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TRANSIT-ORIENTED DEVELOPMENT AND URBAN TRADE IN SEMARANG CITY

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Abstrak: Pengembangan perdagangan perkotaan berkaitan erat dengan sistem transportasi dan aksesibilitas regional. Kota Semarang, sebagai pusat perdagangan dan jasa utama di Jawa Tengah, menghadapi tantangan seperti kemacetan lalu lintas, perluasan kota yang tidak terencana, dan penggunaan transportasi massal yang belum optimal. Kondisi ini menyebabkan peningkatan biaya mobilitas dan berkurangnya efisiensi kegiatan ekonomi. Penelitian ini bertujuan untuk menganalisis peran Transit-Oriented Development (TOD) dalam mendukung pengembangan perdagangan perkotaan di Kota Semarang. Penelitian menggunakan pendekatan deskriptif kualitatif dengan analisis dokumen kebijakan, data sekunder, dan studi kasus area aktivitas ekonomi utama. Temuan menunjukkan bahwa TOD berpotensi meningkatkan aktivitas perdagangan dan jasa melalui peningkatan aksesibilitas, konsentrasi fungsi ekonomi, dan efisiensi mobilitas konsumen serta tenaga kerja. Namun, integrasi antarmoda yang lemah dan tidak adanya rencana ekonomi berorientasi TOD yang komprehensif masih menjadi hambatan signifikan. Studi ini menyimpulkan bahwa TOD dapat menjadi instrumen pendukung yang efektif untuk pengembangan perdagangan perkotaan jika diintegrasikan secara konsisten dengan kebijakan transportasi dan ekonomi.

Kata kunci: transit-oriented development, perdagangan perkotaan, transportasi massal, ekonomi regional, Kota Semarang

Abstract: *Urban trade development is closely related to transportation systems and regional accessibility. Semarang City, as a major trade and service center in Central Java, faces challenges such as traffic congestion, urban sprawl, and the suboptimal use of mass transportation. These conditions have contributed to increased mobility costs and reduced efficiency of economic activities. This study aims to analyze the role of Transit-Oriented Development (TOD) in supporting urban trade development in Semarang City. The research adopts a qualitative descriptive approach using policy document analysis, secondary data, and case studies of major economic activity areas. The findings indicate that TOD has the potential to enhance trade and service activities by improving accessibility, concentrating economic functions, and increasing the efficiency of consumer and labor mobility. However, weak intermodal integration and the absence of a comprehensive TOD-oriented economic plan remain significant obstacles. This study concludes that TOD can serve as an effective supporting instrument for urban trade development if consistently integrated with transportation and economic policies.*

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Keywords:, mass transportation, regional economy, Semarang City, transit-oriented development, urban trade.

I. PENDAHULUAN

Trade and service activities play a central role in driving urban economic growth by supporting the circulation of goods, services, and labor within and across regions. In Indonesia, major cities function as key distribution and service hubs that connect local economies with regional and national markets. Semarang City, as the capital of Central Java Province, holds a strategic position in regional trade networks and serves as an important center for commercial, administrative, and service-based activities. Central urban areas such as Simpang Lima and Jalan Pemuda have developed into dominant economic cores, characterized by a high concentration of retail, office, and service functions [1]. Despite its economic significance, the growth of trade and service activities in Semarang has not been matched by the development of an efficient and integrated transportation system. The increasing reliance on private vehicles, persistent traffic congestion, and the spatial expansion of economic activities toward peripheral areas have contributed to higher mobility costs for consumers and workers. These conditions have reduced travel efficiency, increased time and transportation expenses, and weakened functional connectivity between trade centers and surrounding urban areas, ultimately constraining urban economic performance.

These challenges indicate the need for an integrated development approach that aligns transportation systems with economic activity patterns. One approach that has gained attention in urban economic and transport studies is Transit-Oriented Development (TOD), which places mass transit nodes as focal points of urban activity. From an economic perspective, TOD has the potential to enhance accessibility to trade areas, facilitate the efficient movement of consumers and labor, and encourage the concentration of economic activities around transit nodes. By improving mobility efficiency and reducing transportation-related costs, TOD can support more competitive and sustainable urban trade systems. This study examines the role of TOD in supporting urban trade development in Semarang City. Specifically, it analyzes how TOD can contribute to improving access to commercial areas, reducing mobility costs, and enhancing the spatial efficiency of economic activities. The study also identifies key challenges in TOD implementation and evaluates policy alignment between transportation planning and economic development strategies.

