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Enhancing Accessibility in Philippine Public Bus Systems: Addressing the Needs of Persons with Disabilities

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Abstract: This study examines strategies to enhance transport inclusivity and passenger satisfaction for persons with disabilities in public bus systems in the Philippines. Drawing on data collected through an online questionnaire from 396 persons with disabilities who responded across various regions in the country, this study investigates eight key factors affecting satisfaction: vehicle design, diverse seating options, sensory considerations, assistance services, safety measures, subsidies/discounts, accessibility, and communication and information quality. Structural equation modeling (SEM) was used to analyze the hypothesized relationships between these variables, passenger satisfaction, and intention to reuse public transport. The SEM results revealed that accessibility ($\beta = 0.359$, $p = 0.005$), vehicle design ($\beta = 0.248$, $p < 0.001$), diverse seating options ($\beta = 0.485$, $p < 0.001$), safety measures ($\beta = 0.3867$, $p = 0.001$), and subsidies/discounts ($\beta = 0.447$, $p < 0.001$) significantly influenced passenger satisfaction. In turn, satisfaction had a strong positive effect on the future intention to use public transport ($\beta = 0.760$, $p < 0.001$). However, sensory considerations ($\beta = 0.163$, $p = 0.225$), assistance ($\beta = 0.133$, $p = 0.519$), and communication and information quality ($\beta = 0.171$, $p = 0.345$) were not statistically significant. The model demonstrated a good fit (chi-square/df = 4.03; SRMR = 0.078; NFI = 0.956), supporting the robustness of the proposed framework. These findings suggest that design-centered improvements and subsidies/discounts are critical to inclusive transport experiences, while overreliance on assistance may not guarantee satisfaction. This study recommends promoting autonomy through universal design, enhancing digital and physical accessibility, and increasing public awareness. These insights are intended to guide policymakers and transit authorities in creating a more inclusive, equitable, and user-driven transportation system.

Keywords: persons with disabilities; passenger satisfaction; public bus; accessibility

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1. Introduction

The World Health Organization (WHO) defines disability as a comprehensive term encompassing impairments, activity limitations, and participation restrictions influenced by the interplay between health conditions, societal attitudes, and environmental barriers [1]. The Magna Carta for Disabled Persons of 1992 (Republic Act No. 7277) in the Philippines defines persons with disabilities as "those suffering from the restriction of different abilities, as a result of a mental, physical, or sensory impairment, to perform an activity in the manner or within the range considered normal for a human being" [2]. While we quote this official definition verbatim, we acknowledge that the framing of persons with disabilities as "suffering" from impairments reflects dated and medicalized views of disabilities. In

line with more progressive and rights-based approaches, this study adopts a social model of disability that emphasizes accessibility, inclusion, and agency rather than deficit-based characterizations.

According to the World Health Organization's 2022 Global Report on Health Equity for persons with disabilities, approximately 16% of the population, or 1.3 billion people, live with significant disabilities, a figure largely influenced by population aging and the rise of non-communicable diseases [3]. In the Philippines, 1.57% of the population, approximately 1.443 million Filipinos, grapple with disabilities [4]. Persons with disabilities in the Philippines face barriers to education, employment, healthcare, and social services, with persistent discrimination [5]. Legal frameworks like the Magna Carta for Disabled Persons aim to protect the rights of persons with disabilities, yet challenges in implementation persist, particularly regarding accessibility. The Philippine government has established the National Council on Disability Affairs (NCDA) within the Department of Social Welfare and Development (DSWD) to address these challenges [1,5]. Improving persons with disabilities' accessibility is critical to this since it allows them to fully engage in social, economic, and cultural activities without encountering needless obstacles [6]. In general, although there have been advancements in attending to the requirements of persons with disabilities in the Philippines, and there remains a considerable amount of effort needed to guarantee their complete and meaningful engagement in society on par with others.

Accessibility for persons with disabilities is crucial since it is a key component of building a just and inclusive society [7]. The availability of accessible public transportation and services is essential in empowering persons with disabilities to engage independently in social, economic, and cultural activities. The presence of accessible public transportation not only facilitates mobility but also ensures that persons with disabilities can navigate their surroundings with independence and convenience, contributing to their overall inclusion in societal activities [8].

Transportation accessibility for persons with disabilities presents a multifaceted challenge. Presnell and Keesler [9] highlighted the diverse needs of individuals with physical, sensory, and intellectual or developmental disabilities, emphasizing the structural and informational barriers encountered. Structural obstacles such as challenging terrains and broken sidewalks hinder mobility for those with physical disabilities, leading to advocating for enhanced infrastructure, including well-maintained sidewalks and accessible public transportation. Similarly, individuals with sensory disabilities face informational barriers, necessitating accessible information and navigation tools. Moreover, those with intellectual and developmental disabilities confront distinct challenges, such as limited literacy and spatial awareness issues, emphasizing the need for tailored transportation systems [9].

In the Philippine context, the challenges faced by persons with disabilities in public transportation are significant due to the absence of accessibility features and accommodations [10]. This includes the lack of ramps, lifts, and designated spaces for wheelchairs, hindering mobility and independence. Furthermore, inadequate training for transportation personnel limits assistance for persons with disabilities during travel. Policy changes, infrastructure improvements, and training programs are essential to comprehensively addressing these challenges [11]. Implementing universal design principles and ensuring accessible buses and terminals are crucial to creating a more inclusive public transportation system [11].

Building upon this, prior studies highlighted the necessity for regulations and standards prioritizing the needs of persons with disabilities to foster inclusivity and equity [12]. Additionally, Elsamani and Kajikawa [13] and Gumasing et al. [14] emphasized the importance of making sustainable transport modes accessible to all, highlighting the positive connection between accessibility, well-being, and social inclusion. They advocated for

understanding subjective experiences when planning socially inclusive transport systems [13,14].

Despite efforts to redesign public vehicles to meet the needs of persons with disabilities, a more comprehensive approach to transportation accessibility is needed. Gumasing and Cruz [11] noted the prevalent use of public buses by persons with disabilities, supported by a consumer survey conducted in the Philippines in January 2023 by Statista [15], which revealed that 59.48% of 1224 respondents utilized buses as their primary mode of transportation, followed by private motorcycles at 14.54%. While Gumasing and Cruz [11] focused on redesigning buses to meet the needs of persons with disabilities, there is still a need for a more comprehensive and inclusive approach to transportation accessibility, considering that disabilities comprise a spectrum of needs. A more holistic approach is necessary to consider additional factors in the design, such as assistance, sub/, communication, safety measures, sensory considerations, and passenger satisfaction, to ensure inclusivity in bus design.

Although government laws and guidelines are in place to guarantee inclusivity, there remain apparent issues with meeting the vast diversity of needs that all persons with disabilities have. Persons with disabilities encompass a diverse range of individuals with varying mobility and sensory impairments. The lack of ergonomic design in public vehicles, particularly buses, compromises their safety, general travel experience, and independence in navigating public transit systems [16].

This study aims to address the lack of inclusivity in public bus systems, particularly for persons with disabilities, by identifying key factors such as accessibility, vehicle design, sensory considerations, assistance, subsidies/discounts, safety, seating options, and communication and information quality that contribute to passenger satisfaction. It seeks to evaluate the current inclusivity of public buses, focusing on features that accommodate diverse mobility and sensory needs. Additionally, this study examines how transport inclusivity and positive travel experiences influence passengers' satisfaction and their future use of public buses. Finally, it proposes an ergonomic design solution to enhance inclusivity and improve the overall travel experience for persons with disabilities.

2. Conceptual Framework

This study is grounded in a conceptual framework, shown in Figure 1, that explores factors influencing passenger satisfaction, with a focus on individuals with disabilities using public bus transportation services. The conceptual framework of this study is underpinned by a multi-theoretical approach that brings together perspectives from disability studies, human-centered design, service quality theory, and behavioral intention models. These theoretical foundations guide the selection of latent variables and the hypothesized relationships tested in the structural equation modeling (SEM) model.

2.1. Social Model of Disability

At the core of the framework is the social model of disability, which shifts the focus from individual impairments to the structural and environmental barriers that hinder full participation of persons with disabilities in society [17]. This model informs the inclusion of factors such as accessibility, vehicle design, and assistance, which represent environmental and systemic features of the transportation experience that can either empower or marginalize persons with disabilities.

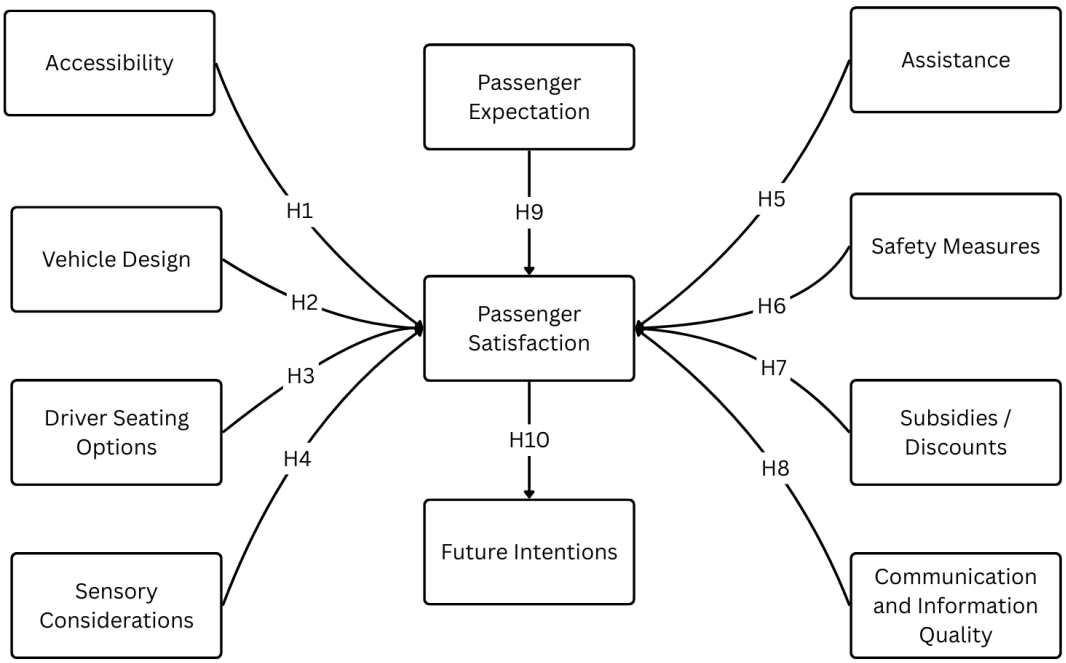

Figure 1. Conceptual framework.

2.2. Universal Design Principles

This study also draws from universal design theory, which promotes products and services that are usable by all people to the greatest extent possible without the need for adaptation [18]. This justifies the inclusion of factors such as diverse seating options, sensory considerations, and safety measures, as these elements are critical to creating inclusive public transportation systems that cater to a wide range of physical, sensory, and cognitive needs.

2.3. Service Quality and User Satisfaction Models

Elements of SERVQUAL and related service quality models are integrated to capture how service delivery features influence user satisfaction. Variables such as communication and information quality, passenger expectations, and subsidies/discounts reflect common dimensions of perceived service quality in transportation studies. These variables align with established findings that clear information, subsidies/discounts, and expectation management significantly impact satisfaction and continued service use [14,19,20].

