



revisited *composition*

MASTER THESIS

Putrikinasih R. Santoso
Delft, June 28th, 2016

Implementation Strategy For Mobility-Based
Development in Bandung City, Indonesia

MASTER THESIS

revisited composition

implementation strategies for mobility based
development in Bandung, Indonesia

Delft, June 28th 2016

Putrikinasih R. Santoso
4411978

title

Revisited Composition:
Implementation Strategies for Mobility
Oriented Development in Bandung,
Indonesia

graduation lab

MSc in Urbanism Graduation Lab:
Urban Transformations

graduation studio

Complex Cities and Urban Regions
in Transformation

mentors

Roberto Rocco, Dr. R.C.
Assistant Professor, Chair of Spatial Planning &
Strategy, Department of Urbanism
Faculty of Architecture and the Built Environment,
Delft University of Technology (TU Delft)
R.C.Rocco@tudelft.nl

Luisa Calabrese, Dr. Ir. L.M.
Associate Professor, Chair of Urban Composition
Department of Urbanism
Faculty of Architecture and the Built Environment,
Delft University of Technology (TU Delft)
L.M.Calabrese@tudelft.nl

Board of Examiners Delegate

Steven Steenbruggen, Ir.
Complex Projects, BSc of Architecture
Faculty of Architecture and the Built Environment,
Delft University of Technology (TU Delft)

author

Putrikinasih R. Santoso
student number 4411978
PutrikinasihRirihSantoso@student.tudelft.nl
putrikinasih@gmail.com

all images are sourced to the author unless stated
the other way.

Delft, June 2016

acknowledgement

I started this master study with a wishful thinking of gaining more knowledge about the city: its development and redevelopment strategies, its challenges, and its processes. It turned out to be one of the most humbling yet thrilling experiences I have had in my life so far. Not only have I gained the comprehension I expected, I have also encountered numbers of pleasant acquaintances whom I have shared the moments with. I am gratefully indebted for the Indonesian Endowment Fund for Education (LPDP) grant, which has allowed this opportunity to happen.

I have always believed that architecture should be part of the solution to the urban challenges, yet I have found out there are more architectural projects that have triggered new questions rather than solving it. This discovery has then led me to the urbanism track. I later found out that I share many common values in the urbanism field rather than mere architecture.

My years in the Master of Urbanism track was inspired a lot by numbers of the great minds in this faculty. I would especially like to thank my mentors, Roberto Rocco and Luisa Calabrese, for the inspirations, the discussions, and the supportive criticism in the past year. Having both of you as my mentors is one of the decisions that I am glad I took. As a supervisor, both Roberto and Luisa have been very supportive and passionate. They consistently allowed this work to be my own, but generously steered me in the right direction as well as gave me the right amount of impulse whenever they thought I needed it.

In addition, I would also like to acknowledge several other tutors with whom I have discussed the initial ideas for this graduation project. Professor Vincent Nadin, Professor Wil Zonneveld, Diego Sepulveda, Stephen Read, Verena Balz, Arie Romein, Birgit Hausleitner, and Dena Kashraian are among those who have given their time and kind

recommendations and helped me a lot in shaping the project at the first place.

Working on a graduation project from 12,000 km away from the site is not always the best option. However, with the assistance from numbers of the expert acquaintances and colleagues in Indonesia, I was able to gather the necessary data. Thus, the credits also go to Sigit Wisnuadji (KFA Indonesia), Aji Bimarsono (Bandung Heritage Society for Heritage Conservation), Achmad Syaiful (SUGU Studio), Seterhen Akbar (Riset Indie), Tammi Lasmini (Dinas Tata Ruang dan Cipta Karya Kota Bandung), Nunun Yanuarti (Bappeda Kota Bandung), Professor Ade Sjafruddin (Civil Engineering ITB), Ramalis Soebandi (Tunas Nusa Foundation), Shinta S. Prabonno (BCCF), Ermaula Assaseang, and Imelda Rosalin. Without their passionate participation and valuable input, the data collection phase of this project could not have been successfully conducted.

Above all, the past two years was not always easy and I must express my very profound gratitude to my family for their undue support and the continuous encouragement. Also, to the dearest friends – the closest to a family – I have left in Bandung and those I have found in Delft: the fellow Urbanism “table” graduates and my restless Indonesian neighbours.

Thank you.

Delft, June 28th, 2016

Putrikinasih R. Santoso

summary

KEYWORDS

mobility oriented development, urban redevelopment, Bandung, Indonesia, sustainable urban development

As of today, most of the world's population is living in urban areas. A lot of people is either migrating or commuting to the city every day. Urban sprawl in many cities in the world tends to trigger severe urban mobility challenges because the development is rarely supported by adequate infrastructure. In addition, the monocentric characteristic of the city worsens the fact that urban sprawl has encouraged massive commuting activities from peripheral areas to the city centre. In the case of high dependency to privately owned vehicles, both in the developed and developing countries, traffic congestion have become inevitable vernacular reality.