LITERATURE REVIEW

Transportation and Regional Economic Theory

Urban trade development is closely linked to transportation systems and accessibility. According to regional economic theory, transportation plays a critical role in shaping the spatial distribution of economic activities by influencing mobility costs, market access, and interaction between producers and consumers. Efficient transportation systems reduce distribution and transaction costs, thereby enhancing the competitiveness of urban trade and service sectors [2]. Conversely, inadequate transport infrastructure and congestion can constrain economic performance by increasing travel time and limiting access to commercial areas [3]. Recent studies emphasize the importance of integrated transport-land use planning in achieving sustainable urban economic growth. Research by Zhang et al. (2021) demonstrates that cities with well-integrated public transport systems experience higher levels of commercial activity concentration and reduced logistics costs. Similarly, Guo et al. (2024) found that accessibility improvements through mass transit expansion significantly enhance retail performance and employment density in urban centers, particularly in developing countries where motorization rates are rapidly increasing.

The Concept of Transit-Oriented Development (TOD)

Transit-Oriented Development (TOD) has been widely discussed as an integrated approach that aligns transportation systems with urban economic activities. TOD emphasizes the role of mass transit nodes as focal points for development, promoting higher levels of accessibility and activity concentration [6]. From an economic perspective, TOD supports the efficient movement of labor and consumers, reduces reliance on private vehicles, and contributes to lower mobility-related costs. Curtis et al. (2009) highlight that TOD can strengthen the functional relationship between transport infrastructure and economic activities when supported by consistent policy frameworks. Contemporary TOD research has evolved to incorporate economic competitiveness and commercial viability as core objectives. Fang et al. (2023) argue that successful TOD implementation requires explicit integration with local economic development strategies, particularly in emerging economies where informal economic sectors remain significant. Furthermore, Papa & Bertolini (2021) demonstrate that TOD effectiveness depends on the quality of multimodal integration and the presence of supportive land use regulations that encourage mixed-use development around transit stations.

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Accessibility and Urban Economic Behavior

Previous studies have also examined the relationship between urban form, accessibility, and economic behavior. Ozbil & Peponis (2012) demonstrates that improved pedestrian accessibility around transit areas increases the likelihood of transit use, which indirectly supports economic activity by enhancing access to trade and service locations. Increased pedestrian flows around transit nodes have been associated with higher demand for retail and service functions, particularly in central urban areas. Building on this foundation, recent research by Hull et al. (2024) shows that transit accessibility improvements generate measurable increases in commercial land values and business establishment density within 500-meter catchment areas of transit stations. Moreover, Cucuzzella et al. (2022) found that TOD zones in Asian cities demonstrate 30-45% higher retail turnover compared to non-TOD areas, attributed primarily to enhanced consumer accessibility and foot traffic concentration.

TOD and Urban Trade Development

The relationship between TOD and urban trade development has received growing attention in academic literature. Dittmar & Ohland (2003) [14] argue that transit-oriented districts create favorable conditions for retail and service businesses by concentrating consumer flows and reducing automobile dependency. This spatial concentration of economic activities generates agglomeration benefits, including knowledge spillovers, labor market pooling, and shared infrastructure, which collectively enhance business productivity and competitiveness [15]. More recent evidence from Lan et al. (2025) indicates that TOD implementation can increase commercial property values by 15-25% within a 400-meter radius of transit stations, while also stimulating new business formation in retail, food services, and professional services sectors. Similarly, research by Silver (2024) in Indonesian cities demonstrates that BRT (Bus Rapid Transit) corridor development has catalyzed commercial development along major transit routes, though benefits remain constrained by weak station area planning and limited pedestrian infrastructure.

