

SYNTHESIZING JAKARTA CITY'S LOCAL WISDOM: REIMAGINING SIDEWALKS WITH AN EMOTIONAL DESIGN AND SUSTAINABILITY APPROACH

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ABSTRACT

The research objective was to design sidewalks as walking facilities and public spaces, considering comfort, safety, cleanliness, and functionality for Jakarta's residents. The city of Jakarta, as a megapolitan center, hosted various societal activities. The high mobility of Jakarta's population led to busy sidewalk activities, especially walking, regulated by the Director General of Highways' guidelines. Walking could help reduce pollution, with Jakarta having the worst pollution in 2023. The research problem, based on 360-degree Google Maps images of sidewalks, was that sidewalks serve not only as footpaths but also as public gathering spaces. The qualitative research method examined digital data on sidewalk use in Jakarta (west, central, south, east, and north). The design process incorporated emotional design (visceral, behavioral, reflective) and three dimensions of sustainability (The Overlapping Spheres Model of Triple Bottom Line/TBL). The result is a 3D sidewalk model using emotional and sustainability design approaches. Synthesis of emotional design interprets visceral (sensory), behavioral (habits), and reflective (values) levels. Synthesis of sustainability includes environmental, social, and economic dimensions, focusing on air quality, water management, and energy efficiency. Social and economic aspects aim to meet Jakarta residents' basic needs. Ultimately, these recommendations aim to make cities and neighborhoods inclusive, safe, resilient, and sustainable. However, this research is limited to design recommendations without direct implementation. Further research or implementation is needed to address these challenges and ensure Jakarta residents' future well-being.

Keywords: design, Jakarta, sidewalk, sustainability

INTRODUCTION

Jakarta serves as the capital of Indonesia until 2023, although there is discourse regarding the potential relocation of *Ibukota Negara Baru Nusantara* (IKN) in the future (Fauzi & Sujadi, 2023). In this context, Jakarta represents a significant part of Indonesia's long development history, encompassing governance, economy, agriculture, society, infrastructure, and urbanization. Jakarta is referred to as a megacity because it serves as the central hub for other large cities such as Bogor, Tangerang, Bekasi, and their surrounding areas. The rapid population growth and economic development have also contributed to Jakarta becoming a megacity that stands as a cornerstone of

Indonesia's development (Rustiadi et al., 2021).

In the development of the city, Jakarta itself has faced numerous unresolved issues dating back to the period between 1950 and 1980. These problems stem from the city's geographical constraints and high population density. Jakarta traces its origins to the era of Prince Jayakarta in 1596, when it served as a trading center for the Dutch East India Company (VOC), later renamed Batavia. Following independence, it reverts to Jayakarta before eventually becoming known as Jakarta (Sedyawati et al., 1987).

One of Jakarta's issues is traffic congestion, which has been addressed through the implementation of the Transjakarta Busway transportation mode (Siahaan, 2015). Through this transportation mode,

it is hoped that the people of Jakarta can utilize public facilities for their daily mobility needs, such as going to work, school, or engaging in activities outside the home. Currently, the government is also continuously developing transportation infrastructure to support the activities of Jakarta's residents through the construction of the Commuter line, Mass Rapid Transit, and Light Rail Transit (Farda & Lubis, 2018). Furthermore, Jakarta has a poor record as one of the cities with severe air pollution (Figure 1), with an estimated death toll of 10,000 people, over 5,000 respiratory-related hospitalizations, and around 7,000 cases of childhood illnesses (Syuhada et al., 2023). One factor is the use of private vehicles in the mobility activities of its residents.



Figure 1 The Worst Pollution in Jakarta (Indra, 2023)

The public facility that supports the mobility activities of Jakarta's residents is the sidewalk. According to the decision of the Director General of Highways No.76/KPTS/Db/1999 dated December 20, 1999, the definition of a sidewalk is a part of the roadway specifically designated for pedestrians, with

a surface elevation higher than the road surface, and generally parallel to the traffic lane with drainage channel placement. The main function of the sidewalk is to provide optimal service to pedestrians in terms of both safety and comfort (Royke, Theo, & Jansen, 2015).

Sidewalk design must incorporate concepts that account for environmental conditions. One of the relevant environmental issues related to the above phenomenon is the air pollution problem in Jakarta. The goal of sustainable design is for future generations, where sustainability design has three dimensions: economic, social, and environmental, commonly referred to as the triple bottom line or 3BL (Limano, 2023).

The agenda of sustainability design focuses on how design can meet the needs of future generations. Designers must be able to create designs that align with this agenda. In line with this agenda, the United Nations has also issued 17 sustainable development goals. In this part, the focus and boundaries that can become goals include achieving good air quality, ensuring good access on roads, increasing public space, and allocating a certain percentage of the city area to streets and sidewalks (45% or 50%, with 15-25% designated as open public spaces and 30-35% allocated for roads and sidewalks) (United Nations, 2023).

