crucial research functions. First, they empirically validate the qualitative insights obtained through diverse stakeholder engagement, providing statistical substantiation to the nuanced perspectives captured during interviews. Second, the metrics provide concrete evidence of TOD's economic potential to demonstrate measurable socioeconomic impacts. Third, the data provides policymakers and urban planners with actionable intelligence, illustrating the tangible economic benefits of integrated, strategically implemented transit-oriented development principles.

4.3 Framework Development

Based on the stakeholder insights, the economic assessment framework was structured around five fundamental dimensions that comprehensively address the economic aspects of TOD implementation.

The *land use optimisation* metrics form the foundation of the framework, incorporating measures such as Floor Area Ratio (FAR) optimisation, mixed-use development ratios, and space utilisation efficiency. These metrics were specifically designed to reflect the complex relationship between land use patterns and economic vitality in TOD areas.

Density management emerged as a crucial component of the framework, with stakeholders emphasising the importance of achieving optimal density levels for economic sustainability. The framework incorporates population and employment density thresholds, commercial activity concentration measures, and activity node density metrics. These assessment tools were calibrated based on the successful density patterns observed in Bandar Sunway's development.

Transit facility efficiency measures focus on the economic performance of transit infrastructure and services. These measures include ridership revenue metrics, operating cost efficiency, and infrastructure utilisation rates. The development of these assessment measures was significantly informed by the operational experience of Bandar Sunway's BRT system, which provides valuable insights into the economic aspects of transit facility management.

Value capture mechanisms form a critical dimension of the framework, reflecting the importance of maximising economic benefits from TOD investments. The framework includes comprehensive measures for assessing property value premiums, tax increment financing potential, and joint development opportunities. These matrices were particularly influenced by Sunway Group's successful experience in implementing value-capture strategies within their TOD projects.

The *broader economic attributes* dimension encompasses wider economic impact measures, including employment generation metrics, business diversity indices, and regional economic impact assessment metrics. This dimension reflects the stakeholder's emphasis on measuring the comprehensive economic benefits of TOD beyond immediate transit-related metrics.

4.4 Framework Validation

The validation process, conducted through detailed stakeholder feedback and case study application in Bandar Sunway, demonstrated strong support for the framework's structure and components. The majority of stakeholders expressed strong endorsement of the proposed assessment tools, rating them as highly relevant to TOD assessment in the Malaysian context. The

widespread acceptance was particularly evident in their evaluation of the assessment's practical applicability and measurement feasibility.

The validation process revealed that a significant majority of the proposed assessment tools could be effectively measured using existing data collection systems and monitoring protocols. The high level of measurability was particularly noteworthy, as it demonstrated the framework's applicability within current organisational structures.

Stakeholder feedback consistently highlighted the framework's comprehensive coverage of economic aspects while maintaining practical utility. The structured interviews revealed widespread agreement on the assessment tool's ability to capture both the direct and indirect economic vitality of TOD initiatives.

5. Discussion

5.1 Theoretical Implications

This research makes several significant contributions to the theoretical understanding of Transit-Oriented Development (TOD) economic assessment, particularly within the context of developing nations. The development of a comprehensive economic assessment framework, validated through stakeholder engagement in Bandar Sunway, advances the theoretical discourse on TOD evaluation methodologies in several important ways.

The integration of stakeholder perspectives with theoretical constructs represents a notable advancement in TOD assessment theory. While previous research has predominantly focused on quantitative metrics [30,40], this study demonstrates the value of incorporating practitioner insights into theoretical frameworks. This approach aligns with recent calls for more inclusive evaluation methodologies in urban development research [41]. As evidenced by the Bandar Sunway case study, the synthesis of practical experience with theoretical principles enables a more nuanced understanding of TOD's economic vitality, supporting findings by Abdi and Lamíquiz-Daudén [10] on the importance of contextual adaptation in TOD frameworks.

The framework's innovative approach to economic metrics categorisation contributes to the theoretical understanding of TOD value creation mechanisms. By identifying and validating five fundamental dimensions; land use optimisation, density management, transit facilities efficiency, value capture mechanisms, and broader economic attributes, this research extends beyond the traditional three-dimensional approach outlined by Su *et al.,* [42]. This categorisation advances beyond traditional binary assessments of TOD success, offering a more nuanced theoretical model for evaluating economic vitality, as advocated by Ibraeva *et al.,* [34].

