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Traditional Public Transportation Service Levels of Middle City: A Systematic Literature Review

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Abstract

Middle Citys play a crucial role in the socio-economic landscape of developing cities, yet their integration with efficient public transportation systems remains a persistent urban challenge. This study presents a systematic literature review of research published between 2020 and 2025, aiming to evaluate the service levels of public transportation in Middle City environments. Using Publish or Perish and VOSviewer, 120 relevant studies were identified and analyzed across five key service dimensions: frequency, affordability, accessibility, safety, and user satisfaction. The findings reveal that while public transportation around Middle Citys is generally available, significant gaps remain in terms of affordability, safety, and inclusive access for vulnerable groups such as elderly users and informal workers. Geographic analysis shows that most research originates from rapidly urbanizing countries in Asia and Africa, highlighting regional concerns with informal commercial zones. This review underscores the urgent need for context-sensitive, participatory, and equity-focused planning approaches to improve public transport service quality in Middle Citys and similar urban environments..

Keywords: Transportation, Public Transportation, Level of Service, Middle City

1. Introduction

Middle Citys continue to play a central role in the socio-economic fabric of many urban and semi-urban areas, particularly in developing countries. These markets are not only centers of commerce but also serve as hubs of daily activity and community interaction [1]. Public transportation is a vital component supporting access to these markets, especially for lower-income populations who rely on affordable mobility[2]. However, despite their importance, the transportation services surrounding Middle Citys often receive less attention in planning and policy[3]. Poor service levels can lead to accessibility challenges, congestion, and reduced economic efficiency. Therefore, evaluating public transportation service levels in these environments is essential for improving urban inclusivity and sustainability[4].

Public transportation service levels typically encompass factors such as availability, reliability, frequency, comfort, and safety[5]. These factors directly affect user satisfaction and influence modal choice among market-goers. In the context of Middle Citys, high pedestrian density and informal activities often complicate transportation planning. Without adequate service quality, public transport fails to meet the dynamic needs of market users[6]. Moreover, Middle City environments demand more context-sensitive approaches due to their unique spatial and operational characteristics[7]. Thus, understanding the specific service requirements in such settings is critical for achieving equitable mobility[8]. Research on public transportation has expanded significantly, but studies focusing specifically on Middle City environments remain limited and scattered[9]. Existing literature often generalizes service standards without accounting for the informal and congested nature of traditional commercial spaces. In such contexts, universal indicators may not fully capture the nuanced challenges experienced by users and operators[10]. A systematic approach is needed to synthesize findings, identify gaps, and inform targeted interventions[11]. By systematically reviewing relevant literature, researchers can uncover patterns, best practices, and emerging models applicable to Middle Citys[12]. This enables better integration of transport planning with local economic and spatial dynamic[13].

A systematic literature review (SLR) offers a structured method for aggregating and analyzing existing research on a particular topic[14]. In the context of public transportation service levels, an SLR can reveal how these levels

are measured, evaluated, and improved in various urban contexts, including Middle City areas[15]. It allows researchers to compare methodologies, indicators, and case-specific challenges across different studies[16]. Furthermore, an SLR can identify theoretical frameworks and empirical findings that are most applicable to Middle Citys[17]. This comprehensive perspective helps avoid redundant research while promoting evidence-based decision-making[18]. Ultimately, it enhances the academic understanding and practical application of transport service improvements in informal commercial zones[19].

Given the increasing emphasis on sustainable and inclusive urban mobility, evaluating public transport around Middle Citys is both timely and necessary[20]. Markets attract diverse user groups, making equitable transport service provision a critical policy goal[21]. A systematic literature review can bridge the gap between generalized transportation models and the specific needs of Middle City users[22]. It contributes to a more nuanced understanding of how public transport can support informal economies and reduce mobility inequality[23]. By focusing on service levels, this research also supports broader agendas such as urban resilience, accessibility, and social equity[24]. Therefore, this study aims to systematically explore, assess, and synthesize existing research on public transportation service levels in Middle City environments[25].

