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Enhancing Urban Livability Place Making of Outdoor Spaces within Transit-Oriented Development (TOD)

A Study Case on Rajawali Station Area, Jakarta

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Abstract – Urbanization profoundly impacts urban spaces, often resulting in inadequate planning, integration, and sustainability. Enhancing urban livability can overcome these problems with Place Making of Outdoor Spaces within Transit-Oriented Development (TOD). This study integrates insights from two research perspectives: firstly, exploring sustainability in outdoor spaces broadly through behavior mapping, documentation, and semi-structured interviews; secondly, focusing specifically on Rajawali Station in Jakarta. Despite Jakarta's TOD emphasis, gaps persist in implementing placemaking principles effectively. Employing qualitative methods, including behavior mapping and stakeholder interviews, this research assesses current usage patterns and proposes placemaking strategies for Rajawali Station. Based on the identification results, a mechanism for using outdoor space is needed to improve the quality of urban livability. Apart from that, based on the evaluation results, collaboration is needed in the use of outdoor space by participants. The impact of this collaboration can produce design recommendations based on sustainable human orientation. These recommendations are crucial for guiding sustainable urban development efforts and fostering community-centric outdoor spaces within TODs.

Keywords: *Jakarta, outdoor spaces, place-making, Transit Oriented Development (TOD).*

I. INTRODUCTION

Outdoor spaces are not just physical locations but integral parts of urban life that facilitate various activities and interactions (Lai et al., 2019). Jan Gehl, in his writing "Life Between Buildings: Using Public Space," emphasizes that outdoor spaces are where people can meet and interact, extending their private activities into the public realm (Gehl, 2011). The design of outdoor spaces is crucial as it affects how long people can enjoy outdoor activities (Jens & Gregg, 2021). Effective design should make people love their outdoor space, leading to vibrant, lively places.

However, current design practices often neglect the inclusivity of public spaces. A lack of understanding of what people want and need creates uninviting spaces that are devoid of pride for their participants (Mattsson, 2019). These spaces often become havens for criminal activities and negative social effects. One prominent example of an outdoor space that has suffered from neglecting community

participation, inclusivity, and good planning is the Pruitt-Igoe public housing project in St. Louis, Missouri (Heathcott, 2012). This case is often highlighted by urban designers and planners as a cautionary tale. Another example is Boston City Hall Plaza, known for its vast, uninviting, and windswept concrete expanses (Goad, 2023). It has been criticized for lacking human scale and comfort, leading to underuse and neglect.

Placemaking is an approach to urban planning and design that focuses on creating vibrant, engaging, and inclusive public spaces that cater to the needs and desires of the community (Ramli & Ujang, 2020). It involves the active participation of residents in the planning process, ensuring that the spaces reflect their values, culture, and lifestyle. Effective community involvement helps to make more informed decisions, thus providing a sustainable and high-quality living environment (Zanudin et al., 2024). This concept evolved from the influential urban activist and writer Jane Jacobs, who emphasized the importance of observing how people use spaces and involving the community in planning (Jacobs, 1961). An example of successful placemaking is Times Square in New York City, which transformed from a congested traffic area into a pedestrian-friendly plaza with seating, greenery, and public art (Abdel-Aziz et al., 2020). This transformation highlights the powerful approach of placemaking in prioritizing the needs and aspirations of the community.

Transit-Oriented Development (TOD) is primarily focused on creating and enhancing outdoor spaces, integrating public transit with residential, commercial, and recreational areas (Ibraeva et al., 2020). The current design direction in urban planning heavily emphasizes TOD due to its potential to reduce traffic congestion, promote sustainable living, and create more livable urban environments (Khaderi et al., 2021). In Jakarta, TOD projects are gaining momentum as the city seeks to address its chronic traffic problems and improve urban livability (Hasibuan & Mulyani, 2022). The Indonesian government, particularly in Jakarta, is committed to achieving increased public transportation usage, reduced reliance on private vehicles, and developing mixed-use neighborhoods that encourage walking and cycling (Rianawati et al., 2022). However, there is a noticeable lack of placemaking in Jakarta's TOD initiatives. While the infrastructure for TOD is being developed, the design and enhancement of outdoor spaces within these areas often fail to consider placemaking principles. This oversight results in spaces that are not fully optimized for community engagement and usability. To realize the full potential of TOD in Jakarta, there is a need for a clearer direction in incorporating placemaking elements into the design and development of outdoor spaces.

