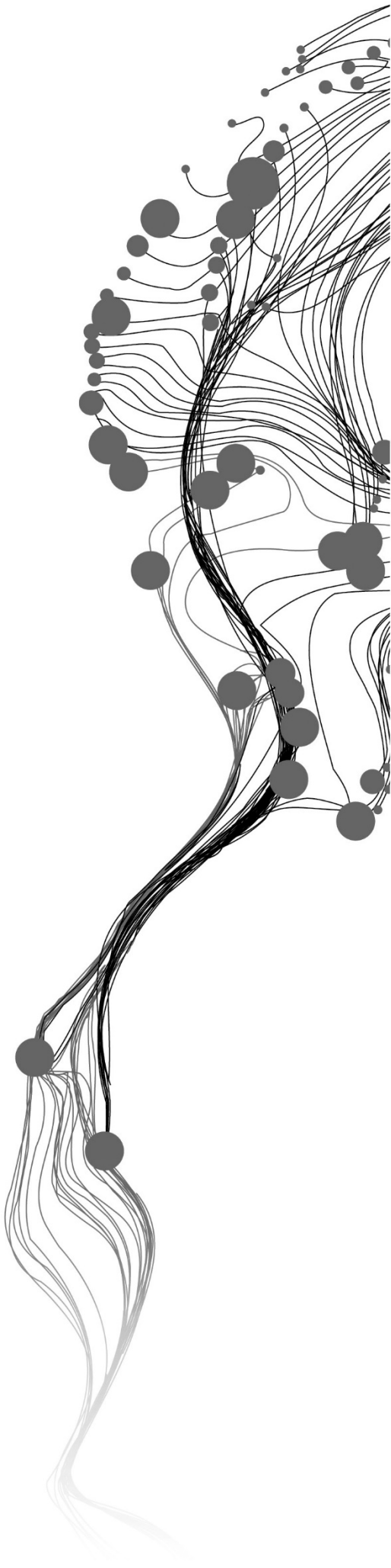


THE POTENTIAL OF TRANSIT- ORIENTED DEVELOPMENT TO SUPPORT CREATIVE INDUSTRIES IN BANDUNG, INDONESIA

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August 2023

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Enschede, The Netherlands,
August 2023

Thesis submitted to the Faculty of Geo-Information Science and Earth Observation of the University of Twente in partial fulfilment of the requirements for the degree of Master of Science in Geo-information Science and Earth Observation.
Specialisation: Urban Planning and Management

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ABSTRACT

Transit-Oriented Development (TOD) is an urban development strategy focusing on concentrating many activities into a transit node. This study sees the opportunity to synergise and develop creative industries (CI) with TOD. This study explores the TOD potential of Kampung Binong, Kampung Cigadung, and Kampung dago of Bandung, Indonesia, to propose recommendations that support CI growth through TOD dimensions. This study focuses on researching the relationship between the concepts of TOD and CI development and assessing the potential based on the context of each study case. Policy recommendations for integrating TOD and CI were formulated based on the results of the contextualisation through the local government's policies and the survey of the communities. This study produced a model of the TOD potentials of the three kampungs and found that the three studied kampungs, on average, have a 'Moderate Potential' to be developed as a TOD node, which, hypothetically, would support CI development in the kampungs. Based on those results, this study detects which indicators need improvements in each kampung. For example, all three studied cases are lacking 'pedestrian infrastructure availability', 'bike lanes availability', and 'distance to transit node'. For Binong which has a rather dense area with small roads, vehicle restriction or time restriction from motoric vehicle and an addition of one transit node to shuttle the kampung to the nearest train station and bus stop was recommended. In Cigadung, three additional transit nodes to shuttle the kampung to a bus terminal and bus stop were recommended to improve its TOD potential. Lastly, due to its street characteristics, building sidewalks for pedestrian and adding two transit nodes to connect the kampung Dago to the bus terminal were recommended. This study managed to investigate the general picture of the TOD potential of the studied creative kampungs by integrating the government's local policy on TOD and the needs of the CIs community, as well as proposed strategy recommendations that were tailored specifically for each kampungs for future policymaking.

Keywords: Transit-Oriented Development, TOD, creative industry, land-use and transport interaction, creative kampung

ACKNOWLEDGEMENTS

I used to believe that the best kind of thesis is the thesis that is done. However, during my research progress journey, I realise there are always more things to see, find, and discuss when it comes to the fascinating topic of people, land and urban system. It will never be done. Hence, I now believe that the better kind of thesis is the thesis that is submitted. So here we go; I'm glad I have this chance to thank each and everyone who has contributed positively to my master's study and the completion of this thesis before we get into it.

First of all, I'm very grateful to the Faculty of ITC for having confidence in me to give me the ITC Excellence Scholarship. Thank you for opening so many doors I never knew existed before. I wouldn't be able to stand where I am right now and reach this point in my life if it wasn't for the opportunity you've given me.

I would also like to thank Mafalda and Karin for all the love, support, and guidance you've given me through my master's and thesis journey in ITC. The kindness you've shown me has inspired me on how I should treat people. I have received Mafalda's support since my earlier journey at UPM, which continues through my GCLA project, her INECIS project, and finally, my thesis project, and I am grateful for all the courage she's put in me. I'm also most grateful I got to know Karin since last year's INECIS project. Thank you for all the care you've given through all the time you've known me.

Since starting this journey, I've also gained some people I consider as family here in the Netherlands. To Cham, my now housemate, thank you for being my person here; you know how grateful I am for you. To Aulia, Xuanya, and Enzo, my 'critical thinkers' crew, thank you for all the time, laughter, and therapy sessions for the last 2 years. My journey here wouldn't be the same without you guys. To Caro, Zannat, and Ivan, thank you for the ideas, support, and concerns you've shared with me in this master's journey.

I'm also very blessed to have my Indonesians here in Enschede. To Ali, whose presence is a big comfort to me on this journey, thank you for being around. I'm glad I get to share so many core memories with you. To Hafidz, thank you for always being ready to lend me your ears for all my troubles. To Arivia, Nuzul, and Wildan, for all the hang-out sessions that were much needed from time to time. And to my Geminis, Raka and Yesaya, thank you for caring for me like a sister. Hanging out with you guys keeps my sanity intact.

To my Drupadis, Antrik, Olivia, Orin, and Viona. Thank you for sticking around with me since 8 years ago (10 for Viona), and thank you for keep sharing your love even though we're 11,329 km apart.

And last, to the loves of my life, Mum and Dad, whose support has been the backbone of my existence. No words will ever be able to properly express how grateful I am to be born as your daughter. Thank you for always pushing me through my limits and making sure I know that you'll be there to catch me if I fall. My prayers are with you guys always.

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1. INTRODUCTION

1.1. Background and justifications

The creative industry (CI) is an economic sector utilising intellectual and creative abilities to generate jobs and income (Daubaraitė & Startienė, 2015; UNCTAD & UNDP, 2008). Several reports and papers on creative economy and CI mentioned that the term 'creative industry' includes advertising, architecture, arts and crafts, design, fashion, film, video, photography, music, performing arts, publishing, research and development, software, computer games, television, and radio (DCMS, 2001; F. Fahmi et al., 2016; Matiza, 2020; UNCTAD, 2022). The impact of CI on the national economy of developing countries is increasing its popularity because the industry is not limited by the country's economic level, as evidenced by the narrowing of the export gap between developing and developed countries in the past decade (UNCTAD, 2022). Additionally, CI is important to the economic development of developing countries as its ability to boost income and employment generation for developing countries (Shafi et al., 2019). Hence, CI is considered to have a huge potential for developing countries to contribute to the global economy due to their wide range of creative talents and significant levels of intangible cultural capital (UNCTAD & UNDP, 2008).

However, there are challenges often met by the CI's stakeholders while developing the industry. For example, one research concluded that the government's policy to develop the CI by providing infrastructure in creative clusters in Shanghai, China, does not show the expected positive impact (Zheng & Chan, 2014). Additionally, research on the CI of Bandung, Indonesia, found that inefficient bureaucracy, lack of infrastructure, lack of educated labour, lack of financing access, and corruption are the reasons that halt the growth of the CI in Bandung, Indonesia (Maryunani & Mirzanti, 2015). UNCTAD (2008) mentions that the lack of funding, management skill, and infrastructure provision influences the obstacles to the development of CI in developing countries. For these reasons, policies aimed at developing CI are considered to frequently fail to assign proper policies that meet the industry's demand (Schoales, 2022). Furthermore, the report of UNCTAD's creative economy report deduced that collaboration between various bureaucratic sectors is vital to generate an inclusive policy to promote the CI in a country (UNCTAD & UNDP, 2008). In summary, these challenges met by the stakeholders in developing CI mostly revolve around management issues, lack of resources, and lack of access.

In light of the aforementioned challenges, CI development has shown an opportunity to be supported by Transit-Oriented Development (TOD). Zandiatashbar et al. (2019) have produced evidence that developing Transit-Oriented Development (TOD) in the US has a significant positive impact on the sales number of CI (Zandiatashbar et al., 2019). Transit-Oriented Development (TOD) is a development strategy focusing on transportation modes interchanges at an activity pole, meaning that the land use's potential to connect the different types of transportation modes provides the opportunity to organise and integrate various types of activities in the area (Bertolini, 1996). Recent studies have introduced that TOD covers some dimensions relating to spatial and non-spatial aspects, namely: density, diversity, design, distance to transit, destination accessibility, demand management, demographics, and economic development (Cervero & Kockelman, 1997; Ewing & Cervero, 2010; Singh et al., 2014). Additionally, it has been established that the land use and

transportation system have a cycle of feedback, as can be seen in Figure 1, that is caused by the activities and the movement between those activities. These aspects will further affect the accessibility and the attractiveness of the land use development (Bertolini, 2012; Wegener, 2004). Furthermore, Zandiatashbar et al. (2019) concluded their research by arguing that strategies for TOD and CI should be integrated to maximise the growth of CI (Zandiatashbar et al., 2019).

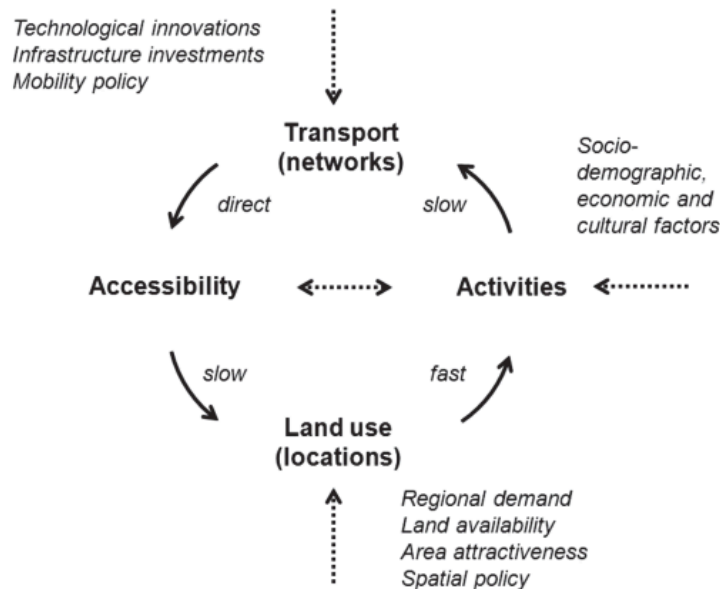


Figure 1 Transport land use feedback cycle (Bertolini, 2012)

Moreover, a previous study by Kang (2010) observed the impact of the availability of transportation nodes on the employment density growth of CI in Seoul, South Korea, and concluded that the existence of the transport nodes is attracting the establishment of CI within a 500m distance, which eventually results in improving the employment density within the area (Kang, 2010). This indicates that infrastructure provision in targeted locations has the potential to attract CI and generate new clusters.

Following the previous discussions that CI growth has opportunities and challenges that have to be supported by TOD, the report on Creative Economy 2022 by UNCTAD includes some countries that have been showing impacts and interest in developing the CI at the national level, such as Indonesia, Mexico, South Africa, etc. (UNCTAD, 2022). Furthermore, the report continues to highlight Indonesia's impact and progress towards CI in the past years as:

“Indonesia consistently attaches importance on developing and promoting an inclusive creative economy. Throughout 2021, it carried out various activities at national, bilateral, regional, and multilateral levels, through collaboration with various stakeholders.” (UNCTAD, 2022).

In Indonesia, Bandung is known as the place where the trend of the creative industry first started during the emergence of the indie music and clothing industries in the early 2000s (F. Fahmi et al., 2016). The municipality also showed great support for the branding of Bandung as a Creative City by creating the Bandung Creative City Forum (BCCF), which has now been integrated into the national framework of the Indonesia Creative Cities Network (ICCN). Bandung's municipality has adopted a clustering policy for the

city's CI development by appointing a few kampungs¹ that act as thematic villages for specific industries. For instance, there is Kampung Dago which focuses on performing arts and traditional crafts; Kampung Cigadung, which focuses on batik production; and Kampung Binong, which focuses on the knitting industry (Bustamante Duarte et al., 2022). These kampungs are spread within Bandung and come with a context-specific set of obstacles that need to be tackled to support their growth and impact on the city and the nation's economy.

As part of the Informal Economies and Creative Industries Strategies (INECIS) project's result presentation in September 2022, a roundtable discussion with stakeholders from creative kampungs was held in Bandung. During the discussion, it became clear that the municipality, entrepreneurs, and community leaders face challenges and obstacles when attempting to develop CIs in Bandung. These difficulties are primarily due to bureaucracy, resource limitations, and accessibility issues. For example, stakeholders state that customers' interest in visiting Kampung is limited due to their inaccessibility. Furthermore, in Indonesia, residents often avoid walking as much as possible, which reduces the attractiveness of using public transportation and is exacerbated by the current lack of pedestrian facilities and public transportation reliability, all of which decrease people's interest in visiting Kampung sites (Stakeholders of Creative Industry of Bandung, personal communication, September 7, 2022). The analysis of these issues may be quantifiable using TOD dimensions such as density (potential activity in the area), diversity (variety of potential activity in the area), design (convenience of the area), distance to transit (distance of the sites to the nearest transport nodes), destination accessibility (distance or travel time from the study area to the attraction), and economic development (economic opportunities in the area).

1.2. Research problem

A previous study in Bandung, Indonesia, found that some issues are holding back the growth of the city's CI, such as the provision of physical infrastructure and the accessibility aspect (Bustamante Duarte et al., 2022). The lack of a proper transportation system connecting the Creative Kampungs to the city results in low accessibility of the area, which will restrict the Kampungs' land-use development. The Kampungs are significant because they serve as a centre for the exploration of creative potential and social movement for the local communities (Rahmany, 2014). On top of that, the aforementioned issues impede the exchange of knowledge and resources and limit access to potential clients. Furthermore, according to a group discussion with stakeholders from the Bandung Spatial Planning Agency, Transportation Agency, NGOs, and CI representatives, the municipality's current plan to become a creative city has not been integrated with the city's agenda to develop a Transit-Oriented Development (TOD) (Stakeholders of Creative Industry of Bandung, personal communication, September 7, 2022).

Therefore, there is an opportunity to improve the accessibility of these Kampungs in the city by utilizing the municipality's current TOD agenda. A previous study focusing on CI policies in Bandung, as well as the UNCTAD report on the Creative Economy, stated that significant collaboration between ministries and departments is required to support the growth of the CI (Aritenang, 2015; UNCTAD & UNDP, 2008). As a result, the purpose of this research is to investigate strategies for integrating the CI development plan with the municipality's TOD plan in order to improve the area's accessibility and attractiveness.

¹ Kampung is a unit of a legal community that has the authority to regulate and manage the interest of the local community based on their local origins and customs that are recognised in the national government system and located in the Regency/City area. (UU No. 21 Tahun 2001).