Indonesian Context and Implementation Challenges

In the Indonesian context, urban development policies have increasingly emphasized the integration of transportation and spatial planning to support economic growth. Government planning documents, such as regional spatial plans, recognize the importance of improving mass transportation systems to enhance urban accessibility and economic efficiency [18]. However, empirical evidence suggests that implementation challenges, including limited system integration and inconsistent planning, continue to constrain the economic benefits of TOD [19]. Research by Taki et al. (2025) on Jakarta's TOD initiatives reveals that institutional fragmentation, inadequate financing mechanisms, and weak coordination between transport agencies and local governments significantly hinder TOD effectiveness. Furthermore, Nugroho et al. (2023) identify that Indonesian cities face unique challenges in TOD implementation, including high informal sector presence, mixed traffic conditions, and limited pedestrian-oriented infrastructure, which collectively reduce the economic spillover effects typically associated with TOD in developed countries [22]. This study builds on existing literature by examining TOD as a supporting mechanism for urban trade development, with a specific focus on the case of Semarang City. It contributes to the literature by analyzing the alignment between TOD policies and economic development objectives in a medium-sized Indonesian city context, and by identifying actionable pathways for enhancing TOD's contribution to urban trade competitiveness [23].

II. METODE DAN MATERI

This study employs a qualitative descriptive approach to analyze the role of Transit-Oriented Development (TOD) in supporting urban trade development in Semarang City. The research design integrates document analysis, secondary data evaluation, and spatial analysis of economic activity patterns.

Data Sources

Primary data sources include official planning documents such as the Semarang City Regional Spatial Plan (RTRW) 2011-2031, transportation development reports from the Semarang City Transportation Agency, and Bus Rapid Transit (BRT) corridor planning documents. Secondary data encompass economic statistics on trade and service sector performance, transportation usage patterns, and demographic distribution obtained from the Central Bureau of Statistics (BPS) and relevant municipal agencies.

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Analysis Procedure

The analysis follows a three-stage process. First, policy documents are reviewed to identify TOD-related planning objectives and their alignment with economic development strategies. Second, spatial analysis is conducted to examine the relationship between mass transit infrastructure, particularly BRT corridors, and the concentration of commercial activities. Third, a comparative assessment is performed to evaluate the accessibility and economic performance of areas with and without TOD characteristics.

Study Area

The study focuses on major economic activity centers in Semarang City, including Simpang Lima, Jalan Pemuda, and BRT corridor zones. These areas were selected based on their significance as commercial centers and their proximity to existing or planned mass transit infrastructure.

Analytical Framework

The analytical framework examines TOD through four dimensions: (1) accessibility improvements to trade and service areas, (2) labor and consumer mobility efficiency, (3) concentration of economic activities around transit nodes, and (4) reduction of transportation-related costs. Each dimension is assessed using available quantitative indicators and qualitative evidence from policy documents and spatial observations.

III. PEMBAHASAN DAN HASIL

Trade and Service Characteristics in Semarang City

Semarang City functions as a major trade and service hub in Central Java, with economic activities concentrated in central urban districts. Data from the Central Bureau of Statistics indicate that the trade and service sectors contribute approximately 65% of the city's Gross Regional Domestic Product (GRDP), reflecting their dominant role in the urban economy. The spatial distribution of commercial activities shows a strong concentration in areas such as Simpang Lima, Jalan Pemuda, and the historic Kota Lama district, where high accessibility and pedestrian flows support retail and service businesses.

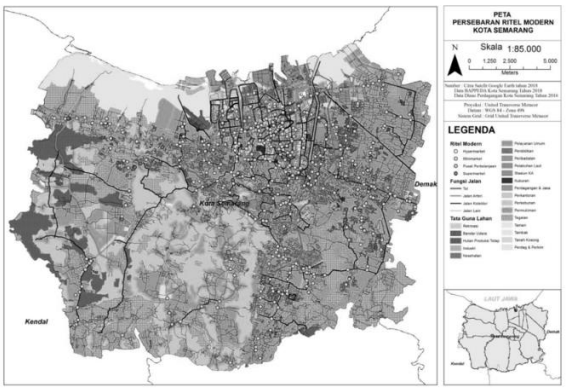

Figure 1. Map of Modern Trade and CBD Areas in Semarang (Source: Regional spatial plan (RTRW) of Semarang City 2011-2031)