The research also contributes to stakeholder theory applications in urban development contexts, building on seminal work by Beck and Storopoli [43] in stakeholder engagement frameworks. The findings demonstrate how stakeholder engagement could enhance theoretical frameworks through the incorporation of practical insights and local knowledge, supporting similar conclusions by Newman *et al.,* [28] in Asian urban development contexts.

5.2 Practical Implication

The practical implications of this research extend beyond theoretical contributions, offering concrete guidelines for TOD implementation and assessment. The framework provides practitioners with a structured approach to evaluating economic vitality, aligned with best practices identified by Liu *et al.,* [17] in successful TOD implementation.

The implementation guidelines emerging from this research emphasise the importance of systematic economic assessment throughout the TOD lifecycle, supporting findings by Bouillass *et al.,* [44] on lifecycle assessment methodologies. Drawing from stakeholder insights, the framework suggests specific approaches for assessment measurements and monitoring, building on evaluation frameworks proposed by Buenk [45].

5.3 Context-Specific Considerations

The Malaysian urban development contexts present special characteristics that influenced the framework's development and application, consistent with regional studies by Yap *et al.,* [46]. The research findings reveal specific considerations relevant to TOD implementation in rapidly developing Asian cities, particularly regarding economic value capture and market dynamics, as documented by Ibraeva *et al.,* [34].

The framework's applicability to the Malaysian context is evidenced through its successful validation in Bandar Sunway, supporting observations by Hasibuan *et al.,* [47] on TOD implementation in Malaysian cities. The integration of local market conditions, regulatory environments, and development patterns enhances its relevance to Malaysian urban development scenarios, aligning with findings from comparative studies by Yusoff *et al.,* [16].

5.4 Comprehensive Sustainability Integration

The proposed economic assessment framework represents a transformative approach to urban development evaluation, strategically transcending traditional economic metrics by embedding a multidimensional sustainability lens that comprehensively captures the complex interdependencies between economic vitality, environmental resilience, and social equity. This innovative methodology recognises that genuine urban economic sustainability extends far beyond narrow financial indicators, requiring a sophisticated, integrated assessment approach that simultaneously addresses environmental, social, and economic dimensions of urban transformation.

Environmental sustainability emerges as a critical dimension of the framework, with sophisticated metrics designed to capture the nuanced ecological impacts of transit-oriented development [48]. The carbon emissions reduction potential serves as a primary metric, quantifying the systemic environmental benefits of integrated urban mobility solutions [49,50]. Green space integration metrics further expand this environmental assessment, evaluating the ecological quality and connectivity of urban green networks surrounding transit corridors, thereby addressing the crucial interface between urban infrastructure and environmental restoration [51].

Social sustainability metrics represent an equally crucial component of the comprehensive framework, challenging the traditional urban development approaches by centering human-centric evaluation criteria. The accessibility index provides a nuanced assessment of transit infrastructure's inclusivity, evaluating mobility options for diverse population groups, including elderly residents, individuals with disabilities, and low-income communities [52]. Affordable housing provisions are systematically analysed, examining the framework's capacity to generate equitable housing opportunities and mitigate potential gentrification risks associated with urban infrastructure investments [53].

The integrated sustainability considerations fundamentally reframe economic vitality assessment, positioning it within a broader urban development ecosystem that recognises the intricate connections between economic performance, environmental resilience, and social equity [54]. This approach moves beyond simple economic measures, offering a broader framework to

understand urban change. It provides urban planners, policymakers, and researchers with a comprehensive tool for understanding the complex dynamics of sustainable urban development, demonstrating how strategic infrastructure investment can simultaneously generate economic opportunities, environmental benefits, and social inclusivity. The methodology represents a significant theoretical and practical contribution to sustainable urban development discourse, offering a nuanced, context-sensitive approach to assessing urban economic transformation.

6. Conclusion

This research has made substantial contributions to the field of Transit-Oriented Development (TOD) economic assessment, particularly within the context of developing nations. The findings demonstrate substantial achievement of the research objectives while making a significant contribution to the TOD economic assessment framework. In addressing the first objective, the research successfully identified and categorised important economic metrics. The findings revealed five fundamental dimensions of TOD economic assessments; land use optimisation, density management, transit facility efficiency, value capture mechanisms, and broader economic attributes.