2.4. Behavioral Intention Models

The relationship between passenger satisfaction and future intention to use public transport is rooted in theories of behavioral intention, such as the theory of planned behavior [21,22] and expectancy confirmation theory [23]. These theories posit that satisfaction is a key predictor of behavioral intention, which justifies modeling satisfaction as a mediator between design and service factors and future use.

2.5. Empirical Foundations in Transportation SEM Research

The framework also builds on previous SEM-based empirical studies in the transportation and mobility domain. For instance, Tanwar and Agarwal [24] used SEM to model service quality attributes in public transit systems, and more recent work such as that of Gangadharaiah et al. [25] applied SEM to model acceptance in shared mobility, incorporating latent variables like safety, accessibility, and perception. These studies validate the structure and variables selected for the current model.

By synthesizing these theoretical perspectives, the conceptual framework reflects a holistic view of the public transport experience for persons with disabilities, capturing both physical infrastructure (e.g., accessibility and vehicle design) and service-level factors (e.g., communication and assistance), as well as outcome variables (satisfaction and future use). This integrated framework allows for a nuanced analysis of how these factors interact and influence user perceptions, making it a theoretically grounded and practically relevant model.

Accessibility, vehicle design, diverse seating options, and sensory consideration significantly impact the satisfaction of passengers with disabilities with public buses. According to studies, bus features like wheelchair ramps, priority seats, and security of areas directly affect how easily and safely persons with disabilities can board, move around, and exit buses [26,27]. Buses with low floors and wider aisles make it easier for persons with disabilities to move around [11]. Furthermore, various seating options, like priority seating, ensure that persons with disabilities, like those who have trouble moving or seeing, can find a comfortable and easy-to-reach seat [28]. Prior studies also revealed that having adjustable seats and flexible layouts that accommodate the varying needs and preferences of persons with disabilities could also influence their satisfaction [11,29]. In addition, sensory issues on public buses have also been found to have a significant effect on the satisfaction of passengers with disabilities [30]. Research indicates that reducing noise, using softer lighting, climate control systems, and sitting arrangements that give people privacy can help make a place more comfortable and relaxing for persons with disabilities [31]. Research also suggests that public buses can better meet the needs of persons with disabilities by including sensory-friendly design features [32]. These factors would make it easier and more satisfying for persons with disabilities to use public buses. With this, the following is hypothesized:

H1. *Accessibility has a positive impact on the passenger satisfaction of persons with disabilities.*

H2. *Vehicle design has a positive impact on the passenger satisfaction of persons with disabilities.*

H3. *Diverse seating options have a positive impact on the passenger satisfaction of persons with disabilities.*

H4. *Sensory consideration has a positive impact on the passenger satisfaction of persons with disabilities.*

For persons with disabilities using public transportation, the effects of subsidies/discounts, safety measures, communication and information quality, and assistance are also crucial. Empirical evidence suggests that having access to assistance services like priority seating and boarding assistance significantly improves the travel experience for persons with disabilities, ensuring that their requirements are satisfied and encouraging accessibility [33]. In addition to promoting physical safety, strong safety measures, such as securement systems for mobility aids and audio announcements for stops, also give persons with disabilities comfort and satisfaction according to research [34]. Furthermore, to enable accessible and independent travel experiences for persons with disabilities and raise satisfaction levels, efficient communication systems, such as audio announcements, apparent signs, and staff training on disability awareness, are crucial [35]. Lastly, subsidies/discounts are essential to guaranteeing persons with disabilities fair access to public transit since financial limitations can create substantial obstacles to mobility, as Golbabaei et al.'s [8] research indicates. Public transportation authorities may foster a more accessible, inclusive, and fulfilling travel experience for persons with disabilities by addressing these crucial criteria, eventually encouraging more independence and social inclusion within the community. With this, the following is hypothesized:

H5. *Assistance has a positive impact on the passenger satisfaction of persons with disabilities.*

H6. *Safety measures have a positive impact on the passenger satisfaction of persons with disabilities.*

H7. *Subsidies/discounts have a positive impact on the passenger satisfaction of persons with disabilities.*

H8. *Communication and information quality has a positive impact on the passenger satisfaction of persons with disabilities.*

In the context of public transportation, passenger expectations substantially influence satisfaction and future intentions among passengers with disabilities. Numerous studies have highlighted the significance of exceeding passenger expectations to improve satisfaction and promote future use of public transportation services. Research conducted by Mogaji and Nguyen [36] highlighted the importance of passenger satisfaction and future intentions in public transportation for passengers with disabilities. According to the study, the expectations of persons with disabilities for accessibility in transportation systems were met or surpassed, resulting in higher satisfaction levels and more plans to use public transportation in the future. Similarly, research by Gumasing et al. [37] highlighted how crucial it is to match service quality to customer expectations to improve satisfaction and promote recurrent use of public transportation systems. Additionally, Gilbert and Wong [38] emphasized the influence that passengers' views of the discrepancy between their expectations and actual experiences have on their satisfaction and plans for the future. With this, the following is hypothesized:

H9. *Passenger expectation has a positive impact on the passenger satisfaction of persons with disabilities.*

H10. *Passenger satisfaction has a positive impact on the future intentions of persons with disabilities to use public bus transportation.*

3. Methodology

3.1. Study Context and Respondent Profile

This study employed purposive sampling to target persons with disabilities in the National Capital Region (NCR) of the Philippines who rely on public transportation, specifically public utility buses (PUBs). Purposive sampling involved the deliberate selection of participants based on specific criteria relevant to the research objectives, ensuring that participants could contribute meaningful insights. Unlike random sampling, which sought unbiased representation, purposive sampling prioritized depth of understanding over statistical generalization, making it ideal for qualitative research in which participants' insights, experiences, and perspectives were paramount. Although purposive sampling is more commonly used in qualitative research, it was employed in this quantitative study to deliberately recruit participants who met the inclusion criteria, namely individuals with disabilities who have used public bus transportation in the Philippines. This ensured the relevance and validity of the responses for the (SEM) analysis.

In the context of studying persons with disabilities in the National Capital Region who rely on public transportation, purposive sampling emerged as the most suitable choice. By intentionally selecting participants based on criteria relevant to transportation habits and requirements, purposive sampling allowed the researchers to capture comprehensive insights aligned with the research objectives. Therefore, in this context, purposive sampling stood out as the best approach for ensuring meaningful contributions and depth of understanding regarding the transportation needs of persons with disabilities.

3.2. Sampling Method, Collection, and Participant Criteria

As per the National Council on Disability Affairs, there were a total of 1,468,405 registered persons with disabilities as of 11 March 2024, with 235,408 residing in the NCR [39]. This study aimed to collect responses specifically from persons with disabilities in the NCR.

The researchers employed Arya et al.'s [40] formula to determine the sample size, as it accounted for both the known population size and behavior. To validate the chosen sample size and ensure its appropriateness for the study, confirmatory factor analysis (CFA) was employed. This comprehensive approach considered the specific population characteristics and integrated insights from previous research and statistical validation techniques, enhancing the reliability of the study's methodology. The minimum required number of respondents for this research was 384, as determined through the sample size estimation equation used by Arya et al. [40]:

$$n = (N \times Z^2 \times p \times (1 - p))((N - 1) \times E^2 + Z^2 \times p \times (1 - p)) \quad (1)$$

Utilizing standard sample size estimation equations, the determination of the number of persons with disabilities to be surveyed considered several key parameters. In the formula, "n" denotes the required sample size, while "p" represents the estimated proportion of persons with disabilities using public transportation. Due to the lack of prior empirical data on the proportion of persons with disabilities using public transportation in the Philippines, a conservative estimate of $p = 0.5$ was applied. This value was chosen because it maximizes the sample size requirements and provides the most statistically robust estimate under conditions of uncertainty. This approach maximizes variability and ensures the largest required sample size, providing the most statistically robust estimate. *A* 95% confidence level was applied using a Z score of 1.96, with the margin of error ("E") set at 0.05. Additionally, the total population size "N" was specified to be 235,408. Through these calculations, a minimum sample size was determined to ensure statistical validity and reliability in capturing insights into the transportation habits and requirements of persons with disabilities.

To ensure reliable participant selection, the researchers directly engaged with municipalities to screen individuals with disabilities. This approach involved cross-referencing participant details with official records obtained from barangays. By accessing authenticated lists of persons with disabilities, the researchers effectively identified and excluded individuals with potentially fraudulent disability documentation.

Only respondents aged 18 years and above were eligible to participate in the survey. Responses from minors and individuals requiring parental guidance were excluded from the final analysis. For individuals with limited Filipino language skills, the researchers developed a survey in Filipino to accommodate varying language proficiencies. Surveys were conducted face-to-face, allowing for direct interaction and clarification of queries, thereby enhancing the quality and reliability of the data collected. The data gathering process commenced in April 2023 and extended until December 2023.

3.3. Instrumentation

The survey (Table S1) tailored for persons with disabilities encompassed 44 questions categorized into 11 sections, with each containing 4 questions covering topics such as accessibility, vehicle design, and sensory considerations. These inquiries were structured as item-based queries, utilizing a 5-point Likert scale from "strongly disagree" to "strongly agree" for responses. Participants were encouraged to engage autonomously in this self-administered survey, freely expressing their opinions. However, for individuals who

required assistance, a guardian or support person was welcomed to aid them in completing the survey.

To ensure the survey process was inclusive and convenient for all, interviews were conducted and tailored to accommodate various disabilities. For individuals who were deaf or hard of hearing, visual aids such as sign language interpreters or written communication were provided. Those with visual impairments were given access to materials in formats such as Braille or large print. Mobility-impaired individuals were offered accessible venues equipped with ramps and other necessary facilities. Additionally, for those with speech impairments, alternative communication methods such as text-based options were made available. By customizing the interview process to suit the specific needs of each participant, the researchers ensured that every individual could comfortably and effectively participate in the survey, fostering inclusivity and enabling meaningful engagement.

3.4. Data Analysis

The data collected from 396 valid responses were analyzed using a combination of descriptive statistics, inferential analysis, and SEM to examine the relationships between service design factors and satisfaction outcomes among persons with disabilities using public transportation in the Philippines.

3.4.1. Descriptive Statistics and Preliminary Analysis

Descriptive statistics were computed to summarize respondent demographics and to identify mean satisfaction ratings for each latent construct. These descriptive measures provided initial insights into areas of high and low satisfaction, guiding the interpretation of subsequent inferential analyses.

3.4.2. Analysis of Variance (ANOVA)

To explore differences in satisfaction scores across different disability types, a one-way ANOVA was conducted. The test aimed to determine whether satisfaction with public transportation features varied significantly depending on the type of disability. A significant F statistic ($p < 0.05$) indicated meaningful differences, justifying the need for disaggregated analysis in future research and policy development.

3.4.3. Measurement Model Validation

Prior to hypothesis testing, confirmatory factor analysis (CFA) was conducted to assess the reliability and validity of the measurement model. Each latent variable—accessibility, safety measures, vehicle design, subsidies/discounts, assistance, communication and information quality, sensory considerations, diverse seating options, passenger satisfaction, future intentions, and passenger expectations—was measured using multiple observed indicators adapted from validated survey instruments.