The sidewalk serves as the primary mobility access and can also function as public space, but there are issues where sidewalks do not perform well in their implementation. Sidewalks should ideally prioritize the implementation of comfort, safety, cleanliness, and functionality for the community. Table 1 is the data of photo errors in implementation from *Kementrian Pekerjaan Umum dan Perumahan Rakyat* (PUPR, 2023).

Table 1 Sidewalk Problems in Implementation (PUPR, 2023)

Comfort: The width and surface of the sidewalks do not meet standards, and there are numerous obstructions along the pathways.

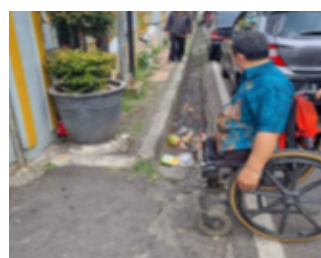


Table 1 Sidewalk Problems in Implementation (PUPR, 2023) (Continued)

Safety: Open drainage without covers, hazardous sidewalk surfaces and materials, safety barriers blocking access to the road, and poorly anchored bollards.



Cleanliness: Infrequent trash bins, non-durable materials, and improper placement of trash bins.



Functionality: The sidewalk does not fully serve mobility and public space functions properly.



Based on the phenomenon and data mentioned, this research aims to develop recommended designs for Jakarta's sidewalks that align with the representation of Jakarta's community life in utilizing sidewalks based on a sustainable design concept approach. This will thereby achieve the sustainable development goal of "Make cities and human settlements inclusive, safe, resilient, and sustainable". The recommended designs will be created using visual techniques such as 3D modeling.

Based on the research objectives, a qualitative research method with a descriptive approach is conducted by analyzing emotional design and sustainability. Emotional design is utilized to generate a design that is liked by individuals (Norman, 2004), exploring why people like and dislike something.

This aims to understand the community's preferences regarding sidewalk usage, thus enabling the recommended sidewalk design to be emotionally appealing to Jakarta residents on an individual level. Sustainability design involves analyzing the triple bottom line approach (Environment, Economic, Social) (Correia, 2019).

Design for sustainability transitions is a process whereby a society or community undergoes an adjustment process for a design or policy that supports sustainable concepts. Designers themselves are important agents in generating sustainable concepts within a country or specific community (Gaziulusoy & Öztekin, 2019). Therefore, it is imperative for researchers to conduct research that addresses the issues with the stated research objectives.

METHODS

The research method employed is qualitative, involving the process of creating recommendations for sidewalk design, which will be analyzed through descriptive interpretation (Lê & Schmid, 2022). The focus of this research is limited to the sidewalks in Jakarta's west, central, south, east, and north regions, which encompass major roads, public transportation routes, and business districts. These areas are chosen due to the high level of mobility observed in the community's activities using the sidewalks.

The data collected is secondary and consists of visual documentation of activities occurring on the sidewalks of Jakarta (west, central, south, east, and north) in the form of images extracted from Google Maps (Mehta, Kanani, & Lande, 2019). This data aims to provide an understanding of the activities of Jakarta city residents on the sidewalks. The images will be analyzed using literature on emotional design and sustainability.

Analysis of sidewalk problems based on literature studies of emotional design and sustainability results in the development of recommended designs through 3D modeling. The design recommendations will be interpreted descriptively to explain the use of emotional design and sustainability in sidewalk design. This process is also referred to as synthesis (Chigbu, Atiku, & Du Plessis, 2023), where the design is created based on the interpretation of emotional design with approaches at the visceral (sensory), behavioral (habits), and reflective (values) levels, accompanied by sustainability design reviewing dimensions in three dimensions (economic, social, and environmental). It is hoped that these recommendations can contribute to achieving the Sustainable Development Goals (SDGs) "Make cities and human settlements inclusive, safe, resilient, and sustainable".

Visual communication design works will be created using 3D modeling techniques. Figure 2 shows a schematic of the 3D model design work process.

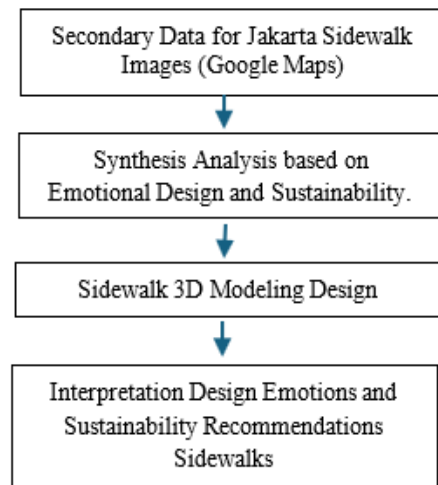


Figure 2 Design Process 3D Modelling Sidewalk

RESULTS AND DISCUSSIONS

The following is data collected online through photo data from the Google Maps application. This data collection also aims to synthesize the local wisdom of the people of Jakarta based on an analysis of community activities contained in photos.