1.3. Research objectives and research questions

The main objective of this study is to explore the potential of Transit-Oriented Development (TOD) to support the Creative Industries (CI) development in Bandung, Indonesia. Four sub-objectives are formulated to achieve the goal of the main objective.

1.3.1. Sub-objectives and research questions

1. To understand the dimensions of TOD that can support CI development.
 - a) What are the spatial demands of CI?
 - b) What are the spatial dimensions of TOD?
 - c) How can the spatial demands of CI be supported by the spatial dimensions of TOD?
2. To construct a TOD assessment adjusted to the context of the CI in Bandung.
 - a) How to assess the TOD level of an area?
 - b) What is the existing framework for a TOD plan from the Government of Bandung?
 - c) What parameters are considered necessary by the community representatives of the CI Bandung to improve the industries' accessibility concerning the TOD dimensions?
3. To analyse the potential of TOD nodes in the creative kampungs in Bandung with the contextualised TOD assessment.
 - a) What is the baseline TOD degree of the potential transport nodes in the creative kampungs in Bandung?
 - b) Which TOD dimensions should be improved from the existing situation to connect the creative kampungs to the city-level TOD?
4. To formulate recommendations for TOD as a supporting tool for the growth of CI.
 - a) How to improve the TOD degree of the creative kampungs and associate them with the city-level TOD framework plan?

2. LITERATURE REVIEW

The concepts of the Creative Industry (CI) and Transit-Oriented Development (TOD) are explored here to understand their relationship. This chapter addresses the questions related to the first objective of understanding the dimensions of TOD that can support CI development. The chapter includes the definitions and dimensions of the two concepts and discusses land-use and transport interactions to elaborate on how CIs can affect and be affected by the transport system. Lastly, the relationship between the demands of CI and how the TOD dimensions can fulfil these demands will be discussed.

2.1. Definition of the creative industry (CI)

The creative industry concept refers to a specific economic sector that relies on creativity as a source of income (Daubaraitė & Startienė, 2015). The concept was first documented in 1994 in Australia as a cultural policy to embrace the growth of technology development and digital media and was expanded to include cultural industries, popular culture, and urban rejuvenation (Moore, 2014; UNCTAD & UNDP, 2008). The creative industries, led by the growth of the creative class, are generating new geographic clusters and have been able to improve the regional employment and population (Florida, 2003). The creative industry has several economic and social benefits (Dronyuk et al., 2019; UNCTAD, 2022). Among its economic benefits are the contribution to the world's gross domestic product, job creation for nearly 50 million people worldwide, support of start-ups and entrepreneurship, and stimulating investment (Dronyuk et al., 2019; Florida, 2003; UNCTAD, 2022). Social benefits include promoting citizens' collaboration and participation in production and work, improving happiness and health, building trust and dialogue among citizens, facilitating knowledge transfer between generations, and promoting diversity and tolerance (Dronyuk et al., 2019; Scott, 2006). However, incorporating creativity into urban development strategies is doomed if social, cultural, and economic inequalities are not addressed (Scott, 2006). In conclusion, the creative industry can be considered one of the most important leading sectors of the world's economy, and understanding the domains that have an impact on this sector would be beneficial in supporting its development.

2.1.1. Influencing domains of the CI's development

The development of creative industries is context specific and is affected by multiple domains such as *feature*, *function*, *space use*, *spatiality*, and *legacy* (Hutton, 2006; Yigitcanlar et al., 2020). The *feature* domain refers to the main features of their speciality, namely economic (investment, workforce size, patents, etc.), physical (area size, location, jurisdiction, etc.), operational (management model, funding, business services, etc.), and social (demographic and social welfare). The *feature* domain has the ability to influence CI development by: being a booster for economic activities, varying the planning level, determinant for operational funding, and being a supplying source for the labour forces (Battaglia & Tremblay, 2012; Benneworth & Ratinho, 2014; Esmailpoorarabi et al., 2016; Forsyth, 2014). *function* relates to the characterisation of how the place functions, such as the activity type and economic opportunities in a geographic location. The *function* domain has the ability to influence the type of development, type of activities, economic significance, and capability of intergenerational knowledge transfer of the CI (Esmailpoorarabi et al., 2018). Additionally, *space use* refers to elements that distinguish the site, which can be measured by the spatial design, surrounding environment, and governance model (stakeholders' relation to the space). The *space use* of the CI is able to affect the image of the creative cluster (Loures et al., 2007). Furthermore, creative industries can also be affected by their

spatiality and *legacy* (Hutton, 2006). In this context, *spatiality* refers to the approximate location within the city, and *legacy* refers to the historical continuity of the space function. The *spatiality* of CI can influence the proximity and connectivity of the cluster with the rest of the city (Asheim et al., 2007). Lastly, the *legacy* of the CI can also influence the perspective of the historical sentiments in the cluster (Hutton, 2006).

2.1.2. Spatial demands from the influencing domains of CI's development

Research conducted in many cities has shown that the CI has similar tendencies in its spatial distribution related to the influencing domains of the creative industry's development. In general, related to the physical feature or the spatiality, the creative industry tends to locate in the inner city or adjacent to the inner city (Gregory, 2016; J. He & Gebhardt, 2014; Hutton, 2006; Landry, 2008). These industries are often also located near CBDs and universities (J. He, 2014). In relation to the function domains, the CI also tend to locate in an area with mixed land uses and good accessibility (Durmaz, 2015; P. He, 2014; Mengi et al., 2020; Yigitcanlar et al., 2020). A recent study also showed that specific creative industries, such as architecture, design, and advertisement, attach importance to an attractive environment, which refers to the space-use domains (Kiroff, 2017). Additionally, on the feature domains, CI also need to be located within a vast concentration of people and business establishments (Clare, 2013).

2.1.3. The challenges of the CI's development

CI's face several challenges hindering their development. In general, the challenges revolve around management issues, resource issues, and accessibility issues. The challenges on management issues are related to the institutional settings for the functioning of the CI. The decision-makers in CI development often fail to assign proper policies that satisfy the demand and attraction of the industry (Schoales, 2022). UNCTAD (2008) came to the conclusion in the report on the Creative Economy that collaboration between various bureaucratic sectors is vital to generate an inclusive policy to promote the CI in a country (UNCTAD & UNDP, 2008). Another study by Zheng & Chan (2014) on the CI clusters in Shanghai, China, found that the provision of infrastructure for creative clusters does not have the expected positive impact on the CI's development. Instead, the policy restrained the diversity and creativity of the industries and limited the scope of people's businesses (Zheng & Chan, 2014).

In addition, CI's also often face challenges related to resources. availability Maryunani & Mirzanti (2015) explored Bandung's entrepreneurship development as a creative city and found that development challenges include a lack of infrastructure, lack of educated labour, and lack of access to financing. The authors concluded that collaboration among different parties is necessary to combat the aforementioned issues and suggested that the government policies should focus on easing the process of doing business in Indonesia (Maryunani & Mirzanti, 2015). Proper policies that are drafted and maintained by collaborating parties of the government are necessary for the development of CI.

There are also challenges related to the accessibility of the creative industry. Previous research studying the sustainability of the CI in Ghana during the Covid-19 pandemic found that most of the challenges they met in their efforts were related to access, either from the production side or from the consumer side (Langevang et al., 2022). However, many approaches to combat the CI's challenges are taking practical courses on people-based strategies, such as educating labour, niche branding of the products, content creation, interactivity, finding new ways of distribution, price control, and maintaining communication between cooperation (Alexandri et al., 2019; Yue, 2006). The realisation of these strategies can be facilitated by providing a creative hub or creative centres (Gill et al., 2019; Luka, 2022; Virani et al., 2016). This issue of the industries' accessibility relies on the mobility and transportation system.

2.2. Land use and transport system

Land use and transportation in an urban ecosystem are closely related and affect each other (Bertolini, 2012; Lopane et al., 2023; Wegener, 2004). Land use determines the type of activities that can be conducted within the area, and the transportation system determines the movement of the people between these activities. Furthermore, the service area of the transportation system to the land use affects the accessibility level of the areas, which could further alter the area's development. Previous research has known and explored this concept as the "land use feedback cycle" (Ariza-Álvarez et al., 2021; Bertolini, 1996). However, this feedback does not have the same periodic range. The changes in accessibility from transportation system provision and activity type in an area are immediate, while the changes in land use's development and transportation system could take more time. That being said, understanding the general framework of this feedback could be used as a guideline to plan an accessible area that could fulfil the needs of its population.

2.2.1. Creative industry's development and transportation nodes

The provision and improvement of a transportation system have been indicated to positively impact the area's development (Kang, 2010). Specifically in the public transportation system, providing nodes for buses, trams, trains, or bike share can provide connectivity between the creative industry and the consumers (Florida, 2019). Improvements in connectivity can push the growth of CIs as it eases face-to-face interaction between actors (Glaeser et al., 2000). Furthermore, recent studies by Kang (2010), Granpayehvaghei et al. (2019) and Pojani & Stead (2014) explored the growth of CIs in Seoul, the Metropolitan Statistical Areas (MSA) in the USA, and the Metropolitan Region of Amsterdam, respectively, and found that areas with adequate transit are more attractive and able to support the growth of CIs (Granpayehvaghei et al., 2019; Kang, 2010; Pojani & Stead, 2014). Additionally, a recent study by Di Matteo et al. (2023) on Milan has mentioned that the rise of CIs in the city has become one of the reasons for establishing a high-speed rail (HSR) corridor, making them act as a feeder for the economic dynamic (Di Matteo et al., 2023). These case studies indicate that CIs and transportation nodes affect each other in a feedback cycle.

2.3. Transit-Oriented Development (TOD)

Researchers have explored the concept of Transit-Oriented Development (TOD) for several years. The concept was first introduced by Calthorpe (1993) as "A mixed-use community within an average 2000-foot walking distance of a transit stop and core commercial area. TODs mix residential, retail, office, open space, and public uses in a walkable environment, making it convenient for residents and employees to travel by transit, bicycle, foot, or car." (Calthorpe, 1993). The rapid development surrounding railway stations across Europe that started to emerge also inspired Bertolini (1996) to study the phenomenon further. In his research, Bertolini highlights that stations have the potential to provide connectivity and space (Bertolini, 1996). In this thesis, TOD is considered one of the urban development strategies that aim to cluster various types of activities in one area, centred on a transportation hub to provide connectivity in the city.

2.3.1. TOD's assessment dimensions

Measuring the current Transit-Oriented Development (TOD) level of an area can help understand the current situation of the area and plan for future TOD development (Hartanto, 2017; Huang, 2017). Huang (2017) also mentioned that TOD could be implemented and adjusted based on the situation and the goal of each project themselves (Huang, 2017). This highlights the fact that the measurement of a TOD level in an area shall not be generalised. However, previous research has established several dimensions of how to measure TOD that can be implemented in various ways. The initial dimensions identified by Cervero & Kockelman (1997) to measure TOD level focused on the 3D (Density, Diversity, and Design) (Cervero &

Kockelman, 1997). The 'Density' dimension depicts the demand and opportunity in an area in case of the development of the TOD (Bertolini, 2012; Cervero & Kockelman, 1997; Lyu et al., 2016; Singh et al., 2014), the 'Diversity' dimension represents the potential variety of activities that could be happening in an area (Kamruzzaman et al., 2014; Lyu et al., 2016; Singh et al., 2014), and the 'Design' dimension of TOD portrays the physical design of the built environment around public transportation nodes (e.g., train stations, bus stops, etc.) that impact the desirability and usability of the area, particularly for pedestrians (Cervero & Kockelman, 1997; Z. Chen et al., 2023; Shastry, 2010; Wey et al., 2016).

Three other dimensions have been added by researchers in subsequent research: Distance to transit, Destination accessibility and Economic development. 'Distance to Transit' refers to the accessibility of the transport nodes from the origin location (Ewing & Cervero, 2010; Shastry, 2010), 'Destination Accessibility' measures the access to the destinations (Ewing & Cervero, 2010), and the 'Economic Development' measures the economic opportunity in the area (Singh et al., 2014). These dimensions can be elaborated on and represented by various indicators that can be adapted to the study's context (Lyu et al., 2016; Singh et al., 2014; Tsumita et al., 2023).

Research conducted in different cities around the world has assessed the level of TOD in the area with a different set of combinations of the dimensions. A study in the city region of Arnhem and Nijmegen (Singh et al., 2014) used four dimensions to measure the level of TOD to stimulate sustainable development: 'Density', 'Diversity', 'Design', and 'Economic Development' (Singh et al., 2014). The four dimensions were chosen because the author believed that the dimensions are actively influencing the demand for transport. Another study on Beijing by Lyu (2016) uses several indicators for the TOD level assessment that divided the TOD dimensions into three main categories, which are the 'Transit' aspect, the 'Oriented' aspect, and the 'Development' aspect (Lyu et al., 2016). The authors opt for this approach due to their aim to extend the "node-place" model of land use and transport interaction by adding the 'Oriented' aspect that evaluates the interrelations of the land uses. A study by Tsumita et al., (2023) compared four different cities in Asia, considering the transportation network and several types of points of interest (POI) for land use (Tsumita et al., 2023). The two data types were chosen to investigate the hypothesis of TOD's ability to improve urban accessibility by comparing four cities in different development stages. These studies illustrate how the assessment of a TOD can be adjusted to the context of the study case and the objectives of the analysis.

2.4. Supporting the creative industry's development demands with Transit-Oriented Development (TOD)

Previous research focusing on Creative Industries (CI) development has identified that the industry has several spatial demands. A study by Clare (2013) on the role of place in the CI concludes that the development of the industry is closely attached to the vast concentration of people, resources, and industries, which are usually established in specific locations (Clare, 2013). Zhang et al. (2023) also mentioned in their study that the "density of cultural, scientific and educational facilities" affects the popularity of CI parks (Zhang et al., 2023). These indicators affect the number of opportunities that could happen in a place. Similar indicators are also often used to measure an area's 'Density' in Transit-Oriented Development (TOD). In this sense, a higher density of an area would also be beneficial to the development of CI.

The distribution of CI is often related to the diversity of the land use. CIs have been studied by Gregory (2016) in the case of re-centralisation in the Maboneng precinct, Johannesburg. The author investigated

factors that increase the popularity of CI in the area, the main one being that the area is close to artists, galleries, and other businesses (Gregory, 2016). Additionally, studies by Durmaz (2015), He (2014), and Mengi et al. (2020) all mentioned that CIs are mostly located in mixed-use areas (Durmaz, 2015; J. He, 2014; Mengi et al., 2020). These aspects can be measured with indicators used to measure 'Diversity' in TOD. A more diverse area with various types of activity potentials is more attractive to stimulate the growth of CI.

He (2014) and He and Gebhardt (2014) found that creative workers need good public transit access (J. He, 2014; J. He & Gebhardt, 2014). Zhang et al. (2023) also found that the number of bus stops near Beijing CI parks affects their popularity (Zhang et al., 2023). This demand of the CI is also measurable by the 'Distance to transit' dimension of TOD, which eventually can also be seen as the 'Destination accessibility' of TOD. The short distance between the industries and the public transit can improve the accessibility of the industries themselves.

Another study found that the differences in productivity between creative clusters are heavily influenced by their environments. Kiroff (2017) concluded in their study on the spatial distribution of the CI in Auckland that the Parnell subsector outperforms the other subsectors that are located in the CBD fringe areas due to its attractive environment (Kiroff, 2017). The broad concept of an 'attractive environment' is highly relatable to the indicators that are affecting the 'Design' dimension of TOD. Several indicators, such as access for people with disabilities, comfortable pedestrian paths, and a safe environment, could improve the attractiveness of an area for the CI (Arief et al., 2017; Cervero & Kockelman, 1997; Ke et al., 2021; Khare et al., 2020).

In conclusion, it can be deduced from the theory that integrating TOD with CI strategies allows policymakers and urban planners to support the expansion of CI, which is a positive development.