Construct reliability was confirmed using Cronbach's alpha and composite reliability (CR), with all values exceeding the 0.70 threshold. Convergent validity was established through the average variance extracted (AVE), with AVE values greater than 0.50 for all constructs. Discriminant validity was assessed using the Fornell–Larcker criterion and the heterotrait-monotrait ratio (HTMT), following the study by Kline [41]. Despite high inter-construct correlations (e.g., between assistance and sensory considerations), all HTMT values were below the 0.85 conservative threshold, confirming acceptable discriminant validity.

3.4.4. Variance Inflation Factor (VIF) Analysis

To assess multicollinearity among the independent variables, variance inflation factor (VIF) values were computed for each construct. All VIF values ranged between 1.2 and 3.4,

well below the commonly accepted cutoff of 5.0, indicating no multicollinearity issues that could compromise the interpretation of path coefficients.

3.4.5. Structural Equation Modeling

Structural equation modeling (SEM) was utilized to examine the hypothesized relationships between multiple latent variables and passenger satisfaction in the context of public bus transportation. This method is particularly well suited for transportation research as it allows for the simultaneous analysis of complex interrelationships among observed and unobserved (latent) variables, following the study of Gumasing [42]. In this study, the latent constructs included accessibility, safety, vehicle design, subsidies/discounts, diverse seating options, sensory considerations, assistance services, and communication and information quality. Each construct was measured using multiple observed indicators developed based on a comprehensive review of the relevant literature and validated by domain experts to ensure content validity and contextual relevance.

Before testing the structural model, CFA was conducted to assess the reliability and validity of the measurement model. The CFA confirmed the adequacy of item loadings for each latent construct, with standardized factor loading exceeding 0.60. Reliability was ensured through Cronbach's alpha and composite reliability, while convergent validity was established using the average variance extracted, all of which met the accepted thresholds.

Model fit was evaluated using multiple indices appropriate for variance-based partial least squares structural equation modeling (PLS-SEM), including the chi-square/df ratio, normal fit index (NFI), and standardized root mean square residual (SRMR). The root mean square error of approximation (RMSEA) was not reported, as it is commonly used in covariance-based SEM and not typically applicable in variance-based PLS-SEM analyses. The reported indices indicated an acceptable to good model fit, supporting the robustness of the proposed structural model. After validating the measurement model through confirmatory factor analysis, the structural model was tested to examine the causal relationships among latent constructs—particularly between factors such as accessibility, safety, and subsidies/discounts—and their influence on passenger satisfaction and their future intentions to use public transport.

4. Results

4.1. Demographic and Descriptive Statistics of the Respondents

The results gathered from the survey show that 396 respondents answered the survey. This meets the minimum requirement of 384, as stated in the previous section. The respondent profile was categorized based on gender, age, disability type, location, educational attainment, monthly salary, and occupation. Based on the results, the gender distribution was almost split evenly between male and female respondents at 46% and 50.5%, respectively, with 3.5% of the respondents preferring not to disclose their gender. In terms of age, the majority of the respondents were aged 25–34, comprising 30.8% of the total respondents. This was closely followed by respondents aged 45–54, comprising 26.8% of the total. Respondents aged 18–24 comprised 17.4% of the total, closely followed by the 55–64 age group with 16.2%. Respondents aged 65 and older comprised the minority, with only a combined percentage of 8.9% of the total. Regarding disability type, both physical and sensory disabilities comprised the majority, as they each comprised 43.2% of the sample size; the remaining proportion was classified into intellectual (or developmental), communication, and other disabilities, with percentages of 5.6%, 5.3%, and 2.8%, respectively.

It can be observed that the top five cities where the respondents resided were Quezon City, Manila, Pasig, Parañaque, and Makati, with their percentages being 23.7%, 14.4%,

13.9%, 6.8%, and 6.1%, respectively. Other respondents, with a percentage of 64.9%, were spread across the different cities in Metro Manila. As for the highest educational attainment, the majority of the respondents said that they had finished college with a proportion of 61.4%, followed by respondents who had reached secondary level education, with a proportion of 26.5%. The rest of the proportion was divided among the primary level and no formal schooling, each comprising 3% of the total. For occupation, 24% said they had no work and were unemployed, while 11.9% said they were still studying. Common types of occupations included service crew (7.1%), office or store clerk (14.1%), data encoder (2.5%), seamstress (2.8%), graphic web designer (5.6%), self-employed (5.3%), packaging and production worker (9.9%), and accounting and finance (3.5%). Other types of jobs comprised 13.4% of the total. Lastly, most respondents earned a salary of less than PHP 20,000 (63.1%), followed by salary ranges of PHP 20,000–29,000 and PHP 30,000–39,000, with percentages of 16.2% and 7.1%, respectively. The percentages for the following categories slowly decreased as the income range increased.

4.2. Results of Satisfaction Survey

Ranking of Satisfaction Scores

Table 1 presents the satisfaction scores based on responses from 396 individuals with disabilities, The rankings were determined by the overall average satisfaction scores, where a higher score indicates greater passenger satisfaction.

Table 1. Satisfaction scores of persons with disabilities per construct.

Satisfaction Scores (*n* = 396)		
Construct	Overall Average	Ranking
Subsidies and Discounts (SD)	3.44	1st
Communication and Information (CI)	3.18	2nd
Safety Measures (SM)	3.04	3rd
Diverse Seating Options (DS)	3.03	4th
Assistance (AS)	2.96	5th
Sensory Consideration (SC)	2.94	6th
Vehicle Design (VD)	2.88	7th
Accessibility (AC)	2.84	8th
Passenger Satisfaction (PS)	2.80	-
Passenger Expectation (PE)	3.93	-
Future Intentions (FI)	3.32	-

Subsidies/discounts ranked first ($\overline{x}$ = 3.44), suggesting that financial support is the most satisfying aspect of public transportation for persons with disabilities. Communication and information followed in second place ($\overline{x}$ = 3.18), indicating that passengers are relatively content with the information provided during their journeys. Safety measures ($\overline{x}$ = 3.04) and diverse seating options ($\overline{x}$ = 3.03) ranked third and fourth, respectively, reflecting moderate satisfaction with safety protocols and seating accommodations. On the other hand, assistance ($\overline{x}$ = 2.96) and sensory consideration ($\overline{x}$ = 2.94) scored lower, suggesting a need for better assistance services and accommodations for sensory impairments. Vehicle design ($\overline{x}$ = 2.88) and accessibility ($\overline{x}$ = 2.84) received the lowest satisfaction ratings among all factors assessed. These lower scores suggest that the respondents perceived these aspects as less satisfactory, highlighting them as priority areas for design and policy interventions to enhance inclusivity in public transportation.

Passenger satisfaction ($\overline{x}$ = 2.80), future intentions ($\overline{x}$ = 3.32), and passenger expectations ($\overline{x}$ = 3.93) were dependent variables and therefore not ranked in terms of satisfaction levels like the independent factors. These variables were used to assess the outcomes influenced by key service attributes—such as accessibility, vehicle design, diverse seating options, sensory consideration, assistance, safety measures, subsidies/discounts, and communication and information quality—which serve as independent variables in the analysis. The purpose of including these dependent variables was to evaluate how improvements in the independent factors impacted the overall user experience, likelihood of continued use, and the extent to which passengers' expectations were met. This framework allowed us to identify which service attributes had the most significant effect on enhancing public bus satisfaction and usage among persons with disabilities.

4.3. Overall Satisfaction Scores per Disability

After presenting the overall satisfaction scores of the constructs, Table 2 presents the average satisfaction scores per construct for each disability type. The varying importance of transportation factors across different disability types can be attributed to the specific challenges and needs associated with each condition. In the context of the current public transportation system in the Philippines, accessibility ($\overline{x}$ = 2.42) and vehicle design ($\overline{x}$ = 2.51) received the lowest satisfaction scores among all of the evaluated factors. These scores reflect users' perceptions that these aspects are performing poorly and failing to meet their mobility needs. For individuals with physical disabilities, these variables are particularly critical, as they determine the ease and safety with which they can access, board, and use public buses. Rather than implying a lack of importance, the low satisfaction scores signal urgent areas for improvement, underscoring the need for better infrastructure, ergonomic features, and inclusive design solutions to ensure equitable transportation access for all. Babik and Gardner [43] noted that physical disabilities often result in visible biases, influencing the need for tangible mobility support, such as wheelchair access and ergonomic vehicle designs.

Table 2. Satisfaction scores per disability per construct.

	Construct								
Disability Type	**Accessibility**	**Vehicle Design**	**Sensory Consideration**	**Assistance**	**Diverse Seating Options**	**Safety Measures**	**Communication and Information**	**Subsidies/Discounts**	**Overall Passenger Satisfaction**
Communication	3.48	3.36	3.30	3.49	3.36	3.52	3.50	3.64	3.31
Physical	2.42	2.51	2.79	2.64	2.67	2.75	2.99	3.17	2.45
Intellectual	2.77	2.77	2.60	2.63	2.85	2.69	2.73	3.13	2.74
Sensory	3.22	3.20	3.13	3.28	3.37	3.35	3.43	3.73	3.11
Others	2.41	2.73	2.43	2.77	2.91	2.66	2.70	3.30	2.48

In contrast, respondents with sensory disabilities prioritized communication and information (3.43) and safety measures (3.35), which highlights the need for clear, consistent guidance and secure environments. According to Asghar [44], individuals who experience sensory disabilities may find it difficult to process certain information and find it difficult to perform certain tasks, thus requiring assistance. Proper communication and safety protocols must be placed to ensure that sensory-impaired individuals feel informed and secure during travel.

For those with intellectual disabilities, the emphasis on assistance (2.63) and communication (2.73) points to the need for support systems to aid comprehension and navigation. Babik and Gardner [43] explained that cognitive disabilities often lead to misconceptions

about individuals' abilities, making structured assistance and clear communication essential for enhancing accessibility.

Lastly, respondents with other disabilities placed greater importance on subsidies/discounts (3.30), suggesting that financial assistance is more crucial for this group. This may reflect the economic barriers faced by individuals with disabilities, who are often concentrated in low-wage jobs, as noted by Guimarães et al. [45]. Financial aid helps alleviate these barriers, ensuring that transportation remains accessible to all. In line with this, the government published Republic Act 9442, which aims to support individuals with disabilities by increasing their benefits and privileges [46]. Such benefits include offering persons with disabilities at least 20% discounts for basic services. These services include the use of public transportation such as public buses, jeeps, trains, and taxis.

In summary, the differing importance of these transportation factors is shaped by the specific needs and challenges associated with each type of disability. Factors like mobility support, communication, and financial aid vary in importance based on the nature of the disability, societal attitudes, and the specific accommodations required. Understanding these distinctions helps tailor support and advocacy more effectively across disability types.

4.4. Results of ANOVA Test

The average satisfaction scores per disability from the previous table were used to conduct a statistical two-way ANOVA test. This test factored in two categorical variables—disability type and satisfaction factor (or constructs)—and was us×ed to determine whether the average of the satisfaction scores was affected by these two variables. The results of this statistical test are presented in Table 3.

