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Revitalization of a Futuristic Smart Bus Station: K.H. Ahmad Sanusi Sukabumi

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Abstract

Along with the increasing population growth every year which has a variety of economic and social activities, it causes an increasing demand for development, repair, and improvement of infrastructure and services that support the increasing mobility of the population. One of the important roles in supporting the movement of population mobility is the terminal. As an effort to support the smooth mobility of the population, a terminal is needed that is feasible and able to adjust its carrying capacity to the development of the surrounding area. Type A Bus Terminal K.H. Ahmad Sanusi Sukabumi City is the only bus terminal in Sukabumi City. The K.H. Ahmad Sanusi Sukabumi Terminal is a vital infrastructure for the transportation system in Sukabumi City and plays an important role in the mobility of the population and economic development of the region. However, this terminal is still not less feasible as a type A terminal and still has several other problems such as flow problems that make the circulation of people and goods unclear and the division of zones in the terminal which is still not firm, as well as the lack of cleanliness and comfort in the terminal so that improvement efforts are needed to ensure that the K.H. Ahmad Sanusi Sukabumi Terminal is able to serve and support various activities in it Optimal. Therefore, to overcome all the problems that exist in the K.H. Ahmad Sanusi Sukabumi Bus Terminal and in line with the development of increasingly modern technology, applying the concept of smart bus station to the K.H. Ahmad Sanusi Sukabumi Bus Terminal is very relevant. In addition to being able to overcome the problems found in the K.H. Ahamad Sanusi Sukabumi Bus Terminal, the implementation of smart bus stations can support economic and creative growth.

Keywords: *Sukabumi, Terminal, Smart bus station*

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INTRODUCTION

Along with the increasing population growth every year which has various economic and social activities, causing an increase in demand for development, improvement, and improvement of infrastructure and services that support increasing population mobility. One of the important roles in supporting population mobility is the terminal. As an effort to support the smooth mobility of the population, a terminal is needed that is feasible and able to adjust its carrying capacity to the development of the surrounding area. The terminal is one of the public facilities in the transportation sector that functions as a place to stop public vehicles and pick up and drop off passengers. The scope of terminal service standards has a road transport terminal organizer in providing services to terminal users, for the main facility services and supporting facilities that are adjusted according to type and class so that aspects are added to achieve optimization of terminal implementation (Ministerial Regulation No. 40 of 2015). With the important role of the terminal in supporting connectivity between cities and regions, the passenger terminal is a vital point in supporting the movement of population and goods mobility that affects economic growth in Sukabumi.

Sukabumi is an area located in West Java Province which has a fairly strategic route because it is a route that connects several major cities such as Jakarta, Bogor, and Bandung. As a connecting area, Sukabumi has potential in the fields of economy and tourism. Trade and services in Sukabumi are developing as a distribution center for goods to Jakarta, Bogor, and Bandung. In terms of tourism, the tourism potential in Sukabumi is also very interesting. Sukabumi Regency is the second largest regency in Java Island with an area of 4,162 km2 or 11.21% of the provincial area. With its size, it is no wonder that Sukabumi Regency is famous for its extraordinary cultural and tourism diversity. So that many local residents and tourists visit Sukabumi to visit various tourist destinations with various modes of transportation, including buses. Tourists can easily explore the natural beauty and culture in Sukabumi. Currently in Sukabumi there are several terminals, one of which is the K.H. Ahmad Sanusi Terminal which is the largest terminal in Sukabumi. This terminal is located in Sudajaya Hilir Village, Baros District, Sukabumi City. This terminal located in the South of Sukabumi City is also the gateway to Sukabumi City. Although this terminal was only opened on October 10, 2016, several problems have already occurred at this terminal.