3. RESEARCH DESIGN

This chapter provides an in-depth discussion of the research design employed in the study, covering the overall approach used in the research to obtain the main objective of exploring the potential of Transit-Oriented Development (TOD) to support the Creative Industries (CI) development in Bandung, Indonesia. The chapter commences with an overview of the methodology, followed by an introduction to the study area and a detailed description of the data collection and analysis methods utilized to generate the potential TOD score for both the kampungs and the city. Furthermore, the analysis aims to identify the TOD indicators that require improvement and subsequently formulate recommendations to enhance the TOD potential of the kampungs.

3.1. Methodology overview

This research utilizes a case study approach to gain a comprehensive understanding of the potential of Transit-Oriented Development (TOD) in supporting the development of the Creative Industry (CI) in Bandung. The data collection and analysis methods employed in this study include a literature review on CI and TOD, an analysis of policy documents and a questionnaire survey to contextualize the kampung community and the model development of the TOD potential. These methods allow for a thorough examination of the topic and provide a reliable foundation for the research findings. The overall structure and scope of the research are depicted in Figure 2, which provides an overview of the research process and its components.

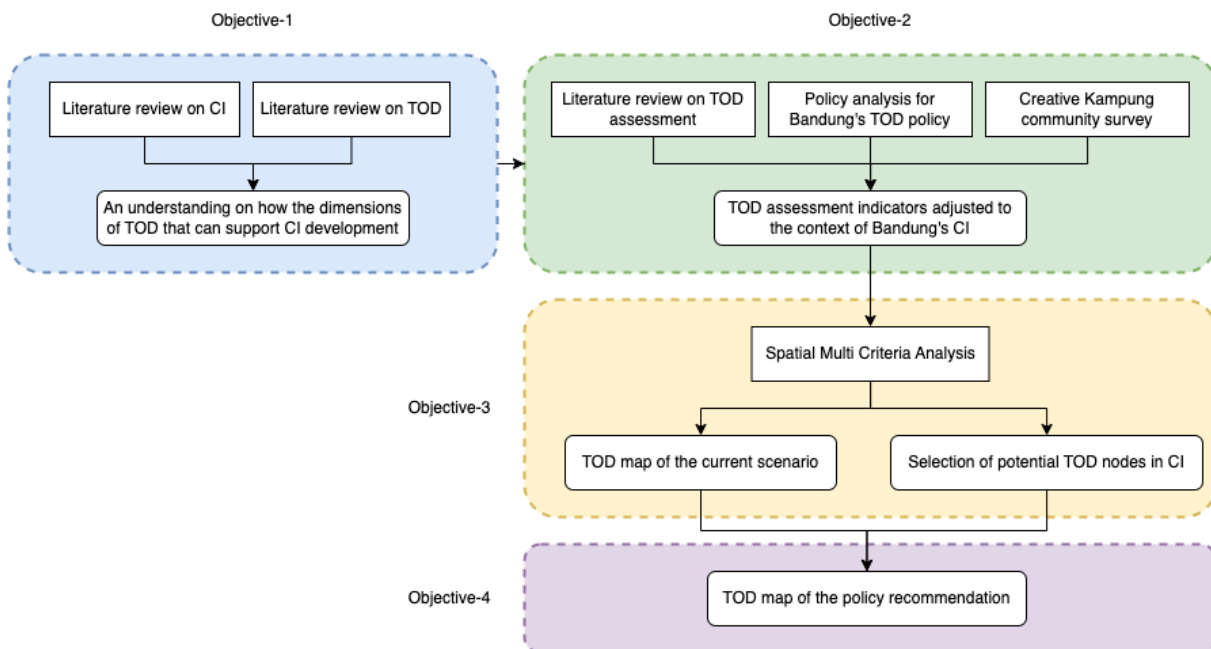


Figure 2 Methodology overview

The study starts with a literature review on the concepts of CI and TOD to obtain [an understanding of whether a TOD has the potential to support CI development](#). The research is then followed by a literature review of the TOD assessment, a document analysis of the local policies, and a questionnaire survey to contextualize the TOD indicators that are essential to the creative kampung community. This step is done to [construct a contextualized TOD assessment for CI in Bandung](#). The next step is a spatial multicriteria

analysis (SMCA) model development to analyse the potential TOD nodes in the creative kampungs in Bandung. The SMCA on this research is done with QGIS to get an illustration of the current state of the TOD potential in the area and to select potential TOD nodes in the Kampungs further to connect it to the city's TOD plan. Lastly, the policy recommendation on each dimension of the TOD is formulated based on the result of the SMCA analysis.

3.2. Study area

This research examines three creative kampungs in Bandung, Indonesia (Figure 3). Bandung, Indonesia, is the capital city of West Java province. It is the largest metropolitan city in the province and the third-largest city in Indonesia (Himayah et al., 2023). Bandung has a population of 2.452.900, and its population growth trend is indicative of a more complex and dynamic urban environment, which may result in land use changes (Badan Pusat Statistik Kota Bandung, 2022; Himayah et al., 2023). Bandung is also known as a creative city; this was recognized when the city joined UNESCO's Creative Cities Network in 2015 (Yujin, 2017). Additionally, Bandung is considered to be strategically located, being passed through by the Purbaleunyi highway that connects the city to Jakarta (F. Z. Fahmi et al., 2017).

Furthermore, the kampungs included in this study are Kampung Binong Jati, Kampung Cigadung, and Kampung Dago Pojok. These study areas were selected based on the kampung's industry reputation, which is well-known in the regional, national, and international community (Bustamante Duarte et al., 2022). The selected kampungs were officially appointed by the Municipality of Bandung as creative kampungs in Pemerintah Kota Bandung. Keputusan Walikota Bandung Nomor 556/Kep.953-DISBUDPAR/2020. The three chosen Kampungs are situated on the outskirts of the inner city, with Kampung Binong Jati situated on the eastern side of Bandung's Central Business District (CBD). While Kampung Cigadung and Kampung Dago Pojok are located in the northern Bandung highland region. The Creative Kampungs are bounded by the Kelurahan boundary (equivalent to a sub-district).

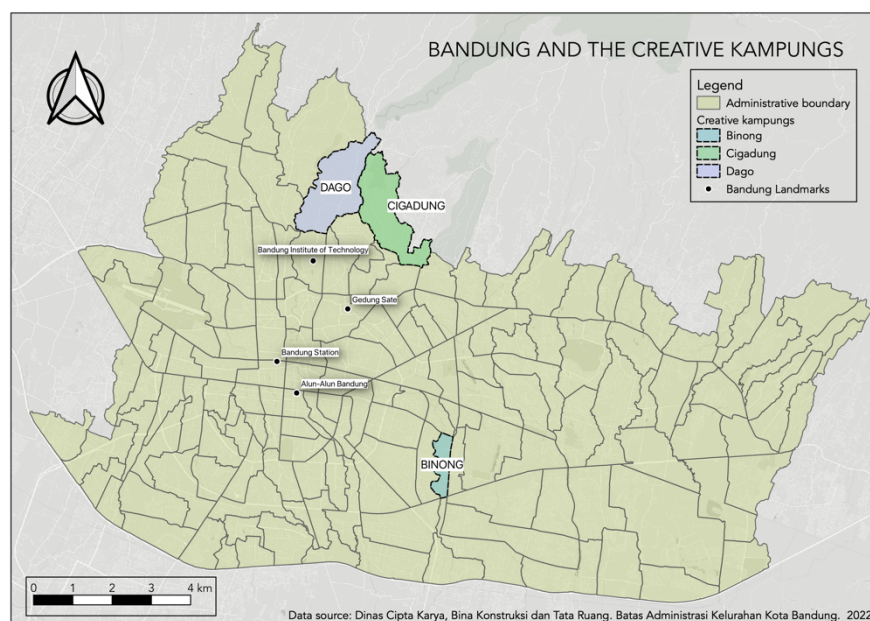


Figure 3 Study area

3.3. Data collection

This section discusses the methods used for the data collection that were used in this research design. This includes the collection of the relevant literature regarding the creative industry (CI) and Transit-Oriented Development (TOD) and the contextualisation of Bandung creative kampung's community. The results of these data collection methods will be used for the data analysis elaborated in Section 3.4.

3.3.1. Collecting relevant literature regarding CI, TOD, and TOD Assessment

The literature review to answer the research question 1a: "What are the spatial demands of CI?", 1b: "What are the spatial dimensions of TOD?", 1c: "How can the spatial demands of CI be supported by the spatial dimensions of TOD?", and 2a: "How to assess the TOD level of an area?" was selected and found following through these criteria:

- Three databases were considered to ensure the thoroughness of the search to get the most information: Science Direct, Scopus, and Web of Science.
- A search string considering the key concepts of the research (Creative Industry and Transit-Oriented Development) with Boolean operators was used to filter out the pieces of literature.

The results of this search retrieved 850 articles related to the CI and TOD concepts. However, only 53 articles were included for the analysis based on their relevance to this research topic.

3.3.2. Contextualising Bandung creative kampung's community

This section discusses the method of obtaining the context of Bandung's creative kampung from the perspective of the involved community, and this includes the stakeholders from the government, business owners or employees of the industry, and the visitors of the creative kampungs. The contextualization considers the inputs from the stakeholders of Bandung's government, official policy documents that discuss the city's framework on TOD, and the questionnaire distributed specifically to the communities of the three studied kampungs.

3.3.2.1. Roundtable discussions with the stakeholders of Bandung's creative kampung

This research also uses the outputs of the roundtable discussions the author participated in as part of the final symposium for the project INECIS (Informal economies and creative industries strategies) held in Bandung in September 2022. The roundtable discussions were held to present the result of the studies on informal economies and creative industries of Bandung to the stakeholders, including the representatives of the creative kampungs and local government. The discussions were documented with the recording of the session. Furthermore, the output of the roundtable discussions was used as the starting point of the contextualization of Bandung creative kampung's community.

The role of the roundtable discussions with the stakeholders of Bandung's creative kampung was to obtain information from stakeholders on the Municipality's current framework and which documents can be used for the document analysis to answer the research question of 2b: "What is the existing framework for a TOD plan from the Government of Bandung?". During the roundtable discussions involving the government stakeholders of the creative kampungs in Bandung, it was mentioned that the official documents which are used as a reference for the city to plan a TOD are: a. Detailed Spatial Plan and Zoning Regulations for Bandung 2015-2035, and b. Bandung Urban Mobility Project (BUMP) (Stakeholders of Creative Industry of Bandung, personal communication, September 7, 2022).

3.3.2.2. Questionnaire survey with the representatives and visitors of Bandung's creative kampung

This study includes a close-ended multiple choice paper survey to get primary data on the preferences of the creative kampung community related to the indicators mainly used to assess TOD. The survey was intended to answer the research question of 2c: “What parameters are considered necessary by the community representatives of the CI Bandung to improve the industries’ accessibility concerning the TOD dimensions?”. This survey aims to get the community’s perspective on which aspect they consider important to be included in the assessment of the TOD potential in the area. The survey targets employees/workers of the creative kampungs and the visitors of the kampungs themselves.

The choice of sampling strategy used in the questionnaire survey is the stratified sampling strategy to differentiate the employees and the visitors and the random sampling strategy. The random sampling strategy is employed as it considers everyone to be equal and representative of the studied population, while the stratified sampling strategy is employed due to its ability to divide the populations into different groups (Turner, 2020). The determination of the sample selection for this research follows the hypothesis of previous research on a similar study case. The respondents shall fit into either of these categories:

- The owner or employee of the creative industry in the creative kampung. The questionnaire aims to draw the current situation of the creative industry’s community perspective on public transportation usage and which aspects they consider useful in improving their willingness to use them.
- The visitors or clients of the creative industry in the kampung. The questionnaire aims to understand the current perspective of the visitors/clients on using public transportation to visit the creative kampungs and which aspects will improve their willingness to use public transportation. The survey for the visitors is distributed during weekdays and weekends due to the assumption that the increase in visitors on the weekends tends to be significant (Liu et al., 2021)

The survey (see Annex 1: Survey questionnaire) was conducted by distributing a set of questionnaires consisting of 10 closed questions and 2 open questions and took about 5 minutes to complete. The questions relate to the general understanding of the community’s perspective and preference related to the included dimensions of TOD, such as destination accessibility, diversity, design, and distance to transit (Elaborated in Table 4). The survey was conducted from June 28th, 2023, to July 4th, 2023, in Kampung Binong Jati, Kampung Cigadung, and Kampung Dago Pojok and included 147 people in total. The survey was distributed manually on-site and done by paper to make it easy for the community to fill out the form and ensure the privacy of the respondents. The author of this thesis keeps the only copy.

The result of this survey was used as to define a threshold to measure the TOD potential and add a further explanation on how the dimensions of TOD shall be improved according to the needs of the Kampung’s representative and the visitors of the Kampung.

In addition to the listed questions, there were also supplementary follow-up questions regarding the visitors’ willingness to use public transportation and an elaboration of the reasoning.

3.4. Data analysis

This section discusses the methods used for the data analysis that were used in this research design. This includes the collection of the relevant literature on the creative industry (CI) and Transit-Oriented Development (TOD), the document analysis of Bandung's government related to TOD planning, of Bandung creative kampung's community.

3.4.1. Literature Review on CI and TOD

A literature review analysis was done to answer the questions from research question 1a on the [spatial demands of CI](#) and 1b on the [spatial dimensions of TOD](#). The review of the two key concepts of this research ultimately used as a base information to answer the research question of 1c: [“How can the spatial demands of CI be supported by the spatial dimensions of TOD?”](#). Furthermore, the literature review on TOD assessment was also done to answer the research question of 2a: [“How to assess the TOD level of an area?”](#).

3.4.2. Document analysis of the policies from the government of Bandung related to TOD planning

The goal of conducting document analysis on the government's framework is to answer research question 2b: [“What is the existing framework for a Transit-Oriented Development \(TOD\) plan from the Government of Bandung?”](#). This analysis entails thoroughly examining the document's content to gain insights into various aspects of the policy. Several guiding questions were used during the analysis process to ensure a thorough investigation. These guiding questions sought to identify and comprehend which specific aspects of the policy of a. Detailed Spatial Plan and Zoning Regulations for Bandung 2015-2035, and b. Bandung Urban Mobility Project (BUMP) are clearly outlined, whether they are directly or indirectly referenced, and what explicit statements are made. Furthermore, the analysis sought to identify any potential gaps or omissions in the policy's content, assessing how well it aligns with existing regulatory requirements. Finally, a critical analysis of the document analysis focused on determining the level of alignment between local policy and national or international trends and objectives related to Transit-Oriented Development was done. Using this methodical approach to document content analysis, a deeper understanding of the Government of Bandung's TOD framework can be obtained, providing valuable insights for future urban planning endeavours and policy development.

3.4.3. Describing the statistics of the questionnaire result from Bandung creative kampung's community

Descriptive statistics was used to explore the central tendency and distribution of the questionnaire result of Bandung creative kampung's community. The results of this analysis were used to answer the research question of 2c: [“What parameters are considered necessary by the community representatives of the CI Bandung to improve the industries' accessibility concerning the TOD dimensions?”](#). Furthermore, the results are also used in determining thresholds for some indicators of the TOD model development.

3.4.4. TOD Assessment

This section discusses the information regarding the TOD assessment included in this research design. The section is divided into two sub-sections: Section 3.4.4.1 on the dataset and indicators used in the assessment and Section 3.4.4.2 on the technical steps of the assessment method.

3.4.4.1. Dataset and Indicators

The potential of TOD in the study area was investigated. This section will elaborate on the indicators and data requirements that are used to measure each dimension of TOD, as well as the data source and the role of the indicators in the TOD model. Table 1 elaborates the indicators chosen for the measurement of TOD from the result of the literature review of research question 2a on [how to assess the TOD level of an area](#).