Table 3. Results of two-way analysis of variance (ANOVA).

Source	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F Value	*p* Value	F Crit
Disability type	4.618902	4	1.154726	77.25568	5.6×10^{-16}	2.668437
Satisfaction factor	1.220058	8	0.1525207	10.20333	6.03×10^{-07}	2.244396
Error	0.478298	32	0.014947			
Total	6.317258	44				

The two-way ANOVA results show that both disability type and satisfaction factors (constructs) had significant effects on the satisfaction scores. The *p* value for disability type was 5.6×10^{-16}, much smaller than the critical value (F crit = 2.668), indicating a significant difference in satisfaction scores among the different disability types. This means that respondents with various types of disabilities experienced varying levels of satisfaction.

For satisfaction factors (constructs), the *p* value was 6.03×10^{-07}, which is also much smaller than the critical value (F crit = 2.244), indicating a significant difference in satisfaction levels across the various constructs, such as accessibility and vehicle design. Both factors—disability type and satisfaction constructs—independently impacted overall satisfaction.

After determining that both disability type and satisfaction factors significantly impacted the satisfaction scores, a Tukey pairwise comparison test was performed. This test revealed which categories differed from one another and which could be grouped together.

The Tukey pairwise comparisons for disability type revealed significant differences in satisfaction scores across groups. Individuals with communication disabilities reported the highest mean score (3.44), followed by those with sensory disabilities (3.31), with both classified as Group A. In contrast, individuals with intellectual disabilities had a lower

mean score (2.77), while the physical and other disability groups scored even lower (2.71), forming Group B. These findings reveal the need for targeted interventions to enhance services for those in the lower satisfaction groups, as addressing their unique challenges could improve accessibility and overall experiences. Tukey's test identifies which group means are significantly different and estimates the magnitude of those differences, using statistical tools to highlight meaningful distinctions between the groups [47].

Similarly, a Tukey pairwise comparisons test was conducted for the satisfaction factors (constructs). The Tukey pairwise comparisons for the satisfaction construct revealed significant differences in satisfaction scores, with "subsidies/discounts" achieving the highest mean score of 3.394, categorized as Group A. This high score is supported by Section 3.2, Chapter 8 of Republic Act No. 9442, which provides a 20% discount on public transport for persons with disabilities, and Republic Act No. 10754, which grants a minimum 20% discount and VAT exemption for select goods and services specified in Republic Act No. 9442 for their exclusive use [48]. In contrast, constructs like "communication and information" (3.070), "diverse seating options" (3.032), and "safety measures" (2.994) fell into Group B, indicating lower satisfaction levels. These findings suggest that subsidies significantly enhance user satisfaction by directly impacting affordability and accessibility, especially for individuals with disabilities. Lower scores for "accessibility" (2.860) and "overall passenger satisfaction" (2.818) highlight areas needing improvement which, if addressed through targeted interventions, could foster a more inclusive transportation experience.

The two-way ANOVA results showed a significant interaction effect between disability type and satisfaction factors, with the p values for both disability type (5.6×10^{-16}) and satisfaction factors (6.03×10^{-7}) falling below their critical values. This indicates that the impact of satisfaction factors varied by disability type. For example, individuals with communication disabilities reported greater satisfaction than those with intellectual or physical disabilities.

To effectively meet the diverse needs of individuals with disabilities in public transportation, a comprehensive approach is essential. For those with communication disabilities, clear visual aids and assistive technology can enhance comprehension and communication, supported by staff trained in alternative communication methods. Individuals with physical disabilities require accessible infrastructure, such as ramps and specialized vehicles equipped with wheelchair lifts, along with trained personnel to assist with navigation. Those with intellectual disabilities benefit from clear instructions and guided assistance, creating safe environments to reduce anxiety. Sensory-impaired individuals need auditory and visual signals for effective communication and designated quiet areas to manage overwhelming stimuli. Financial assistance through subsidies/discounts enhances accessibility, while community engagement ensures that transport services reflect the diverse needs of individuals with disabilities, ultimately improving overall user satisfaction and accessibility for everyone [49].

4.5. Results of Initial SEM

The initial SEM results provide insights into the relationships between various factors influencing passenger satisfaction and future intentions to continue using public buses among persons with disabilities. The analysis showed significant pathways between satisfaction determinants and future behavioral intentions, providing key focus areas for enhancing service quality. The visual representation of the model for determining the factors affecting transport inclusivity and passenger satisfaction in public bus systems is illustrated in Figure 2 below. The model comprised 11 variables, with four indicators each.

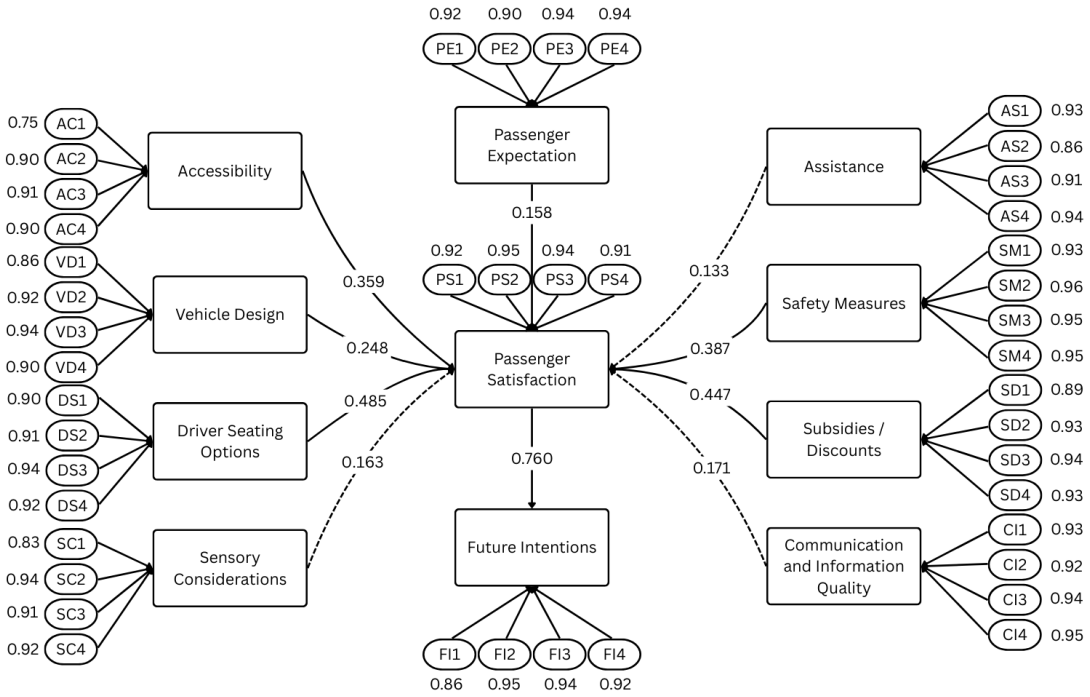

Figure 2. Initial SEM framework.

4.5.1. Reliability and Convergent Validity Results

Furthermore, the reliability and convergent validity of the model determining factors related to passenger satisfaction are illustrated in Table 4. The factor loading, Cronbach's alpha (α), composite reliability, and average variance extracted results are presented in the table. These indicators were essential for assessing the reliability and validity of the constructs before performing SEM. The assessment of reliability and convergent validity is crucial to ensure the consistency and accuracy of the measurement model used in the study of passenger satisfaction and future intentions of public bus use for persons with disabilities.

Table 4. Results of reliability and convergent validity.

Construct	Items	Mean	S.D.	FL (≥0.70)	α (≥0.70)	CR (≥0.70)	AVE (≥0.5)
Accessibility (AC)	AC1	2.91	1.42	0.749	0.906	0.908	0.934
	AC2	2.78	1.38	0.899			
	AC3	2.86	1.37	0.908			
	AC4	2.81	1.4	0.899			
Vehicle Design (VD)	VD1	2.96	1.28	0.864	0.927	0.931	0.948
	VD2	2.81	1.35	0.919			
	VD3	2.82	1.3	0.937			
	VD4	2.91	1.28	0.902			
Driver Seating Options (DS)	DS1	2.96	1.33	0.9	0.927	0.932	0.948
	DS2	2.96	1.31	0.907			
	DS3	3.13	1.36	0.943			
	DS4	3.04	1.33	0.924			

Table 4. *Cont.*

Construct	Items	Mean	S.D.	FL (≥0.70)	α (≥0.70)	CR (≥0.70)	AVE (≥0.5)
Sensory Consideration (SC)	SC1	2.94	1.34	0.833	0.922	0.922	0.945
	SC2	2.95	1.31	0.937			
	SC3	2.95	1.28	0.911			
	SC4	2.92	1.31	0.918			
Assistance (AS)	AS1	2.93	1.32	0.931	0.932	0.934	0.951
	AS2	2.8	1.31	0.864			
	AS3	3.12	1.31	0.906			
	AS4	3.01	1.33	0.942			
Safety Measures (SM)	SM1	3.08	1.35	0.927	0.963	0.964	0.973
	SM2	3.01	1.35	0.96			
	SM3	3.03	1.36	0.953			
	SM4	3.05	1.34	0.953			
Subsidies/Discounts (SD)	SD1	3.35	1.31	0.887	0.94	0.941	0.957
	SD2	3.53	1.29	0.929			
	SD3	3.5	1.33	0.937			
	SD4	3.37	1.34	0.93			
Communication and Information Quality (CI)	CI1	3.21	1.3	0.931	0.952	0.952	0.965
	CI2	3.14	1.31	0.922			
	CI3	3.18	1.34	0.935			
	CI4	3.2	1.35	0.951			
Passenger Expectations (PE)	PE1	2.82	1.27	0.922	0.945	0.96	0.96
	PE2	2.74	1.26	0.9			
	PE3	2.82	1.3	0.943			
	PE4	2.82	1.29	0.938			
Passenger Satisfaction (PS)	PS1	3.82	1.36	0.921	0.948	0.95	0.963
	PS2	3.91	1.3	0.949			
	PS3	4	1.32	0.941			
	PS4	3.99	1.29	0.909			
Future Intentions (FI)	FI1	3.46	1.34	0.862	0.939	0.945	0.956
	FI2	3.26	1.38	0.945			
	FI3	3.27	1.41	0.943			
	FI4	3.3	1.43	0.924			

In behavioral models, Cronbach's alpha (α) is used to measure internal consistency, while reliability and validity are further supported by factor loading, composite reliability, and the average variance extracted [50]. As noted by several researchers, these measures are expected to meet specific thresholds. Specifically, Cronbach's alpha, FL, and CR should each exceed 0.7 for a model to be considered reliable [50]. FL is particularly crucial in determining the contribution of each item to its respective latent variable. Additionally, CR measures the overall reliability of the items associated with a latent construct. For validity,

the AVE should exceed 0.5, which implies that the variance captured by the construct outweighs any variance due to measurement error [50]. The AVE also provides insight into the extent to which a construct is explained by its indicators. This is vital in ensuring the quality of the measurement model.

