

**DEVELOPING A PWD-INCLUSIVE PEDESTRIAN AND SIDEWALK MOBILITY
TRANSPORTATION ENVIRONMENT IN DAVAO CITY
A SYSTEMATIC LITERATURE REVIEW****MACAPAYAG, CONCEPCION T.****ORCID Number: 0009-0009-3891-2375**Graduate Student, College of Development Management, University of Southeastern Philippines,
Mintal, Davao City**ABSTRACT**

The rationale behind conducting this research study is to respond to the city's need to transform and adopt a modernized public transportation system. One of the components of this modernization is the capacity and readiness of our pedestrians and sidewalks, which is noticeable in its lack of spaces and good infrastructure and causes a very inconvenient way of mobility in traversing the pedestrians and sidewalks to our brothers and sisters who have special needs, senior citizens, pregnant women, and children. ADB (Jan 2022), in conjunction with the Davao Public Transport Modernization Project (DPTMP) wherein the project aims to decongest and introduce lesser carbon footprints of public transportation by eradicating Public Utility Jeepneys (PUJ) and introducing modernized Public Utility Buses (PUB) that include e-buses which will stop and fetch passengers in its designated terminals and bus stops.

In the current transportation landscape of the city with PUJ playing along the carriageways and the norm of stopping and fetching passengers at any time and anywhere; sidewalks and pedestrians become secondary concerns of the commuters as they can ride wherever they are, and mainly focus on the available jeepneys, arrival timeliness, and congested traffic. The Philippine government set the standard for inclusive transportation mobility through the Batasang Pambansa 344 in addressing these gaps and the Department of Public Works and Highways (DPWH) together with the Department of Transportation (DOTr) are the primary implementing agencies spearheading infrastructure projects in resolving the issues. Using the criteria of Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) with 5 publications being considered, the researcher identified three factors of the underlying problems. First is the Infrastructure Readiness, which explains the variables related to the availability of ramps, walkway width, and pathway accessibility. The second factor is Systemic Barriers, which explain the absence of structured intersections and road signs. The third factor is Perceived Inclusivity, which explains the variance and deals with participants' perceptions of pedestrian infrastructure regarding inclusivity and accessibility to PWDs.

These mobility factors affect and relate to the psychological and emotional state of these groups of individuals living in a certain community. As mentioned by Kose, S., & Kato, H. (2019), creating inclusive environments that accommodate individuals with disabilities will highlight strategies for enhancing accessibility in public spaces, transportation systems, and residential areas, aiming to improve the quality of life for all residents. The Spatial-physical as well as social-relational features of the neighborhood in identifying the walking intentions and behaviors, thereby emphasizing the importance of considering both aspects in measures to support urban pedestrian friendliness. The community will play a significant role with the help of the Local Government Unit (LGU) of Davao City to strengthen their existing transportation policy and even modify the ordinances to tailored fit in emphasizing the weight of strict and full implementation of the law across all public and private infrastructures and employ the Urban and Transportation Planners to response to the public spaces needs of walkable and safe sidewalks and pedestrians for all, especially to our vulnerable population.

Keywords:

PUJ, PUB, DPTMP, pedestrians, sidewalks, PWD, modernized transportation, Davao City, inclusivity, accessibility, BP 344, LGU, ADB, urban planning

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INTRODUCTION

With the growing demand for modernization in Davao City's public transportation system, this study focuses particularly on its impacts on pedestrian infrastructure and sidewalk accessibility. The Davao Public Transport Modernization Project (DPTMP) underscores a big change from the traditional Public Utility Jeepneys (PUJs) of the city to the modern bus system that incorporates diesel buses and electric buses (e-buses). These bus systems will ease traffic congestion, reduce carbon emissions, modernize the transport system as a whole, and change the transportation landscape in the city. However, this modernized introduction of vehicles came with problems that had more to do with sidewalks and pedestrian facilities, which are generally underdeveloped and inaccessible.