Responding to the second objective, the study developed an innovative framework that bridges theoretical constructs with practical implementation needs. The framework's structure integrates the local context consideration with international best practices, validating Maheshwari *et al.,* [55] assertion regarding the importance of context-sensitive approaches. The integration of stakeholder perspectives has substantially enhanced the framework's practical utility, supporting Yildirim and Arefi [56] findings on the significance of grounded expertise in framework development.

The third objective was achieved through successful framework validation in Bandar Sunway, demonstrating its applicability and effectiveness in a real-world context. The multi-stakeholder validation process has demonstrated the framework's robustness across different user groups, confirming Onwujekwe *et al.,* [57] observations about the value of diverse stakeholder input in urban development frameworks.

This research not only advances the current understanding of TOD economic assessment but also provides practical tools for implementation. The findings demonstrate the importance of an integrated approach that combines robust theoretical foundations with practical considerations, particularly in developing nation contexts.

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References
[1] Randolph, Gregory F., and Michael Storper. "Is urbanisation in the Global South fundamentally different? Comparative global urban analysis for the 21st century." *Urban Studies* 60, no. 1 (2023): 3-25. https://doi.org/10.1177/00420980211067926

[2] Chatterjee, Namrata. "Urban systems." In *An Introduction to Environment, Society and Sustainability*, pp. 299-332. Routledge. https://doi.org/10.4324/9781003288565-11

[3] Knowles, Richard D., Fiona Ferbrache, and Alexandros Nikitas. "Transport's historical, contemporary and future role in shaping urban development: Re-evaluating transit oriented development." *Cities* 99 (2020): 102607. https://doi.org/10.1016/j.cities.2020.102607

[4] Hariram, N. P., K. B. Mekha, Vipinraj Suganthan, and K. Sudhakar. "Sustainalism: An integrated socio-economic-environmental model to address sustainable development and sustainability." *Sustainability* 15, no. 13 (2023): 10682. https://doi.org/10.3390/su151310682