The images are taken from various parts of Jakarta, such as the west, east, north, south, and central. The observation area includes areas considered to be main routes, public transport routes, and business districts. These are photo documentation from the Google Maps application (2022-2023).

Overall, the data obtained looking at general activities in West Jakarta (Figure 3) shows the use of sidewalks as parking for vehicles, especially motorbikes. Traders carry out buying and selling activities either by traveling around, in carts, or in shelters.

Overall, the community's activities in using sidewalks in Central Jakarta (Figure 4) include sitting while waiting for public transportation, motorcycle



Figure 3 Activities on West Jakarta Sidewalks – Sidewalks Problem; Obstructed, Commerce, and Encroachment

taxi stands, places for vendors to set up carts for trading at certain times, motorcycle parking areas, and locations for buying and selling activities.



Figure 4 Activities on the Sidewalks of Central Jakarta – Sidewalks Problem; Obstructed, Informal Commerce, and Congestion



Figure 5 Activities on the Sidewalks of South Jakarta – Sidewalks Problem; Encroachment, congestion, informality

Activities that occur on the sidewalks of South Jakarta (Figure 5) include mobile coffee sellers, a place for employees to gather, rest, and look for food at cheaper prices. Apart from that, it is also a place for online motorcycle taxi drivers to wait for passengers on the application.

Community activities on the sidewalks of East Jakarta (Figure 6) are generally used as a place for trading both goods and services. In fact, it sometimes looks very messy due to the large amount of equipment used by traders on the sidewalk. This also replaces the main function of the sidewalk, which should be used for mobility on foot, turning it into a place for people to trade goods and services. The presence of street traders requires cooperation with the government through the regulation of activity spaces, distribution patterns, and types of goods (Azima, Yuniarman, & Lestari, 2020).



Figure 6 Activities on East Jakarta Sidewalks – Sidewalks Problem; Trade encroachment, Clutter, and Regulation

Interesting activities from the northern Jakarta area can be found in Ancol and Kelapa Gading (Figure 7). This area is known for recreational activities, such as visiting the beach and Dufan amusement park in Ancol, making it a popular destination. Consequently, food and beverage vendors can be seen along the Lodan

sidewalk. Meanwhile, Kelapa Gading is known for its commercial activities, including offices, culinary delights, and shopping centers, leading to sidewalks being converted into parking spaces.

The community's activities are shaped by individual habits influenced by matter, life, mind, and culture. The units that build these habits are objects, organisms, animals, and humans (Henriques & Michalski, 2020). From this statement, design recommendations can be proposed as objects to be implemented based on the needs of the Jakarta community. This can influence the habits of the community based on the use of objects. In this research, the object used is the sidewalk as a stimulus.



Figure 7 Activities on North Jakarta Sidewalks – Sidewalks Problem; Parking Encroachment and Recreational Congestion

Based on the community activities in Jakarta obtained from the data (Figure 3-7), a literature analysis will be conducted using emotional and sustainability design. After the analysis is completed, the process will proceed to design sidewalk recommendations through 3D modeling to visualize the results of the literature analysis (Cakmak et al., 2022). Analysis of the issues arising is conducted through a synthesis of literature (Chigbu, Atiku, & Du Plessis, 2023) to generate findings that identify the problems based on sidewalk data in Jakarta. This synthesis is used to analyze emotional design and

sustainability design by understanding the key maps of these two approaches. The key map for emotional design includes visceral (sensory), behavioral (habits), and reflective (values). The key map for sustainability design includes environmental, social, and societal aspects. This discussion aims at developing sidewalk design concepts through literature synthesis.

When talking about design that influences social activities, one of the well-known design theories is emotional design. Emotional design, as stated by Norman, has three levels in producing designs that suit individual emotions: visceral level, behavioral level, and reflective level. The visceral level is a design level based on the individual's five senses, the behavioral level is a design aimed at individual habits, and the reflective level is the basis of design based on reflective values in society (Hou, 2020).

| Visceral | Behavioral | Reflective |
|--|---|---|
| <ul style="list-style-type: none"> • Subconscious • Biologically determined • Attractiveness • Rapid judgement • First impression | <ul style="list-style-type: none"> • Subconscious • Influenced by training • Usability • Understandability • Performance • Function | <ul style="list-style-type: none"> • Conscious • Influenced by experience • Extending much longer • Value • Meaning • Culture |