Research and writing on placemaking within TOD areas have highlighted both the potential benefits and implementation challenges. For instance, a study by Latip et al. (2023) explored the integration of placemaking principles into TOD projects and emphasized the importance of community engagement and multifunctional spaces in creating successful TOD environments. According to Nursanty (2023), integrating TOD and placemaking can transform transportation hubs into vibrant centers of social life and community activities. Furlan et al. (2022) proposed context-driven design strategies to enhance the livability of the TODs studied and suggested extending these strategies to other potential transit hubs in metropolitan areas. Another relevant study by Hrelja et al. (2020) highlighted the gap between TOD planning and the actual user experience, pointing out that many TOD projects fail to create inviting and functional outdoor spaces due to a lack of emphasis on placemaking. The primary challenges in implementing placemaking within TOD projects include limited community involvement in the planning process, inadequate funding for high-quality public space design, and often conflicting priorities of various stakeholders (Abdullah et al., 2023). Bridging these gaps requires a concerted effort to prioritize placemaking in TOD planning, ensuring that outdoor spaces are both transit-efficient and vibrant, inclusive, and engaging for the community.

Motivated by the critical importance of outdoor spaces, the adverse effects that poorly designed outdoor spaces can have on society, and the current lack of placemaking implementation in TOD areas, this research focuses on a TOD area near Rajawali Station on the KRL Commuter Line in Jakarta. This area is a significant node in the city's urban and transportation network, playing a crucial role in facilitating the movement of people within Jakarta and its surrounding regions. Given its importance, the outdoor space in this area must incorporate effective placemaking strategies. This research aims to evaluate and recommend the design of TOD outdoor spaces in this case study using placemaking strategies. The research aims to understand the current use of TOD outdoor spaces in the study area and to evaluate their usage based on placemaking standards. The primary objective is to provide

recommendations for using outdoor spaces in the case study area, guided by placemaking strategies to enhance their functionality and appeal.

II. LITERATURE REVIEW

This literature review focuses on transit-oriented development (TOD) and placemaking strategies to define and synthesize variables essential for this research. Defining these definitive variables will help direct the evaluation of existing conditions around Rajawali Station. The review encompasses the elements of TOD and the core strategies of placemaking.

Transit Oriented Development (TOD) is a sustainable urban planning concept that focuses on creating compact, mixed-use communities within walking distance of high-quality public transportation (Abdullah et al., 2023). This approach aims to reduce dependency on motorized vehicles by fostering pedestrian-friendly neighborhoods. According to Juliana et al. (2021), TOD emphasizes the integration of various land uses and activities, promoting vibrant, accessible, and environmentally sustainable urban living. The principles of TOD are designed to create livable, efficient, and sustainable urban environments. Putri and Trisnawan (2020) explain that TOD integrates development with the city's spatial layout to support diverse activities and multifunctional buildings, ensuring easy connectivity for pedestrians and cyclists. These principles are categorized into eight key areas that contribute to the overall goals of TOD.

- Walk: This principle focuses on designing streets prioritizing pedestrians, and ensuring safety, accessibility, and comfort. Human-centric street designs make neighborhoods more walkable, enhancing the quality of life for residents.
- Cycle: Promoting non-motorized transport networks is essential for TOD. Providing secure and convenient infrastructure for cycling supports healthy and flexible mobility options.
- Connect: Developing dense networks of streets and paths prioritizes pedestrians and cyclists, facilitating easy and flexible travel within neighborhoods. This connectivity is crucial for integrating communities and reducing travel distances.
- Transit: Locating development near high-quality public transit anchors neighborhoods to the city's larger transportation network, making it easier for residents to access various parts of the city.
- Mix: Planning for mixed uses, incomes, and demographics creates inclusive and vibrant communities. This diversity ensures that neighborhoods cater to various needs and preferences, fostering social interaction and economic activity.
- Density: Optimizing density to match transit capacity supports efficient public transport services and self-sustaining neighborhoods. High-density development ensures that essential services and amenities are within walking distance.
- Compact: Creating compact regions integrates transit and activities in a space-efficient manner. This principle enhances the neighborhood and city scales, making urban areas more livable and reducing the need for long commutes.
- Shift: Regulating parking and road use increases mobility and reduces the impact of private vehicles. This principle reclaims urban space for safer and healthier living environments, particularly benefiting vulnerable groups like young children.

These eight principles can be grouped into four elements for evaluating existing TOD areas: Walk and Cycle, Compact and Connect, Mix and Density, and Transit and Shift.

