

Research Article

SOFAST Concept for Effective Interior Design at Giwangan Bus Station

Akhmadi*, Shika Savira Andarista, and Reza Hambali Wilman Abdulhadi

Telkom University, Bandung, Indonesia

Abstract.

The Giwangan bus station is a type A station that serves inter-city, inter-provincial, and rural transportation in Yogyakarta Province, Indonesia. This station is the only type A station that plays an important role as the main entrance and exit for buses. The purpose of this study is to provide an effective interior design concept that meets government regulatory standards for all classes of bus passengers. The method used is a qualitative explorative research method, which includes conducting a survey, measuring the site, documenting, and interviewing passengers of the bus station. The results of this first analysis are combined with a study based on the universal design approach. The keyword SOFAST appears as an answer to the elements of safety, organized, friendly, accessible, and fast. The SOFAST design at Giwangan bus station will be reviewed by rendering digital images with technical lines and arrows to understand the universal design approach.

Corresponding Author: Akhmadi;
email:
akhmadi@telkomuniversity.ac.id

Published: 8 January 2025

Publishing services provided by
Knowledge E

© Akhmadi et al. This article is distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use and redistribution provided that the original author and source are credited.

Selection and Peer-review under the responsibility of the BCM 2023: Sustainable Design Conference Committee.

Keywords: bus station, friendly design, SOFAST

1. Introduction

Public service refers to a range of activities that aims to fulfill the needs of citizens and residents as outlined in statutory regulations for the provision of goods and services by public service providers [1]. One of the key components of the public transportation system is the bus station, which serves as a temporary stop for public transportation to pick up and drop off passengers and goods en route to their final destination [2]. As a transit point, the bus station facilitates the transfer of passengers and goods from one type of transportation to another. It is a space that sees interactions and activities from various elements such as passengers, merchants, and crewmembers. The facilities provided by the bus station include seating, a waiting room, ticket counters, bus agents, information and complaints centers, wayfinding, ATM centers, toilets, and prayer rooms, among other services.



The Special Administrative Region of Yogyakarta in Indonesia boasts several bus stations, including the Giwangan Station. This station falls under the category of Type A bus stations, catering to inter-city and inter-provincial transportation (AKAP for short), inter-city transportation within the province (AKDP for short), as well as transportation to more rural areas. Giwangan Station is the only Type A bus station in Yogyakarta and plays a crucial role as the primary gateway for individuals who opt to use the bus for transportation [3]. The station is situated at Jalan Imogiri Timur, Giwangan, Umbulharjo, with an approximate building area of 6,583 m² square and several separate buildings with two floors maximum, along with a land area of approximately 5.8 hectares. It was inaugurated on October 10, 2004. A research done by Nadya Iresha indicates that the station serves an average of 20,000 passengers daily, with 850 buses arriving or departing to other provinces [4]. Then, based on the results of interviews with the head of the local bus station service, the condition in 2022 doesn't align with the vision and mission of the City of Yogyakarta to further develop the public infrastructure of the city. The station lacks directions for the layout of facilities at the entrance, and user circulation is irregular. Users may need to opt for circulation outside the station instead of the dark, quiet hallways inside, which lack clear directions. Additionally, the passenger arrival and departure areas are far apart, and shopping stalls are disorganized, as waste piles up [5]. Anyone with disabilities, such as wheelchair users, would face issues accessing the second floor, with no suitable facilities or ramps available.

Universal design refers to the design of products and environments that can be used by all individuals to the greatest extent possible without the need for any further adaptations or specialized designs [6]. It is a design concept that can be applied to all aspects of design for all user groups without the requirement of special adaptations or designs. Universal design makes it possible for everyone with different abilities and backgrounds to use a building, product or environment comfortably without hassle [7]. The definition of universal design implies that products, originally designed for normal or healthy people, can be modified to accommodate a wider range of parameters and suit other users, including persons with disabilities, the elderly, adults, children and pregnant women. The Seven Universal Design Principles, TPUD for short, were put forward by Ronald Mace in his article, Universal Design in Housing and includes Equitable Use, Flexibility in Use, Simple and Intuitive Use, Perceptible Information, Tolerance for Error, Low Physical Effort, and Size and Space for Approach and Use [8 Mace]. These principles ensure that the designs are useful and can be marketed to people with various disabilities, accommodate all types of users and various individual

disabilities, are simple and easy to use, equipped with important supporting information for users, minimize the harm and consequences that can be detrimental from intentional or unintentional actions, can be used lightly and don't take up too much physical muscle, and use size in design through the posture, body and movement approaches of locality users.