Figure 8 Level Emotional Design – Norman

Based on the emotional design in Figure 8, data on the activities of Jakarta residents on the sidewalks can be analyzed. The visceral level reflects an individual's state of consciousness, where decision-making is influenced by the five senses in the mental process. External conditions that can influence an individual's psychology are closely related to the interaction of the five senses: sight, hearing, smell, touch, and taste (Rodrigues et al., 2019). Focusing on the five senses, such as the eyes, nose, mouth, ears, and sense of touch, is the key to analyzing the design of Jakarta's sidewalks. The visual design of sidewalks can stimulate individuals' eyes, creating an aesthetic impression that can influence their perception of the surrounding environment. The nose, as one of the five senses related to air freshness, can be linked to efforts to reduce pollution through sidewalk designs that support improved air quality. Meanwhile, the mouth focuses on understanding the eating and drinking needs of people who use the sidewalk. A sidewalk design that considers these activities can create a more functional space and support daily activities. The ears, as the five senses involved in social interactions, can be linked to the habit of 'hanging out' or talking on the sidewalk. Creating comfortable meeting spaces on sidewalks can be an important consideration in urban design. Lastly, the sense of touch or skin layer requires an environment that provides a shady sensation. Sidewalk designs that take into account elements such

as greenery or shade can create a more comfortable experience for individuals.

At the behavioral level of design, the focus is on individual perception and mindset influenced by function, understanding, and needs. Based on Law Number 2 of 2022 concerning the Second Amendment to Law Number 38 of 2004 concerning roads, lanes for motorized two-wheeled vehicles, pedestrians, cyclists, and/or persons with disabilities are part of the road's utility space. Road authorities have an obligation to ensure inclusive pedestrian facilities for vulnerable groups. However, the technical planning guidelines for pedestrian facilities (Pd-03-2017-B) do not fully meet the regulatory requirements, lacking inclusivity for persons with disabilities, the elderly, children, and women. Therefore, it needs to be improved with adjustments to ensure that pedestrian facilities comply with regulatory developments and meet the needs of all segments of society. In this context, issuing a Circular Letter by the Director General regarding the technical planning guidelines for pedestrian facilities becomes a necessary step PUPR in 2023. So, in sidewalk design, it is intended for community mobility activities, but within community activities, the sidewalk also serves as a meeting space for interaction in the buying and selling process and socialization.

The reflective level exists within the full consciousness of individuals, where consciousness is grounded in objects, phenomena, and processes measured by values, pragmatics, aesthetics, morals, culture, and religion. This results in individual awareness to decide their interest in sidewalk design (Kapustina et al., 2021). Therefore, at this level, it is called reflective, which means measuring value based on current consciousness or future values. Sidewalk design must have values that can be a reflection for individuals, such as engaging in mobility activities using sidewalks and public transportation. Based on these discussions, the emotional design is formulated in Table 2.

After discussing emotional design, further discussion is on how Jakarta's sidewalks can have a sustainable design concept. Considering the background goal of sustainability, the most suitable goal for the research theme is Goal 11, making cities and human settlements inclusive, safe, resilient, and sustainable. More specifically, within sub-target 11.8 Strong National and Regional Development Planning, this section addresses support for economic, social, and environmental aspects, which are also dimensions

in the triple bottom line in sustainable design planning (Küfeoğlu, 2022).

Triple Bottom Line (TBL) is a sustainability aspect that encompasses people, planet, and profit. The dimensions of TBL include environmental quality, social equity, and economic benefits. The economic dimension focuses on profit generation, including values, growth, and cash flow. The social dimension emphasizes human focus, involving interactions between individuals during activities. The environmental dimension concentrates on the planet, aiming to minimize energy consumption, manage waste, adopt green practices, and utilize natural resources effectively and efficiently (Correia, 2019).

A popular scheme model is used to illustrate TBL in Figure 9. In three dimensions, there is no hierarchy; rather, they are interrelated and interconnected (Limano, 2023).

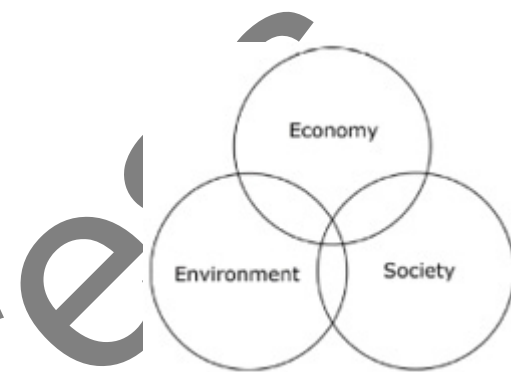


Figure 9 The Nested Spheres Model TBL



Figure 10 The Overlapping Spheres Model TBL

The TBL diagram in Figure 9 is considered by researchers to be an approach that is not suitable for the SDGs. The appropriate approach is for the environment to have a larger overlap than society and

Table 2 Analysis Emotional Design Problem
Sidewalk Jakarta

| Visceral | Behavioral | Reflective |
|--|---|--|
| Eyes: Visual Design Nose: Fresh air Mouth: Eating and drinking Ears: Social interactions Skin: Protection from the sun | Habits in the mobilization of the Jakarta community, as a meeting space for interaction in the buying and selling process and socialization | Measure value based on current awareness or future value in using the sidewalk. For example, for health. |

the economy. In terms of design, the environment should be the primary focus, larger than society and the economy (Sandhu, McKenzie, & Harris, 2014). The TBL model in Figure 10 is considered better.