Semarang City exhibits a high concentration of trade activities that are predominantly focused within its central urban areas, where commercial, retail, and service functions are spatially clustered. This spatial concentration reflects the historical and functional role of the city center as the primary hub of economic activity, where business services, government offices, retail outlets, and supporting facilities are closely interconnected. The clustering of trade functions in central areas creates agglomeration advantages, including higher consumer footfall, improved information exchange, and greater market visibility for businesses. As a result, central urban areas continue to attract both consumers and business actors despite increasing congestion and mobility challenges. However, this strong centralization also increases the dependence of urban trade performance on accessibility and transportation efficiency. The ability of consumers and workers to reach central trade areas in a timely and cost-effective manner becomes a critical determinant of economic activity. When accessibility is constrained by congestion or inadequate mass transportation coverage, the benefits of spatial concentration can be partially offset by higher travel costs, longer travel times, and reduced convenience. This condition places pressure on both consumers

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and business operators, particularly small and medium-sized enterprises that rely on consistent customer access. Therefore, the high concentration of trade activities in Semarang's central urban areas highlights the importance of transportation systems that support efficient access to economic hubs. Improving connectivity between central trade areas and surrounding urban zones is essential to sustaining urban trade performance and ensuring that the economic benefits of centralization can be fully realized.

Transportation System and Accessibility

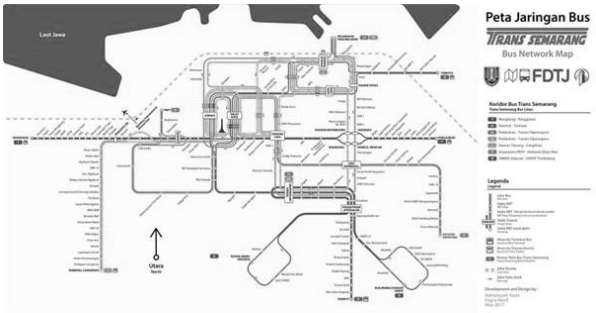

Figure 2. Existing BRT / Mass Transit Network Map (Source: Information and Documentation Management Officer (PPID) Semarang City)

However, persistent traffic congestion and the limited coverage of mass transportation systems have reduced overall mobility efficiency, resulting in longer travel times, higher transportation costs, and decreased accessibility for consumers and workers. These conditions have constrained the effectiveness of urban trade activities and weakened the functional connectivity between major commercial areas and surrounding urban zones.

Figure 3. Congestion in Central Trade Areas (Source: Kompas)

Consumers and business actors remain heavily dependent on private vehicles, which has led to longer travel times, higher transportation and fuel costs, and increased exposure to congestion-related inefficiencies. This dependence reduces the predictability and reliability of mobility, constrains access to trade areas, and ultimately increases operational and transaction costs for urban economic activities.

The Role of TOD in Supporting Urban Trade

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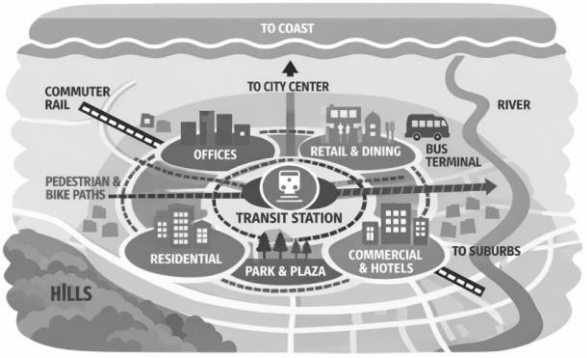

Figure 4. TOD Concept Diagram Supporting Urban Economic Activities (Source: Personal Documents)

The implementation of Transit-Oriented Development (TOD) has the potential to generate multiple economic benefits for urban trade systems. First, TOD improves consumer access to trade areas by reducing travel time and increasing the convenience of reaching commercial centers through mass transit. Second, it enhances labor mobility efficiency by facilitating easier and more reliable commuting for workers, which contributes to higher productivity and a more flexible labor market. Third, TOD encourages the growth and spatial concentration of trade and service businesses around transit nodes by increasing pedestrian flows and market exposure, thereby supporting retail performance and service demand. Finally, TOD reduces overall mobility and distribution costs by decreasing reliance on private vehicles, lowering transportation expenses, and minimizing congestion-related inefficiencies. Through the concentration of economic activities near mass transit systems, TOD contributes to a more efficient, accessible, and competitive urban trade system.