Table 4 shows that all constructs met the required thresholds, indicating good reliability and validity across the model. Each construct's items had high FL values, with all being above 0.7, which means that the indicators reliably reflected the underlying construct. The Cronbach's alpha (α) values also exceeded the 0.7 threshold, confirming that the items within each construct had high internal consistency. The CR values, all above 0.7, further confirm the reliability of the measurement model. Additionally, the AVE values for all constructs were above 0.5, demonstrating sufficient convergent validity. For instance, the accessibility (AC) construct, with four items (AC1–AC4), showed factor loading values ranging from 0.749 to 0.908, a Cronbach's alpha of 0.906, CR of 0.908, and AVE of 0.934. This suggests that the construct was well defined and its indicators were consistent. Similarly, other constructs such as safety measures (SM) and passenger satisfaction (PS) demonstrated excellent reliability and validity, with high factor loading (all above 0.9), Cronbach's alpha values of 0.963 and 0.948, respectively, and AVE values comfortably above the 0.5 threshold. In conclusion, Table 4 demonstrates that the constructs and their respective items were valid and reliable based on the established thresholds for the FL, α, CR, and AVE. Each construct was sufficiently defined by its indicators, allowing for a strong assessment of the factors affecting passenger satisfaction and related aspects of the model.

Overall, the results demonstrate that the measurement model used in the study was both reliable and exhibited convergent validity, confirming that the scales used were robust and the constructs were well defined. This ensures the accuracy of further analyses, providing confidence in the relationships between passenger satisfaction factors and future intentions of bus use among persons with disabilities.

4.5.2. Discriminant Validity Results (Fornell–Larcker Criterion)

Further analysis had to be conducted in order to identify and conclude that there were no relationships or collinearity between the constructs under investigation [51]. The assessment of discriminant validity was critical to ensure that each construct in the model was distinct and measured a unique concept. In this study, discriminant validity was evaluated using the Fornell–Larcker criterion and the heterotrait-monotrait (HTMT) ratio. In the Fornell–Larcker criterion, the value for a particular construct, which can be observed along the diagonal, must be greater than the correlations between different constructs [51]. For discriminant validity to be established, the diagonal value should exceed any corresponding off-diagonal correlation values within the same row and column.

Table 5 presents the results of the Fornell–Larcker criterion. The diagonal values in the table represent the square root of the average variance extracted (AVE) for each construct, indicating the proportion of variance accounted for by the respective construct's indicators. For example, the accessibility (AC) construct had a diagonal value of 0.883, suggesting that it effectively captured a significant amount of variance. Similar patterns were observed for other constructs, such as accessibility satisfaction (AS) with a value of 0.911 and construct validity (CI) with a value of 0.935, indicating that these constructs were well defined. Moreover, the AC value, for instance, remained higher than all of its correlation values with other constructs, confirming its distinctiveness. Overall, the findings demonstrate that all constructs met the Fornell–Larcker criterion, indicating they were more closely related to their indicators than to other constructs. This reinforces the uniqueness of each construct, ensuring the integrity of the model assessing factors influencing transport inclusivity and passenger satisfaction.

Table 5. Results of discrimanant validity: Fornell–Larcker criterion.

	AC	AS	CI	DS	FI	PE	PS	SM	SC	SD	VD
AC	0.883										
AS	0.842	0.911									
CI	0.729	0.852	0.935								
DS	0.817	0.849	0.759	0.905							
FI	0.677	0.639	0.685	0.585	0.919						
PE	0.514	0.575	0.617	0.600	0.607	0.926					
PS	0.704	0.691	0.762	0.635	0.760	0.508	0.930				
SM	0.791	0.876	0.851	0.822	0.634	0.533	0.681	0.949			
SC	0.828	0.846	0.786	0.824	0.630	0.496	0.681	0.795	0.901		
SD	0.758	0.837	0.816	0.779	0.623	0.641	0.655	0.781	0.726	0.921	
VD	0.850	0.816	0.894	0.855	0.629	0.503	0.702	0.807	0.815	0.774	0.906

While some constructs in the model—particularly assistance (AS), sensory considerations (SC), and safety measures (SM)—showed high inter-correlations (e.g., AS and SC = 0.846; SM and AS = 0.876), further analysis using the Fornell–Larcker criterion and the heterotrait-monotrait ratio confirmed acceptable levels of discriminant validity. All HTMT values were below the conservative threshold of 0.85, indicating that the constructs, although related, measure distinct aspects of the passenger experience.

This closeness can be explained by the interdependent nature of real-world transit experiences among persons with disabilities, where assistance often influences perceptions of safety and sensory comfort. However, each construct was carefully defined and measured to reflect unique dimensions. Assistance refers to help provided by personnel during boarding, navigating, and problem resolution. Sensory considerations include environmental stimuli like lighting, temperature, and noise. Safety measures focus on passengers' perceptions of physical safety, emergency preparedness, and accident risk.

These distinctions are critical for identifying targeted interventions in public transport. Recognizing their overlap is valuable for understanding the holistic experience of persons with disabilities, but treating them as separate constructs allows for more precise analysis and design recommendations.

4.5.3. Dicriminant Validity Results (Heterotrait-Monotrait Ratio)

The heterotrait-monotrait ratio criterion, shown in Table 6, is another criterion to prove discriminant validity. This test complements the previous test to further ensure that there was no collinearity between the constructs. According to this criterion, the ratio of the values of the constructs must be no higher than the threshold limit of 0.85 [51]. Having a value of 0.85 would indicate high measures of collinearity among the constructs. The results of this discriminant validity test are presented in Table 6. The results of this test indicate that all values fell within the 0.85 limit, thus proving discriminant validity.

Overall, the discriminant validity results suggest that the constructs used in the model were clearly distinct from one another. This ensures that each factor—such as accessibility, safety considerations, and communication and information—represented a unique element of passenger satisfaction and contributed uniquely to the analysis of future intentions to use public buses among persons with disabilities.

Table 6. Results of discrimanant validity: heterotrait-monotrait ratio.

	AC	AS	CI	DS	FI	PE	PS	SM	SC	SD	VD
AC											
AS	0.816										
CI	0.786	0.804									
DS	0.825	0.810	0.806								
FI	0.733	0.681	0.725	0.623							
PE	0.558	0.612	0.650	0.643	0.644						
PS	0.758	0.733	0.801	0.674	0.802	0.528					
SM	0.846	0.822	0.819	0.807	0.665	0.622	0.712				
SC	0.806	0.813	0.839	0.810	0.676	0.528	0.727	0.743			
SD	0.824	0.734	0.816	0.834	0.659	0.685	0.693	0.820	0.779		
VD	0.830	0.816	0.845	0.819	0.671	0.534	0.747	0.802	0.811	0.830	

4.6. Results of Hypothesis Testing

The hypothesis testing results, summarized in Table 7 reveal that several predictors had statistically significant and practically meaningful effects on passenger satisfaction (PS). Among them, accessibility (AC → PS; β = 0.359, p = 0.005, f^2 = 1.38) demonstrated an extremely large effect size, indicating its critical role in shaping user satisfaction among persons with disabilities. Similarly, vehicle design (VD → PS) and diverse seating options (DS → PS) showed large effect sizes (f^2 = 0.56 and 0.48, respectively), further reinforcing the importance of inclusive and ergonomic design features.

Table 7. Results of hypothesis test.

No	Relationship	Beta Coefficient	p Value	Effect Size (Cohen's f^2)	Result	Significance	Hypothesis
1	AC → PS	0.359	0.005	1.38	Positive	Significant	Do Not Reject
2	VD → PS	0.248	0.015	0.56	Positive	Significant	Do Not Reject
3	DS → PS	0.485	<0.001	0.48	Positive	Significant	Do Not Reject
4	SC → PS	0.163	0.225	0.36	Positive	Not Significant	Reject
5	AS → PS	0.133	0.519	0.15	Positive	Not Significant	Reject
6	SM → PS	0.387	0.001	0.31	Positive	Significant	Do Not Reject
7	SD → PS	0.447	<0.001	0.27	Positive	Significant	Do Not Reject
8	CI → PS	0.171	0.345	0.06	Positive	Not Significant	Reject
9	PE → PS	0.158	0.201	0.06	Positive	Not Significant	Reject
10	PS → FI	0.760	<0.001	0.74	Positive	Significant	Do Not Reject

Safety measures (SM → PS) and subsidies/discounts (SD → PS) exhibited moderate-to-large effect sizes (f^2 = 0.31 and 0.27, respectively), confirming their substantial contributions to satisfaction. Although sensory considerations (SC → PS) was a not statistically significant construct (p = 0.225), its effect size of 0.36 suggests a potentially meaningful influence that warrants further investigation, particularly in larger or more targeted samples.

On the other hand, assistance (AS → PS), communication and information (CI → PS), and passenger expectations (PE → PS) showed both non-significant p values and small effect sizes, indicating limited influences on satisfaction in the current model.

Lastly, passenger satisfaction (PS → PS) had the strongest impact on future intention to use public transport, with a rather large effect size (f^2 = 0.74) and high statistical significance (p < 0.001), confirming its central role as a predictor of behavioral intention.

4.7. Model Fit Analysis

Table 8 presents the key results regarding the model fit for SEM analysis, which is crucial for evaluating how well the proposed model aligns with the observed data. The

SRMR had a value of 0.078, which is below the acceptable threshold of 0.08 established by Gorai et al. [52]. This indicates that the model fit the data well, as it reflects minimal discrepancy between the observed and predicted correlations. Additionally, the adjusted chi-square/degrees of freedom (df) ratio was 4.03, which is under the cutoff of 5.0 recommended by Khattak et al. [53]. This ratio suggests that the model was appropriately constrained and fit the data reasonably well without being overly complex. Lastly, the normal fit index was reported to be 0.956, exceeding the minimum requirement of 0.90 noted by Shengeza [54]. This indicates that the proposed model represented a significant improvement over a baseline null model, showing its effectiveness in explaining the relationships among the variables. Collectively, these fit statistics affirm the reliability and validity of the SEM model, reinforcing its applicability for further analysis of passenger satisfaction and future intentions regarding public transportation for persons with disabilities.

4.8. Results of Final SEM

The results of the final SEM to examine passenger satisfaction and future intentions for public bus use by persons with disabilities are shown in Figure 3. Significant findings included accessibility (AC) positively influencing passenger satisfaction (PS) ($\beta = 0.359$, $p = 0.005$) and vehicle design (VD) ($\beta = 0.248$, $p = 0.015$) and the strongest effect being from diverse seating options (DS) ($\beta = 0.485$, $p < 0.001$). Additionally, safety measures (SM) also significantly enhanced passenger satisfaction (PS) ($\beta = 0.387$, $p = 0.001$), and subsidies/discounts (SD) showed a strong positive effect ($\beta = 0.447$, $p < 0.001$). Notably, a strong positive relationship existed between passenger satisfaction (PS) and future intentions (FI) ($\beta = 0.760$, $p < 0.001$), indicating that higher satisfaction levels increased the likelihood of continued public transportation use among persons with disabilities.