Table 1 TOD assessment indicators

Dimension	Representing	Indicator	Rationale	Reference	Data	Data Source	Role to TOD
Density	Potential demand and/or opportunities for transportation in the area	Building density	Higher building density in the area is assumed to improve the demand for transportation system	(Widyahari & Indradjati, 2015; Zhang et al., 2019)	Building Data	Bandung Geodata	Benefit
Diversity	Potential variety of activities present in the area	Land-use diversity	Higher variety of activities that can happen in one area is assumed to reduce the demand to travel and improve the attractiveness for people to have their activities in the area	(Cervero & Kockelman, 1997)	Land use Data	Bandung Geodata	Benefit
Design	Affecting the comfort level of the people to be within the area of TOD	Pedestrian infrastructure	Provision of a decent pedestrian infrastructure is assumed to increase the convenience of people to be in the area	(Cervero & Kockelman, 1997)	Footpath Data	Open Street Map	Benefit
		Greenscape	Higher availability of greenscape in the area is assumed to improve comfort of the people to be in the area	(Cervero & Kockelman, 1997)	Planet Data	Planet Scope	Benefit
		Bike lane	Provision of bike lane is assumed to improve the attractiveness for people to have transport-interchange with public transportation	(Cervero & Kockelman, 1997)	Bike Lane Data	HaloBdg.com	Benefit

Table 1 TOD assessment indicators

Dimension	Representing	Indicator	Rationale	Reference	Data	Data Source	Role to TOD
Distance to transit	The distance from origin point to transit nodes affects the willingness of the people to use public transportation	Distance to transit node	Shorter distance from the creative kampungs to transit nodes is assumed to improve the willingness for people to use public transportation	(Ewing & Cervero, 2010; Shastry, 2010)	Public Transportation Stops Data	Bandung Geodata	Cost
					Bus Terminals and Train Stations Data	Bandung Geodata	Cost
Destination accessibility	The ease of access to destinations affects the desirability for in-and-out travel	Threshold travel time	Travel time to access the creative kampungs within the threshold is assumed to improve the possibilities for people to visit the area	(Ewing & Cervero, 2010)	Average Threshold for Travel Time	Questionnaire	Cost
Economic development	The number of economic opportunities in the area affects the demand for transportation in the area	Business Establishment	Higher distribution of business establishment in the area is assumed to generate higher travel demand in the area	(Lyu et al., 2016; Singh et al., 2014)	Business Establishment Data	Badan Pusat Statistik	Benefit
		Trade Supporting Facilities	Higher distribution of trading facilities in the area is assumed to generate higher travel demand in the area	(Fadhly, 2019)	Trade Supporting Facilities Data	Badan Pusat Statistik	Benefit

Due to the limitation of data, the indicators on the design dimension of ‘trees that provide shades’ and ‘more green areas (bushes, gardens, grass patches)’ were combined as one indicator of ‘greenscape’ that was measured using satellite image and Normalized Difference Vegetation Index (NDVI) analysis.

3.4.4.2. Technical steps for the model development for the TOD assessment adjusted to the context of Bandung's creative kampungs

This section describes the technical steps used for the model development to measure the TOD degree of the baseline scenario, select potential TOD nodes, and measure the TOD degree after the interventions. TOD degree of the baseline scenario refers to the variations of the TOD potential within the studied area measured by the selected indicators with the data of the current situation. The concept of TOD nodes refers to locations that are used as a centre for the transit mode. The model was generated using Spatial Multi-Criteria Analysis (SMCA) in QGIS. SMCA is used in this research due to its ability to bridge the gaps between geographical information and the multi-criteria decision analysis (Malczewski, 1999).

3.4.3.2.1 Assessment of the baseline scenario of the TOD degree in creative kampungs

The first technical step elaborated in Table 2 is used to measure the baseline scenario of the TOD degree in the creative kampungs of Bandung. This analysis was done to answer the research question of 3a, 3b, and 4a. The model development of the TOD potentials is carried out in a 500m hexagonal grid, following the definition of TOD as first introduced by Calthorpe (1993), which states that TOD is a mixed-use community with an average walking distance of 2000 feet (609 meters) from a transit stop, and the reference from Singh et al. (2014), which states that the typical TOD area is approximately 80 hectares within a radius of 500 meters from an existing station (Calthorpe, 1993; Singh et al., 2014). Additionally, the assessment for the TOD potential within the kampungs will be done in 100 meters hexagons within the 500 meters buffer area from each kampung.

The results of each measurement of the indicators were then classified into five classes: ‘Very Low Potential’, ‘Low Potential’, ‘Moderate Potential’, ‘High Potential’, and ‘Very High Potential’. The classifications of the classes based on the natural breaks (Jenks optimisation) were chosen due to its ability to group the data in ways in which each set would have the maximum differences, thereby endowing the distribution approach with robust adaptability and heightened precision when applied to spatial data (J. Chen et al., 2013).

Table 2 Model development for baseline TOD degree

Dimension	Indicator	Analysis
Density	Building density	Building density is the ratio of the building footprint to an area unit (Soltani et al., 2020). The measurement of the building density in the hexagon boundary is done by comparing the buildings' area and the hexagon's area. Hence, the result will show the ratio of the built-up area in the designated hexagon.
Diversity	Land use diversity	<p>Land use diversity represents the extent of variation in land use categories within an area (Singh et al., 2014). The land use mix for the land use diversity is measured by the entropy diversity index with this formula adapted from (Singh et al., 2014):</p> $LU_d(i) = \frac{-\sum_i Q_{lu_i} \times \ln(Q_{lu_i})}{\ln(n)} \text{ and } Q_{lu_i} = \frac{S_{lu_i}}{S_i}$ <p>Where lu_i is the land use class, Q_{lu_i} is the share of specific land use in the hexagonal grid, S_{lu_i} is the total area of the specific land use in the hexagonal grid, and S_i is the total area of the hexagonal grid.</p>

Table 3 Model development for baseline TOD degree

Dimension	Indicator	Analysis
Design	Pedestrian infrastructure	The availability of pedestrian infrastructure can be seen by the availability of footpath in a studied area (Cervero & Kockelman, 1997). The pedestrian availability in this research is measured by measuring the intersected length of the available footpath inside the hexagon boundary.
	Bike lane	The availability of bike lane in the studied area indicates the provision of the bike lane infrastructure (Parkin et al., 2008). Bike lane availability in the area is measured by the length of the intersected bike lane in the hexagon boundary.
	Greenscape	The level of greenscape availability in the area is quantified by measuring the vegetation index (NDVI) of the area (Yang et al., 2017). The equation is done in QGIS with its Raster calculator using this formula: $NDVI = \frac{NIR - Red}{NIR + Red}$ The values are then summarized into the hexagonal boundary by using the Zonal Statistics plugin.
Distance to transit	Distance to bus terminals and train stations	The distance to bus terminals and stations can be measured by the interpolation from the road network (Marti et al., 2018). The distance to transit nodes is measured using the plugin of QNEAT from QGIS, with the generation tool of Iso-Area as Interpolation (from Layer). The Iso-Areas consider the network to generate the catchment areas from a given Starpoint. The output of this tool is a distance raster in either meters or seconds. The result of the distance to stations, terminals, and transit nodes in this study is measured in time (seconds). The catchment time was measured with a default walking time of 5km/h (Montufar et al., 2007). The values are then summarised based on the average distance values in the hexagon 500x500m boundary.
Destination accessibility	Threshold of travel time	The threshold for this dimension is obtained by a questionnaire and used to assess the accessibility of the study case with the travel time (Erath et al., 2017). The catchment areas of the threshold were generated from the Isochrones (from layer) tool in the plugin of QNEAT plugin in QGIS. The starting point for this analysis was the creative kampungs, and the results were then summarised within the hexagonal boundaries of 500 meters.
Economic development	Business establishments Trading facilities	The data on business establishments and trading facilities are measured in the spatial unit used in the analysis. The results from the indicators of the number of business establishments and trading facilities are intersected and summarised into the hexagon 500x500m boundary.

3.4.3.2.2 Selection of potential TOD nodes in creative kampungs

Potential TOD nodes in the creative kampungs were selected by overlaying the results of the baseline TOD map obtained from Section 0 and the five categories of distance to the transit node from the survey from Section 0 into a bivariate map. The potential TOD nodes will be selected from areas with a considerably high TOD score and a low distance score to the transit node. The process of this section is illustrated in Figure 4.

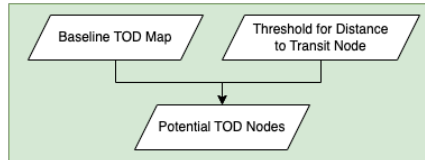


Figure 4 Selection of TOD nodes

2.4.3.2.3 Assessment of the TOD degree in creative kampungs after the intervention

The second assessment of the TOD degree in the creative kampungs happens after an intervention is carried out using the same analysis as described in Section 0, but with an additional dimension of destination accessibility, as shown in Table 3. Additionally, Figure 5 depicts the overall model development process to obtain the TOD degree in the creative kampungs after the intervention.

Table 3 TOD degree assessment for destination accessibility

Dimension	Indicator	Analysis
Destination accessibility	Travel time	The preferred travel time for this dimension is obtained by a questionnaire and used to assess the accessibility of the study case. The catchment areas of the threshold were generated from the Isochrones (from layer) tool in the plugin of QNEAT plugin in QGIS. The start point for this analysis was the creative kampungs, and the results were then summarised within the hexagonal boundaries of 500 meters.

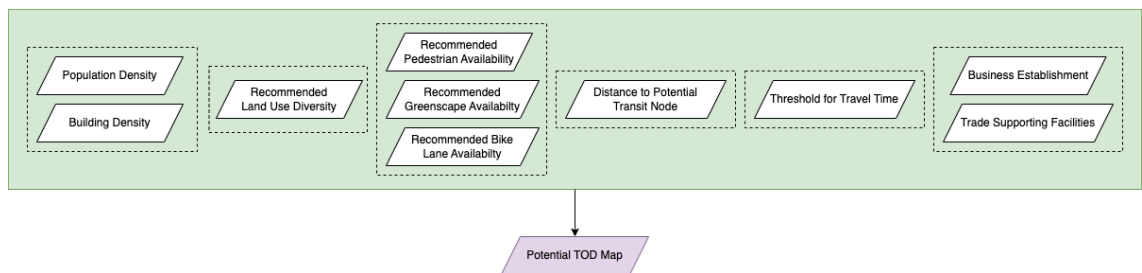


Figure 5 Potential TOD assessment

4. RESULTS

This chapter will display the results of data analysis in this research. The results from research question 1a on the [spatial demands of CI](#) are elaborated in Section 2.1. The result from the research question of 1b on the [spatial dimensions of TOD](#) is described in Section 2.3. The result from the research question of 1c on [how the spatial demands of CI can be supported by the spatial dimensions of TOD](#) is reported in Section 2.4 and the result from the research question of 2a on [how to assess the TOD level of an area](#) is discussed in Section 3.4.4.

Furthermore, this chapter is divided into five subjects, which are (a) the existing framework of Bandung's government for TOD, (b) parameters that are considered necessary by the community representatives of the CI Bandung to improve the industries' accessibility concerning the TOD dimensions, (c) the baseline TOD degree of the Creative Kampung in Bandung, (d) the dimensions to improve the connection of the Creative Kampung's TOD with Bandung's TOD, and (e) policy recommendation to improve TOD potentials in the creative kampungs.

4.1. The existing framework for TOD from the Government of Bandung

This section discusses the document analysis of the policies from the government of Bandung related to TOD planning to answer the [research question of 2b](#), which is [“What is the existing framework for a TOD plan from the Government of Bandung?”](#). The government of Bandung has developed a TOD development policy on their Detailed Spatial Plan and Zoning Regulations for Bandung 2015-2035. The policy stated that an area can be developed as a Transit-Oriented Development (TOD) if it is located in a mixed land use in high and medium intensity (C1 and C2) zone; these areas have a ratio of a maximum of 65% of commercial area and minimum 35% of a residential area (Peraturan Daerah Kota Bandung No. 10 Tahun 2015 Tentang Rencana Detail Tata Ruang Dan Peraturan Zonasi Kota Bandung Tahun 2015 - 2035, 2015). There are 144 zones spread throughout the city that are considered to have a high and medium intensity of mixed land use in Bandung (illustrated in Figure 6).

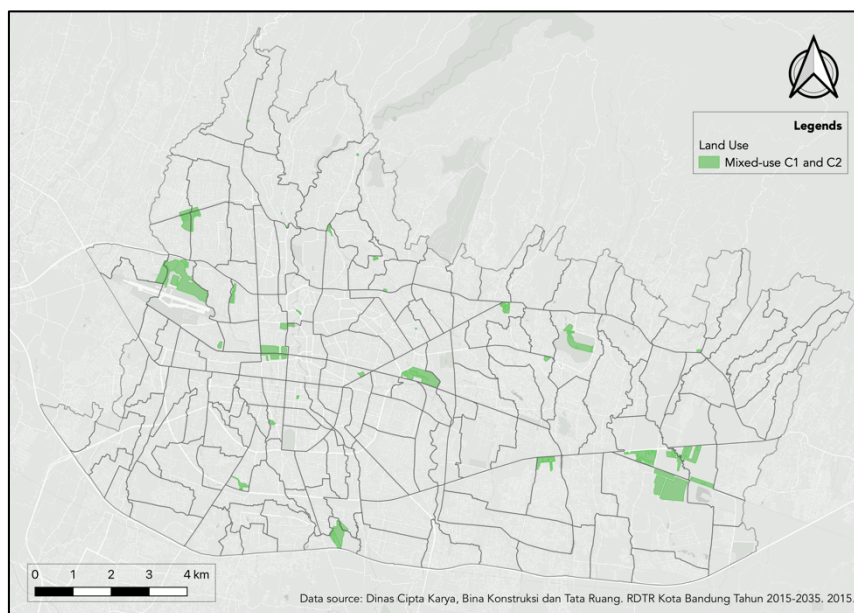


Figure 6 Bandung's mixed-use from the zoning regulations 2015-2035

Additionally, the Department of Transportation from Bandung has also developed a framework to select several nodes for the city's TOD plan documented in the Bandung Urban Mobility (BUMP) (Dinas Perhubungan Pemerintah Kota Bandung, 2016), which is:

1. The TOD must be placed on the main network of mass transit.
2. The TOD must be placed on a bus/BRT network lane with a high frequency.
3. The TOD must be placed on a branch network of a bus/BRT with less than 10 minutes of travel time from the main network of mass transit.
4. The TOD must be placed on the designated land use that utilizes the Light Rail Transit (LRT) facility that passes through residential areas and mixed land use.

The document of Bandung's Urban Mobility Project from the Department of Transportation of Bandung has also concluded with proposing 9 proposed locations to be developed as TOD (illustrated in Figure 7). The locations were chosen due to their relations to the existing public transit network. That being said, none of those nine appointed locations are near the selected Creative Kampung.