The biggest problem at the K.H. Ahmad Sanusi Sukabumi terminal is that the K.H. Ahmad Sanusi Sukabumi terminal is still not suitable to meet the standards of a type A terminal. In terms of the flow inside this terminal, it is also unclear, causing unclear circulation of people and goods and there are no clear boundaries between the division of room zones, then many terminal users are confused about determining the direction in meeting their needs because there is no clear signage in the K.H. Ahmad Sanusi Sukabumi Bus Terminal. To meet the standards of a type A terminal and ensure a sense of comfort and security at the terminal, changes are needed at the K.H. Ahmad Sanusi Sukabumi Bus Terminal. To overcome the problems at the K.H. Ahmad Sanusi Sukabumi Bus Terminal and in line with the development of modern technology, the smart bus station concept is implemented at the K.H. Ahmad Sanusi Sukabumi becomes very relevant. This terminal will also be used as a center for economic and creative activities in Sukabumi Referring to the Tirtonadi Terminal as a pilot terminal that has been realized earlier. In addition, the redesign of the K.H. Ahmad Sanusi Sukabumi Terminal is expected to improve the local economy through commercial facilities in the terminal. So that in the future, the K.H. Ahmad Sanusi Sukabumi Terminal will increase its popularity, people prefer to use buses, leaving a scary impression on the terminal, and improving the economy and tourism in Sukabumi.

METHOD

The design methodology applied to this terminal redesign is based on references from Ballast 1992 (Ballast, 1992). The programming method uses five process steps which include setting goals, collecting data (programming, Data analysis/design schematics), expressing concepts, determining needs, stating problems.

1. Setting Goals

Setting goals is a very important initial step. Design goals are set to provide clear direction for the project and ensure that all design decisions are aligned with client needs, space functions, and project constraints. By setting

clear goals early in the process, designers can ensure that each step in the design methodology is consistent with client needs and project parameters.

2. Data Collection

a. Programming

- Survey

Conducting a survey to the location of the K.H. Ahmad Sanusi Sukabumi Type A Bus Terminal and conducting surveys to pilot terminals such as the Pulo Gebang Terminal, Tirtonadi Terminal, Tingkir Terminal.

- Interview

Conducting interviews with parties related to the K.H. Ahmad Sanusi and pilot terminals, namely Pulo Gebang Terminal, Tirtonadi Terminal, Tingkir Terminal

- Observation

Collecting data by going into the field and conducting direct observations at the K.H. Ahmad Sanusi Sukabumi Bus Terminal location and direct observations at other bus terminals

- Documentation

Taking pictures in the form of photos or videos when conducting surveys, interviews, and observations as one of the supporting data and evidence in field studies.

3. Revealing the Concept

In the design methodology according to Ballast, revealing the concept is a key step taken at the Schematic Design stage. The design concept is a statement or main idea that is the basis and direction in creating a comprehensive design solution. This concept helps align the client's vision with the design decisions made during the process. At the stage of revealing the concept in the redesign of the K.H. Ahmad Sanusi Sukabumi Type A Bus Terminal with the smart bus station concept, reviewing the existing conditions of the K.H. Ahmad Sanusi Sukabumi Terminal, such as spatial layout, facilities, and transportation routes, to identify primary needs. Then analyze the needs such as the needs of users and stakeholders related to terminal modernization. Then after identifying the problems and analyzing the needs of the terminal, the next step is to determine the objectives of the terminal redesign itself, such as Providing user-friendly facilities with a focus on comfort and safety, Applying sustainability principles to reduce environmental impact. Furthermore, the theme and style that reflect the values of the smart bus station The theme and form aspects that will be applied to the K.H. Ahmad Sanusi Sukabumi Terminal are in line with the concept of a smart bus station, bringing aspects of technology integration, sustainability, and user comfort that reflect modernization in the terminal. Several aspects will be applied to the K.H. Ahmad Sanusi Sukabumi Terminal, one of which is futuristic and dynamic which depicts the terminal as a modern icon with an attractive appearance such as the curve of the building with glass plates and local cultural elements combined in the design to create an iconic terminal. Thus creating a bus terminal that does not function as a place for passengers to get on and off, but also as an inclusive, innovative, and inspiring public space. Concept visualization is done through sketches, mood boards, and initial renderings that depict elements that reflect the concept of a smart bus station. The resulting concept is evaluated and selected through discussions with clients and communities to ensure its suitability for purpose. Functional and aesthetic elements are then combined and the selected concept is documented in the form of drawings, descriptions, and presentations for further design development guidance and communication with all parties involved.