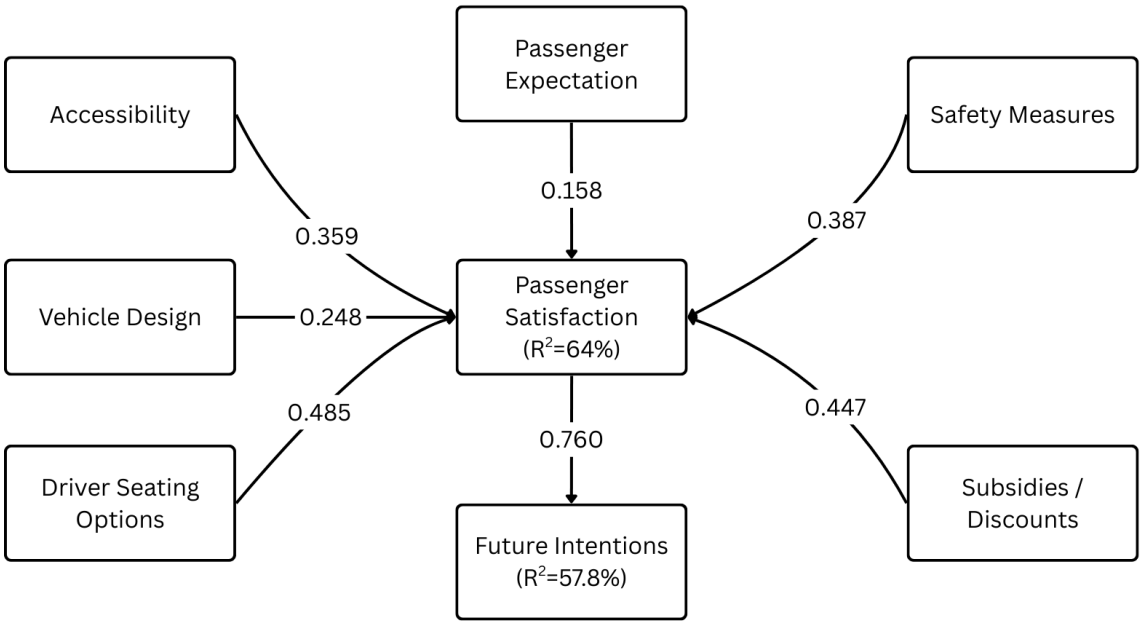

Figure 3. Final SEM framework.

The SEM model was evaluated using the beta coefficients and R^2 values from the hypothesis tests. Overall, 64% of the variation explained passenger satisfaction, while 57.8% accounted for future intentions to patronize public buses. Therefore, the model was deemed sufficient for explaining and predicting both passenger satisfaction and future intentions.

Table 8. Results for model fit.

Model Fit for SEM	Parameter Estimates	Minimum Cutoff	Recommended by
Standardized Root Mean Square Residual (SRMR)	0.078	<0.08	Mohd Dzin and Lay [55]
(Adjusted) Chi-Square/df	4.03	<5.0	Fauzi [56]
Normal Fit Index (NFI)	0.956	>0.90	Fauzi [56]

5. Discussion

The final SEM provided a comprehensive framework for understanding the factors influencing passenger satisfaction (PS) and future intentions (FI) to use public transportation among persons with disabilities. The results of the SEM analysis revealed significant insights that inform both theoretical and practical implications in the realm of public transportation accessibility.

5.1. Accessibility

The results revealed a significant positive relationship between accessibility (AC) and passenger satisfaction (PS), thereby supporting H1. This finding emphasizes the importance of designing public buses with accessibility features that empower persons with disabilities by promoting independence and inclusivity. Buses equipped with ramps, designated seating, and clear information about accessible routes significantly enhance the travel experience for persons with disabilities. By removing physical barriers, these features enable individuals to navigate their environments with confidence. Furthermore, accessible information about bus routes and schedules—such as clear signs, Braille or audio announcements, and user-friendly digital platforms—enables persons with disabilities to plan their trips effectively. When persons with disabilities can quickly find and understand the information they need, it helps them feel more independent and in control of their travel decisions.

The research by Gumasing and Cruz [11] emphasized that a positive correlation between accessibility and passenger satisfaction indicates that transportation systems designed to meet the needs of all users lead to a superior travel experience. Accessibility encompasses various elements, including the physical infrastructure of transportation vehicles and stations, the availability of assistance services, and the overall ease of navigating the transportation system. Supporting these findings, previous studies demonstrated that when public transportation systems prioritize accessibility through features like low-floor buses, ramps, clear signage, and effective communication strategies, persons with disabilities are more likely to feel comfortable and confident when using these services [57].

To enhance experiences for persons with disabilities, public buses can implement specific recommendations under three categories: user interaction and convenience, digital accessibility, and accessibility oversight, as suggested by the study conducted by Kbar et al. [58]. In terms of user interaction and convenience, adding stop buttons, clear signage, and audio announcements would cater to various needs. For instance, stop buttons, signage, and visual indicators can assist deaf and non-verbal passengers, while audible, clear announcements support those with visual impairments, ensuring accessible and inclusive transit options for all users.

In the context of digital accessibility, key recommendations include enhancing digital access, implementing digital maps, utilizing real-time monitoring, and integrating up-to-date technology. These improvements can be achieved through user-friendly mobile applications or online platforms accessible to everyone, particularly persons with disabilities. Real-time bus monitoring and route maps would not only assist persons with

disabilities but benefit all passengers [59]. Additionally, incorporating real-time digital maps on applications or online platforms that highlight accessibility features, such as low-floor buses and accessible stops, would further enhance the user experience. The application provides real-time digital maps and routes for public buses, using up-to-date technology that is easy to access via an app or website. This accessible, real-time route information aims to enhance the travel experience for all users, especially individuals with disabilities.

Lastly, in terms of accessibility oversight, establishing advisory committees that include persons with disabilities is crucial for gathering insights and recommendations to enhance public transportation accessibility. To further improve satisfaction among passengers who are persons with disabilities, effective marketing strategies (programs) should be employed to raise awareness that public transport systems are now inclusive and welcoming to individuals with disabilities [60]. This proactive approach ensures that persons with disabilities are informed of the improvements made to accommodate their needs within the public transit system. These recommendations are crucial for improving accessibility and passenger satisfaction while addressing sensory considerations within public transportation systems.

5.2. Vehicle Design

The results of the model show that vehicle design (VD) had a significant positive impact on passenger satisfaction (PS), thus supporting H2. This indicates that the design of a bus must meet functional, safety, and ergonomic requirements to enhance passenger satisfaction. These designs must satisfy the needs of persons with disabilities before, during, and after transit. This highlights the overall importance of the design to minimize potential hazards and enhance safety for persons with disabilities. In addition, these designs provide adequate spaces and measures for the persons with disabilities to maneuver around the bus. To be able to significantly enhance the comfort and safety of these passengers, persons with disabilities must easily board the bus safely and with ease through improving the entrance and exit doors and isles. Lastly, during transit, securement systems must be in place to ensure that persons with disabilities that need mobility assistance such as wheelchairs or walkers are able to be at ease. Once these bus design requirements are met, overall passenger comfort and experience will greatly improve, thus convincing persons with disabilities to ride buses more frequently and promoting independence.

The importance of vehicle design plays a crucial role in overall passenger satisfaction on these buses. A study conducted by Gumasing and Dela Cruz [11] emphasizes the importance of improving vehicle design to meet the needs of persons with disabilities, specifically those who experience physical or mobility difficulties. Furthermore, it highlights the need for better design, which factors in safety, comfort, and security systems. In line with this, a study by Wilkin [61] highlights the importance of proper design measures such as wide doorways, spaces, and aisles to better cater to persons with disabilities. According to this study, the results show that the majority of the respondents struggled with boarding or alighting. In addition, their results also show that most bus aisles are too narrow to accommodate persons with disabilities, signifying a need for improvement. For a bus to cater to the needs of passengers, the improvements must meet all design factors to enhance passenger comfort and satisfaction. In addition to these findings, several practical design recommendations can be implemented to further enhance accessibility and safety for passengers with disabilities.

Integrating low-floor buses into public transit is highly beneficial for passengers with disabilities, especially those using wheelchairs or mobility aids. Low-floor designs minimize the need for steps when boarding or alighting, making it easier and safer for

passengers with mobility challenges to enter and exit the bus without assistance. This design also helps reduce waiting times, as it facilitates quicker and more autonomous boarding, ultimately improving passenger satisfaction. Studies by Calvo and Ferrer [62] and Gumasing et al. [63] indicated that low-floor buses not only enhance accessibility (H1) and align with vehicle design considerations (H2) but also encourage persons with disabilities to use public transportation more frequently due to the ease of access and independence they provide, supporting future usage intentions (H10).

Moreover, equipping buses with reliable ramps or lifts is essential for accessibility, particularly for passengers who require assistance when boarding or alighting. These features enable drivers to deploy ramps easily and quickly, providing necessary support to individuals with mobility limitations, including wheelchair users. As outlined by Gumasing and Dela Cruz [11] and Gumasing et al. [63], ramps and lifts improve the overall functionality of public buses and ensure that public transportation is inclusive for all. The presence of these accessibility features significantly increases passenger satisfaction (H9) by facilitating an inclusive environment and reducing dependency on others.

Additionally, providing handrails and grab bars throughout the interior of buses provides critical stability and safety for all passengers, especially persons with disabilities, while boarding, alighting, or standing during transit [64]. Kendrick et al. [65] emphasized that these additions are crucial for reducing falls and injuries, particularly for those who may need additional support to maintain balance. By ensuring that handrails and grab bars are accessible, public buses become safer, and the overall travel experience is improved. These features align with both vehicle design (H2) and safety measures (H5), as they enable persons with disabilities to navigate a bus independently and safely.

Another significant improvement involves wider doorways and aisles, allowing individuals who use wheelchairs or walkers to maneuver with ease. Redesigning buses with wider doorways and aisles can significantly enhance maneuverability for passengers using wheelchairs, walkers, or other mobility aids. According to Ferrari et al. [66], wider spaces allow for easier movement throughout the bus, reducing congestion and improving accessibility (H1). This adjustment addresses one of the most common issues reported by persons with disabilities: limited space within buses. By providing sufficient room for mobility aids, wider doorways and aisles also support better seating access and help create a less restrictive and more inclusive environment for all passengers, directly impacting passenger satisfaction (H9).

5.3. Diverse Seating Options

Supporting H3, the results indicate a positive and significant relationship between diverse seating options (DS) and passenger satisfaction (PS), highlighting the value of inclusive seating arrangements in enhancing public bus accessibility for persons with disabilities in the Philippines. Diverse seating options—such as priority seating, additional legroom, and tailored support for various disabilities—create a more welcoming environment that directly addresses the specific needs of passengers with mobility, visual, or hearing impairments, thereby improving their travel experience and satisfaction. These accommodations foster a sense of dignity and comfort for persons with disabilities, enhancing their quality of life and making public transport a viable option for their daily needs.

Priority seating areas near the front of the bus are particularly beneficial, as they offer more space and easier access for elderly passengers and those with mobility challenges. Reserved seating near entrances and exits and close to the driver also facilitates better mobility and allows for smoother communication if assistance is needed [67]. For many persons with disabilities, these designated areas are essential for a more comfortable journey, ensuring they can access and use public transportation more independently [68].