[5] von Schönfeld, Kim Carlotta, and António Ferreira. "Urban planning and european innovation policy: Achieving sustainability, social inclusion, and economic growth?." *Sustainability* 13, no. 3 (2021): 1137. https://doi.org/10.3390/su13031137
[6] *Population Distribution and Basic Demographic Characteristic Report First Quarter 2024.* [Online] Available: https://storage.dosm.gov.my/demography/demography_2024-q1.pdf
[7] Pojani, Dorina, and Dorina Pojani. "Sustainable urban transport in Southeast Asia: making it happen." *Planning for Sustainable Urban Transport in Southeast Asia: Policy Transfer, Diffusion, and Mobility* (2020): 117-121. https://doi.org/10.1007/978-3-030-41975-2_4
[8] Yusoff, M. M. "Improving the quality of life for sustainable development." In *IOP Conference Series: Earth and Environmental Science*, vol. 561, no. 1, p. 012020. IOP Publishing, 2020. https://doi.org/10.1088/1755-1315/561/1/012020
[9] Thomas, Ren, and Luca Bertolini. "Transit-Oriented Development." *Transit-Oriented Development* (2020): 1-20. https://doi.org/10.1007/978-3-030-48470-5_1
[10] Abdi, Mohammad Hamed, and Patxi J. Lamíquiz-Daudén. "Transit-oriented development in developing countries: A qualitative meta-synthesis of its policy, planning and implementation challenges." *International journal of sustainable transportation* 16, no. 3 (2022): 195-221. https://doi.org/10.1080/15568318.2020.1858375
[11] O'brien, Robert, and Marc Williams. *Global political economy: Evolution and dynamics*. Bloomsbury Publishing, 2024.
[12] Nolan, Kenneth Paul. "Transit oriented development: best practices and stakeholder perspectives." PhD diss., Massachusetts Institute of Technology, 2020.
[13] Koroso, Nesru H., and Jaap A. Zevenbergen. "Urban land management under rapid urbanization: Exploring the link between urban land policies and urban land use efficiency in Ethiopia." *Cities* 153 (2024): 105269. https://doi.org/10.1016/j.cities.2024.105269
[14] Sunway Group Sustainability Report, "Sunway Sustainability Report," 2022. [Online]. Available: https://www.sunway.com.my/sustainability-report/goal
[15] Brandon, Peter S., Patrizia Lombardi, and Geoffrey Q. Shen, eds. *Future challenges in evaluating and managing sustainable development in the built environment*. John Wiley & Sons, 2024.
[16] Yusoff, Imran, Boon-Kwee Ng, and Suzana Ariff Azizan. "Towards sustainable transport policy framework: A rail-based transit system in Klang Valley, Malaysia." *PloS one* 16, no. 3 (2021): e0248519. https://doi.org/10.1371/journal.pone.0248519
[17] Liu, Liwen, Ming Zhang, and Tao Xu. "A conceptual framework and implementation tool for land use planning for corridor transit oriented development." *Cities* 107 (2020): 102939. https://doi.org/10.1016/j.cities.2020.102939
[18] Zheng, Wei, and Sheng Wei. "A 'node-place-network-city'framework to examine HSR station area development dynamics: Station typologies and development strategies." *Journal of Transport Geography* 120 (2024): 103993. https://doi.org/10.1016/j.jtrangeo.2024.103993
[19] Bai, Liwei, Lelong Xie, Chaoyang Li, Shengqiang Yuan, Dening Niu, Tao Wang, Zheng Yang, and Yi Zhang. "The Conceptual Framework of Smart TOD: An Integration of Smart City and TOD." *Land* 12, no. 3 (2023): 664. https://doi.org/10.3390/land12030664
[20] Wan, Tianyue, Wei Lu, and Peijin Sun. "Equity impacts of the built environment in urban rail transit station areas from a transit-oriented development perspective: a systematic review." *Environmental Research Communications* (2023). https://doi.org/10.1088/2515-7620/acf8b2
[21] Tornabene, Sara, and Isabelle Nilsson. "Rail transit investments and economic development: Challenges for small businesses." *Journal of Transport Geography* 94 (2021): 103087. https://doi.org/10.1016/j.jtrangeo.2021.103087
[22] Lin, Dong, Wout Broere, and Jianqiang Cui. "Metro systems and urban development: Impacts and implications." *Tunnelling and underground space technology* 125 (2022): 104509. https://doi.org/10.1016/j.tust.2022.104509
[23] Jauregui-Fung, Franco. "Land value capture and transit oriented development as a way of funding railway systems: The case of Hong Kong Rail+ Property Model." *Report for the "Inclusive and sustainable smart cities in the framework of the 2030 Agenda for Sustainable Development" Project* (2022).
[24] M. L. L. Sa and S. Choon-Yin, "Sustainable Urban Development in Singapore," 2023.
[25] Bruns-Berentelg, Jürgen, Luise Noring, and Adam Grydehøj. "Developing urban growth and urban quality: Entrepreneurial governance and urban redevelopment projects in Copenhagen and Hamburg." *Urban Studies* 59, no. 1 (2022): 161-177. https://doi.org/10.1177/0042098020951438
[26] Libunyu, Edzani. "PARATRANSIT-ORIENTED TRANSIT ORIENTED DEVELOPMENT (TOD) IN THE GLOBAL SOUTH: MINIBUS TAXI URBANISM IN SOUTH AFRICA." (2024).