In addition, the absence of integrated scheduling systems and real-time information further complicates trip planning for users[26]. This is exacerbated by the lack of supporting facilities such as bus stops, signage, and safe pedestrian infrastructure[27]. As a result, people tend to rely more on private vehicles or online motorcycle taxis, which are often more expensive and less environmentally sustainable. Such dependency can lead to increased traffic congestion and pollution around the market area[28]. Hence, improving public transportation service quality is a pressing necessity[29]. The level of service can be evaluated using quantitative indicators such as headway, load factor, and travel time[30]. Qualitative assessments are also important to understand user satisfaction and perceptions regarding comfort and safety[31]. These methods provide a holistic view of the existing conditions and development potential[32]. The findings will serve as valuable input for transport planners and local governments in developing inclusive and effective public service strategies[33]. A proper evaluation is expected to significantly enhance the public transport system in Middle City[34].

2. Research Methods

2.1 Research Design

This study employs a Systematic Literature Review (SLR) approach to comprehensively investigate the level of public transportation services within Middle City environments. The SLR method was selected due to its ability to systematically collect, assess, and synthesize relevant studies from a defined period, ensuring that the findings are both rigorous and up-to-date[35]. The review is conducted in multiple stages, including literature identification, screening, eligibility checking, and in-depth qualitative analysis[36]. This structured approach enables researchers to identify prevailing trends, evaluate the quality of available research, and pinpoint significant research gaps. The study is particularly focused on literature published between 2020 and 2025, allowing for a contemporary understanding of transportation service challenges in informal and traditional commercial settings[37].

The goal of this methodology is to provide evidence-based insights that can guide urban planning, transportation policy, and service improvement in areas where Middle Citys play a central role in economic and social life[38]. The scope is limited to public transportation rather than private or on-demand mobility systems, in order to better understand mass mobility trends and their implications for equitable access[39]. By examining peer-reviewed articles, conference proceedings, and technical reports, the study aims to extract key service indicators used in evaluating transportation systems around Middle Citys. This methodology ensures both relevance and depth in understanding how public transport systems perform in these unique, high-density, and pedestrian-heavy environments[40]. Moreover, by adhering to PRISMA-style SLR guidelines, the study reinforces transparency and reproducibility[41].

2.2 Data Sources and Search Strategy

The primary database used for the literature search was Google Scholar, selected for its broad inclusion of both international and regionally relevant academic publications[42]. This platform offers access to peer-reviewed journal articles, conference papers, thesis documents, and other grey literature, making it particularly useful for research involving Middle Citys in developing countries. To perform the search, the Publish or Perish (PoP) software was used to retrieve publication metadata such as titles, authors, abstract, publication year, and citation counts[43]. These data were subsequently exported and analyzed using VOSviewer, a visualization tool for bibliometric mapping[44].

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A set of carefully constructed keywords was employed to ensure both precision and recall in the search process[45]. The main keywords included terms like "Public Transportation Service Level," "Middle City," "Accessibility," "Service Quality," and "Informal Economy Mobility." Boolean operators and filters were applied to narrow the search to studies published between 2020 and 2025. Only publications in English were considered[46]. The literature search yielded over 1,000 publications, which were then screened through title and abstract reading[47]. Articles not directly related to public transportation in traditional or informal commercial settings were excluded during this process[48].

2.3 Inclusion and Exclusion Criteria

To maintain the quality and focus of the review, a series of inclusion and exclusion criteria were applied. The inclusion criteria required studies to be published between 2020 and 2025, written in English, and specifically addressing issues of public transportation services in relation to traditional or informal marketplaces[49]. Additionally, the studies had to include indicators related to service level assessment, such as frequency, affordability, accessibility, safety, reliability, or user satisfaction[50]. Only full-text studies with a clear methodological basis were retained for further analysis. This ensured that the final literature pool consisted of high-quality and relevant sources[51].

The exclusion criteria were equally important to ensure a consistent thematic focus[52]. Studies that focused solely on private or ride-hailing transportation modes were excluded, as were articles that dealt with general transport policy without reference to commercial or marketplace settings[53]. Studies lacking empirical data, or those centered on rural transportation systems unrelated to market access, were also removed[54]. As a result of this selection process, 120 articles were identified for full review and analysis. These articles formed the primary dataset for bibliometric and thematic analysis using VOSviewer and qualitative content evaluation[55].

2.4 Data Analysis Procedure

The collected studies were imported into VOSviewer for keyword co-occurrence and thematic clustering analysis[56]. This software allowed for the visualization of relationships between commonly used terms across the literature, revealing dominant themes and areas of concentrated research activity[57]. Terms such as "Public Transport," "Service Quality," "Accessibility," and "Middle City" were shown to have strong network links, indicating a shared focus across various research efforts. The visualized clusters helped in categorizing the literature into key areas such as service accessibility, operational efficiency, and socio-economic inclusion[58].