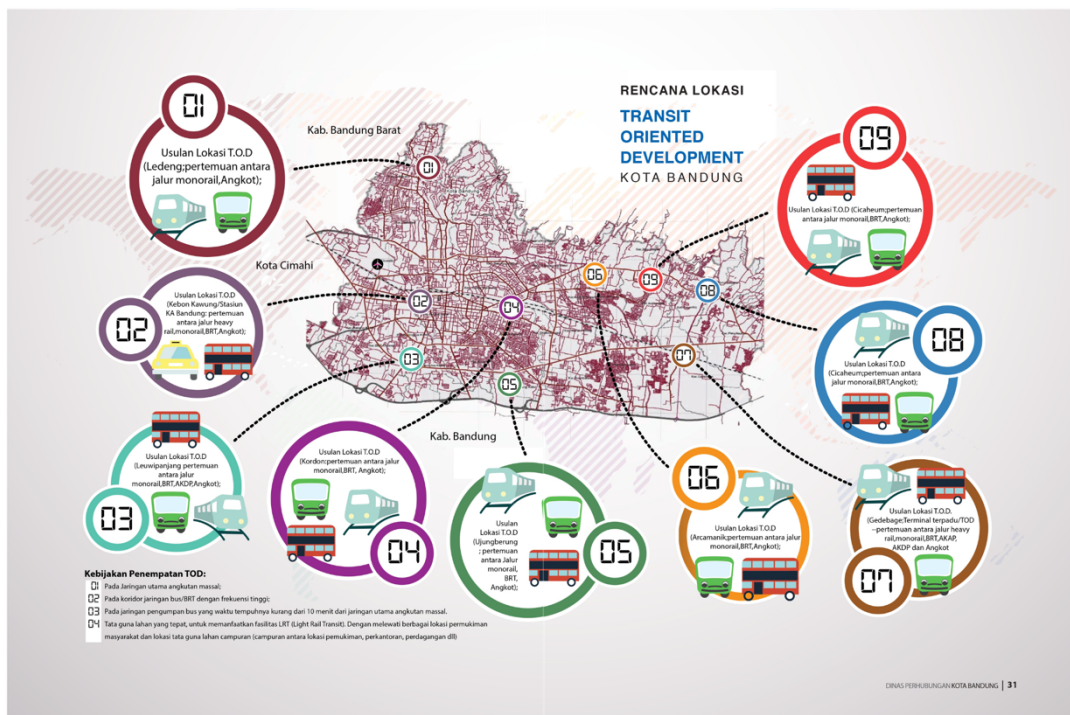


Figure 7 Bandung Urban Mobility Project (BUMP)'s TOD proposition (Dinas Perhubungan Pemerintah Kota Bandung, 2016)

4.2. CI community's demands to improve accessibility

This section discusses the results of the questionnaire surveys distributed to the CI community in Bandung. This section addresses research question 2c: “What parameters are considered necessary by the community representatives of the CI Bandung to improve the industries’ accessibility concerning the TOD dimensions?”. Ultimately, the results of the questionnaire show that the prevalent mode of transportation within the community is private vehicles. The community also prefers to travel within the travel durations of 0 to 15 minutes. The community's preference for the types of activities to be conducted by using public transportation is primarily centred around business-related activities. The design aspects that the community wishes to encounter within the proximity of bus stops, bus terminals, and train stations are mostly the presence of sidewalks and trees. And the threshold for the community's willingness to walk to the

transportation nodes of bus stops, bus terminals, and train stations all lies within the 5 to 10 minutes range. The elaboration of the questionnaire results is available in Annex 2: Questionnaire result

In detail (see distribution in Figure 8), 43% of the respondents chose private vehicles as their preferred transportation mode, which is consistent in all three studied kampungs. The next most preferred transportation mode is walking by 27%. This might be caused by the employees and visitors often coming from within the kampung itself. The results are then followed by using online bikes/taxis by 17%, public transportation by 12%, and 1% other.

Furthermore, on the open question distributed to the visitors of the kampungs, 22% of the respondents answered that they were not willing to use public transportation to visit the creative kampungs. Out of those responses, some of the reasons mentioned are: there is no access to public transportation from their house, too many traffic jams, the destinations were too close, and the respondents used just to use private vehicles.

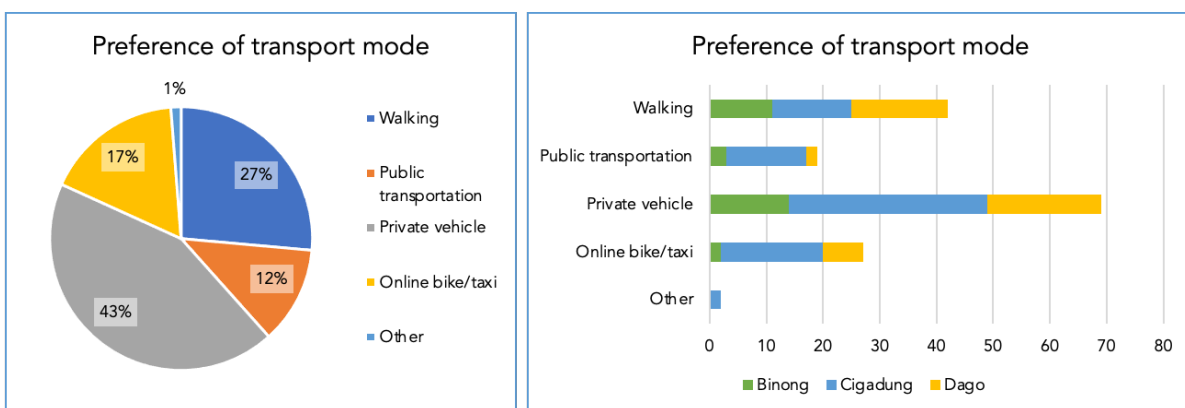


Figure 8 Community's preference on transportation mode

On the question regarding the community's preference for destination accessibility measured in travel time (see distribution in Figure 9), 33% of the respondents prefer to travel within 0 to 15 minutes daily. However, 30% of the respondents are willing to travel within 15 to 30 minutes daily. This is followed by 22% of the respondents are willing to travel within 30 to 60 minutes daily, and the rest of the 15% are willing to travel for more than 60 minutes daily.

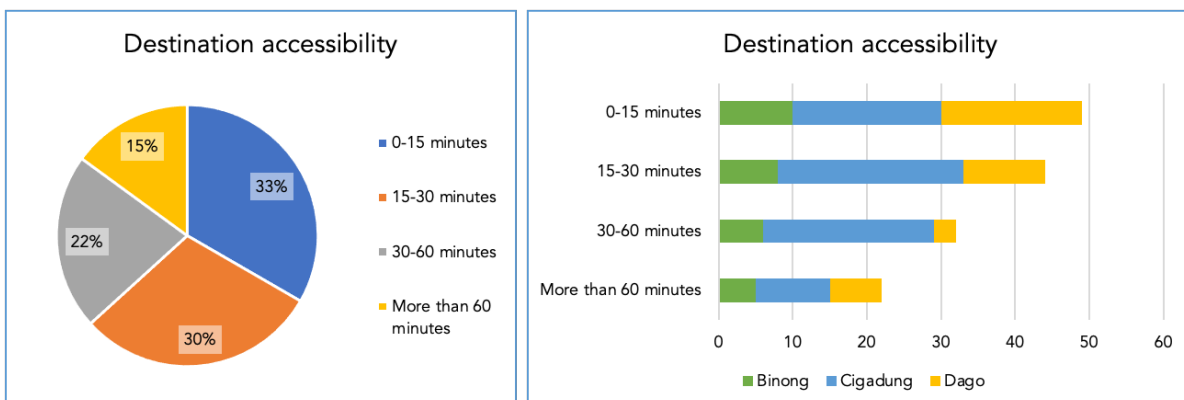


Figure 9 Community's preference on destination accessibility

Figure 10 illustrates the distribution of the respondent's preference for the types of activities they wished could be done by using public transportation. 30% of the answers would like to be able to conduct business-related activities using public transportation, followed by 22% on leisure activities such as meeting some friends, going to cafes, watching a movie in cinemas, shopping, visiting tourist attractions, etc. 17% of the

answers mentioned that they would like to be able to do some household-related activities, while another 17% of the answers mentioned that there are no other types of activities that they wish they can do using public transportation. Furthermore, 7% of the respondents answered 'Self-improvement' when asked about the types of activities they would like to do using public transportation. While 6% answered they would like to be able to do healthcare-related activities, and 1% of the answer choose the option of 'Other'. Some of the respondents elaborated that they'd like to use public transportation to travel inter-city.

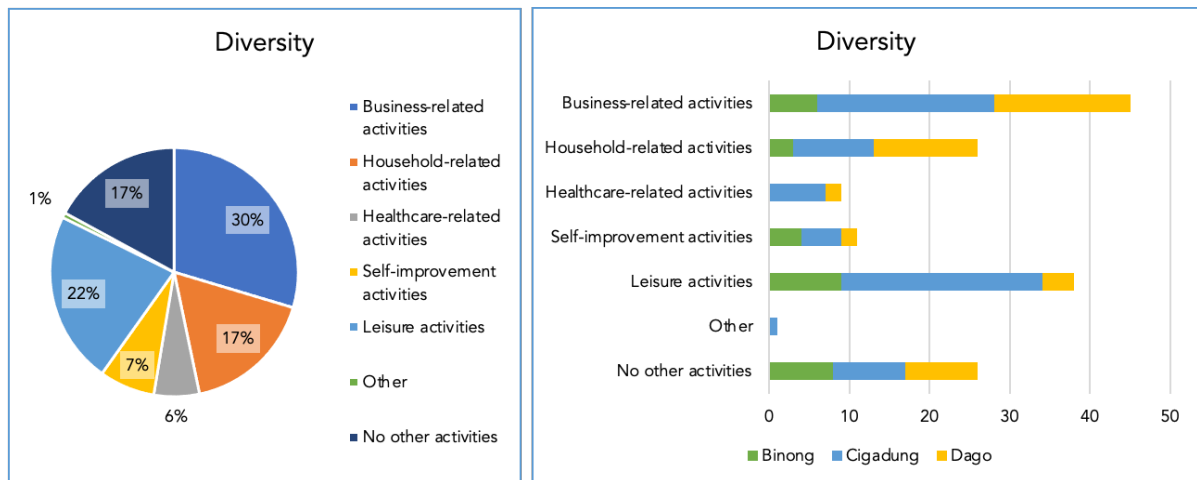


Figure 10 Community's preference on activities for land use diversity

On the design aspect of bus terminals or train stations, illustrated in Figure 11, 28% of the answers chose that they would like to see the presence of a sidewalk for pedestrians. 24% of the answers want more green areas, and 23% of the answers want the presence of trees to provide shade. The two categories were merged into 'greenscape' during the TOD assessment due to the limitation of data. Next, 12% of the answers lies in access for people with disability, 10% wants the provision/addition of streetlights, and 3% of the answers wants the presence of bike lanes.

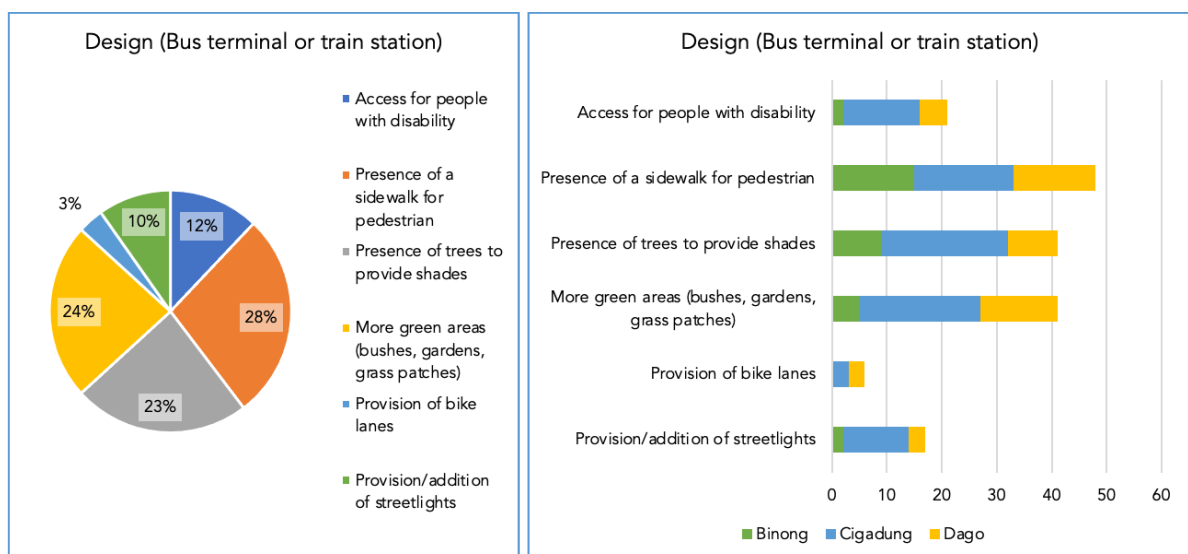


Figure 11 Community's preference on the design aspect for bus terminal or train station

Similarly, on the design aspect for bus stops (Figure 12), 26% of the answers chose that they would like to see the presence of trees to provide shade in the proximity of the bus stops. 23% of the answers were on the presence of sidewalks for pedestrians, 19% on access for people with disability, 17% on more green areas, 10% on the provision/addition of streetlights, and 5% on the presence of bike lanes.

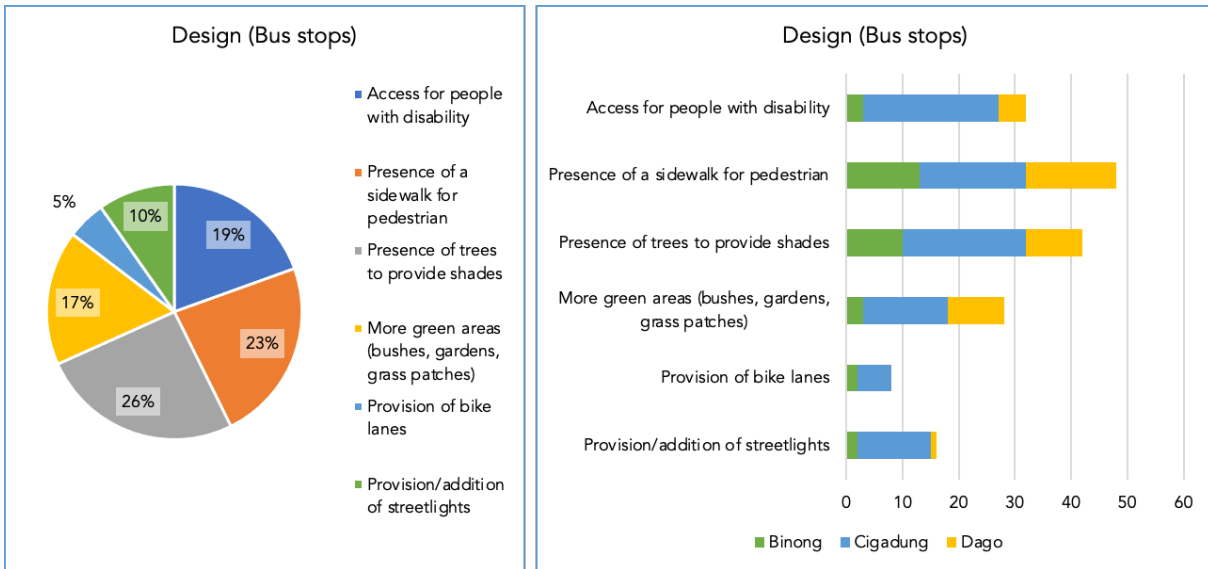


Figure 12 Community's preference on the design aspect for bus stops

Lastly, regarding the distance to transit (see the distributions in Figure 13), the majority of the respondents (31%) is willing to walk within 5-10 minutes to either the bus terminal/train station or the bus stops. The second most chosen time interval is 10 to 15 minutes, with 27% to the bus terminal or train station and 30% to the bus stops. The third most chosen time interval is more than 15 minutes, with 26% to the bus terminal or train station and 23% to the bus stops. The last group is the time interval of 0 to 5 minutes, with only 16% to both bus terminals or train stations and bus stops.