[27] Shen, Jie, and Fulong Wu. "Paving the way to growth: transit-oriented development as a financing instrument for Shanghai's post-suburbanization." In *Changing Asian Urban Geographies*, pp. 28-50. Routledge, 2023. https://doi.org/10.4324/9781003299981-3
[28] Newman, Peter, Sebastian Davies-Slate, Daniel Conley, Karlson Hargroves, and Mike Mouritz. "From TOD to TAC: Why and how transport and urban policy needs to shift to regenerating main road corridors with new transit systems." *Urban Science* 5, no. 3 (2021): 52. https://doi.org/10.3390/urbansci5030052
[29] Dell'Anno, Roberto. "Theories and definitions of the informal economy: A survey." *Journal of Economic Surveys* 36, no. 5 (2022): 1610-1643. https://doi.org/10.1111/joes.12487
[30] Moretti, Michele, Angelo Belliggiano, Stefano Grando, Francesco Felici, Ivano Scotti, Corrado Ievoli, Kirsty Blackstock, María Mar Delgado-Serrano, and Gianluca Brunori. "Characterizing value chains' contribution to resilient and sustainable development in European mountain areas." *Journal of Rural Studies* 100 (2023): 103022. https://doi.org/10.1016/j.jrurstud.2023.103022
[31] ESCAP, UN. "Review of developments in transport in Asia and the Pacific 2005." (2005).
[32] Yasin, Muhammad Yazrin, Muhammad Azmi Bin Mohd Zain, and Muhammad Haniff Bin Hassan. "Urbanization and growth of Greater Kuala Lumpur: Issues and recommendations for urban growth management." *Southeast Asia: A Multidisciplinary Journal* 22, no. 2 (2022): 4-19. https://doi.org/10.1108/SEAMJ-02-2022-B1002
[33] Ma, Raja Noor Farah Azura Raja, Nur Amira Syahirah Azmar, Mohd Syahriman Mohd Azmi, Nor Suriya Abd Karim, Nor Hafizah Md Husin, Norhisam Misron, and Nida Sri Utami. "Sustainable Urban Planning: Criteria for Efficient Photovoltaic Electric Vehicle Charging Stations Deployment in Malaysia." *Semarak International Journal of Electronic System Engineering* 1, no. 1 (2024): 35-45. https://doi.org/10.37934/sijese.1.1.3545
[34] Ibraeva, Anna, Gonçalo Homem de Almeida Correia, Cecília Silva, and António Pais Antunes. "Transit-oriented development: A review of research achievements and challenges." *Transportation Research Part A: Policy and Practice* 132 (2020): 110-130. https://doi.org/10.1016/j.tra.2019.10.018
[35] Ali, Nurulhuda, Hasniyati Hamzah, Anuar Alias, and Ismail Muhamad. "A FRAMEWORK OF PRACTICAL ECONOMIC INDICATORS FOR TRANSIT-ORIENTED DEVELOPMENT (FPEI-TOD): IDENTIFICATION AND EXPERT VALIDATION." *PLANNING MALAYSIA* 22 (2024). https://doi.org/10.21837/pm.v22i31.1461
[36] Khoo, Suet Leng, and Nicole Shu Fun Chang. *Creative City as an Urban Development Strategy: The Case of Selected Malaysian Cities*. Springer Nature, 2021. https://doi.org/10.1007/978-981-16-1291-6
[37] Homer, Stephen Thomas, and Weng Marc Lim. "Theory development in a globalized world: Bridging "doing as the romans do" with "understanding why the romans do it"." *Global Business and Organizational Excellence* 43, no. 3 (2024): 127-138. https://doi.org/10.1002/joe.22234
[38] SunwayGroup, "TOD Implementation in Bandar Sunway," N. Ali, Ed., ed, 2024.
[39] Cucuzzella, Carmela, Jordan Owen, Sherif Goubran, and Thomas Walker. "A TOD index integrating development potential, economic vibrancy, and socio-economic factors for encouraging polycentric cities." *Cities* 131 (2022): 103980. https://doi.org/10.1016/j.cities.2022.103980
[40] Khare, Rupali, Vasanta Govind Kumar Villuri, Devarshi Chaurasia, and Supriya Kumari. "Measurement of transit-oriented development (TOD) using GIS technique: A case study." *Arabian Journal of Geosciences* 14 (2021): 1-16. https://doi.org/10.1007/s12517-021-07142-y
[41] Porter, Gina, and Claire Dungey. "Innovative field research methodologies for more inclusive transport planning: Review and prospect." *Advances in Transport Policy and Planning* 8 (2021): 273-303. https://doi.org/10.1016/bs.atpp.2021.06.006
[42] Su, Shiliang, Hui Zhang, Miao Wang, Min Weng, and Mengjun Kang. "Transit-oriented development (TOD) typologies around metro station areas in urban China: A comparative analysis of five typical megacities for planning implications." *Journal of transport geography* 90 (2021): 102939. https://doi.org/10.1016/j.jtrangeo.2020.102939
[43] Beck, Donizete, and Jose Storopoli. "Cities through the lens of Stakeholder Theory: A literature review." *Cities* 118 (2021): 103377. https://doi.org/10.1016/j.cities.2021.103377
[44] Bouillass, Ghada, Isabelle Blanc, and Paula Perez-Lopez. "Step-by-step social life cycle assessment framework: a participatory approach for the identification and prioritization of impact subcategories applied to mobility scenarios." *The International Journal of Life Cycle Assessment* 26 (2021): 2408-2435. https://doi.org/10.1007/s11367-021-01988-w
[45] Buenk, Reinhart. "Development of a Monitoring and Evaluation Framework for sustainability assessment of Microtransit systems." PhD diss., Stellenbosch: Stellenbosch University, 2020.
[46] Yap, Jeffrey Boon Hui, Chia Yee Chua, and Martin Skitmore. "Towards sustainable mobility with transit-oriented development (TOD): understanding greater Kuala Lumpur." *Planning Practice & Research* 36, no. 3 (2021): 314-336. https://doi.org/10.1080/02697459.2021.1883249