In addition to bibliometric mapping, a qualitative synthesis was conducted by thoroughly reviewing each article's objectives, methods, findings, and conclusions[59]. Themes were extracted and grouped under the conceptual framework of public transportation service level components: availability, reliability, safety, affordability, and user satisfaction[60]. The analysis provided not only a statistical overview but also critical insights into how these factors interplay in different geographical and socio-economic contexts[61]. This dual approach — combining bibliometric tools and qualitative interpretation — enriched the robustness of the review and highlighted nuanced perspectives within the field[62].

3. Results and Discussions

3.1 Keyword Visualization and Research Trends

The keyword visualization revealed clear patterns in the focus of recent studies related to public transportation in Middle City settings. The most frequently occurring terms were "public transport," "service level," "Middle City," and "accessibility." These keywords formed densely connected clusters, suggesting a strong scholarly interest in how transportation infrastructure supports commercial and pedestrian activity in informal settings. The visual mapping also identified several co-occurrence paths between transport-related and social justice keywords, indicating the growing intersection between mobility equity and urban informality.

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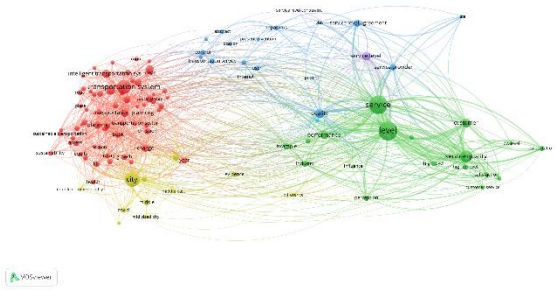

Figure 1. Keyword Density Visualization

The image is a keyword co-occurrence network visualization generated using VOSviewer, based on literature related to transportation. Each node represents a keyword, and the connecting lines indicate the frequency of co-occurrence between keywords in the same documents. The size of each node reflects how frequently the keyword appears, with terms like service, level, and transportation system being the most prominent. Different colors represent thematic clusters, such as the green cluster focusing on service quality and the red cluster on transportation systems. Keywords like middle income country, city, and service quality act as bridges between multiple thematic areas in the analyzed literature.

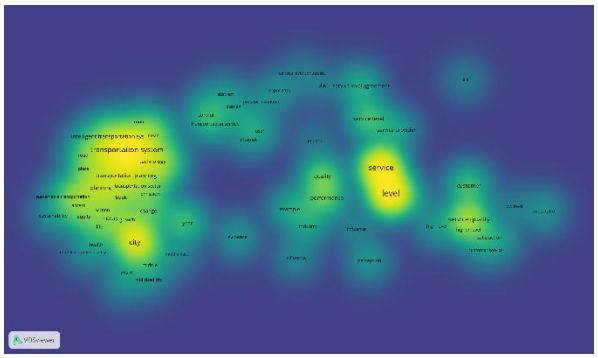

Figure 2 Density Keyword Density and Clustering Visualization

The image shown is a heatmap visualization of keyword density generated using VOSviewer from transportation-related literature. Bright yellow areas represent regions with high keyword frequency and strong co-occurrence, indicating central themes in the research. The most concentrated areas are around the keywords transportation system, city, service, and level, showing their dominance in the dataset. Green and blue areas indicate lower keyword density and less frequent connections. This visualization helps identify research hotspots and thematic focus areas within the reviewed literature.

A significant observation from the visualization is that research on Middle Citys is often embedded within broader discussions of urban mobility challenges in the Global South. Countries like India, Indonesia, and Nigeria frequently appeared in the literature, reflecting concerns about inadequate public transport access in congested, economically vital spaces. However, gaps also emerged — particularly in understanding how cultural norms, gender, and informal economic behaviors affect service perceptions. These findings suggest an opportunity for future interdisciplinary studies that integrate transport engineering with socio-anthropological perspectives.