4. Determining Needs

In the redesign of the K.H. Ahmad Sanusi Sukabumi Type A Bus Terminal with the Smart Bus Station concept, there is a very important aspect, namely determining needs. These needs include various functional, technical, and aesthetic aspects that must be met to support the goal of modernizing an efficient and user-friendly terminal.

5. State the Problem

In the process of redesigning the K.H. Ahmad Sanusi Sukabumi Type A Bus Terminal with the Smart Bus Station concept, it is important to identify and state the existing problems. In the context of redesigning the K.H. Ahmad Sanusi Sukabumi Type A Bus Terminal with the Smart Bus Station concept, the problems are that the K.H. Ahmad Sanusi Sukabumi Type A Bus Terminal has not been able to meet the standards of a type A terminal and the flow problems within the terminal. This problem statement will be the basis for designing a

better, more efficient, and user-friendly design solution, as well as integrating technology and sustainability.

RESULT AND DISCUSSION

Based on the results of the analysis conducted to find the formulation of the problem at Terminal Type A K.H. Ahmad Sanusi Sukabumi, several problems were found in the terminal. These problems are the basis for creating the Smart Bus Station concept. Redesigning the building of Terminal Type A K.H. Ahmad Sanusi Sukabumi is expected to create a more modern terminal, overcome flow problems, create a cleaner and safer terminal for everyone, and improve the economy in Sukabumi. Redesigning Terminal Type A K.H. Ahmad Sanusi Sukabumi is also in line with the government's mission to improve land transportation services by revitalizing terminals and integrating between modes. In addition, it is hoped that the concept of this terminal can improve the local economy and increase public interest in coming to the terminal. From the characteristics of the Smart Bus Station concept itself, what will be taken and applied to Terminal Type A K.H. Ahmad Sanusi Sukabumi is a Smart Building which in general is a modern terminal that is environmentally friendly and sustainable, can provide a sense of security and comfort for all passenger elements without exception. Terminal Type A K.H. Ahmad Sanusi Sukabumi will later integrate technology, sustainability, and user comfort that reflects modernization in the terminal such as utilizing information and communication technology to manage the terminal such as providing real-time information about bus schedules, bus ticket prices, routes, and travel status through digital screens that are useful for passengers, security systems and services towards digital. In addition, the K.H Ahmad Sanusi Sukabumi Terminal will apply environmentally friendly and sustainable principles in terms of terminal design and operations, such as the use of environmentally friendly materials and low carbon footprint, maximizing natural lighting and ventilation to reduce energy consumption.