The literature on universal design was reviewed and analyzed with the interior conditions of the Giwangan bus station. This literature serves as a reference to create new solutions for the station. Passengers can now utilize the bus station space more effectively and have a better understanding of the technical form used for the concept solutions.

2. Methods and Equipment

2.1. Methods

The research method used was qualitative and exploratory. The authors began by conducting a survey, measuring the site, documenting and interviewing regulars of the bus station. Interviews were conducted to obtain data on bus station facilities, 2021 visitor data, bus arrival and departure routes, operating hours, and the schedule of the employees and traders. Additionally, a questionnaire was administered to 14 participants to gather data on visitor activities, the advantages and disadvantages of the station's facilities, and the facilities visitors expect. The interview data, questionnaires, and observations will be combined with an analysis of data from literature reviews. The results of this merger will be explored in the 3D interior rendering results. This method provides design examples from real case studies in the field regarding user-friendly designs for the Giwangan bus station.

3. Results and Discussion

Based on the results of the interviews and questionnaires, several conclusions can be drawn. Firstly, there are no supporting facilities for passenger activities in the waiting room, such as television, charger points, lockers, children's playroom, speakers, and departure information LCDs. Secondly, there are no supporting facilities for passengers with disabilities, pregnant women, and children. Thirdly, many stalls are empty and poorly maintained, leading to abandonment by their owners. Fourthly, there is a lack of

directions or signage regarding placement and size. Lastly, the interior materials, such as ceilings, floors, and walls, are damaged by animal waste and the climate, causing the floor to become slippery.

After conducting the Universal Design approach questionnaire, several areas were identified that require improvement. Firstly, it was noted that the floor material in some areas is slippery and poses a hazard to users. Secondly, the corridors are not wide enough to allow two wheelchair users to pass each other safely. Additionally, there is a lack of signage to direct users on escalators. Finally, the information facilities, such as information desks, do not adequately support wheelchair users. These findings highlight the need for changes to be made to ensure the safety and accessibility of the space for all users.

Through interviews, questionnaires, and literature studies, the theme of ‘Travel Experience with Equality’ had been identified as a suitable design solution. This theme is particularly relevant for addressing issues faced by users with special needs, such as mothers, children, disabled people, as well as the elderly. It aims to provide an equal experience for all users, regardless of their disabilities or circumstances. To implement this theme, the technical application of the keyword SOFAST can be utilized, as illustrated in the chart below.

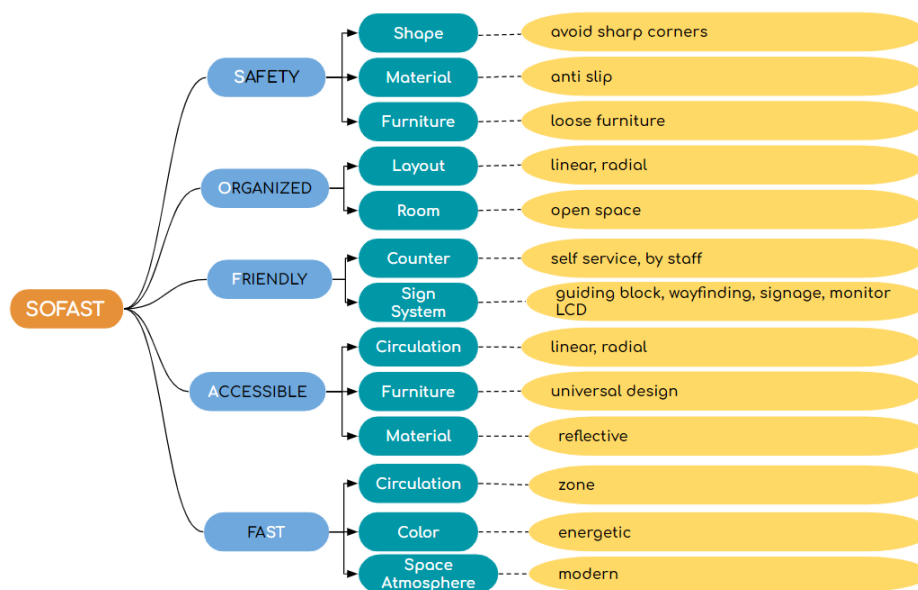


Figure 1: Keyword division of SOFAST with relationship to the interior keywords, image created by the authors.

The arrow direction chart above shows the abbreviation of SOFAST. These keywords can serve as a reference for designing bus stations that are friendly to all groups. The explanation about SOFAST will be provided in the following slide. Safety Station refers

to a bus station interior design that provides a sense of security and comfort for all users, so that they feel safe and confident in using the facilities that have been provided.