- Walk and Cycle: This element evaluates pedestrian and bicycle infrastructure, including the availability of bike lanes and parking and the vibrancy and safety of public spaces (Humaira et al., 2021; Zafira & Puspitasari, 2022).
- Compact and Connect: This aspect examines how TOD areas facilitate connections to city nodes, making movement within the area more accessible and enhancing the sense of proximity (Humaira et al., 2021).
- Mix and Density: Evaluating the completeness of amenities and diversity of land uses in the area is crucial. This element looks at the location density and whether residents can access a variety of facilities within a short distance (Zafira & Puspitasari, 2022).

- Transit and Shift: This evaluates the connection of public transportation to the TOD area and assesses the variety of transportation options available to residents for convenience (Khaderi et al., 2021).

In assessing existing TOD areas in Jakarta, these four elements provide a comprehensive framework to ensure the principles of TOD are effectively implemented, promoting sustainable and livable urban environments.

Placemaking is a multi-faceted approach to planning, designing, and managing public spaces. Rooted in community-based participation, it emphasizes creating quality places that people want to live in, work in, and visit. According to Thomas (2016), placemaking should move beyond the priorities of powerful individuals and influences, focusing instead on a more inclusive, process-centric model that engages the community and stakeholders in the development process. There are four key strategies essential for successful placemaking:

- Access & Linkage: This strategy emphasizes the importance of connectivity and ease of access between the place and its surroundings. Both physical and visual connections are essential, supported by efficient parking solutions and easy access to public transportation. This ensures that places are easily reachable and well-connected to the broader urban fabric (Bimantoro et al., 2022; Nugroho et al., 2022).
- Comfort & Image: Providing comfort and creating a positive image are critical for successful placemaking. This can be achieved by ensuring the area is safe, clean, and equipped with amenities that enhance the user experience, such as comfortable seating and rest areas. The environment should reflect a character or image that resonates with its context, contributing to a welcoming atmosphere (Bimantoro et al., 2022; Nugroho et al., 2022).
- Uses & Activities: A successful place attracts people through diverse and engaging activities. Visitors' ability to engage in a variety of activities creates a sense of vibrancy and uniqueness, encouraging repeated visits and fostering a special connection to the place. This strategy involves designing spaces that can accommodate a range of uses, making the area lively and dynamic (Bimantoro et al., 2022; Nugroho et al., 2022).
- Sociability: Placemaking should encourage social interactions, making safe and inviting spaces for people to meet and engage with others. A sociable environment enhances the sense of community and makes a place more appealing. These spaces must remain active and lively for longer periods, contributing to increased safety (Bimantoro et al., 2022; Nugroho et al., 2022).

These four strategies—Access & Linkage, Comfort & Image, Uses & Activities, and Sociability—serve as a comprehensive framework for evaluating existing public spaces and formulating design recommendations. By applying these strategies, this research aims to create environments that are not only functional but also vibrant, inclusive, and engaging.

III. METHODOLOGY

This study employs a qualitative research methodology to evaluate and recommend the design of Transit-Oriented Development (TOD) outdoor spaces near Rajawali Station using placemaking strategies. The chosen method is crucial for achieving the research objectives of understanding current usage patterns and evaluating these spaces against placemaking standards. Key components include data triangulation through behavior mapping, field observations, and semi-structured interviews with stakeholders. The research design adopts a qualitative approach, which is suitable for exploring placemaking within the TOD context near Rajawali Station. This approach allows for a nuanced exploration of social situations, encompassing activities, people, and places in outdoor spaces. The case study method is justified as it enables an in-depth examination of specific locations, facilitating detailed insights into the complexities of placemaking dynamics.

The literature review underpinning this research defines key variables essential for evaluating TOD spaces and guiding placemaking strategies. Identified Transit-Oriented Development (TOD) components include walkability, connectivity, density, and transit accessibility. These components are aligned with the criteria of placemaking, focusing on participants activities, access linkages, sociability, and comfort. This conceptual framework guides the assessment and recommendations for enhancing outdoor spaces.

This research employs a triangulation method to comprehensively collect and analyze data, ensuring a robust understanding of the dynamics of outdoor spaces and participants needs in the TOD area. Mindell et al. (2017) state the triangulation method offers a more comprehensive, holistic, and contextual portrayal when gathering data for social science research. Specifically, data triangulation involves three key elements: people, time, and space (Fusch et al., 2018). The people element is addressed through semi-structured interviews conducted with diverse stakeholders, including residents, commuters, urban planners, and business owners, to capture various perspectives on outdoor space usage and preferences. The time element is represented by behavioral mapping conducted at different times of the day and week to observe and document variations in the utilization patterns of the outdoor spaces. Lastly, the space element is explored through observation and documentation, which map the physical elements and spatial characteristics of the TOD area near the Station, providing insights into the existing layout of outdoor spaces and its surrounding environment.