Based on this TBL model, the researcher also considers the overlap model to be the appropriate choice for designing sidewalks in Jakarta. With the environment having a larger scope than society and the economy, the environmental dimension should be larger in the design of Jakarta's sidewalks.



Figure 11 Sidewalks with the Same Height on the Road Body (PUPR, 2023)



Figure 12 Sidewalk Along Lot with Parking Edge (PUPR, 2023)



Figure 13 Division of Zones on the Sidewalk (PUPR, 2023)



Figure 14 Commercial Areas and Bollards (PUPR, 2023)

Figure 14 depicts a commercial area for vendors' stalls in the innermost part of the sidewalk. Bollards are placed to separate the pedestrian area, particularly for those with disabilities, to ensure safer activities on the sidewalk. In this design, the bollards are shaped like an S. This S-shaped design aims to prevent conflicts between motor vehicles and pedestrians.

In the sidewalk designs by PUPR, everything is well planned. However, considering the issues presented in Table 1 and the data in Figures 3-7, there is a need for a design approach that incorporates local wisdom. The local values used in the sidewalk design implementation reflect the community's habits and activities, making them an integral part of the communal experience (Primayanti & Puspita, 2022). The first thing to consider is why people prefer to use sidewalks, which depends on their emotional attraction to the design (Norman, 2004). The results of incorporating local values into emotional design can be seen in Table 2. Additionally, to ensure the sustainability of this design approaches that consider the environment, economy, and society are necessary. (Correia, 2019).

Based on the discussion and analysis of the data, a 3D model design will be developed. The design process will be based on the interpretation of community activity data and the concept of sustainable design, which encompasses three dimensions (environment, society, and economy), as seen in Figure 15.

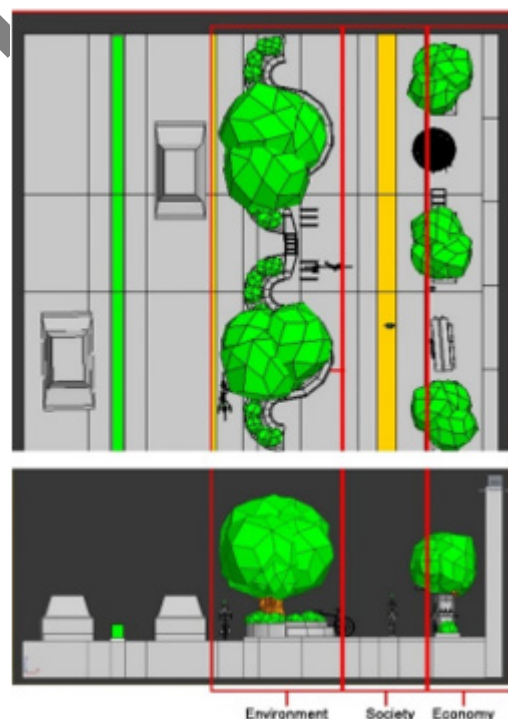


Figure 15 Recommendations for Sidewalk Design with TBL Sustainability

The sidewalk design has a sustainable concept with SDG 11 - make cities and human settlements inclusive, safe, resilient, and sustainable. The design

is carried out with a 50% percentage of public space on sidewalks and roads compared to buildings in the city. The sidewalk design is divided into overlapping spheres model TBL (Figure 9). The division of environmental dimensions is greater than society and economy, so it can produce better air and high-water absorption.

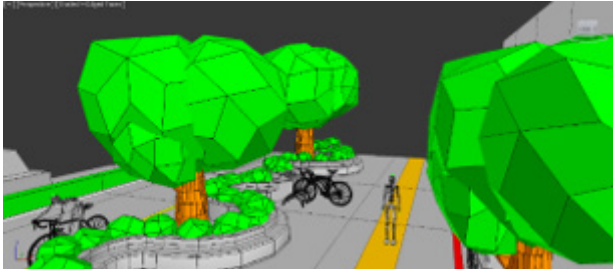


Figure 16 Environment Dimension

The environmental dimension (Figures 16 and 17) consists of road dividers made in an S shape, aiming to provide vegetation for better air quality, water absorption, and protection from direct sunlight. The essence of the environmental dimension is eco-city, namely the use of green energy in excessive energy consumption through alternative uses of new energy (Bibri, 2020). This can also be applied to mobility vehicles such as bicycles, electricity via solar power, and so on, which can be applied to the design of Jakarta city sidewalks.