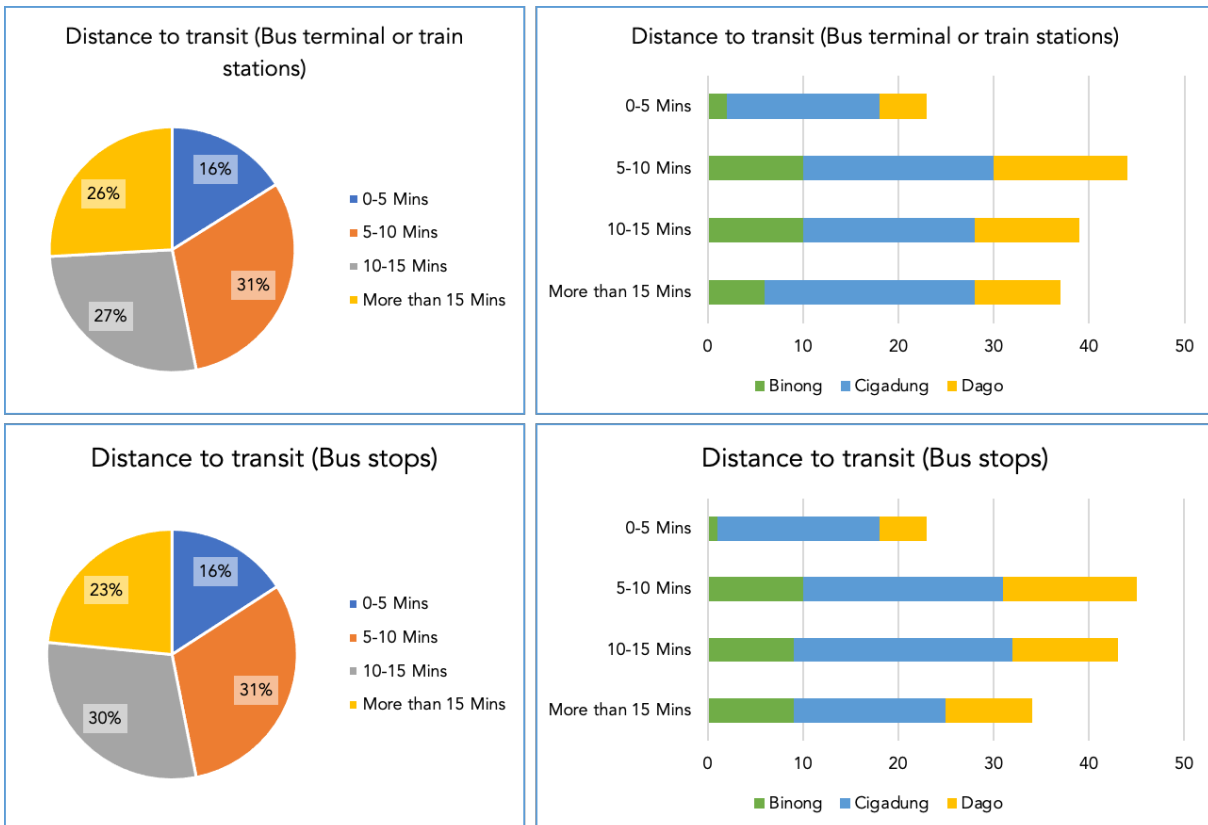


Figure 13 Community's preference on the distance to transit for bus terminal or train station and bus stops

4.3. Baseline TOD degree

This section is discussed to answer the research question 3a “What is the baseline TOD degree of the potential transport nodes in the Creative Kampung in Bandung?” and 3b: “Which TOD dimensions should be improved from the existing situation to connect the Creative Kampung to the city-level TOD?”. The results of this part of the data analysis is depicted in five classes ranging from ‘Very Low Potential’ to ‘Very High Potential’. Here, ‘Very High Potential’ indicates that the area has a higher potential to be developed as TOD, while ‘Very Low Potential’ indicates that the area has low to no potential to be developed as TOD.

4.3.1. Kampung Binong

The results of the TOD assessment results and each TOD indicator in Kampung Binong are illustrated in Figure 14. The statistics distribution of these results is further elaborated in Figure 15.



Figure 14 TOD and TOD Dimensions of Kampung Binong

Kampung Binong scored an average of ‘Moderate Potential’ for the overall TOD assessment (53.36% of the area). The 2.47% of the area of Binong that are classified as having ‘High Potential’ are located near the main road of Jalan Ibrahim Adjie. This is caused by the availability of the sidewalk for pedestrians within the proximity of the kampung is only available on the main road of Jalan Ibrahim Adjie. On the results of the entropy index, the areas that notably have a higher potential are located near the main road, either on the north or east side of the kampung. Additionally, Kampung Binong scored an average of ‘High Potential’ on the building density and destination accessibility indicators. However, the kampung only scored ‘Moderate Potential’ on the land use diversity (entropy index) and greenscape (NDVI). Furthermore, the kampung has a ‘Very Low Potential’ when it comes to the presence of sidewalks for pedestrian, the availability of bike lanes, and the distance to bus terminals or train stations. This comes in contrast to the result of the survey in Section 4.2 where the community of Kampung Binong indicates that the design aspect they would like to see within the proximity of transit nodes is the presence of sidewalks. This implies that an upgrade on Binong’s sidewalk infrastructure for pedestrians is essential to cater to the kampung community's needs in accordance with TOD dimensions indicators.

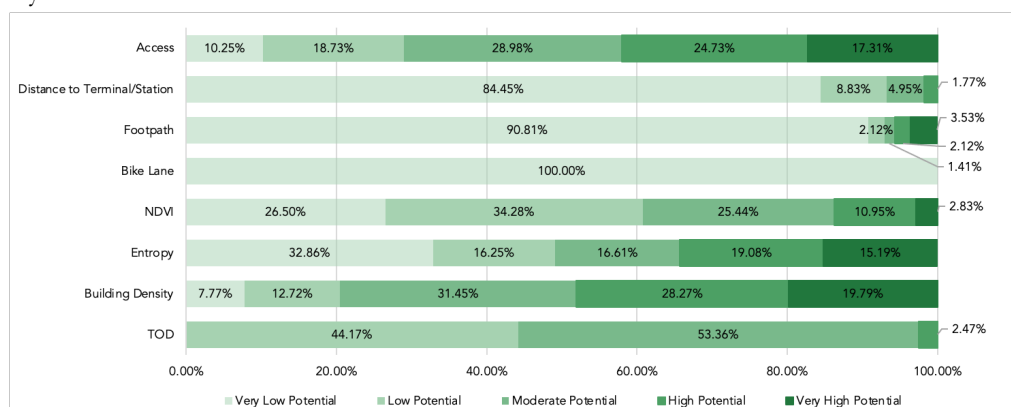


Figure 15 Distribution of TOD and TOD indicator's potential in Kampung Binong

4.3.2. Kampung Cigadung

The result of the overall TOD assessment on Kampung Cigadung, along with the indicators, are shown in Figure 16 and Figure 17. In general, Cigadung has an average score for ‘Moderate Potential’. Some of the areas (4.05%) that have ‘High Potential’ are located outside the boundary of the kampung, partly located in Kampung Dago near the Terminal Dago and partly on the south side of the kampung. This is caused by the availability of bike lanes, sidewalks for pedestrians, and distance to bus terminals or train stations within the proximity of Cigadung are only available outside of the kampung’s boundary. Cigadung got an average score of ‘High Potential’ in the indicator of destination accessibility, with the biggest share of the kampung area (36.49%). That being said, some of the indicators average within the ‘Moderate Potential’ in the building density, land use diversity (entropy index), and greenscape (NDVI). Additionally, the distance to terminals or stations and the sidewalks and bike lanes availability lies on ‘Low Potential’ and ‘Very Low Potential’, respectively.

The results, along with the results of the questionnaire survey discussed in Section 4.2, hinted that the Cigadung community’s preference for the distance to terminals or stations, sidewalks availability, and bike lanes availability is not urgently requested. However, improving the facility that supports the three aforementioned indicators will be beneficial to the TOD potential of Cigadung.

It is also important to note that there is a bias for results on the buffered areas that are located outside the city’s administrative boundary. This is caused by the limitations on some of the data that are only available

on the city level. The indicators that are affected by this issue are building density and greenscape (NDVI). Generally, the building density and greenscape within the kampung's boundary have a rather high potential.

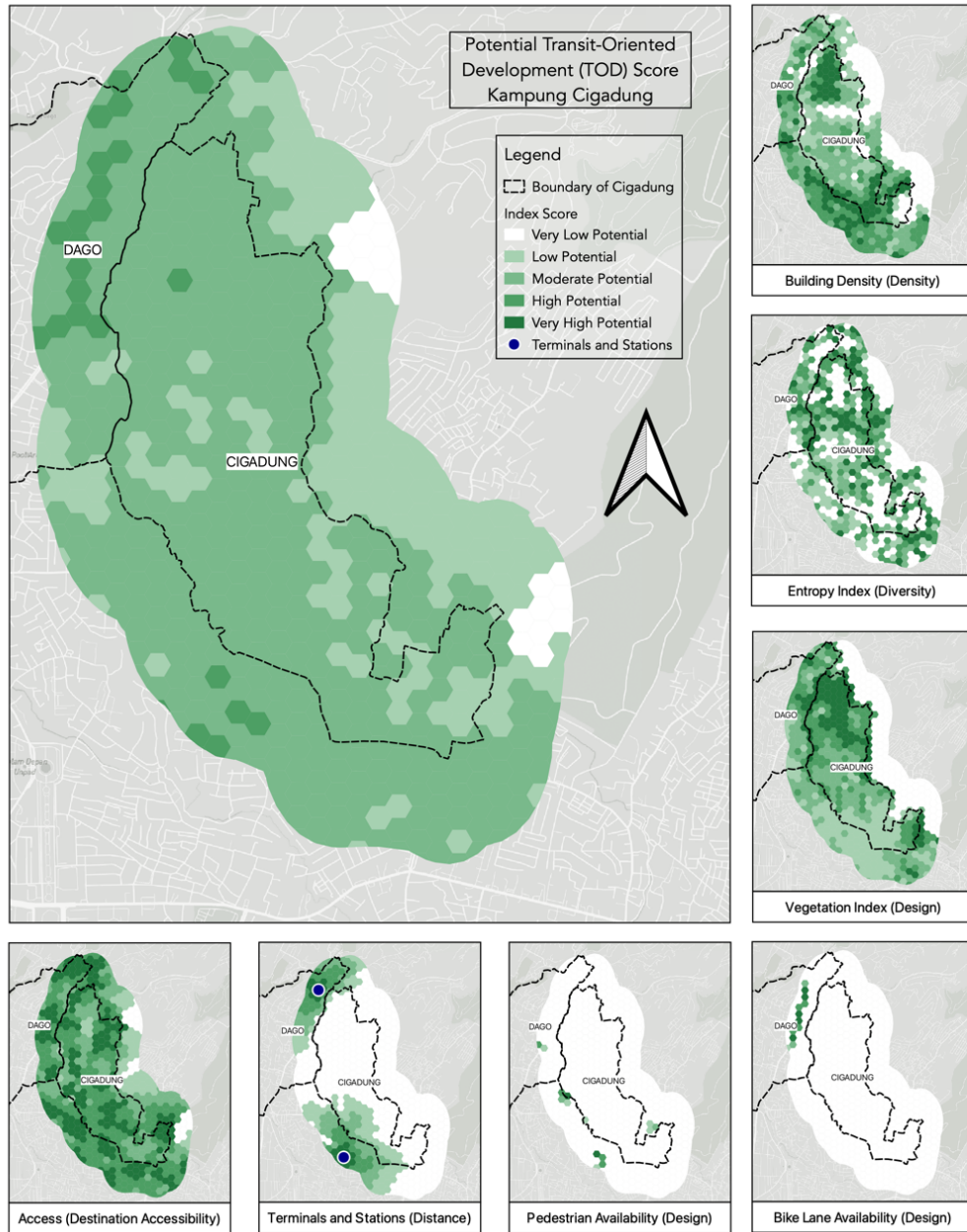


Figure 16 TOD and TOD Dimensions of Kampung Cigadung

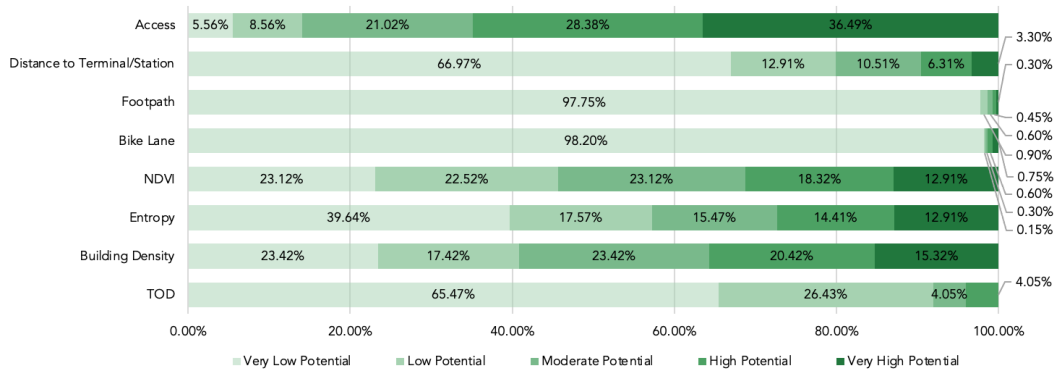


Figure 17 Distribution of TOD and TOD indicator's potential in Kampung Cigadung

4.3.3. Kampung Dago

Figure 18 and Figure 19 show the result of the overall TOD assessment and TOD indicators in Kampung Dago. Dago's overall TOD assessment average is 'Moderate Potential' (71.79%). Small portions of the kampungs (4.98%) are classified as having a 'High Potential'. These areas are located on the main road of Jalan Ir. H. Juanda (north) and on the main road of Jalan Siliwangi (south). This might be caused by the three indicators of bike lane availability, sidewalks availability, and distance to terminals or stations that are only available on the aforementioned areas.

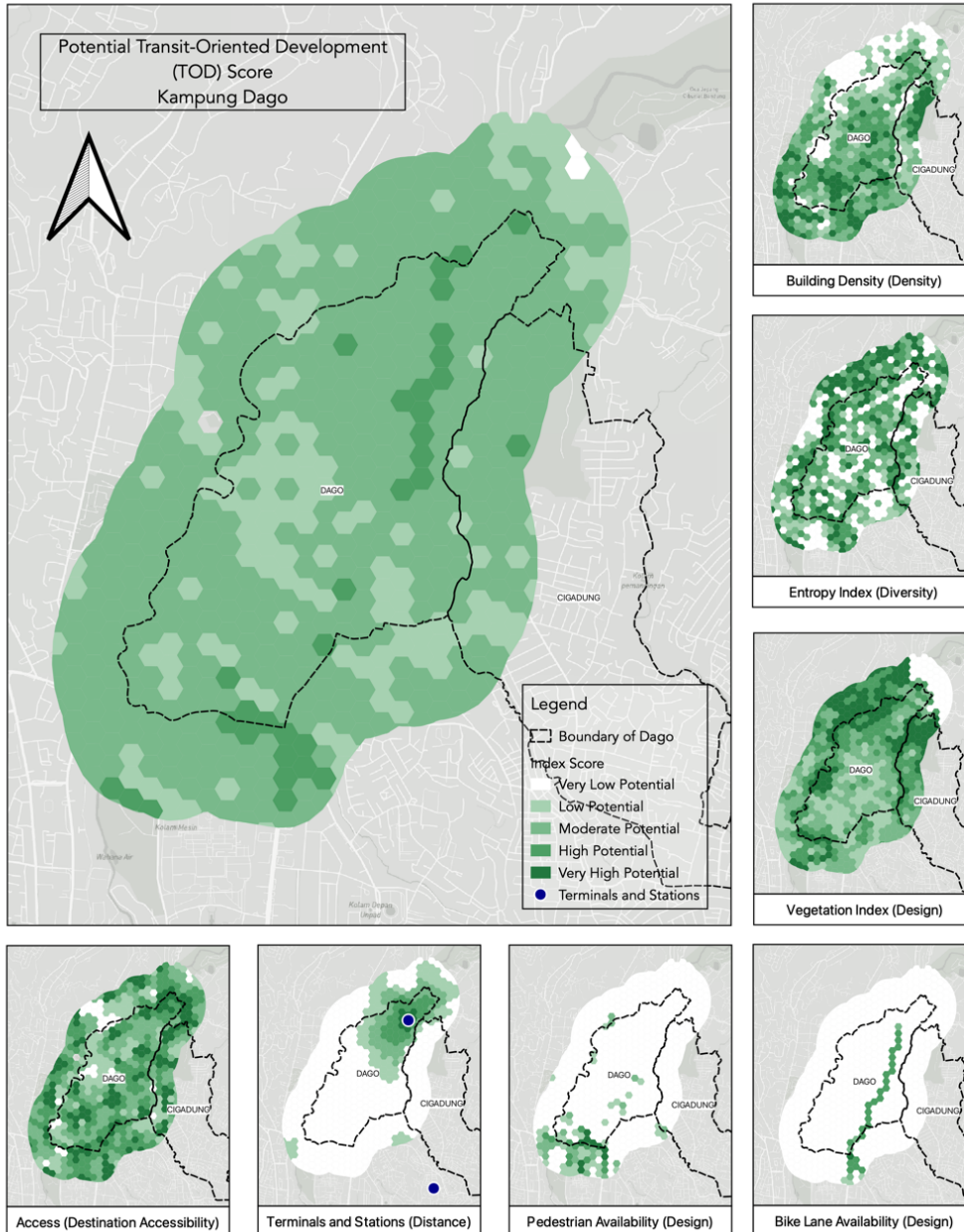


Figure 18 TOD and TOD Dimensions of Kampung Dago

Dago got an average score of 'High Potential' in the indicator of destination accessibility and greenscape (NDVI). On average, the building density and entropy index indicator got classified as 'Moderate Potential'. The rest of the indicators, such as the availability of sidewalks and bike lanes and the distance to terminals or stations, are classified as 'Low Potential'.