Behavior mapping in urban studies involves systematically observing and documenting how people interact with outdoor spaces (Haryadi, 2010). In this study, place-centered mapping (Al-Sayed, 2018) specifically focuses on mapping participants behaviors and activities within the TOD area near Rajawali Station. This method is chosen to provide spatial insights into how outdoor spaces are currently utilized and perceived by different participant groups. Field observations are conducted to complement behavior mapping, capturing real-time usage patterns and environmental conditions within the TOD area. The observation process involves documenting current activities, participants behavior, and spatial configurations to inform placemaking strategies effectively. Interviews form a critical part of data collection, aimed at understanding community needs and perceptions regarding outdoor spaces near Rajawali Station. Participants include residents, urban planners, and other stakeholders selected based on their involvement and expertise in TOD development. Key questions focus on participants experiences, satisfaction levels, and suggestions for improving the functionality and appeal of outdoor spaces.

These approaches were crucial for understanding current usage patterns and spatial dynamics in Transit-Oriented Development (TOD) outdoor spaces near Rajawali Station. This comprehensive approach ensures the recommendations are informed by robust data and align with community needs and preferences. However, challenges related to data collection, such as time constraints during behavioral mapping and the subjective nature of observational data, could impact the depth and breadth of the analysis. These limitations underscore the need for a cautious interpretation of the results and suggest opportunities for future research to explore a broader range of TOD environments and enhance methodological rigor.

IV. RESULTS AND DISCUSSION

Rajawali Station Area, located in Jakarta, Indonesia, is a critical node in the city's urban and transportation network. As part of the KRL Commuter Line network, it plays a crucial role in facilitating the movement of people within Jakarta and its surrounding areas. This research focuses on the outdoor space Rajawali Station Area due to its strategic importance within Jakarta's Transit Oriented Development (TOD) initiatives (see Fig. 1). TOD is a significant urban planning strategy in Jakarta aimed at reducing traffic congestion, promoting sustainable living, and enhancing urban livability by integrating transportation hubs with mixed-use developments (Taki et al., 2017). Rajawali Station's strategic location and potential for urban development make it an ideal case study for evaluating and recommending design improvements using placemaking strategies.

Fig. 1. The View of Current Outdoor Space in the Rajawali Station Area
Source: Authors (2024)

Rajawali Station Area is strategically located near Mangga Dua and the Ancol area, both major commercial districts in Jakarta. Mangga Dua is renowned for its shopping centers, wholesale markets, and trade centers, making it a critical hub for both locals and tourists. According to Rifai et al. (2023), Mangga Dua is one of the largest shopping areas in Southeast Asia and a significant attraction point set by the DKI Jakarta Provincial Government to draw foreign tourists (see Fig. 2). On the north side of Rajawali Station Area lies Mangga Dua Square Shopping Mall, a key commercial hub. To the east, several attractions exist, including the New Museum and the complex of convention and trade centers where the Jakarta International Expo stands. The Ciliwung River borders the west side, one of the longest rivers in Jakarta, and is historically significant as the oldest settlement generator in the city (Permatasari et al., 2017). These surrounding developments underscore the station's economic and social importance.

For detailed and context-specific data collection, the study area around Rajawali Station Area is divided into three segments based on the functions of surrounding buildings and the types of activities observed. This segmentation allows for a comprehensive understanding of the diverse uses and characteristics of the outdoor space around Rajawali Station Area. By focusing on distinct segments, the research captures each area's unique dynamics and requirements, providing a robust basis for developing targeted placemaking strategies.