5.4. Sensory Considerations

Sensory considerations (SC) positively correlated with passenger satisfaction, as indicated by a beta coefficient of 0.163. However, the p value of 0.225 reveals this correlation was not statistically significant, leading us to reject the hypothesis. This suggests that while sensory considerations enhance the bus experience for individuals with sensory impairments, their impact on overall satisfaction is limited. Essential elements include clear visual and auditory indicators, which are crucial for assisting passengers with hearing or vision disabilities. Research indicates that visually impaired individuals often struggle with navigation without proper cues [69], highlighting the need for effective communication systems and minimized physical barriers to foster independence.

Despite the observed positive correlation, factors such as accessibility and vehicle design may overshadow the effects of sensory enhancements on satisfaction. To improve the bus experience for individuals with sensory impairments, several sensory-friendly design initiatives can be implemented.

Clear and accessible visual and auditory indicators, such as stop announcements and route displays, are essential in assisting passengers with sensory impairments. Visual displays—like LED signs showing the next stop—provide important information for those who are hard of hearing, while audible announcements benefit visually impaired passengers by keeping them informed without needing to rely on visual cues. According to Jain et al. [70] and Zhao et al. [71], visually impaired individuals often struggle to navigate public transportation without clear directional cues, emphasizing the importance of these indicators in promoting independence. Implementing both types of signals ensures that all passengers, regardless of their sensory abilities, have equal access to information, reducing confusion and enhancing overall comfort.

Second, a low-noise interior environment is essential for improving the experiences of passengers with sensory sensitivities. Excessive noise and vibrations can be overwhelming, especially for individuals with conditions like autism or sensory processing disorders. By utilizing sound-absorbing materials within the bus and minimizing interior vibrations, transportation systems can create a quieter, more comfortable space. Lorenzino et al. [72] highlighted that low-noise environments contribute to the overall comfort and satisfaction of passengers, reducing anxiety and allowing individuals to better focus on their surroundings without the distraction of disruptive noises. This approach not only benefits sensory-sensitive individuals but can also create a more pleasant travel experience for all passengers.

Lastly, installing tactile ground markers at bus stops and within buses provides a tangible guide for visually impaired passengers, enabling them to navigate with greater ease. Tactile markers are typically raised or textured paths that guide individuals from bus stops to entrances or assist with orientation within the vehicle. Presley and D'Andrea [73] emphasized that tactile markers are an invaluable resource for visually impaired individuals, offering consistent guidance and helping them recognize specific locations like doorways or seating areas. These markers reduce the need for assistance and promote independent travel, fostering confidence in using public transportation.

5.5. Assistance

The results indicated a positive relationship between assistance (AS) and passenger satisfaction (PS); however, this relationship was not significant enough to support the hypothesis. While assistance can enhance the passenger experience, particularly for persons with disabilities, it may also foster concerns about dependency. Timely help with boarding, disembarking, and navigating public transport significantly improves the sense of safety and comfort for persons with disabilities. Drivers who proactively assist persons with

disabilities create a supportive environment that fosters satisfaction, particularly through effective problem resolution and high-quality service characterized by empathy and assurance [74]. However, some persons with disabilities may prefer solutions that promote independent living, as the independent living (IL) paradigm emphasizes autonomy and self-determination [75].

However, an overreliance on human assistance may also be disempowering, as it can undermine the autonomy and self-determination of persons with disabilities. The independent living (IL) paradigm emphasizes the importance of agency, independence, and dignity, advocating for transportation systems that support users' ability to travel without needing to rely on others [75]. From this perspective, while assistance is appreciated when needed, the ultimate goal should be to minimize the need for such interventions through inclusive and universally designed infrastructure.

To enhance passenger satisfaction, public transport providers should train staff in respectful assistance techniques, implement systems that allow persons with disabilities to request help, and actively involve them in designing assistance programs. These measures ensure services are responsive to the needs of persons with disabilities, promoting accessibility and fostering a more inclusive environment. Additionally, public awareness campaigns highlighting accessible transport can encourage greater understanding and support from all passengers, creating a more supportive community overall [76].

In line with this, two recommendations can be made to better enhance the overall assistance of persons with disabilities. The first recommendation is for proper driver training. Comprehensive driver training must be conducted so that drivers are better equipped and well informed on how to properly assist persons with disabilities who are boarding and disembarking from buses. The training must also include the use of accessibility features and sensitivity training to better understand passenger needs. This recommendation aligns with considerations such as safety measures (H6), communication and information (H8), and passenger satisfaction (H9). Similarly, another recommendation is customer service training. Not only should bus drivers be knowledgeable, but all staff should learn how to handle persons with disabilities with empathy and professionalism to ensure their needs are met throughout the experience. This recommendation aligns with the considerations of communication and information (H8) and passenger satisfaction (H9).

Future improvements should aim to create transport environments where physical design and technology reduce or eliminate the need for constant assistance. Features such as low-floor buses, automated ramps, real-time audio-visual navigation aids, and designated seating with priority signage all contribute to a more independent, dignified, and seamless travel experience for persons with disabilities. By shifting the focus from assistance to autonomy, public transportation systems can become truly inclusive.

5.6. Safety Measures

The results revealed a significant positive relationship between safety measures (SM) and passenger satisfaction (PS), highlighting the critical role of robust safety protocols in enhancing the passenger experience. Key factors, including driver competence, on-board security, and regular bus maintenance, are essential for fostering a secure environment. When these elements are effectively implemented, passengers feel more secure, resulting in higher satisfaction levels. Previous research supports these findings, demonstrating a strong correlation between safety measures and passenger satisfaction. Passengers are more likely to express satisfaction when they perceive that transportation services prioritize safety through trained drivers, secure environments, and well-maintained vehicles [77]. Investing in safety measures not only ensures compliance with legal requirements but also enhances the overall user experience. Competent drivers capable of managing varied

driving conditions and emergencies enhance passengers' sense of safety, and surveillance systems contribute further to this confidence. Routine bus safety checks reduce mechanical failure risks, positively impacting service perceptions. Effective accident management protocols, like clear communication and swift responses, also boost satisfaction, offering reassurance in emergencies. For passengers with disabilities, specialized training for drivers and security personnel, along with safety features such as secure anchor points for mobility devices, are essential. Tailoring maintenance protocols to the needs of persons with disabilities also elevates their travel safety and satisfaction [78].

For passengers with mobility aids, securement systems are crucial in ensuring safety during transit. These systems, such as wheelchair tie-downs and restraint mechanisms, securely hold mobility devices in place, preventing them from shifting or tipping over while the bus is in motion. This added stability is essential for passengers using wheelchairs or other assistive devices, as it minimizes the risk of injury and provides a sense of security. The QUANTUM Automatic Wheelchair Securement Station [79] and similar systems exemplify the best practices in safety design by allowing passengers to easily secure their devices independently or with minimal assistance. By implementing securement systems, public transit services not only comply with safety standards but also enhance the travel experience by accommodating the specific needs of passengers with disabilities. This directly aligns with improving passenger satisfaction, as individuals feel reassured that their mobility aids will remain secure throughout their journey.

Additionally, implementing closed-circuit television (CCTV) systems inside buses is a highly effective safety measure, enhancing both passenger security and overall bus safety. As emphasized by Kreissl et al. [80], bus surveillance plays a critical role in safeguarding passengers by deterring criminal activities and unwanted behaviors. The presence of cameras creates a secure environment, significantly reducing the likelihood of incidents and promoting responsible conduct among passengers. This recommendation ensures passenger satisfaction, as it shows safety measures inside the bus by adding bus surveillance. The addition of CCTVs would help passengers who are persons with disabilities feel secure and safe, therefore enhancing passenger satisfaction.

Furthermore, comprehensive emergency training for bus staff is essential to ensure that all passengers, especially persons with disabilities, receive appropriate assistance during unexpected situations. Such training should include general emergency procedures and specific protocols for assisting individuals with various disabilities. For instance, bus staff should be well versed in guiding persons with disabilities to safety in case of an evacuation, offering verbal cues and physical assistance if needed. Chaichi [81] and Pekkarinen and Vitikainen [82] highlighted the importance of well-trained staff in boosting passengers' confidence and satisfaction, as knowledgeable staff can address safety concerns effectively. Staff training on proper handling and communication techniques can also create a more supportive environment, fostering trust and reducing anxiety among persons with disabilities in emergency situations. This recommendation ensures that public transportation services are not only compliant with safety regulations but also capable of offering a high standard of care tailored to the needs of persons with disabilities.

5.7. Subsidies/Discounts

The results revealed a significant positive relationship between subsidies and discounts (SD) and passenger satisfaction (PS), indicating that these financial incentives enhance overall satisfaction with public transportation systems, including for persons with disabilities. While much of the existing research focuses on ridership among lower-income users, it is evident that subsidies improve access for persons with disabilities, allowing them to travel more frequently for essential activities. Guzman and Hessel [83] highlighted that subsidies

significantly increase the total number of public transport trips among beneficiaries. This increased access not only facilitates mobility but also contributes to the overall well-being of persons with disabilities, fostering a more inclusive environment. The targeted nature of these subsidies ensures that low-income individuals and persons with disabilities can afford regular transport use, enhancing their perception of public services. However, the diminishing effectiveness of subsidies over time may lead to reduced satisfaction if users perceive them as less beneficial. Changes in access conditions and fare increases could further impact satisfaction levels. To maximize the positive effects of subsidies/discounts on passenger satisfaction, particularly for persons with disabilities, several recommendations have been proposed. To foster a more inclusive public transport environment, regular assessment of subsidy programs is essential to ensure they address the unique needs of persons with disabilities effectively. Public awareness campaigns can educate passengers about available discounts, enhancing subsidy utilization. Flexible subsidy models which are adaptable to shifting economic and demographic conditions further support equitable access. Establishing feedback channels enables continuous improvements informed by user experiences, while partnerships with other transportation services can enhance overall accessibility. Together, these measures improve passenger satisfaction and promote a more inclusive transport system, aligning well with the approaches recommended by Biplob [84].

5.8. Communication and Information Quality

The results revealed a positive relationship between communication and information quality (CI) and passenger satisfaction (PS), but this relationship was not significant, leading to the rejection of H8. This indicates that communication features such as clear and audible announcements, route information, signage, maps, and visuals for persons with disabilities do not have a notable impact on their travel experience in public buses in the Philippines. This finding contrasts with previous research, which emphasized the importance of clear communication and information in enhancing the travel satisfaction of persons with disabilities. According to Anwer et al. [85], communication and availability of information, such as schedules, maps, and routes, play a key role in passenger satisfaction. With a standardized weight score of 0.535, their study emphasized that the accessibility and clarity of information significantly impact overall satisfaction levels. Seputra and Simarmata [86] further supported the findings of Eboli and Mazzulla [87], showing that service planning and reliability, which includes communication and information, are crucial for passenger satisfaction. Prior studies reinforced the idea that well-communicated schedules and reliable service significantly enhance the overall passenger experience. This divergence may be attributed to the unique characteristics of persons with disabilities in the Philippines, who prioritize other factors such as accessibility and diverse seating options when evaluating their satisfaction with public transport.

Persons with disabilities may not prioritize communication and information quality (CI) as a key factor for passenger satisfaction, instead focusing on accessibility and ease of movement. Physical barriers, such as those related to boarding and seating, are their primary concerns, as these directly impact their ability to move comfortably and independently. While features like audible announcements, route maps, and signage are important, they may not be viewed as critical to satisfaction, especially in the context of the Philippine public transport system, where communication systems are often unreliable. As a result, although CI has value, persons with disabilities currently place greater emphasis on physical accessibility, making CI less significant in determining their overall satisfaction with public buses.