In the current transport system, there needs to be more pedestrian infrastructure. The sidewalks are narrow, in an impoverished state of maintenance, and encroached upon by other road users such as ambulant vendors and transforming sidewalks into parking lots; thus, it is not safe or comfortable for pedestrians, especially for PWDs, senior citizens, pregnant women, and children. This equates to a proportion of the urban population needing to move more safely and comfortably. Extant literature calls attention to the fact that the built environment influences people's experience of the city as a physical environment in a bid to cope with mobility handicaps. Kose and Kato (2019) emphasize that making public spaces and transportation systems accessible to PWDs as well as other marginalized groups is necessary for equitable access. They argued that universally accessible spaces were not only beneficial in improving the mobility of such individuals but also for the betterment of the overall urban experience of all residents through increased inclusion and equity.

Inclusive design within urban transportation systems is an issue gaining much attention in the urban planner's community, especially due to cities' needs to cater to a senior citizen population and growing challenges in mobility for differently-abled persons. Studies also show that cities where the design principle of universal use is given prominence, including the wide provision of barrier-free walkways, accessible road services, and sharply defined pedestrian zones, are better at public health, safety, and social inclusion outcomes (Baker et al., 2018). Given these patterns, Davao City's modernization efforts can't simply revolve around updating the transport fleet but also give equality importance to the upgrading and improvement of the sidewalks and pedestrian infrastructures, so that these new public transit systems will serve all segments of the population regardless of age, ability, or physical condition. Our government should acknowledge the need to empower them by designing a community where they can thrive in their daily lives, as constituted in BP 344 also known as An Act to Enhance the Mobility of Disabled Persons by Requiring Certain Buildings, Institutions, Establishments, and Public Utilities to install Facilities and Other Devices. This study investigates not only the possible benefits associated with DPTMP concerning traffic congestion and environmental mitigation but also a corresponding requirement on pedestrian infrastructure development to make transport inclusive. Kose and Kato (2019) defined that the success of urban modernization is dependent on the ability of such projects to create an environment where every citizen can safely and easily access their options for transportation. Furthermore, this study seeks to explore these considerations within the context of ongoing public transport reforms in Davao City, emphasizing the assessment of challenges and opportunities for integrating inclusive design within urban planning.

METHODS

This study made a systematic literature review as the dominant research approach in determining all aspects concerning the existing infrastructures regarding pedestrians and walkways in relation to these systems being used within Davao City in modernizing the public transportation structure. Making an SLR ensures a systematic, objective, and replicable procedure in identifying relevant studies while looking at the infrastructure issues and how the current conditions and proposed structures create new gaps in policies and existing conditions of the transportation framework. The study strictly followed the PRISMA guidelines to maintain the high standards of methodological rigor and transparency. A structured framework was provided for conducting the review by the PRISMA, making it easier to ensure uniformity in the selection process of the studies, extracting data, and analysis of the study. With the use of this approach, the study hoped to acquire evidence-based insights that might inform policy recommendations and thus help in the development of inclusive and efficient urban mobility systems.

Table 1: SLR Method Applied in this Study

Step	Description	References
Search Strategy	Keywords used in Scopus, Google Scholar, and PubMed with Boolean operators.	PRISMA framework (Page et al., 2021)
Inclusion Criteria	Studies published after 2018 focusing on infrastructure and inclusivity.	Rivera (2022); Kose & Kato (2019)
Exclusion Criteria	Excluded articles lacking empirical data or relevance to urban mobility.	Gehl (2018); ADB (2022)
Data Extraction	Used a standardized form to capture objectives, methods, findings, and limitations.	PRISMA Checklist (Page et al., 2021)
Data Analysis (EFA)	Classified issues into infrastructure readiness, systemic barriers, and perceived inclusivity.	Rivera (2022); Kose & Kato (2019)

1. Search Strategy. Relevant studies published from 2018 onwards were identified through Scopus, Google Scholar, and PubMed databases. Keywords used included "Davao City pedestrian infrastructure," "inclusive mobility," "public transportation modernization," and "PWD accessibility."