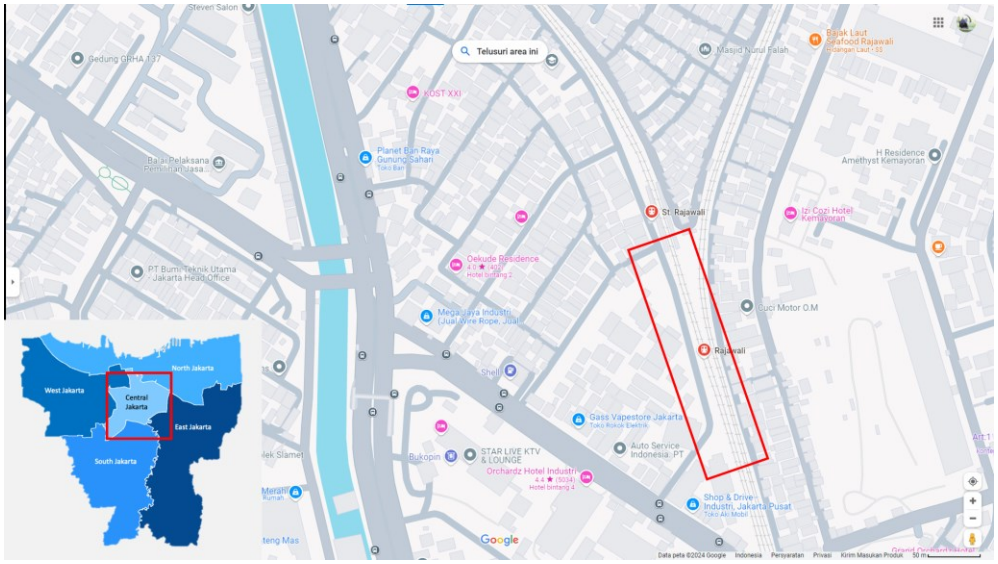

Fig. 2. Map of Study Location at Rajawali Station Area, Jakarta
Source: Authors (2024)

Rajawali KRL Station is a pivotal element in Jakarta's urban landscape, especially within the context of TOD (Hasibuan & Mulyani, 2022). Its strategic location near key commercial and cultural hubs enhances its importance for economic activities and social connectivity. The segmentation of the study area ensures that the research can provide detailed insights into the varied uses and needs of the space, facilitating the development of effective placemaking strategies to improve its functionality and appeal. This approach not only supports the city's transportation network but also contributes to the economic and social vitality of the surrounding areas.

In this study, the use of outdoor space was identified using the behavior mapping method, specifically through place-centered mapping. Observations were made based on participants, activities, time, and location at the study site, particularly within each previously segmented area. Based on observation this research identified three major types of participant: Industry (Participant 1), pedestrian (Participant 2), and online taxi (Participant 3). Based on activity density in the case study area, summarized in Table 1, segments 2 and 3 are highly active between 05.00-09.00 (Fig.4 – A.1.) and segment 2 between 09.00-12.00 (Fig. 4 – B.1.). This high activity is due to the concentration of key activities nearby, leading to potential congestion during these times, particularly in segments 2 and 3.

Mechanisms to reduce congestion in these outdoor spaces are necessary (see Fig. 3). The outdoor activity mechanism is one of the policies that can increase Urban Livability in a place.

Table 1. Behavior and Usage of Outdoor Space in Rajawali Station Area

Code	Time	Location	Participant 1	Participant 2	Participant 3
A.1	05.00-09.00	Segment 1		✓	✓
A.2	05.00-09.00	Segment 2	✓	✓	✓
A.3	05.00-09.00	Segment 3	✓	✓	✓
B.1	09.00-12.00	Segment 1		✓	✓
B.2	09.00-12.00	Segment 2	✓	✓	✓
B.3	09.00-12.00	Segment 3	✓		

Source: Authors (2024)