Implementation Challenges

Despite its economic potential, the implementation of Transit-Oriented Development in Semarang continues to face several structural challenges. These include weak integration between mass transit systems and feeder transportation, which limits effective last-mile connectivity and reduces user accessibility to trade areas. In addition, the absence of TOD planning that is explicitly oriented toward economic and trade development has constrained the ability of transit nodes to function as active commercial centers.

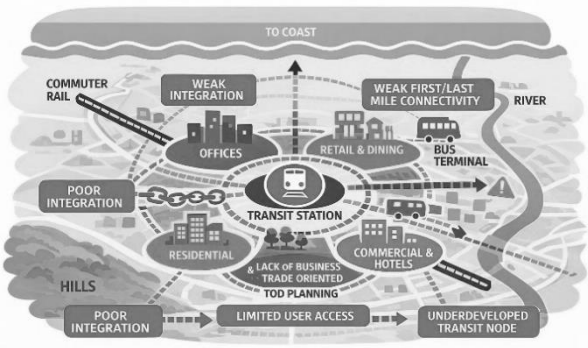

Figure 5. Illustration of key barriers hindering TOD implementation in Semarang (Source: Personal Documents)

As a result, the expected benefits of TOD in improving mobility efficiency, supporting business growth, and enhancing urban trade performance have not been fully realized.

IV. KESIMPULAN

Transit-Oriented Development (TOD) represents an important policy instrument for supporting urban trade development through improvements in accessibility and mobility efficiency. This study demonstrates that, in the context of Semarang City, the performance of trade and service activities is closely linked to the effectiveness of the urban transportation system. High concentrations of commercial and service functions in central urban areas indicate that accessibility plays a critical role in sustaining urban economic activities. However, persistent traffic congestion, reliance on private vehicles, and limited integration of mass transportation have reduced mobility efficiency and increased economic costs for consumers, workers, and business actors. The findings of this study

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suggest that TOD has the potential to address these challenges by restructuring the relationship between transportation systems and economic activities. By concentrating trade, service, and employment functions around mass transit nodes, TOD can improve access to commercial areas, reduce travel time, and lower transportation-related costs. Improved mobility efficiency enhances consumer reach and labor market flexibility, which are essential for maintaining the competitiveness of urban trade systems. In addition, TOD encourages the development of trade and service businesses in areas with high pedestrian flows, thereby strengthening local economic activity and supporting small and medium-sized enterprises. Despite these potential benefits, the case of Semarang City highlights several structural challenges that limit the effectiveness of TOD implementation. Weak integration between mass transit systems and feeder transportation has constrained last-mile connectivity, reducing the accessibility of trade areas for a large segment of the urban population. Furthermore, the absence of TOD planning that is explicitly oriented toward economic and trade development has limited the ability of transit nodes to function as active commercial centers. As a result, TOD initiatives have largely focused on transportation improvements without fully leveraging their potential to support urban economic growth.

These findings underscore the importance of policy alignment between transportation planning and economic development strategies. TOD should not be treated solely as a transport-oriented intervention, but rather as a comprehensive development approach that integrates mobility systems with trade, service, and employment activities. Local governments play a crucial role in coordinating stakeholders, including transport agencies, urban planners, and business communities, to ensure that TOD implementation supports broader economic objectives. Clear policy direction, consistent implementation, and institutional coordination are essential for maximizing the economic benefits of TOD. In the long term, the successful integration of TOD into urban development strategies can contribute to more efficient, competitive, and sustainable urban trade systems. By reducing dependence on private vehicles and improving access to economic centers, TOD can help mitigate congestion-related costs and enhance overall urban productivity. For Semarang City, strengthening TOD implementation through improved intermodal integration and economic-oriented planning offers a viable pathway to support trade development and enhance urban economic resilience. Future studies may build on this research by incorporating quantitative analysis or updated empirical data to further evaluate the economic impacts of TOD on urban trade performance.

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