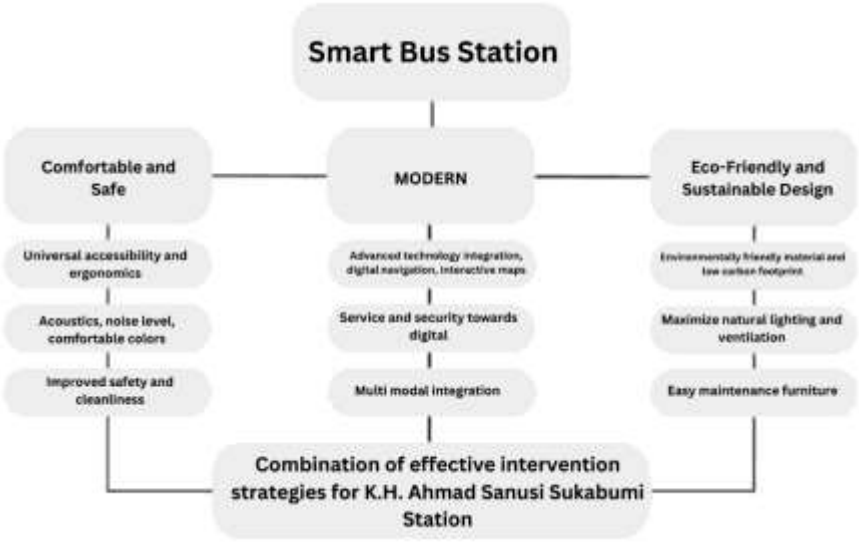

Figure 1. Idea and Concept Scheme
Source: Muhamad Andika Nugroho, 2024

Comfortable and Save

Terminal Type A K.H. Ahmad Sanusi Sukabumi is designed to be a modern transportation hub that integrates advanced technology, sustainability principles, and maximum comfort for users. Safety and comfort are fundamental elements that must be prioritized in the design of a Smart Bus Station. As a busy transit hub and often a hub for various modes of transportation, the bus terminal must be designed to provide a positive user experience while supporting operational efficiency. In the context of a modern terminal, an innovative and technology-based design approach can ensure that these safety and comfort aspects are optimally met. Here are some elements that ensure safety and comfort in the Smart Bus Station concept. Universal accessibility and ergonomics are two very important aspects in designing a Smart Bus Station that is friendly to all its

users. Universal accessibility in the Redesign of Terminal K.H. Ahmad Sanusi Sukabumi prioritizes the principle of universal accessibility to create an inclusive terminal, friendly to all users, and able to serve various needs without barriers. As a type A transportation hub, this terminal is designed to be easily accessible to every individual, including people with disabilities, the elderly, children, and users with special needs. Universal accessibility is realized through various elements of physical infrastructure designed to support the mobility of all users such as Ramps with standard slopes in vertical areas ensuring accessibility for wheelchair users, Provision of toilets equipped with wider space, additional handles, and special facilities for wheelchair users, warehouse blocks to support visually impaired passengers. Meanwhile, ergonomic design has a primary focus on efforts to create comfort and maintain the health of terminal users, by considering various influencing factors, such as posture, physical ability, and the needs of users from various age groups and conditions. In this case, every design element, from chairs in the waiting room, handrails on the stairs, to tables in the service area, is carefully designed to suit human needs and reduce the risk of injury or discomfort during use. In the context of Smart Bus Station, this ergonomic concept is not only applied individually but also combined with the principle of universal accessibility to produce an environment that is truly inclusive, comfortable, and supports the mobility of every user, both those with full physical abilities and those with special needs. The combination of these two concepts aims to create a terminal that is friendly to all, providing a better experience, and ensuring that everyone, without exception, can benefit from the facilities available at the terminal.

Figure 2. universal accessibility at K.H. Ahmad Sanusi Sukabumi Station
(Source: Muhamad Andika Nugroho, 2024)

In the redesign of Terminal Type A K.H. Ahmad Sanusi Sukabumi, the acoustic aspect plays a very important role in creating a comfortable terminal environment and supporting the overall user experience. Terminals that function as transportation hubs with high activity have major challenges in terms of noise, both from the sound of bus engines, vehicle horns, and interactions between users passing by in the terminal area. This noise, if not managed properly, can create discomfort for passengers, terminal staff, and other visitors. Therefore, an effective acoustic management system is needed to reduce noise levels while creating a conducive atmosphere in the terminal. In this terminal redesign, one of the approaches that will be applied to manage acoustics is the use of materials that have soundproof properties and are able to reduce noise.

One of the materials chosen is wood wall panels, which will be used in the convention hall, and slat acoustic wall panels, which are applied to rooms such as offices, medical rooms, toilets, and lactation rooms. Wood wall panels, or wooden wall panels, are interior design elements that not only provide aesthetic value through their natural and warm appearance but also function as effective materials in reducing noise. This material is designed to absorb excessive sound waves in the room, thereby reducing the echo or reflection of sound that can interfere with comfort. By integrating this material in the convention hall space, a quieter and more controlled acoustic environment can be created, supporting the function of the space as a place to gather or hold events with a comfortable atmosphere. Meanwhile, slat acoustic wall panels are chosen for more specific spaces, such as offices, medical rooms, toilets, and lactation rooms. These panels have similar capabilities to wood wall panels in terms of soundproofing, but with a more flexible and modern design. The use of slat acoustic wall panels in these spaces aims to create a quiet and private area, which is very important especially in

medical rooms and lactation rooms. By incorporating these materials into the interior design of Terminal Type A K.H. Ahmad Sanusi Sukabumi, the acoustic system applied not only functions to reduce noise but also increases the overall comfort of the terminal. This approach demonstrates a commitment to creating public spaces that are not only functional but also support the well-being o