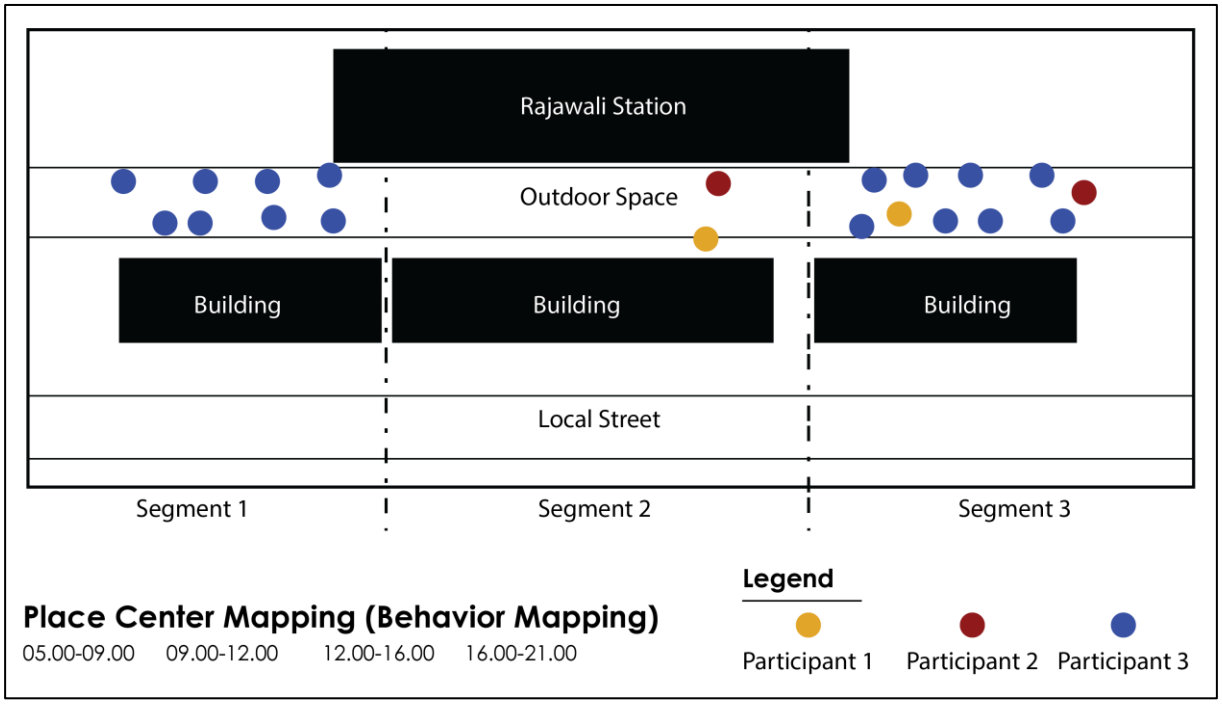

Fig. 3. Diagram of Behavior Mapping at Rajawali Station Area
Source: Authors (2024)

As shown in Fig. 4, field documentation reveals varying situations based on time, place, activities, and users. Activities from morning to evening tend to be more active than at night. The primary users are categorized into three main groups: industrial workers, online motorcycle taxi drivers, and pedestrians. Given the limited width of the outdoor space, careful observation of its usage is necessary.

A.1. Place Center Mapping (Behavior Mapping): 05.00-09.00 (UTC +07.00)

Location 1 Location 2 Location 3

B.1. Place Center Mapping (Behavior Mapping): 09.00-12.00 (UTC +07.00)

Location 1 Location 2 Location 3

C.1. Place Center Mapping (Behavior Mapping): 12.00-16.00 (UTC +07.00)

Location 1 Location 2 Location 3

D.1. Place Center Mapping (Behavior Mapping): 16.00-21.00 (UTC +07.00)

Location 1 Location 2 Location 3

Fig. 4. Participants Activity at Outdoor Space Rajawali Station
Source: Authors (2024)

A. Activity Density

The case study area has the potential for activity and physical space management based on time or the placement of activities. Managing these activities can improve the TOD standard quality through placemaking strategies. Activity management can be implemented by zoning activities and establishing clear physical spaces, thus achieving good standards moving forward.

Next, the authors conduct semi-structured interviews with users in the case study area to enhance the validity of this research. Users will provide insights into local conditions, with questions directed by the theoretical framework. These interviews will cover aspects related to TOD standards and placemaking strategies. In the case study evaluation process, researchers conduct interviews with users. This is important to know user perceptions regarding outdoor space. Knowledge of user perceptions is one form of increasing Urban Livability.

Table 2 summarizes the results from semi-structured interviews. Beginning with the aspects of walking and cycling, the case study area shows pedestrian activity but lacks clear pedestrian and cycling paths (see image). These activities occur in segments 1, 2, and 3, indicating a need for further planning for pedestrian and cycling paths. Furthermore, regarding the connect and compact aspect, there is potential for connectivity in this area but there is no intermediate area yet, such as a waiting room (transport point) to connect each form of transportation. Apart from that, the connect and compact aspects are closely related to transit and shifts by providing waiting rooms in intermediate areas between segments or by providing street furniture areas. Providing each of the previous elements can potentially create a good social space as a fulfillment of the Sociability aspect.

Table 2. Semi-structured Interview Data of Participants at Rajawali Station Area

TOD Aspects	A		B		C	D	
	Uses	Activity	Access	Linkages	Sociability	Comfort	Images

Walk	Not available	Not available	-	-	-	-	-
Cycle	Activities present	Activities present	-	-	-	-	-
Connect	-	-	Available access	Available access	-	-	-
Compact	-	-	Not connected	Not connected	-	-	-
Mix	Mixed-use present	Mixed-use present	-	-	Mixed-use present	-	-
Densify	Mixed-use present	Mixed-use present	-	-	Mixed-use present	-	-
Transit	-	-	-	-	-	Available	Available
Shift	-	-	-	-	-	Not comfortable	Not comfortable

Source: Authors (2024)

The findings through pedestrian perception indicate a need for designated pedestrian or cycling areas, user transit shelters, the distribution of mixed-use areas, and integrative interconnections in the outdoor space. Achieving this requires managing activities non-physically and providing physical design recommendations through place making, aligning with TOD standards. Such integration and collaboration, both physically and non-physically, among users, are essential for realizing these goals. This collaboration can increase social cohesion in that place.