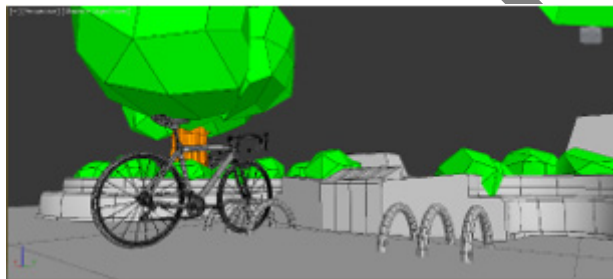


Figure 17 Trash Can and Bicycle Parking Area

In the environmental dimension, bicycle parking spaces and paths are prepared that can be used to reduce the use of motorized vehicles. Prevention of pollution begins with solving environmental problems, but there are ways in which changes in society's culture will also affect the sustainability of the environment (Elleuch et al., 2018). Fresh air and clean water start from the habits of city residents in their daily behavior, through new habits of walking and using public transportation will reduce the high level of emissions in Jakarta.

The dimensions of society and economy (Figure 18) represent designs focusing on the community and aimed at economic improvement. The social and

economic dimensions are one place that fulfills the basic needs of the people of Jakarta. It also contains food and drinks and is a place to socialize (Fajarwati, 2023). From data collection and analysis, it can be observed that community activities on the sidewalk are not only for walking but also for socializing and trading. Therefore, benches are installed for community socialization along with designated trading areas. Additionally, it is essential to consider the needs of people with disabilities with barrier-free pathways (Odame & Amoako-Sakyi, 2020).



Figure 18 Society and Economic Dimension

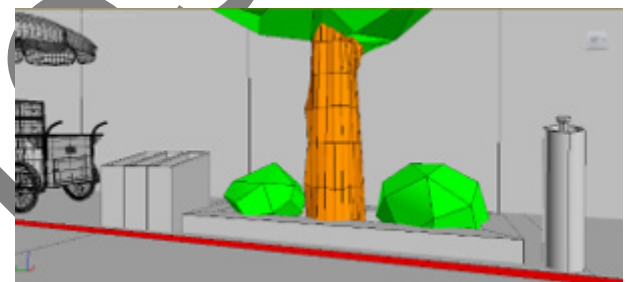


Figure 19 Water Fountain and Trash Can

In the design, provisions are made for trash bins and water fountains for drinking water availability (Figure 19). In the dimensions of society and economy, regulations are needed to govern cleanliness, tidiness, and community safety. In particular, ensuring the community's sense of security is paramount when using the sidewalks. In this discussion, non-physical security systems need to be enhanced, such as installing CCTV cameras at every corner of the sidewalk so that users of these facilities feel comfortable (Piza et al., 2019).

Sustainable urban design needs to have a focus on, among other things, the use of materials in design, a healthy society, and an economy that continues to recover (Wheeler, 2016). This is also related to the three dimensions of sustainability: environment, society, and economy, which are interconnected. These dimensions aim to achieve the sustainability goal: "Make cities and human settlements inclusive, safe, resilient, and sustainable."

Inclusive emphasizes the importance of creating cities and settlements that accommodate and benefit all individuals, regardless of their background, income, or

abilities. Inclusivity involves promoting equal access to resources, services, and opportunities for everyone within urban areas. Safe aims to ensure the safety of residents in cities and human settlements. This includes reducing crime rates, enhancing disaster preparedness, and creating environments where people feel secure in their daily lives. Resilience refers to the ability of cities and settlements to withstand and recover from shocks and stresses, such as natural disasters, climate change impacts, and other challenges. Building resilience involves implementing infrastructure and policies that can adapt to and mitigate these adversities. Sustainable emphasizes the need for development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable cities and human settlements integrate environmentally friendly practices, promote resource efficiency, and seek to minimize their ecological footprint.

In summary, SDG 11 aims to transform cities and human settlements into inclusive, safe, resilient places facing challenges and sustainable development to ensure a better quality of life for current and future generations. If studied based on these points, it can be broken down based on the sidewalk design, as seen in Table 3.

Table 3 SDG Goals from Design
Jakarta City Sidewalk

| | |
|--------------------|--|
| Inclusive | The design is based on looking at community activities and is made based on this to meet individual needs when using the sidewalk. |
| Safe | Designing safe sidewalks for individuals, especially for road users who have special needs, provides freeways, road dividers with vegetation, and CCTV which is recommended as 24-hour monitoring on every street corner in Jakarta. |
| Resilient | Resilience in sidewalk design has the ability to reduce pollution in the city of Jakarta through vegetation which is made dominant on the sidewalks, apart from that through space design for water absorption capacity, even if assisted with proper water flow it will reduce flooding in Jakarta. |
| Sustainable | In designing sidewalks, it provides design dimensions in the environment, society and economics. This is aimed at future generations. |

CONCLUSIONS

Jakarta is a megacity with a diverse range of activities carried out by its residents. The high level of mobility among the people of Jakarta results in significant sidewalk activity, especially walking, which is regulated by the technical facility planning guidelines issued by *Dirjen Bina Marga*. This research

does not focus on technical details but rather on emotional design and sustainability values.