Figure 3. wood wall panel at K.H. Ahmad Sanusi Sukabumi Station
(Source: Muhamad Andika Nugroho., 2024)

Security in the interior of the K.H. Ahmad Sanusi Sukabumi Bus Terminal is one of the most important aspects and is a top priority in efforts to provide comfort and safety to all terminal users. As a transportation hub that serves various passenger activities, this terminal requires a design that integrates various effective security elements to protect users from the risk of crime, accidents, or disasters that can occur at any time. Therefore, every step in the planning and design of the terminal must reflect attention to the needs of user protection, both physically and psychologically, in order to create a safe and conducive environment. To prevent crime in the terminal area, one of the security systems that will be implemented is the installation of CCTV cameras in every corner of the strategic room. This CCTV is designed to provide comprehensive surveillance of activities in the terminal, so that the potential for crime can be minimized. However, user privacy remains a primary concern, so CCTV cameras will not be installed in private spaces, such as toilets, lactation rooms, or medical rooms. In addition, security will also be supported by the presence of security officers who are on duty 24 hours a day. These officers will conduct routine patrols throughout the terminal area to ensure that there is no suspicious activity or dangerous situations. This patrol is also equipped with a monitoring system via CCTV that has been installed at various points, so that supervision can be carried out in real time and comprehensively.

Not only focusing on the aspect of crime prevention, this terminal is also designed to anticipate the potential for fires. The fire prevention system implemented includes the use of modern devices such as smoke and heat detectors that can detect smoke and temperature changes quickly, fire hydrants that provide a water source to extinguish fires, and sprinkler systems that will automatically spray water if a fire is detected. In certain areas, such as the terminal kitchen, gas detectors will be installed to detect gas leaks that have the potential to endanger users and facilities. This system is designed to provide early warning so that evacuation and handling actions can be carried out quickly and accurately.

Through the implementation of these various security systems, the K.H. Ahmad Sanusi Sukabumi Bus Terminal will not only be a functional transportation center, but also provide a sense of security and comfort for every user. The combination of modern technology, the presence of security officers, and complete safety devices creates a terminal environment that is responsive to all potential risks, so that it can support the mobility of the Sukabumi community and its surroundings better and safer.

Figure 4. Security System at K.H. Ahmad Sanusi Sukabumi Station
(Source: Muhamad Andika Nugroho., 2024)

Modern

Modern in the concept of smart bus station aims to integrate advanced technology, comfort, and sustainability in its design and function. Futuristic design serves to create infrastructure that is not only aesthetic, but also innovative, efficient, and functional, by utilizing advanced technology, modern materials, and spatial planning that supports comfort and sustainability, so that it can meet current and future needs. Integrating modernity with futuristic design creates a smart bus station that not only meets functional needs, but also becomes a symbol of innovation and progress. This concept emphasizes dynamic architecture, advanced technology, and progressive aesthetics while still considering sustainability and local identity. Futuristic design with a touch of local ornaments on the smart bus station is a perfect blend of modern technology and cultural wisdom. The local ornaments that will be applied are typical Sukabumi batik ornaments. The application of local batik ornaments at the K.H. Ahmad Sanusi Sukabumi Terminal can be applied as accents to architectural and interior elements. Typical Sukabumi batik motifs integrated with modern design not only beautify the terminal, but also become a medium to preserve and promote regional culture. This terminal will be a transportation facility as well as an iconic cultural landmark.

Figure 5. Futuristic design with local ornaments at K.H. Ahmad Sanusi Sukabumi Station
(Source: Muhamad Andika Nugroho., 2024)

Terminal Type A K.H. Ahmad Sanusi Sukabumi is designed to be a modern transportation center that integrates advanced technology, sustainability principles, and maximum comfort for users. This concept reflects modernization efforts that not only answer functional needs, but also support efficient and environmentally friendly mobility, in line with technological developments and the needs of the Sukabumi community and its surroundings. Terminal Type A K.H. Ahmad Sanusi Sukabumi will later integrate technology such as utilizing information and communication technology to manage the terminal such as providing real-time information about bus schedules, bus ticket prices, routes, and travel status through digital screens that are useful for passengers, security systems and services towards digital. As an effort to support a more modern and integrated terminal, integration between modes is needed so that it can support the economic mobility of the residents of Sukabumi and its surroundings. The following is a description of the transportation integration that will be implemented at the K.H. Ahmad Sanusi Sukabumi Type A Bus Terminal:

A. Intermodal integration
1. Public transportation
The terminal provides public transportation such as Teman Bus and Transjakarta along with shelters or special points available in the terminal so that they can accommodate terminal users who are going to Sukabumi.
2. Online Transportation
Providing shelters or special places for picking up and dropping off online vehicles (online motorcycle taxis, online taxis) without having to disrupt traffic activities at the terminal.

B. Integration Support Facilities
1. Transit and drop off area
The K.H. Ahmad Sanusi Sukabumi Type A Bus Terminal is equipped with a transit and drop off zone specifically for online vehicles and drop-offs so as not to disrupt traffic in the terminal.
2. Integrated information system
Installing a digital screen inside the terminal that contains information on departure schedules, arrivals, destination routes, ticket prices, and vehicle numbers in real time to passengers.
3. E-ticketing
Providing train ticket purchase machines or e-money cards and the like so that they can accommodate passengers who want to continue their journey by train or public transportation with e- money payment methods and the like.

Figure 6. Hallways at K.H. Ahmad Sanusi Sukabumi Station
(Source: Muhamad Andika Nugroho, 2024)

Eco Friendly and Sustainable Design

The application of environmentally friendly and sustainable design principles at the K.H. Ahmad Sanusi Sukabumi Bus Terminal aims to create a bus terminal that combines modern technology and resource efficiency. This terminal can be a model for future transportation facilities that support global sustainability. The selection of environmentally friendly materials is in line with the implementation of the Smart Bus Station concept that will be implemented at the K.H. Ahmad Sanusi Sukabumi Bus Terminal. Thus, the materials to be used, such as the use of environmentally friendly paint, the use of more environmentally friendly and sustainable materials, the use of large and wide glass that is useful for reducing the use of artificial lighting and maximizing natural lighting from sunlight. Environmentally friendly paint is not only the right choice to protect the health of users, but also contributes to environmental conservation efforts. In the Smart Bus Station project, the use of environmentally friendly paint is an important part of sustainable design that supports long-term comfort and sustainability. The interior of the terminal uses VOC-free paint for the waiting room, walls, and ceilings to create a healthy environment for passengers. As well as choosing water-based paint with high weather resistance to protect the outer walls of the terminal.

Figure 7. paint color of K.H. Ahmad Sanusi Sukabumi Station
(Source: Muhamad Andika Nugroho., 2024)

The choice of materials used on terminal floors, such as porcelain tiles and vinyl flooring, is based on functional, aesthetic, and easy maintenance considerations. Porcelain tiles are a material known for their durability and resistance to various conditions. This material is not only stain-resistant, but also able to withstand heavy loads, making it very suitable for areas with high traffic levels such as bus terminals. In addition, its smooth but non-slippery surface ensures safety for terminal users while providing a clean and modern appearance. On the other hand, vinyl flooring is chosen because of its flexible nature, comfortable underfoot, and good soundproofing capabilities. This helps create a quieter terminal atmosphere even though it is busy with activity. Vinyl is also resistant to water and stains, making it a practical choice for public areas that are prone to liquid spills or dirt. With a variety of colors and patterns, vinyl can provide an aesthetic nuance that supports the overall design concept of the terminal. Both materials have similarities in terms of ease of maintenance. Porcelain tile and vinyl surfaces can be cleaned quickly using simple cleaning tools such as mops or vacuum cleaners, helping cleaners keep the floor hygienic. Its resistance to stains and moisture also minimizes the risk of material damage due to daily use, thus reducing maintenance costs in the long term. With the combination of these two materials, the terminal not only has a functional and easy-to-maintain floor, but also provides comfort and aesthetics that are in line with the concept of a smart bus station.