In accordance with the results from the questionnaire survey (see Section 4.2), the community of Dago prefers to have better infrastructure for pedestrians. The preferred distance to terminals or stations of Dago’s community lies within the range of 5 to 10 minutes, while the majority of the area is located within the range of more than 15 minutes. This suggests that an improvement in pedestrians’ infrastructure and the connectivity to terminals and stations are important to support the needs of Dago’s community related to the TOD dimensions.

Similar to the results on Kampung Cigadung, although not as much, some of the buffered areas from Kampung Dago are also located outside of the city’s boundary. This also creates limitations on the results from greenscape (NDVI). However, the kampung managed to be still averaged on ‘High Potential’.

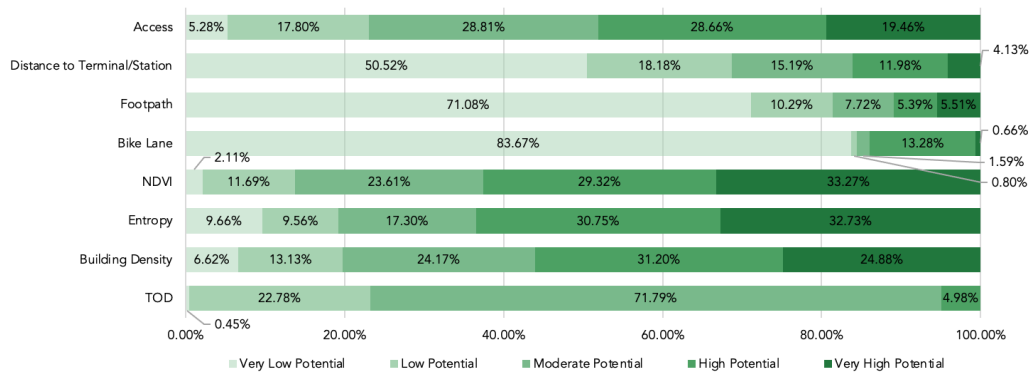


Figure 19 Distribution of TOD and TOD indicator's potential in Kampung Dago

4.4. Selecting new proposed transit nodes

This section discusses the result of the selection of new proposed transit nodes within the proximity of the creative kampungs. The selection of new proposed transit nodes is done to answer the research question of 4a: “How to improve the TOD degree of the Creative Kampungs and associate them with the city-level TOD framework plan?”. In this part of the data analysis, a bivariate map was generated with the overall TOD assessment result and the distance to bus stops. The distance to bus stops plays a role as an ‘urgency’ indicator. The further the distance to the bus stops means, the higher the urgency to propose transit nodes in the area.

4.4.1. Kampung Binong

Due to the characteristics of the kampungs, the proposed transit node would be designed for a feeder. The location of the proposed new transit node can be seen in Figure 20. This transit node has been carefully chosen as a pivotal point that links the kampung with two key transportation hubs: a bus stop on the southeastern side of the kampungs and a train station on the northeastern side. The selection also takes into consideration of the preferred walking distance to bus stops of the Binong community that was gathered from the questionnaire survey (Section 4.2), which is between 5 to 10 minutes. In this instance, the addition of one new transit node was able to improve the overall distance to transit nodes within the kampung area. This approach ensures that the recommendation is efficient and tailored to the specific needs and preferences of the Binong community.

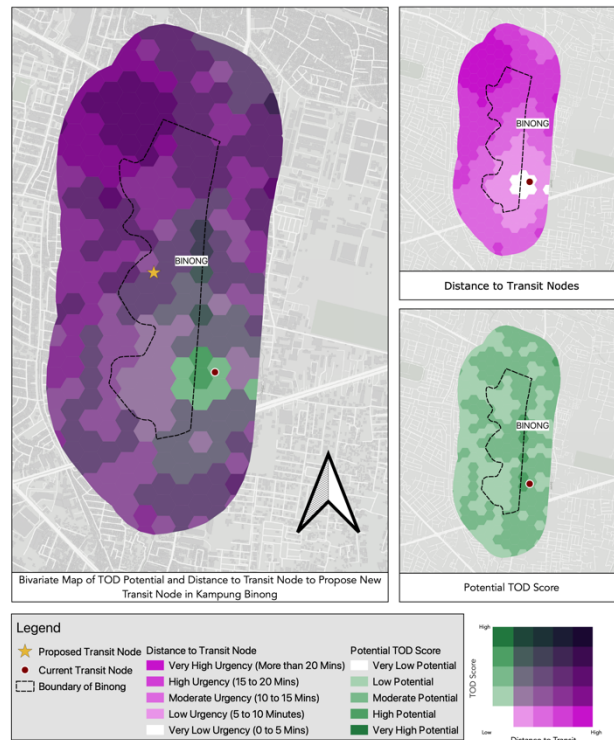


Figure 20 Selecting the proposed area for a new transit node in Binong

4.4.2. Kampung Cigadung

Figure 21 illustrates the selected locations for the newly proposed transit nodes that will connect the kampung to the city's bigger transportation nodes. The transportation nodes that are meant to be connected by these new nodes are the bus terminal on the northwestern side of the kampung and the bus stop on the southeastern side of the kampung.

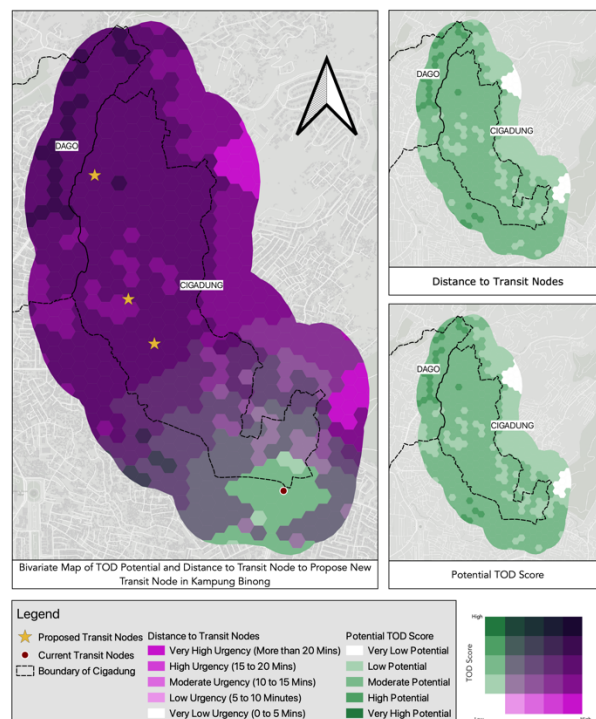


Figure 21 Selecting the proposed area for a new transit node in Cigadung

The addition of the three proposed nodes was selected considering the community's preference on the distance to bus stops previously discussed in Section 4.2 that are within the range of 10 to 15 minutes. In Kampung Cigadung, three new transit nodes were needed to cater to the Cigadung CI community's preference for walking distance to transit nodes.

4.4.3. Kampung Dago

The two newly proposed transit nodes for Dago are illustrated in Figure 22. The two nodes were selected to connect the kampung to the bus terminal on the northwestern side of the kampung to the two bus stops on the southwestern side of the kampung. The addition of the transit nodes is believed to be able to accommodate Dago's CI community's preference for the distance to transit nodes that lies within the 5 to 10 minutes range of walking time.

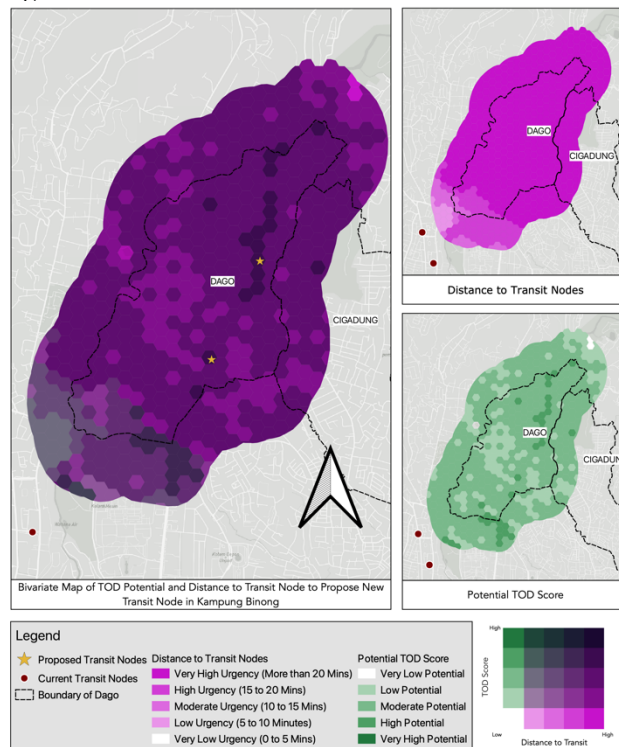


Figure 22 Selecting the proposed area for a new transit node in Dago

5. DISCUSSION

This study aims to explore the potential of Transit-Oriented Development (TOD) to support the Creative Industries (CI) development in Bandung, Indonesia. In this chapter, four of the sub-objectives leading to the aim of the research are discussed: how the dimensions of TOD can support the CI development, the TOD assessment adjusted to the context of CI in Bandung, the baseline TOD potentials in the CI in Bandung and which aspects need improvements, and the recommendations for TOD as a supporting tool for CI growth.

5.1. The relationship of the dimensions of TOD and CI to the CI development

The opportunity to develop CI along with TOD through their respective spatial dimensions was discussed in the literature review that was presented in Section 2.4. It is possible to deduce, based on the findings of the literature review conducted on CI spatial demands (Section 2.1) and TOD dimensions (Section 2.3), that recent research has investigated the factors influencing CI growth in a manner comparable to that of TOD dimensions. As a result, the findings of this study suggest that the development of TOD may also have the potential to support the development of CI in a given region. The CI has several spatial demands that can support its development, elaborated in Section 2.1.2.

First of all, on CI's dimension of features and TOD's dimension of density, a vast concentration of people brings greater exposure to interactions between people (Cervero & Kockelman, 1997; Clare, 2013). Second, CI's dimension of function and TOD's dimension of diversity discussed that CI located in mixed land use areas has better access towards many types of activities, creating opportunities for collaboration and inducing creativity (Miller, 2001; Singh et al., 2014). Furthermore, on CI's space use dimension and TOD's design dimension, both CI and TOD node development are closely related to the attractiveness of its environment (Cervero & Kockelman, 1997; Kiroff, 2017). This implies that the design of the space for both CI and TOD nodes plays a significant role in their success. Additionally, CI's spatiality dimension and TOD's diversity destination accessibility dimension require good accessibility from other parts of the urban space, underlining the need for good accessibility across urban spaces for both CI and TOD effective planning (Bettiol & Sedita, 2011; Ewing & Cervero, 2010). Finally, both CI's spatiality dimension and TOD's distance to transit dimension depend on the proximity of respective nodes to the public transportation (Ewing & Cervero, 2010; Granpayehvaghei et al., 2019; Singh et al., 2014).

5.2. TOD assessment adjusted to the context of the CI in Bandung

Existing research (Section 2.3.1) shows that TOD assessment is often measured by the dimensions of density, diversity, design, distance to transit, destination accessibility, and economic development. The challenges to applying the TOD assessment method to properly measure the TOD potential in the creative kampungs of Bandung are caused by the gaps between the policy prepared by the municipality and the demands requested by the communities.

The TOD framework from the government touches only two dimensions: diversity and destination accessibility. The regulations focus on placing the nodes in a designated mixed-use area on the Detailed Spatial Plan and Zoning Regulations for Bandung 2015-2035 and developing the transit nodes based on the

established transit network. Furthermore, the proposed areas mentioned in these regulations (Figure 6 and Figure 7) do not overlap with the studied creative kampungs. This implies that it would be difficult to integrate the municipality's TOD development plan with the CI development plan using only the current policy.

The results of the survey show that the most common transit mode is private vehicles (43%), and the least preferable is public transportation (12%). The informal interviews found that people are not willing to use public transport due to safety reasons from the opposing parties for the municipality's public transport, the duration of the longer travel time due to the traffic jams, and the inflexibility of the routes and stops. Furthermore, most of the people from the communities are only willing to travel within 15 minutes daily (33%). This is assumed to be caused by a lot of the creative kampungs' employees who are also living in the same kampung (based on the answers of informal communication during the survey). On the diversity dimension, the biggest share of 30% of the creative kampungs community would like to be able to conduct business-related activities. Especially for Binong, this is assumed because the kampung leans more towards an actual knitting industry rather than a tourist-based industry, so most visitors also come within the kampung for business (to find suppliers or to export and import their products). From the result of the survey on the design dimension, most of the answers on which aspects would increase their likeliness to use public transit is the provision of sidewalks for pedestrians (28%) and greenscape for more trees for shade and more green areas (23%). Lastly, most of the respondents (31%) stated that they are willing to walk between 5 to 10 minutes to reach the nearest transit nodes. This is assumed to be the amount of distance that is acceptable by the creative kampung's community to walk.

In conclusion, assessing the TOD based on the demand of creative kampungs that were explored from previous research is necessary to fill in the gaps of the density, design, and distance-to-transit nodes dimensions, as these were not discussed in the municipality's framework to assess TOD potentials.

5.3. The potential TOD nodes in the Creative Kampungs in Bandung with the contextualised TOD assessment

This part of the data analysis was done at the kampung level to understand the spatial distribution of TOD potential within the kampung. The result of this analysis was used to select potential locations for new nodes. This section will discuss the interpretation of the TOD assessment results and their relation to the CI's spatial dimensions.