When planning sidewalk design, it is essential to consider comfort, safety, cleanliness, and functionality in the design elements. Unfortunately, realizing these goals in practice is challenging. This research provides a perspective on how good design needs to incorporate local values into the activities of Jakarta’s residents, using an approach that integrates emotional design and sustainability.

The research process involves identifying problems by collecting secondary data, specifically images from Google Maps of Jakarta (west, central, south, east, north). These images illustrate that sidewalks have changed functions. Sidewalks are no longer merely facilities for walking but have become public spaces for the community. These public spaces incorporate local wisdom in meeting places, socialization, and even buying and selling activities.

Based on these problems, sidewalk design is analyzed using a synthesis of recommended designs from the keymap emotional design approach (visceral, behavioral, and reflective). The design is then carried out based on the three dimensions of sustainability (The Overlapping Spheres Model TBL). This results in sidewalk design recommendations through the reimagination of a 3D model. The design outcomes can address the activities of Jakarta’s residents by synthesizing approaches to emotional design and sustainability.

These design recommendations aim to emotionally attract the residents of Jakarta to use the sidewalks, as they accommodate local activity values based on emotional and sustainable design. This research’s limitation is that the design is offered as recommendations without direct implementation in the community. This presents a further challenge that can be addressed by future research or implementation processes in the field, highlighting the importance of this issue for the people of Jakarta in the future.

REFERENCES

Azima, B. S. N., Yuniarman, A., & Lestari, S. A. P. (2020). Strategi penataan pedagang kaki lima (PKL) berdasarkan pola aktivitas dan pola penyebarannya di koridor jalan Pejanggik kecamatan Cakranegara. *Jurnal Planoearth*, 5(1), 14-19. <https://doi.org/10.31764/jpe.v5i1.1873>.

Bibri, S. E. (2020). The eco-city and its core environmental dimension of sustainability: Green energy technologies and their integration with data-driven smart solutions. *Energy Informatics*, 3(1), 1-26. <https://doi.org/10.1186/s42162-020-00107-7>.

Cakmak, E., Jackle, D., Schreck, T., Keim, D. A., & Fuchs, J. (2022). Multiscale visualization: A structured literature analysis. *IEEE Transactions on Visualization and Computer Graphics*, 28(12), 4918-4929. <https://doi.org/10.1109/TVCG.2021.3109387>.