A comprehensive search was carried out in the academic databases: Scopus, Google Scholar, and PubMed. Keywords were designed to capture the scope of the research and included terms such as pedestrian infrastructure, Davao City mobility, inclusive urban planning, and PWD accessibility.

Boolean operators AND and OR were used to combine keywords effectively. The search aimed at finding peer-reviewed articles, conference papers, and government reports relevant to pedestrian and sidewalk infrastructure and their implications for inclusive urban mobility. Search results were documented systematically to ensure transparency.

2. Inclusion and Exclusion Criteria. The following inclusion and exclusion criteria were applied to screen the studies based on relevance and quality.

Inclusion Criteria: Publication dates after 2018. Research that focused on pedestrian and sidewalk infrastructure, inclusive urban mobility, or public transportation systems. Paper with empirical data or policy evaluation that is relevant for the Philippines or regions sharing the same context.

Exclusion Criteria: Articles irrelevant to urban transportation or pedestrian infrastructure. Publication dates before 2018. Papers that are not relevant to data or policy (such as opinion pieces or editorials). This way, only relevant and high-quality studies were included in the analysis.

3. Data Extraction and Analysis: Standardized forms were developed for data extraction to ensure consistency and reliability in the collection of information from selected studies. The forms were designed to capture key aspects of each study, including its objectives, methodologies, main findings, and limitations. The systematic structure of these forms allowed for a uniform approach in gathering relevant data, thus minimizing bias and ensuring that critical elements of the studies were documented effectively.

Infrastructure Preparedness. This variable included all factors associated with the preparedness and sufficiency of the physical infrastructure, like ramps, the width of walkways, and access pathways. All these aspects are essential for ensuring the safe and efficient movement of pedestrians, particularly vulnerable users, through public spaces.

Systemic Obstacles to Facility Accessibility. This factor refers to systemic obstacles in the city at large, such as unstructured intersections, lack of adequate road signage, and pedestrian mechanisms. This indicates that systemic obstacles to accessing and using public transportation and sidewalks are problems with pedestrian access.

Perception of Inclusivity. This factor included the subjective experiences and perceptions of users regarding the inclusion of pedestrian and sidewalk infrastructures. It captured the perception of individuals, more so those with disabilities and other vulnerabilities, about their accessibility and inclusiveness in the urban environment.

Thus, breaking down the problems into the three factors has provided this analysis with a nuanced explanation of the problems in the pedestrian infrastructure and its relation to the modernized public transportation system. This kind of approach, apart from highlighting the existing gaps, also opens avenues for discussion on the interconnected nature of infrastructure design, systemic barriers, and user perceptions as a pathway toward targeted recommendations to overcome the challenges identified.

Table 2: ADB (2022) report for evaluating Davao City's urban transport modernization using Data extraction and Analysis

Aspect	Details	Relevance to Study
Title	Sustainable Urban Transport in Asia: Case Studies and Best Practices	Provides a framework for evaluating urban transport modernization projects, including inclusive mobility.
Author/Publisher	Asian Development Bank (ADB)	A reputable international organization with expertise in urban planning and sustainability.
Publication Year	2022	Ensures alignment with the inclusion criteria for recent studies (2018 onwards).
Focus	Urban transportation modernization, reducing congestion, minimizing environmental impacts, and inclusivity	Aligns with Davao City's DPTMP goals of modernized PUBs and reduced carbon footprints.
Geographical Scope	Asia, with case studies from multiple cities	Contextualizes findings for the Philippines and Davao City based on similar urbanization challenges.
Methodology	Case studies, policy analysis, and best practice documentation	Serves as a comparative benchmark for evaluating Davao City's pedestrian and sidewalk infrastructure readiness.
Key Findings	<ul style="list-style-type: none"> - Emphasis on reducing reliance on outdated transport systems (e.g., PUJs). - Promotes integration of modernized public transport systems (e.g., e-buses) with pedestrian infrastructure. - Highlights inclusive design for vulnerable populations. 	Supports the need for pedestrian-friendly infrastructure as part of sustainable urban transport systems.
Recommendations	<ul style="list-style-type: none"> - Integrate urban transport planning with pedestrian infrastructure. - Prioritize inclusivity in design to ensure accessibility for PWDs, seniors, and other vulnerable groups. 	Directly applicable to Davao City's sidewalk and pedestrian infrastructure improvement initiatives.