The three kampungs have a 'Moderate Potential' TOD score that varies in the spatial distribution and the leading indicators. As can be seen in Figure 14 in Section 4.3.1, the spatial distribution of TOD potentials within the kampung of Binong is mostly influenced by the main road of Jalan Ibrahim Adjie on the east border of the kampung. The main road provides a higher score of land use diversity, greenscape (design dimension), pedestrian infrastructure (design dimension), and destination accessibility to the kampung. That being said, Binong's highest average dimensions are density and accessibility. From this result, it can be inferred that the development of CI in Binong is mainly supported by the feature and spatiality aspect of CI spatial dimension due to its exposure to the concentration of people and good accessibility from other parts of the city. However, it is important to note that from the informal discussions during the questionnaire survey, Binong's activities are mostly business-related; a lot of the sales nowadays are made through online platforms or exported to other parts of the city.

In Cigadung, Figure 16 in Section 4.3.2 shows a lack of facilities within the kampung itself, as the detected areas to have high potentials are located outside Cigadung's administrative boundary. The areas that have high potential are mostly influenced by Terminal Dago, located in Kampung Dago, on the north-western side of Cigadung. The bus terminal improves the distance to transit nodes and contributes some bike lane and sidewalk availability to the kampung's TOD potential. Furthermore, Cigadung has a high potential in terms of accessibility but moderate potential in the density, diversity, and greenscape (design dimension). In terms of the Cigadung's CI development, the spatiality of the kampung is sufficient for their employees or visitors that mainly prefer to use private vehicles. That being said, improving the function and space use dimension in the kampung is possible to attract more visitors.

Some of Dago's areas that were classified to have high potential is the area on the main road of Jalan Ir. H. Juanda in the direction towards the Terminal Dago on the north side of the kampung (see Figure 18 in Section 4.3.3). The presence of Jalan Ir. H. Juanda improves the overall TOD potential of Dago on the distance to the transit node and bike lane availability aspect. On the other dimensions, Dago scored high on the potential for destination accessibility and greenscape. This indicates that further improvements on the feature, function, and space use aspect of the CI spatial dimensions is necessary for Dago's CI growth.

Additionally, it is important to note that Cigadung and Dago is located on the border of Bandung's administrative boundary. There is a possibility that the two kampungs would have better relation to the distance to terminals or destination accessibilities if the assessment was done with the consideration of the bounding cities or regencies.

5.4. Recommendations for TOD as a supporting tool for the growth of CI

The three kampungs have 'Moderate Potential' that varies on the leading indicators. However, the three studied kampungs have low to very low potentials in the indicators of the presence of sidewalks for pedestrians, the presence of bike lanes, and the distance to bus terminals or train stations.

In Binong, the TOD indicator that is considered to have a 'Very Low Potential' is the presence of sidewalks for pedestrians. This indicator needs to be highlighted as it shows the most contrasting result from the demands of the Binong community discussed in Section 4.2. An upgrade on Binong's sidewalk infrastructure for pedestrians is beneficial to improve the TOD potential of the kampung. However, Figure 23 shows the normal situation of Kampung Binong. This illustrates that the limited space makes building sidewalk infrastructure that goes through the kampung is hard. As an alternative to the sidewalk, it is better to restrict the use of motorized vehicles or put a time restriction on the area from motorized vehicles to improve the comfort and safety of the pedestrian. Furthermore, on the indicator of the presence of bike lanes, the community does not show a strong interest towards it. Lastly, the preferred distance to transit nodes from Binong's creative industry community from the result in Section 4.2 is within the range of 5 to 10 minutes. The addition of a transit node inside the kampung, elaborated in Section 4.4.1 enables the whole kampung to be accessible by the new node within the 5 to 10 minutes range.



Figure 23 Situation of Binong with narrow street and no sidewalks for pedestrian

Similarly, Cigadung also has a low potential on the indicators of the presence of sidewalks for pedestrians, the presence of bike lanes, and the distance to transit nodes (bus terminals or train stations). On the indicator of pedestrian infrastructure, the result from the survey with the community discussed in Section 4.2 indicates that sidewalks are placed 3rd on the design indicators demanded by them. This might be caused by the hilly contour of the kampung that reduces the willingness of the people to walk and use private vehicles instead. The situation of the Kampung Cigadung is depicted in Figure 24. The community also showed the least interest in the bike lane availability indicators, which might also be caused by the uncomfortable environment to bike. Lastly, Section 4.4.2 discussed the possibility of adding three transit nodes that connect the kampung to the city's transit nodes. This addition was proposed to accommodate the preferences of the community to walk within the range of 5 to 10 minutes to the nearest transit nodes.

Lastly, on Dago, the result of the survey in Section 4.2 elaborates that the community of the kampung demands the provision of a sidewalk for pedestrians as an important indicator that will increase their willingness to use public transportation. According to the physical situation of Dago as illustrated in Figure 25 and Figure 26, there are some spaces in some of the roads within the kampung to be designed as sidewalks. The provision of sidewalks for pedestrians inside the kampung is believed to be beneficial to improve the TOD potential of the kampung. This will improve the attractiveness of the area for visitors as well. Additionally, the provision of bike lanes is also not demanded by the community. However, this might be because there's already a bike lane available on the main road of Ir. H. Juanda (northern side of Dago). The community might not feel the need for a designated bike lane on the smaller streets. Furthermore, to improve the indicator of the distance to transit nodes, two additional nodes were proposed in Section 4.4.3 to accommodate the creative kampung's community preference to walk between the 5 to 10 minutes range.



Figure 24 Situation of Cigadung with high elevation and no sidewalks for pedestrian



Figure 25 Situation of Dago with the streets being used to park



Figure 26 Situation of Dago with high elevations

5.5. Limitations

Despite meeting all of the pre-defined research questions, this thesis found some aspects where this research can be improved. Some of them are:

Consideration of Socio-demographic Aspects in Research:

The research currently focuses on spatial dimensions and demands from Transit-Oriented Development (TOD) and the creative industry (CI). To enhance the depth and understanding of the potential impacts, it would be beneficial to incorporate socio-demographic aspects of the communities. This could involve analysing factors such as population demographics, income distribution, education levels, cultural diversity, and social dynamics within the target areas. By integrating socio-demographic data, the study can better assess how proposed developments and policies might affect different segments of the community and ensure that the outcomes are equitable and inclusive.

Enhancing the TOD Potential Measurement Dataset:

The research employs a quantitative dataset to measure Transit-Oriented Development (TOD) potentials. While this approach offers valuable insights, there's an opportunity to enhance the assessment by considering the quality of specific indicators, particularly those related to the design dimension of urban development. For instance, factors like the quality of sidewalks, bike lanes, green spaces, and other urban amenities play a crucial role in creating a vibrant and sustainable urban environment. By including these qualitative aspects, the analysis can provide a more holistic understanding of the city's dynamics and potential for TOD.

Stakeholder Engagement for Effective Policy Recommendations:

The results and recommendations presented in Section 5.4 of the research could be more impactful if they were discussed with key stakeholders from Bandung's creative kampung, particularly representatives from the municipality. Engaging stakeholders in these discussions is essential because they have a direct influence on implementing and enforcing recommended policies. By involving municipal officials, urban planners, community leaders, and other relevant parties, the research can ensure that the proposed recommendations align with the city's strategic goals and are feasible within the local context. This collaborative approach also increases the likelihood of successful policy implementation and long-term positive outcomes for the creative kampung.

Incorporating these suggested elaborations into the research would provide a more comprehensive and nuanced analysis of the potential impacts of Transit-Oriented Development and creative industry integration in Bandung's urban context. It would also enhance the validity and relevance of the research findings for urban planners, policymakers, and community members alike.

6. CONCLUSION

The aim of this study is to explore the potential of Transit-Oriented Development (TOD) to support the Creative Industries (CI) development in Bandung, Indonesia. The study seeks to formulate recommendations for potential TOD development that will support CI development. The recommendations were proposed based on the context of each of the study cases.

To establish a foundation for the study, an in-depth review of existing literature on Transit-Oriented Development and the Creative Industries was conducted to study the relationship between TOD and CI. The findings revealed that common elements used for both TOD and CI development exist, offering chances to foster CI's expansion by potentially enhancing its area in alignment with TOD's dimensions.

Furthermore, the official documents and policies set forth by the local government of Bandung were studied to gain insights into the municipality's stance and strategies concerning Transit-Oriented Development. This was done to put context on the measurements of the TOD and TOD indicators' potential. The contextualization was also equipped by a questionnaire survey deployed to the communities of the studied creative kampungs in Bandung, which are Binong, Cigadung, and Dago. It was found from the studied documents from the municipality that their policies on developing TOD concern the dimensions of diversity and destination accessibility, while the result of the literature review on TOD assessment and the survey to the communities implies the importance of the dimensions of density, design, and distance to transit on planning a TOD and CI development.

The assessment of the TOD potentials was carried out on a grid of 100 x 100 meters hexagons within a 500-meter buffer area around the creative kampungs. Multiple dimensions were considered in this assessment, including density, diversity, design, distance to transit nodes, and destination accessibility. The result of this analysis indicates that all three of the kampungs are considered to have 'Moderate Potential'. The aspects that these three studied kampungs lack the most are the availability of sidewalks for pedestrians, the availability of bike lanes, and the distance to transit nodes. This indicates that the three kampungs are missing several spatial demands that are commonly found in thriving CIs, especially on the space use and spatiality aspect.

Based on the results of low potentials on the distance to transit in all of the study cases, this analysis was carried out and overlaid as a bivariate map with the distance to the transit node (bus stops) to select which area of the kampungs shall be appointed as a new transit node to connect the kampung with the city's broader transportation network. This recommendation was proposed to address the issues highlighted by the stakeholder in the roundtable discussions and confirmed by the questionnaire survey that the community of the CIs in Bandung is only willing to walk within 5 to 10 minutes to the nearest transit nodes (bus stops).

In response to the findings and analysis, context-specific recommendations were formulated. These recommendations were tailored to address the preferences and needs of the local communities, which had been gathered during the contextualization process. The aim was to ensure that the proposed measures align with the aspirations and requirements of the people residing in the creative kampungs. However, there might be challenges either from the government's side or the community's side in the implementation of these

recommendations. For example, managerial issues from the bureaucracy's jurisdictions within the government, lack of funding, lack of cooperation from the communities, etc. Therefore, it is important to align the government's planning and raise the awareness of the communities to improve everyone's sentiments towards the planning.

Overall, it can be inferred that there is a potential for TOD to support the development of CI in Bandung, Indonesia, if the recommendations can be applied. Additionally, these recommendations were developed according to three specific contexts. Further analysis on more creative kampungs in Bandung will be beneficial to the overall CI development in Bandung.

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ANNEX 1: SURVEY QUESTIONNAIRE

Table 4 Survey questionnaire

Dimension	Question	Answer Choices
General	I give permission to use my answers to this survey for research purposes	a. Yes b. No
General	[Kampung representative] What is your usual/preferred transportation mode to carry out your daily activities? [Visitor] How did you get here (The Creative Kampung)?	a. Walking b. Public transportation c. Private vehicle d. Online taxi/bike e. Other: ...
Destination accessibility	[Kampung representative] What is the maximum time that you are willing to travel to carry out your daily activities? [Visitor] What is the maximum time that you are willing to travel to visit this Creative Kampung?	a. 0 to 15 Minutes b. 15 to 30 Minutes c. 30 to 60 Minutes d. More than 1 Hour
Diversity	[Kampung representative] Which activities do you usually carry out by using public transportation?	a. Business-related activities (Going to suppliers, distributing products, shipping/exporting products, etc) b. Household-related activities (Going to market, dropping off/picking up kids from school, etc) c. Healthcare-related activities (Going to hospital, going to doctors, visit a pharmacy, etc) d. Self-improvement activities (Going to community classes) e. Leisure activities (Meeting some friends, going to cafes, watching a movie in cinemas, shopping, visiting tourist attractions, etc) f. Other: ...
Diversity	[Kampung representative] What are the other activities you wish you could carry out by using public transport but currently can't due to the lack of access? [Visitor] What are the other activities you wish you could carry out when you're visiting this kampung by using public transport but currently can't due to unavailability?	a. Business-related activities (Going to suppliers, distributing products, shipping/exporting products, etc) b. Household-related activities (Going to market, dropping off/picking up kids from school, etc) c. Healthcare-related activities (Going to hospital, going to doctors, visit a pharmacy, etc) d. Self-improvement activities (Going to community classes) e. Leisure activities (Meeting some friends, going to cafes, watching a movie in cinemas, shopping, visiting tourist attractions, etc) f. Other: ... g. No other activities

Design	Are there aspects from the surroundings/environment of the train station that you would like to see? (That are not related to the train service itself).	<ul style="list-style-type: none"> a. Access for people with disabilities b. Presence of sidewalk for pedestrian c. Presence of trees to provide shades d. More green areas (bushes, gardens, green patches) e. Provision of bike lanes f. Provision/addition of street lights g. Other: ...
Design	Are there aspects from the surroundings/environment of the bus stops that you would like to see? (That are not related to the bus service itself).	<ul style="list-style-type: none"> a. Access for people with disabilities b. Presence of sidewalk for pedestrian c. Presence of trees to provide shades d. More green areas (bushes, gardens, green patches) e. Provision of bike lanes f. Provision/addition of street lights g. Other: ...
Distance to transit	Assume you can only walk to the train stations, how far are you willing to walk to reach the train station before deciding to travel with other means of transport? (in Minutes).	<ul style="list-style-type: none"> a. 0 to 5 Minutes b. 5 to 10 Minutes c. 10 to 15 Minutes d. More than 15 Minutes
Distance to transit	Assume you can only walk to the bus stops, how far are you willing to walk to reach the bus stops before deciding to travel with other means of transport? (in Minutes).	<ul style="list-style-type: none"> a. 0 to 5 Minutes b. 5 to 10 Minutes c. 10 to 15 Minutes d. More than 15 Minutes
General	Assume that the government provides public transportation that can access all of your preferred activities, have all the surrounding/environment aspects fixed to be more comfortable and safer, and located within your preferred walking distance from your origin and destination, will it be more likely for you to use the public transportation?	<ul style="list-style-type: none"> a. Yes b. No

ANNEX 2: QUESTIONNAIRE RESULT

Table 5 Questionnaire result

Dimensions		Total	Binong	Cigadung	Dago
		(n)	(n)	(n)	(n)
Preference of transport mode	Walking	42	11	14	17
	Public transportation	19	3	14	2
	Private vehicle	69	14	35	20
	Online bike/taxi	27	2	18	7
	Other	2	0	2	0
Destination accessibility	0-15 minutes	49	10	20	19
	15-30 minutes	44	8	25	11
	30-60 minutes	32	6	23	3
	More than 60 minutes	22	5	10	7
Diversity	Business-related activities	45	6	22	17
	Household-related activities	26	3	10	13
	Healthcare-related activities	9	0	7	2
	Self-improvement activities	11	4	5	2
	Leisure activities	34	9	25	4
	Other	1	0	1	0
	No other activities	26	8	9	9
Design (Bus terminals or train stations)	Access for people with disability	21	2	14	5
	Presence of a sidewalk for pedestrian	48	15	18	15
	Presence of trees to provide shades	41	9	23	9
	More green areas (bushes, gardens, grass patches)	41	5	22	14
	Provision of bike lanes	6	0	3	3
	Provision/addition of streetlights	17	2	12	3
Design (Bus stops)	Access for people with disability	32	3	24	5
	Presence of a sidewalk for pedestrian	38	13	19	16
	Presence of trees to provide shades	42	10	22	10
	More green areas (bushes, gardens, grass patches)	28	3	15	10
	Provision of bike lanes	8	2	6	0
	Provision/addition of streetlights	16	2	13	1
Distance to transit node (Bus terminals or train station)	0-5 Mins	23	2	16	5
	5-10 Mins	44	10	20	14
	10-15 Mins	39	10	18	11
	More than 15 Mins	37	6	22	9
Distance to transit node (Bus stops)	0-5 Mins	23	1	17	5
	5-10 Mins	45	10	21	14
	10-15 Mins	43	9	23	11
	More than 15 Mins	34	9	16	9