5.9. Overall Passenger Satisfaction

The results support both H9 and H10, confirming the significant relationships between passenger expectations (PE) and passenger satisfaction (PS), as well as between passenger satisfaction (PS) and future intentions (FI). H9 indicates that higher expectations from public bus services—such as high-quality service, accessibility, safety, and comfort—lead to greater satisfaction among persons with disabilities. In turn, H10 demonstrates that increased passenger satisfaction positively influences future intentions, including more frequent use of public buses, recommendations to others, and a preference for buses over other modes of transport. This suggests that as expectations rise, so does satisfaction, which subsequently boosts the likelihood of persons with disabilities continuing to use and recommend public buses in the Philippines, ultimately improving both the travel experience for persons with disabilities and overall bus utilization.

Understanding customer expectations is crucial, as these expectations determine the level of service passengers anticipate receiving, directly influencing their satisfaction [37]. Expectations act as an enhancing factor for passenger satisfaction, meaning that by meeting or exceeding these expectations, public bus services can improve customer satisfaction and retention. As de Ona et al. [88] suggested, a passenger's satisfaction—or dissatisfaction—shapes their future behavior toward the service. In the context of public buses, providing quality service to persons with disabilities increases the likelihood that they will continue using these services. The relationship between passenger expectations, satisfaction, and future utilization is directly proportional; when buses meet high expectations, delivering quality service to persons with disabilities, it leads to greater satisfaction and, consequently, more frequent future use of public buses in the Philippines.

In addition to the direct effects evaluated through the structural model, this study also examined indirect effects using bootstrapping procedures within the PLS-SEM framework to better understand how service attributes influence future intentions (FI) through passenger satisfaction (PS). The results revealed that several latent variables—such as accessibility, vehicle design, and subsidies/discounts—had statistically significant indirect effects on future intentions via their positive influence on passenger satisfaction. This underscores the mediating role of passenger satisfaction in translating service-related factors into behavioral outcomes. Conversely, constructs such as assistance and communication and information quality, which did not significantly predict satisfaction, also did not exhibit significant indirect effects on future intentions. These findings emphasize that improvements in service design primarily influence future ridership indirectly by first enhancing users' satisfaction levels. This supports the theoretical premise seen in prior mobility-related SEM study [42], where intermediary constructs played a critical role in driving acceptance and behavioral intention.

To boost passenger satisfaction and encourage continued use of public buses, several recommendations are proposed. First, implement accessible complaint and suggestion systems, such as scannable QR codes, allowing passengers to report issues or concerns directly. These submissions can be valuable, offering suggestions to enhance the overall passenger experience. Additionally, conducting regular surveys and focus groups is crucial. Bus management and operators should consistently gather feedback from passengers to pinpoint areas for improvement in accessibility and service quality. This practice also provides staff with a clear perspective on passenger experiences, giving them a better understanding of their current service.

To raise awareness, collaboration with advocacy groups for persons with disabilities is crucial. This ensures that the needs of various groups of persons with disabilities are considered and met during the planning and execution of public transport improvements. Additionally, bus management and operators should launch awareness campaigns empha-

sizing the importance of accessibility. This fosters a supportive environment for persons with disabilities using public transport, promoting inclusivity and making them feel like part of the community.

6. Conclusions

The current study employed a user-centered framework that positioned all latent constructs as parallel predictors of passenger satisfaction. While this structure was based on the established literature and direct user experience inputs, the findings revealed that four factors—assistance, sensory considerations, communication and information quality, and passenger expectations—did not exhibit statistically significant relationships with satisfaction. This suggests that these constructs may not exert strong direct effects but may instead influence satisfaction indirectly or function as intervening variables.

In particular, constructs such as accessibility, diverse seating options, and sensory considerations may contribute to the overall perception of vehicle design, which in turn influences satisfaction. This possibility reflects a hierarchical relationship that was not explicitly modeled in the current analysis. Future studies are encouraged to test respecified models that account for mediated or cascading effects between design- and service-related factors, possibly using multi-level SEM frameworks.

Although multicollinearity was ruled out statistically through acceptable variance inflation factor values, high correlations among some constructs (e.g., assistance and safety) suggest the presence of shared variance that may have attenuated the individual effects of some predictors. These findings support the need for continued refinement of the model structure, both conceptually and empirically, to better capture the complex and interconnected nature of inclusive transport design.

6.1. Practical Implication

The findings of this study offer several practical recommendations for policymakers, transportation authorities, and public bus service providers to enhance the inclusivity and satisfaction of persons with disabilities in public transportation systems. First, prioritizing investments in accessibility features, such as wheelchair ramps, priority seating, and clear signage, can significantly improve the experience of persons with disabilities by reducing physical barriers and promoting independence. Accessibility enhancements should be accompanied by vehicle design improvements, such as wider aisles, adjustable seating, and space for mobility aids, ensuring that buses can accommodate the diverse needs of passengers with different types of disabilities.

In addition to infrastructure improvements, safety measures play a crucial role in increasing passenger satisfaction. Strengthening safety protocols, such as secure seating arrangements for mobility devices and emergency preparedness, will enhance the confidence of persons with disabilities in using public transportation. Equally important is training for bus staff, particularly in areas like effective communication and assistance for passengers with varying disabilities. Training programs should emphasize empathy and a deeper understanding of the specific challenges faced by persons with disabilities, ensuring that staff can provide appropriate and respectful assistance.

Another key recommendation is the implementation of public awareness campaigns to foster a more inclusive and supportive environment for persons with disabilities using public transportation. Educating the general public on the importance of inclusivity can help reduce stigma and encourage empathy toward individuals with disabilities. Finally, establishing feedback mechanisms that allow persons with disabilities to share their experiences and suggest improvements will create a continuous feedback loop, enabling transportation authorities to adapt services based on real user needs. Collectively, these

practical measures can transform public transportation systems into more accessible, inclusive, and user-friendly environments for persons with disabilities, ultimately increasing passenger satisfaction and promoting long-term ridership.

6.2. Theoretical Implication

This study contributes to the broader understanding of transport inclusivity and passenger satisfaction by providing empirical evidence on the factors influencing the experiences of persons with disabilities with public transportation. The research aligns with and extends expectation confirmation theory (ECT), which posits that satisfaction is largely driven by the extent to which services meet or exceed user expectations. The findings confirm that when public transport systems effectively address the accessibility, safety, and comfort needs of persons with disabilities, satisfaction levels rise, encouraging future use and fostering trust in these systems. The study also advances the development of a theoretical framework that integrates multiple factors affecting passenger satisfaction, offering a comprehensive model that future researchers can apply or refine in similar contexts. The successful application of SEM demonstrates its utility in analyzing complex relationships between variables in public transportation studies, particularly in examining the experiences of marginalized groups like persons with disabilities. Additionally, this study highlights significant gaps in the current research, particularly regarding the ergonomic design of public buses and the specific needs of persons with disabilities. Addressing these gaps in future research could lead to even more targeted interventions that enhance transport inclusivity and improve the quality of life for persons with disabilities.

6.3. Limitations and Future Research

Despite offering valuable insights into the factors influencing passenger satisfaction among persons with disabilities in public transportation, this study has several limitations that provide opportunities for future research. The sample size of 396 respondents, while robust, may have lacked diversity in terms of types of disabilities and demographic factors. A broader and more representative sample could enhance the generalizability of the findings, particularly across different groups of persons with disabilities. This study's geographical focus on the Philippines further limits its applicability to other countries with different public transportation systems, cultural attitudes, and infrastructure. Comparative research across regions or countries would allow for the identification of universal best practices and region-specific challenges in enhancing transport inclusivity.

Additionally, this study's reliance on self-reported data through questionnaires introduces potential biases, such as social desirability and recall bias. Future research could mitigate these limitations by employing mixed-method approaches or incorporating qualitative interviews and focus groups to gain a deeper understanding of the real-world experiences of persons with disabilities in public transportation. This study also did not explore the intersectionality of disabilities, namely how different disabilities interact with factors such as accessibility, vehicle design, and communication systems. This could be an important area for future research to provide a more nuanced understanding of inclusivity in transportation systems.

One important limitation of this study concerns the diversity and severity of disabilities among respondents. While the sample included individuals with varying types of disabilities—such as physical, sensory, and cognitive impairments—this study did not capture detailed data on the severity or functional impact of those disabilities. This is a key consideration, as the degree of impairment can significantly influence how individuals interact with public transportation systems and perceive service quality. For example, a

person with complete mobility impairment may have quite different accessibility needs compared with someone with partial mobility challenges.

Although a one-way ANOVA revealed statistically significant differences in satisfaction across disability types, this study was not designed to stratify or compare experiences based on severity levels. Future research should consider incorporating validated scales or self-reported measures that assess both the type and severity of disability to allow for more nuanced subgroup analyses. This would enable a deeper understanding of how transport design and service factors affect users with distinct needs and contribute to the development of more targeted and inclusive transportation policies.

Another key limitation of this study is its singular focus on disability-related dimensions. It did not sufficiently explore the intersectionality of disability with other social categories such as gender, age, income level, and education.

Future research should adopt an intersectional lens to investigate how overlapping identities affect accessibility, mobility, and satisfaction levels. This would provide a more holistic and nuanced understanding of the diverse lived experiences of persons with disabilities, particularly how marginalization may be compounded by multiple factors.

Furthermore, while this study concentrated on infrastructure and service-level improvements, it did not examine the influence of public behavior and cultural norms on transport accessibility. Inaccessible environments can result not only from poor design but also from uncooperative or uninformed public behavior, such as failing to offer reserved seating, blocking accessible pathways, or misusing priority spaces. Cultural attitudes toward disability, public awareness, and everyday social practices are critical in shaping the actual usability of inclusive transport systems. Future research should therefore explore these sociocultural dimensions to better understand how behavioral norms influence the effectiveness of accessibility initiatives.

Moreover, several constructs—such as assistance, sensory considerations, and communication and information quality—did not yield statistically significant effects. Although the VIF values indicated no serious multicollinearity, high inter-construct correlations suggest that shared variance may have affected the significance levels. Future studies should consider redefining or combining overlapping constructs, as well as possibly applying higher-order SEM models to distinguish between latent dimensions more clearly.

In terms of future research directions, longitudinal studies would be beneficial in tracking how passenger satisfaction changes over time as transportation systems evolve and implement the suggested improvements. Investigating the role of technology in enhancing accessibility, such as real-time mobile apps providing detailed accessibility information or requesting assistance, could further improve the travel experience for persons with disabilities. Expanding research on ergonomic design in public buses is another key area, focusing on optimizing comfort and ease of use for passengers with varying disabilities. Additionally, assessing the impact of policy changes and design improvements on passenger satisfaction and ridership among persons with disabilities would help measure the effectiveness of interventions aimed at improving transport inclusivity. Combining these areas of future research would contribute to the ongoing development of more inclusive and accessible public transportation systems globally.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/disabilities5020045/s1, Table S1: Measurement Items. References [89–96] are cited in the supplementary materials.

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