B. Recommendations for Design and Activity Management

In creating an innovative street space, attributes related to urban livability are needed, such as street activity, pedestrian perception, social cohesion, and human-oriented design (Rui & Othengrafen, 2023). This will be seen in the design recommendations in this research. However, it begins with identifying user activities and interviews regarding previous user perceptions, so that a design recommendation can enhance urban livability.

Based on previous identifications, significant recommendations pertain to the neighborhood streets. Most of the time is utilized by pedestrians in each segment (Table 1). Similar needs are observed for online taxi drivers. Priority is given to pedestrians on main neighborhood streets to avoid congestion. Online taxi drivers are provided shelters at the end of each street. This arrangement reduces the interaction between different users on the streets. Industrial users are given specific time slots for using neighborhood streets, ensuring integrative, collaborative, and sustainable use.

In the design recommendations illustrated in Fig. 5, focusing specifically on segment 1, several proposals address non-physical management and physical space design. Initially, as seen in Fig. 7a, there are currently no shelters for online taxi services. The recommendation proposes placing shelters for online taxis at each end of the neighborhood street, depicted in Fig. 7b. Subsequently, in Fig. 7d, the area becomes accessible to various users, highlighting the need for a universally beneficial approach to using neighborhood streets sustainably across all user groups.

Existing Condition Recommendation Design

Fig. 5. Design Recommendation for the Outdoor Space in Segment 1
Source: Authors (2024)

Moving to the recommendations shown in Fig. 6, specifically for segment 2, there are suggestions concerning non-physical management and physical space design. Initially, in Fig. 5b and 5d, priority is given to pedestrians and cyclists on neighborhood streets. This shift can be observed before and after the recommendations in Fig. 5a, 5b, 5c, and 5d. These recommendations respond to evaluations indicating the lack of pedestrian and cycling lanes. Through placemaking strategies, outdoor spaces can better meet the sustainable needs of users in a given location.

Fig. 6. Design Recommendation for the Outdoor Space in Segment 2
Source: Authors (2024)

Finally, in the recommendations depicted in Fig. 7, focusing on segment 3, there are similarities with the previous Fig. 4. In Fig. 6, facilities such as online taxi shelters are provided to facilitate pedestrians requiring online taxi services. Additionally, green pedestrian paths are incorporated into neighborhood streets, serving as pedestrian thoroughfares and environmental enhancements. These recommendations embody sustainable practices that address the neighborhood streets' environmental, social, and economic aspects.