Chigbu, U. E., Atiku, S. O., & Du Plessis, C. C. (2023). The

- science of literature reviews: Searching, identifying, selecting, and synthesising. *Publications*, 11(1), 1-16. <https://doi.org/10.3390/publications11010002>.
- Correia, M. S. (2019a). Sustainability: An overview of the triple bottom line and sustainability implementation. *International Journal of Strategic Engineering*, 2(1), 29-38. <http://dx.doi.org/10.4018/IJoSE.2019010103>.
- Elleuch, B., Bouhamed, F., Elloussaief, M., & Jaghbir, M. (2018). Environmental sustainability and pollution prevention. *Environmental Science and Pollution Research*, 25(19), 18223-18225. <https://doi.org/10.1007/s11356-017-0619-5>.
- Fajarwati, A. A. S. (2023). Adaptive reuse of Pos Bloc and M Bloc: The intersection of third place, nostalgia, and circular economy. *Humaniora*, 14(3), 215-222. <https://doi.org/10.21512/humaniora.v14i3.9688>.
- Farda, M., & Lubis, H. A. (2018). Transportation system development and challenge in Jakarta metropolitan area, Indonesia. *International Journal of Sustainable Transportation Technology*, 1(2), 42-50. <http://dx.doi.org/10.31427/IJSTT.2018.1.2.2>.
- Fauzi, F., & Sujadi, S. (2023). Wewenang otorita ibu kota nusantara selaku pemegang hak pengelolaan kawasan ibu kota nusantara. *Tunas Agraria*, 6(3), 171-186. <https://doi.org/10.31292/jta.v6i3.246>.
- Gaziulusoy, İ., & Öztekin, E. E. (2019). Design for sustainability transitions: Origins, attitudes and future directions. *Sustainability (Switzerland)*, 11(13), 3601. <https://doi.org/10.3390/su11133601>.
- Henriques, G., & Michalski, J. (2020). Defining behavior and its relationship to the science of psychology. *Integrative Psychological and Behavioral Science*, 54(2), 328-353. <https://doi.org/10.1007/s12124-019-09504-4>.
- Hou, Y. (2020). Research on the application of emotional design in cultural creative product design. *E3S Web of Conferences*, 179, 02119. <https://doi.org/10.1051/e3sconf/202017902119>.
- Ibrahim, D. M. F. O. (2023). Enhancing the streetscape of sidewalks for sustainability and liveability in shared streets. *Green Building & Construction Economics*, 4(2), 225-240. <https://doi.org/10.37256/gbce.4220232244>.
- Indra, R. (2023). *Jakartans find worsening air pollution 'unbearable'*. Retrieved from <https://www.thejakartapost.com/paper/2023/06/15/jakartans-find-worsening-air-pollution-unbearable.html>.
- Kapustina, D., Churilova, I. G., Singilevich, D. A., Aralova, E. V., Wang, Y., & Luskin, M. B. (2021). The concept of "conscience" as an ethical category. *Laplace Em Revista*, 7(3D), 43-49. <https://doi.org/10.24115/s2446-6220202173d1689p.43-49>.
- Küfeoğlu, S. (2022). Emerging technologies: Value creation for sustainable development. In *Sustainable Development Goals* (255-275). Switzerland: Springer Cham.
- Lê, J. K., & Schmid, T. (2022). The practice of innovating research methods. *Organizational Research Methods*, 25(2), 308-336. <https://doi.org/10.1177/1094428120935498>.
- Limano, F. (2023). Sustainability of design architectural tourism area (Case study Pangandaran tourist market). In *3rd South American International Conference on Industrial Engineering and Operations Management*. Asuncion, Paraguay. Pp. 400-408. <https://doi.org/10.46254/sa03.20220088>.
- Mehta, H., Kanani, P., & Lande, P. (2019). Google maps. *International Journal of Computer Applications*, 178(8), 41-46. <https://doi.org/10.5120/ijca2019918791>.
- Norman, D. A. (2004). Emotional design. *Ubiquity*, 1(1). <https://doi.org/10.1145/966012.966013>.
- Odame, P. K., & Amoako-Sakyi, R. O. (2020). Sidewalk accessibility and pedestrian safety among students with physical disability in the University of Cape Coast. *Current Research Journal of Social Sciences and Humanities*, 2(2), 109-122. <https://doi.org/10.12944/crjssh.2.2.07>.
- Piza, E. L., Welsh, B. C., Farrington, D. P., & Thomas, A. L. (2019). CCTV surveillance for crime prevention: A 40-year systematic review with meta-analysis. *Criminology and Public Policy*, 18(1), 135-159. <https://doi.org/10.1111/1745-9133.12419>.
- Primayanti, N. W., & Puspita, V. (2022). Local wisdom narrative in environmental campaign. *Cogent Arts and Humanities*, 9(1), 2090062. <https://doi.org/10.1080/23311983.2022.2090062>.
- PUPR. (2023). *Perencanaan teknis fasilitas pejalan kaki*. Retrieved from <https://binamarga.pu.go.id/index.php/peraturan/dokumen/07pbm2023-pedoman-perencanaan-teknis-fasilitas-pejalan-kaki-bilrYWtpLQ&ntb=F>.
- Rodrigues, J. M. F., Ramos, C. M. Q., Pereira, J. A. R., Sardo, J. D. P., & Cardoso, P. J. S. (2019). Mobile five senses augmented reality system: Technology acceptance study. *IEEE Access*, 7, 163022-163033. <https://doi.org/10.1109/ACCESS.2019.2953003>.
- Royke, F. L., Theo K., S., & Jansen. (2015). Pemodelan Fasilitas Arus Pejalan Kaki (Trottoar). *Jurnal Sipil Statik*, 3(3), 212-220.
- Rustiadi, E., Pravitasari, A. E., Setiawan, Y., Mulya, S. P., Pribadi, D. O., & Tsutsumida, N. (2021). Impact of continuous Jakarta megacity urban expansion on the formation of the Jakarta-Bandung conurbation over the rice farm regions. *Cities*, 111, 103000. <https://doi.org/10.1016/j.cities.2020.103000>.
- Sandhu, S., McKenzie, S., & Harris, H. (2014). *Linking local and global sustainability*. Berlin, Germany: Springer.
- Sedyawati, E., Rahardjo, S., Johan, I. M., & Ohrella-Manilet, G. A. (1987). *Sejarah Kota Jakarta 1950-1980*. Jakarta, Indonesia: Departemen Pendidikan dan Kebudayaan.
- Siahaan, U. (2015). Kota metropolitan Jakarta; Kekacauan lalu lintas dan harapan jalan keluar oleh presiden sekarang. *Scale*, 3(1), 297-318.
- Syuhada, G., Akbar, A., Hardiawan, D., Pun, V., Darmawan, A., Heryati, S. H. A., Siregar, A. Y. M., Kusuma, R. R., Driejana, R., Ingole, V., Kass, D., & Mehta, S. (2023). Impacts of air pollution on health and cost of illness in Jakarta, Indonesia. *International Journal of*

- Environmental Research and Public Health*, 20(4), 2916. <https://doi.org/10.3390/ijerph20042916>.
- United Nations. (2023). *The sustainable development goals report 2023 special edition*. Retrieved from <https://unstats.un.org/sdgs/report/2023/>.
- Wheeler, S. M. (2016). Response to Nico Larco's sustainable urban design framework. *Journal of Urban Design*, 21(1), 47-49. <https://doi.org/10.1080/13574809.2016.1114381>.

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