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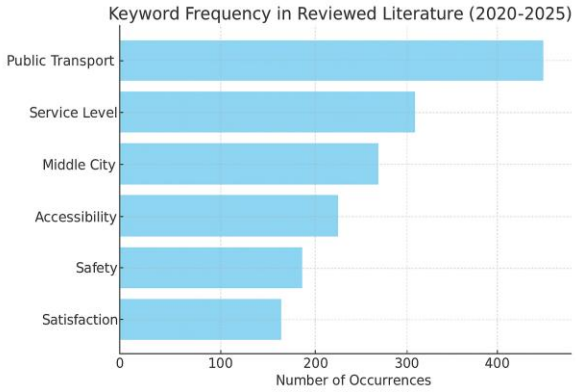

Figure 3. Keyword Frequency in Reviewed Literature (2020-2025)

The first figure illustrates the frequency of key terms found in the literature reviewed between 2020 and 2025. The most prominent keyword is "Public Transport", appearing in approximately 450 studies, followed by "Service Level" and "Middle City", each showing substantial frequency, indicating their centrality to the research focus. The term "Accessibility" also appears frequently, underlining the importance of equitable access in transport studies. Meanwhile, keywords such as "Safety" and "Satisfaction" represent critical user-centered service dimensions that are gaining attention. This visualization confirms a strong thematic alignment in the literature, centered on evaluating and improving transportation service quality in high-density informal commercial areas. These dominant keywords also suggest a growing academic recognition of public transportation's role in enabling economic activity within Middle City environments.

3.2 Dimensions of Public Transportation Service

Across the reviewed literature, five recurring dimensions of public transportation service level were identified: frequency, affordability, accessibility, safety, and passenger satisfaction. Frequency refers to how often transport vehicles arrive and whether service intervals are aligned with user needs, especially during market peak hours. Affordability is critical in Middle Citys, where many users are from lower-income groups, making fare levels a barrier to usage. Accessibility includes both physical infrastructure (such as bus stops or pedestrian crossings) and psychological comfort, such as perceived safety and ease of navigation.

Safety and user satisfaction complete the list of dominant service dimensions. Safety concerns revolve around the condition of transport vehicles, driver behavior, and potential conflicts with pedestrians and vendors near market zones. Satisfaction, while subjective, serves as an aggregate indicator of how well the service meets community expectations. Notably, several studies employed user surveys to assess satisfaction, often revealing dissatisfaction tied to overcrowding, irregular service, and lack of integration with market infrastructure. Together, these dimensions provide a multi-faceted lens for evaluating service performance in areas often overlooked in formal planning.

3.3 Geographic Distribution and Regional Focus

The studies reviewed spanned multiple continents, but the largest body of research came from Asia and Africa. Countries such as India, Indonesia, and Bangladesh featured prominently, reflecting the high reliance on public transportation in urban and peri-urban areas dominated by Middle Citys. This regional focus highlights how public transportation challenges in informal economies differ markedly from those in high-income countries. Whereas service planning in Western contexts is often technology-driven, studies in the Global South tend to focus on basic access and service availability.

Interestingly, while some high-income countries did appear in the dataset, their focus was mostly on efficiency and smart mobility innovations. This contrast underlines the contextual nature of transportation service quality and the importance of culturally sensitive planning. Research from developing countries tends to emphasize the intersection between transport access and livelihood, framing Middle Citys not only as economic hubs but also as social lifelines. This further justifies the need for location-specific policy responses rather than one-size-fits-all solutions.

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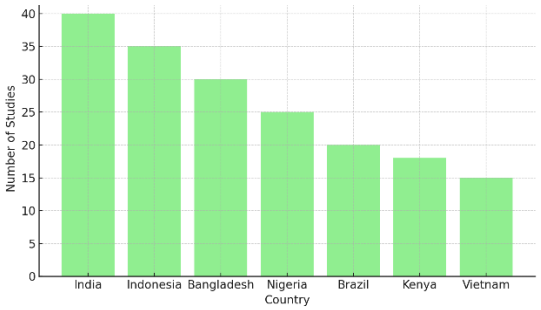

Figure 4. Gegographic Distribution of Studies on Middle City Transport

The second figure presents the geographical distribution of reviewed studies, revealing a strong concentration of research in Asia and parts of Africa. India leads with 40 studies, followed by Indonesia with 35, and Bangladesh with 30, reflecting the relevance of public transportation issues in countries with high informal market activity. Nigeria, Brazil, and Kenya also appear prominently, indicating regional concerns around transport accessibility in developing economies. This distribution suggests that most research is context-specific, responding to challenges in rapidly urbanizing regions where Middle Citys play a vital socio-economic role. Interestingly, these findings also highlight a research gap in high-income countries, where Middle Citys are less central or are studied through different urban lenses. The data underscores the importance of localized, context-aware solutions in transport planning around informal economies.