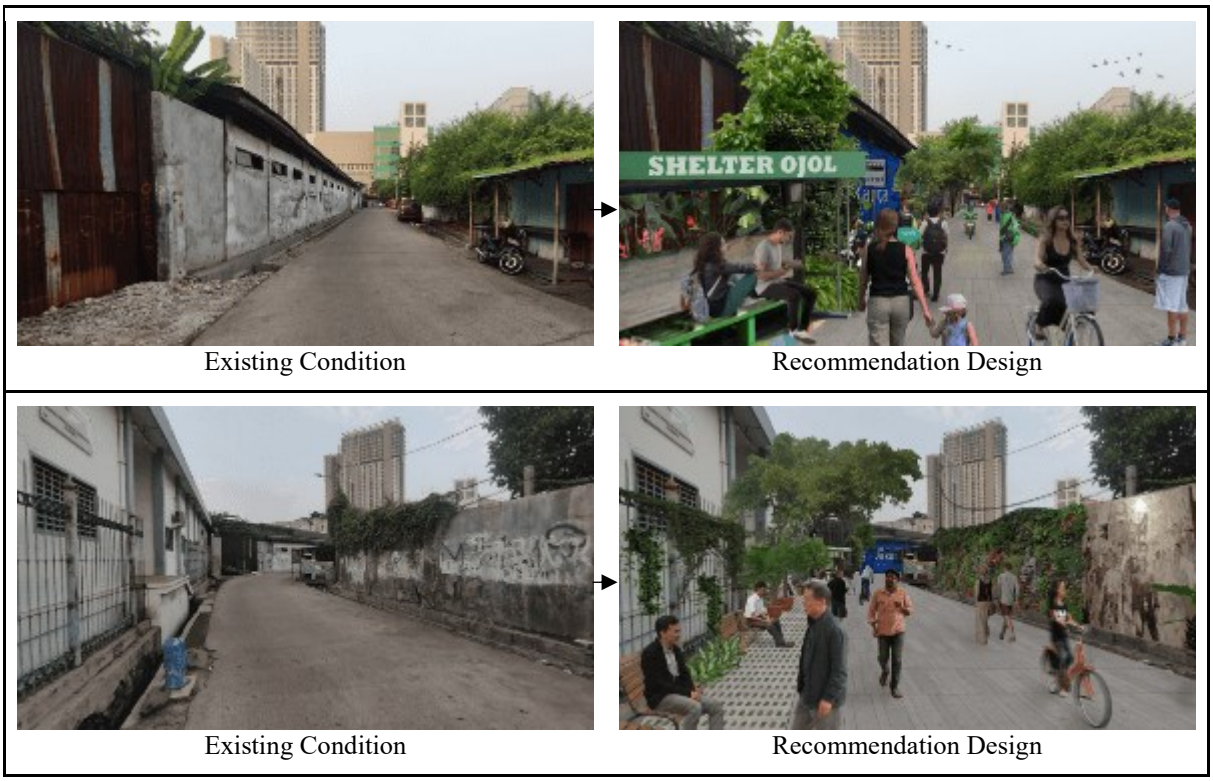

Fig. 7. Design Recommendation for the Outdoor Space in Segment 3
Source: Authors (2024)

These recommendations align with placemaking standards, optimizing space function, clear space markers, and time-based space management. These steps are crucial for creating sustainable outdoor spaces, providing valuable insights for future development around railway stations. Sustainability can be central to Cities and Urban Environments (Loorbach et al., 2016). Vulnerability to ecological, socio-economic, and political crises occurs in Cities and urban environments. On the other hand, cities and urban environments are innovative hubs for sustainability transitions, providing opportunities for many actors to jointly experiment and test urban practices to create and build new sustainable systems and infrastructures (McCormick et al., 2013; Evans et al., 2016). The research findings highlight the need for better pedestrian and cycling infrastructure, user transit shelters, and effective activity zoning in the outdoor space at Rajawali KRL Station. Implementing these recommendations through collaborative placemaking strategies can significantly enhance the TOD standards, promoting sustainable and vibrant urban development around the station. The insights gained from this study provide a valuable framework for future urban planning and design efforts to improve the quality and functionality of public spaces in transit-oriented developments.

V. CONCLUSION

Several strategic issues, such as the lack of integration, planning, and sustainability, influence the use of outdoor space in the case study. These factors affect how users share and utilize the outdoor space. Therefore, further research is needed to incorporate an understanding of placemaking. Placemaking is an approach to creating collaborative spaces. However, to apply this understanding effectively, it is necessary to conduct initial identification from both the user and usage perspectives within a case study so that it can be realistically implemented and impactful for the community.

This research involves several stages to answer the research questions, including identification, evaluation, and recommendations applicable to the case study. The findings from the initial identification process indicate that an outdoor space requires mechanisms for setting and activity regulation. Without such mechanisms, users use the outdoor space freely and without order. Once a mechanism is implemented, it is crucial to have collaborative use and management of the outdoor space. This collaboration should involve users and ensure that the physical space created supports this collaboration. Placemaking is an appropriate approach for providing evaluation and recommendations

to create a collaborative space.

Based on the identification results, to achieve an increase in urban livability, it is necessary to collect data on outdoor activities. This has an impact on the emergence of mechanisms for using outdoor space. Then, through the evaluation process, researchers can find out user perceptions regarding the use of outdoor space. This can impact the social cohesion of users towards the place, so it can be one of the points in increasing Urban Livability. Through design recommendations, innovation can emerge to improve the quality of urban livability. The design has strived to be user-based (human-oriented design) to produce a sustainable design.

The findings indicate a need for designated pedestrian or cycling areas, user transit shelters, the distribution of mixed-use areas, and integrative interconnections in the outdoor space. Achieving this requires managing activities and providing physical design recommendations through place making, aligning with TOD standards. Such integration and collaboration, both physically and non-physically are essential for realizing these goals. This collaboration can increase social cohesion in that place.

A collaborative outdoor space can create a sustainable and integrated environment. A sustainable space can integrate social, economic, and environmental aspects, positively impacting users. Therefore, this research concludes that understanding placemaking can help create a sustainable urban space.

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