Figure 8. Material of K.H. Ahmad Sanusi Sukabumi Station
(Source: Muhamad Andika Nugroho, 2024)

In the application of the Smart Bus Station concept at Terminal Type A K.H. Ahmad Sanusi Sukabumi, natural lighting is one of the important elements that is often overlooked in conventional designs. In fact, natural lighting has a very significant role in creating a more energy efficient, comfortable, healthy, and environmentally friendly space. Therefore, a strategy to maximize natural lighting should be one of the main focuses in the design of this terminal. One of the main steps that can be taken is the installation of large windows and a modern facade, which not only supports energy efficiency but also provides high aesthetic value to the terminal building. Large windows allow sufficient sunlight to enter, so that the need for electric lights during the day can be minimized. This directly supports the principle of sustainability by reducing energy consumption while reducing terminal operating costs. In addition, natural lighting that is evenly distributed in the room creates a brighter, warmer, and more comfortable atmosphere for terminal users, including passengers and staff. To ensure thermal comfort in the room, large windows can be equipped with special coated glass or low-e glass that can control solar heat. This technology allows light to enter without bringing excess heat, so that the indoor temperature remains cool and does not burden the air conditioning system. Thus, the use of large windows not only supports the lighting aspect but also energy efficiency in terminal operations.

In terms of design, large windows provide a futuristic appearance that is in line with the smart station concept, creating a modern, luxurious, and innovative impression. In addition, the presence of large windows provides a wide view outside, which not only beautifies the space but also creates a more open and pleasant atmosphere. Passengers inside the terminal can clearly see incoming vehicles or activities around the terminal, thereby reducing fatigue and providing a sense of connection with the outside environment. By integrating natural lighting elements through the installation of large windows and strategically designed facades, Terminal Type A K.H. Ahmad Sanusi Sukabumi can present a comfortable, efficient, and sustainable environment, while strengthening its identity as a future terminal that prioritizes technology, sustainability, and user comfort.

Figure 9.Hallways and waiting room
(Source: Muhamad Andika Nugroho., 2024)

In the process of redesigning Terminal Type A K.H. Ahmad Sanusi Sukabumi, sun orientation is one of the important factors that must be considered carefully. Design adjustments to the direction and intensity of sunlight play a significant role in improving building energy efficiency, thermal comfort, and the quality of user experience. By optimally utilizing natural lighting and reducing the need for artificial lighting, this terminal can create a more environmentally friendly and energy efficient environment. In addition, adjustments to sun orientation also help reduce excessive heat in summer while maximizing indoor thermal comfort. There are several important elements that need to be considered in terminal design related to sun orientation, one of which is the placement of space based on the direction of the sun. For the North and South sides, these areas are ideal locations for main spaces such as passenger waiting areas or office spaces. This is because sunlight exposure on both sides is more evenly distributed throughout the day, reducing the risk of excessive heat during the day during summer. On this side too, natural lighting can be optimally utilized to support visual comfort and reduce electricity use. Meanwhile, the East side is a suitable choice for spaces that are more active in the morning, such as the passenger arrival area. However, on this side, additional protection is needed to reduce the impact of direct morning sunlight which tends to be dazzling. One solution that can be applied is the use of design elements such as vertical shading or vertical protection, which is designed to minimize direct exposure to sunlight without significantly blocking natural lighting. With this protection, users can enjoy a comfortable atmosphere even though the morning sunlight is quite intense.

Through attention to sun orientation in design, Terminal Type A K.H. Ahmad Sanusi Sukabumi will not only be a functional building but also present a more comfortable, healthy, and efficient experience for users. The combination of intelligent design strategies with the use of modern technology will create a more sustainable terminal, both in terms of the environment and its operations.

Figure 10. Lobby and Hallways
(Source: Muhamad Andika Nugroho., 2024)

CONCLUSION

Redesign of Terminal Type A K.H Ahmad Sanusi Sukabumi with the Smart Bus Station concept is an effort to modernize public transportation facilities intended for all groups by integrating advanced technology, comfort for all users, and environmentally friendly design. By implementing Smart Bus Station into the Redesign of Terminal Type A K.H. Ahmad Sanusi Sukabumi will increase the attractiveness of the terminal as a modern and highly competitive public transportation facility in line with the increasing needs of modern society for decent and comfortable public transportation.

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