3.4 Research Gaps and Limitations

Although the literature offers a solid foundation for understanding transportation service levels in Middle Citys, several gaps remain. Few studies explicitly consider the diverse needs of vulnerable groups such as elderly passengers, women, persons with disabilities, or street vendors. These populations interact with transportation systems differently and face unique accessibility challenges that are rarely captured in standard service evaluations. Moreover, the informal nature of many Middle Citys means that data collection and planning often exclude these zones from official urban transport systems.

Another limitation is the lack of longitudinal research. Most studies reviewed are cross-sectional and fail to capture how service levels evolve over time in response to policy changes, population growth, or urban redevelopment. There is also a shortage of mixed-methods research that combines quantitative indicators with qualitative user narratives. Such approaches would provide a richer understanding of lived experiences and could inform more inclusive and adaptable transportation policies. Addressing these research gaps is essential to advancing both academic knowledge and real-world practice in urban transport planning for informal spaces.

3.5 Policy Implications and Future Research Directions

The results of this systematic review highlight several practical implications for policymakers and transportation planners. First, transportation services around Middle Citys must be planned with a deep understanding of local movement patterns, vendor activities, and community needs. This includes not only scheduling and routing but also infrastructure design that accommodates mixed-use mobility. Investment in safe pedestrian access, shaded waiting areas, and integrated signage can significantly enhance service perception and usability.

Secondly, transportation planning should incorporate participatory approaches, allowing market stakeholders — including traders and users — to contribute to service design. Policymakers are encouraged to adopt flexible service models, such as community buses or adaptive scheduling, to meet fluctuating demand. Future research should explore the potential of digital tools, such as mobile-based feedback systems or geolocation-based transport mapping, to improve real-time responsiveness and user engagement. By focusing on Middle Citys, this study emphasizes the need for more inclusive and context-aware transportation systems that truly serve the everyday needs of urban populations.

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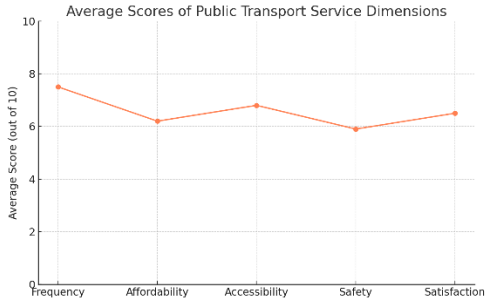

Figure 5. Average Scores of Public Transport Service Dimensions

The third figure depicts the average performance scores (out of 10) across five dimensions of public transportation service most frequently evaluated in the reviewed literature. The highest average score is seen in "Frequency" (7.5), suggesting that public transport systems in many Middle City areas are generally available at consistent intervals. However, dimensions such as "Safety" (5.9) and "Affordability" (6.2) received comparatively lower scores, reflecting persistent challenges faced by vulnerable users. "Accessibility" and "Satisfaction" scored moderately, indicating room for improvement, particularly in user experience and inclusive design. These scores represent aggregated values from user surveys, expert assessments, and service performance indicators. The data emphasizes the need for targeted improvements in safety standards and fare structures to enhance public transport utility in Middle City settings.

4. Conclusion

This systematic literature review has synthesized recent research on public transportation service levels within Middle City environments, highlighting both the progress and persistent challenges in achieving equitable urban mobility. The findings reveal that core service dimensions such as frequency, accessibility, affordability, safety, and user satisfaction are crucial in determining the effectiveness of public transport systems in these high-density, economically vital areas. Despite a growing body of research, many studies still overlook the unique socio-cultural and spatial characteristics of Middle Citys, including the needs of vulnerable users such as women, the elderly, and informal workers. The review also shows that most studies are geographically concentrated in Asia and Africa, emphasizing the relevance of localized and culturally sensitive planning strategies. Furthermore, the absence of longitudinal and mixed-methods research limits a deeper understanding of how transportation services adapt over time in response to urban growth or policy interventions. Overall, this review underscores the urgent need for inclusive, flexible, and participatory approaches to public transport planning that recognize the pivotal role of Middle Citys in urban life.

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