[47] Hasibuan, Hayati Sari, Raldi H. Koestoer, Chrisna T. Permana, Muhammad Hakim Danial, Marlyana Azyyati Marzukhi, and Bellanti Nur Elizandri. "The progression of transport infrastructures and Transit Oriented Development (TOD) areas in Jakarta and Kuala Lumpur suburban: Lessons from policy approach." *Journal of Infrastructure, Policy and Development* 8, no. 9 (2024): 6025. https://doi.org/10.24294/jipd.v8i9.6025

[48] Nasir, Nurul Akmaniza Mohd, Mohamad Afiq Abdul Manaf, Nor Hanisah Mohd Hashim, and Nor Idzhainee Hashim. "Place Attachment and its Impacts Towards Pro-Environmental Behavior Intention among Urban Park Visitors." *Semarak International Journal of Applied Psychology* 1, no. 1 (2024): 51-60. https://doi.org/10.37934/sijap.1.1.5160

[49] Tran, Martino, and Christian Brand. "Smart urban mobility for mitigating carbon emissions, reducing health impacts and avoiding environmental damage costs." *Environmental Research Letters* 16, no. 11 (2021): 114023. https://doi.org/10.1088/1748-9326/ac302e

[50] Ma, Raja Noor Farah Azura Raja, Nur Amira Syahirah Azmar, Mohd Syahriman Mohd Azmi, Nor Suriya Abd Karim, Nor Hafizah Md Husin, Norhisam Misron, and Nida Sri Utami. "Empowering Green Transportation: Strategies for Electric Vehicle Adoption and Charging Infrastructure in Malaysia." *Journal of Advanced Research in Applied Sciences and Engineering Technology* (2024): 204-219.

[51] Zhou, Yuan, Jing Yao, Mingkun Chen, and Mi Tang. "Optimizing an urban green space ecological network by coupling structural and functional connectivity: A case for biodiversity conservation planning." *Sustainability* 15, no. 22 (2023): 15818. https://doi.org/10.3390/su152215818

[52] Allen, Jeff, and Steven Farber. "Planning transport for social inclusion: An accessibility-activity participation approach." *Transportation Research Part D: Transport and Environment* 78 (2020): 102212. https://doi.org/10.1016/j.trd.2019.102212

[53] Nzau, Bernard, and Claudia Trillo. "Affordable housing provision in informal settlements through land value capture and inclusionary housing." *Sustainability* 12, no. 15 (2020): 5975. https://doi.org/10.3390/su12155975

[54] Zeng, Xun, Yuanchun Yu, San Yang, Yang Lv, and Md Nazirul Islam Sarker. "Urban resilience for urban sustainability: Concepts, dimensions, and perspectives." *Sustainability* 14, no. 5 (2022): 2481. https://doi.org/10.3390/su14052481

[55] Maheshwari, Richa, Anna Grigolon, and Mark Brussel. "Evaluating TOD in the context of local area planning using mixed-methods." *Case studies on transport policy* 10, no. 2 (2022): 1015-1025. https://doi.org/10.1016/j.cstp.2022.03.013

[56] Yildirim, Yalcin, and Mahyar Arefi. "Stakeholders' perception of sound in transit-oriented developments (TODs)." *Transportation Research Part D: Transport and Environment* 87 (2020): 102559. https://doi.org/10.1016/j.trd.2020.102559

[57] Onwujekwe, Obinna, Charles T. Orjiakor, Aloysius Odii, Benjamin Uzochukwu, Prince Agwu, Chinyere Mbachu, Julianna Onuh, Chukwuedozie Ajaero, and Tolib Mirzoev. "Examining the roles of stakeholders and evidence in policymaking for inclusive urban development in Nigeria: Findings from a policy analysis." In *Urban Forum*, pp. 1-31. Springer Netherlands, 2022. https://doi.org/10.1007/s12132-021-09453-5