An ideal bus station should be organized, friendly, accessible, and fast. By having a more organized interior design based on spatial proximity with interconnected activities, passengers can easily find their way around and get to their destinations on time. A friendly station with furniture that accommodates all individuals, including those with disabilities, can make passengers feel at ease and comfortable. An accessible station with better circulation ensures that all spaces can be accessed, making it easier for everyone to use. Lastly, a fast station that speeds up individual activities can increase efficiency and reduce waiting times, making the overall experience more pleasant for all users.

The SOFAST design concept could be applied to the Giwangan Bus Station by identifying and addressing the issues found in the station. This modern design concept prioritizes the use of bright, slightly shiny, easy-to-maintain materials that are safe for all users.



Figure 2: The before and after design of the giwangan bus station area. Source: author analysis.

4. Conclusion

The interior design of Giwangan bus station in Yogyakarta is a solution initiated by the author, referring to the universal design phenomenon that is becoming more widely used in public facilities in Indonesia. Based on analysis of data obtained from research and survey results, it was found that universal design provides a solution to the problems



Figure 3: Application of the SOFAST keywords to the rendering image of the interior design of the Giwangan bus station, image created by the authors.

TABLE 1: The application of universal design from SOFAST concept, data came from analysis by the authors.

| No. | Design SOFAST | Universal | Implementation |
|-----|---------------|-----------|--|
| 1 | Safety Design | | Floor material with rough granite tiles will be implemented. To ensure a smooth and safe passage throughout the room, guide blocks will be installed. Loose furniture will be used to create a safe and spacious environment. The walls and structure will be designed to avoid sharp corners. |
| 2 | Organised | | The layout will be both linear and radial in shape in order to effectively organize user activities. This will allow for seamless exploration of the entire room, aided by clear wayfinding. |
| 3 | Friendly | | The sense of room will be created with a cheerful, bright, and friendly atmosphere, in order to provide optimum user comfort. |
| 4 | Accessible | | The concept of universal design will provide easy access for all people. The design features an open space, a ramp to the second floor, and enough space for wheelchairs, making it easily accessible for individuals with disabilities |
| 5 | Fast | | Having activities that can be easily accessed is beneficial for all users. The ticket counter services offered by station staff, as well as the self-service options, provide quick and convenient choices for activities at the bus station. |

that were identified. Applying the SOFAST concept of occupant-friendly universal design to interior elements such as floors, walls, ceilings, furniture, and electrical elements can achieve an atmosphere that is more effective, efficient, and comfortable for users, while also promoting safety, organization, friendliness, accessibility, and speed.

Conflict of Interest

The authors have no conflict of interest to declare.

References

- [1] Pratama AD. Penyelenggaraan Pelayanan Publik Berdasarkan UU Nomor 25 tahun 2009 (Report no. n/a). Palembang: Universitas Sri Wijaya; 2019.
- [2] Keputusan Menteri Perhubungan Nomor 31 Tahun 1995 tentang Terminal Transportasi Jalan. [Ministry of Transportation Decree No. 31 Year 1995 regarding Road Transportation Terminal]
- [3] Puspitasari ME. Analisis Kebijakan Pengoperasian Terminal Giwangan Yogyakarta Sebagai Pengganti Terminal Umbulharjo. *Jurnal Dimensi*. 2014; 3(3).
- [4] Nadya J. Redesain Interior Terminal Giwangan yang Memenuhi Kebutuhan Aksesibilitas Penumpang Difabel. *Jurnal Institut Seni Indonesia Yogyakarta* 2017/2018. 2017; n/a(n/a)
- [5] Salda R, Iresha FM, Putra HP. Perencanaan Pengelolaan Sampah di Terminal Giwangan Yogyakarta. Undergraduate Thesis, Universitas Islam Indonesia; 2018.
- [6] Berbesz AM, Gronostajska BE. Universal Design in the Education of Architecture Students. *World Transactions on Engineering and Technology Education*. 2020;18(3):345–9.
- [7] Anonymous. What are the differences between universal design, accessibility, and inclusive design? [Internet]. Toronto: Sayyeah. 2020 May 12 [cited 2023 June]. <https://sayyeah.com/digital-insights/universal-design-accessibility-inclusive-design/>
- [8] Mace RL. Universal Design in Housing. *Assistive Technology: the official journal of RESNA*. 1998; 10(1): 21-28 <https://doi.org/10.1080/10400435.1998.10131957>.