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RESULTS

The systematic review identified 5 relevant studies, which were grouped based on thematic focus:

1. **Infrastructure Readiness:** Studies revealed significant gaps in the availability of ramps, walkway width, and pathway accessibility. For example, poorly maintained sidewalks and narrow pathways were common, limiting mobility for PWDs and other vulnerable groups (Kose & Kato, 2019).
2. **Systemic Barriers:** The absence of structured intersections, road signs, and pedestrian crossings emerged as critical issues. These systemic deficiencies contribute to unsafe and inefficient pedestrian movement, particularly in high-traffic areas (Gehl, 2019).
3. **Perceived Inclusivity:** Surveys and interviews highlighted participants' perceptions of pedestrian infrastructure. Many reported feeling excluded due to the lack of accessible and inclusive design features in public spaces (Rivera, 2022).

Field observations validated these findings by assessing the physical condition of sidewalks, bus stops, and other public spaces. Key gaps included inadequate ramps, poor signage, and insufficient pedestrian mechanisms, emphasizing the need for urgent improvements.

DISCUSSION

The general results were that universal design principles should be added to urban planning to consist of diverse mobility needs. As stated by Kose and Kato (2019), "Urban spaces have to become friendly and accessible to all citizens especially to people with specific needs to access public transportation and shared public spaces." On the other hand, adequate sidewalk and pedestrian infrastructure is absent in Davao City, and no clear paths for vulnerable groups, providing another challenge to the success of the DPTMP wherein the bus stop interval distance runs from 400 meters to 800 meters, which means that there will be a more walking for our public commuters. In this sense, there is a recommendation for incorporating inclusive design features in the modernization plans of the inclusive-wider sidewalks, ramps, pathways, signages, and accessible bus stops to ensure truly inclusive public transport. The study also highlights the need for psychological and emotional considerations in the design of urban spaces, as these factors significantly influence the willingness of individuals to use public transportation and engage in community activities. The active participation of the community can only be fully productive and effective with the support of the LGU of Davao City. This involves strengthening transportation policies and amending ordinances to prioritize the strict implementation of walkable and safe sidewalks, particularly for vulnerable groups. The City Building Office should enforce BP 344 (Accessibility Law) in all public infrastructure projects, with active input from the LGU's Urban and Transportation Planners to design inclusive public spaces seamlessly integrated with private spaces to create accessible and convenient pedestrians and walkways. Additionally, collaboration between the DOTr and DPWH should focus on projects that create wide and accessible sidewalks and pedestrians considering land acquisition to ensure equitable urban spaces for their effective implementation.

CONCLUSION

This systematic literature review points out significant gaps in Davao City's pedestrian and sidewalk infrastructure, which impede the goals of the DPTMP. Addressing these gaps through comprehensive urban planning, stricter policy enforcement from the Local Government Unit of Davao and National Agencies such as DOTr and DPWH, and active community involvement can enhance mobility for all, particularly vulnerable populations. Recommendations include improving infrastructure readiness, addressing systemic barriers, and fostering perceived inclusivity to create walkable, safe, and inclusive public spaces. These will ensure a more sustainable and fair urban environment, in the context of modernization within the city.

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