The context chosen for this project is Bandung, Indonesia, the second largest cities in West Java. Bandung has been acknowledged as Jakarta's backyard and experiencing quite massive urbanization since 1960's. The city has grown into one big agglomeration of 17,000 hectares area where almost 3 million people live

in. Regretfully, the urban development in Bandung has outpaced the government's efforts in providing adequate infrastructure to connect the new (housing) complexes in the peripheries to the existing urban core, or providing new urban cores. The development trend has resulting certain tension between the city centre and the peripheral areas in the form of a severe daily traffic jam.

There are three main development issues in Bandung, Indonesia addressed in this project: inefficient mobility, degradation of environment quality, and the lack of comprehensive planning in addressing the development.

This project aimed to promote sustainable urban development in Bandung City as a response to current development trend which, one way another, encourages urban sprawl. The theses will be presented in the form of the development framework, structure vision, and development guidelines, which are exemplified in a key project.

content

ACKNOWLEDGEMENT	3	Conclusion on Analyses	60
SUMMARY	5	Potential Location for Future Development	64
CONTENT	7		
INTRODUCTION		DEVELOPMENT STRATEGIES	
Urban Sprawl and Sustainable Urban Development	13	Development Framework	70
Problem Statement	14	Structure Vision	71
Design Goals	15	Development Guidelines	72
Relevance	15	Implementation Strategy	75
Scope & Limitations	16	CONCEPTUAL DESIGN	
Methodology	16	Gede Bage District	83
Expected Outcome	18	Development Framework	86
Report's Structure	18	Gede Bage Intersection: The New Melting Pot For Ideas	87
THEORETICAL FRAMEWORK		CONCLUSION & REFLECTION	
What Makes Urban Centrality	21	Conclusion	119
Multinodal Urban Structure	22	Reflection on the Thinking Process	120
BANDUNG		Further Research	123
General Information	29	REFERENCES	127
History & City Genesis	29	APPENDIX A	
Economy	33	Theory Paper: "Dispersed Concentration"	135
Socio-Cultural	33	APPENDIX B	
ANALYSES		Workshops	147
Urban Development Trend in Bandung City	37		
Bandung Metropolitan Area Layered Analysis	43		
	44		

introduction

CONTENT

*problem analysis, design goals, relevance, scope and limitations,
methodology, expected outcome*

URBAN SPRAWL AND SUSTAINABLE URBAN DEVELOPMENT

As of today, most of the world's population is living in urban areas. A lot of people is either migrating or commuting to the city every day. In developing countries like China and India, for example, the urbanization rate could reach the number of 30 – 50%. To cope with this migration wave, cities need to provide more living space. These spaces are usually provided by promoting new development both within the existing built environment and in the vacant spaces around urban peripheries. The latter type of development is often recognized by the term of urban sprawl.

Although there is no single definition of 'sprawl', it is often defined as *"low-density, scattered, urban development without systematic large-scale or regional public land-use planning"* (Bruegmann, 2005, p. 18).

"Defining 'sprawl' is a little bit like defining pornography, you know it when you see it. There is no consensus on any one single definition of 'sprawl'."

(Dunham-Jones in Hustwit, 2011)

In developing countries, the urban population is growing more rapidly and often, if not always, put a lot of pressure to infrastructure and increasing demand for services. This rapid development has outpaced urban management efforts, causing both physical and socio-economic consequences (Devas and Rakodi, 1993).

Urban sprawl is one of the commonly renowned urban phenomena that have drawn a lot of interests, discourses, and criticisms. It is often addressed as

phenomenon :

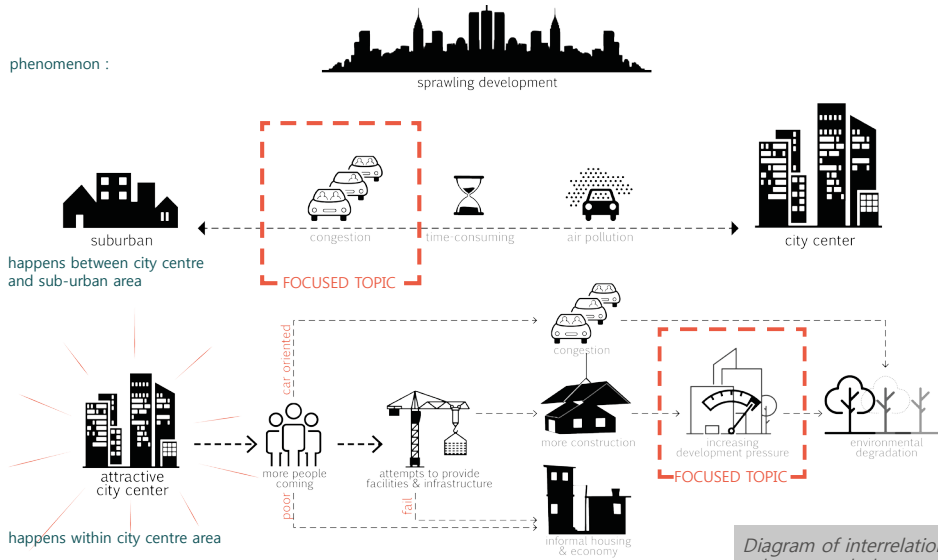


Diagram of interrelation between urban sprawl phenomenon and its effects to urban areas

a problem because of its tendency in deriving certain impacts such as massive land use change, low-quality housing complexes, and severe traffic jam. For almost the same reasons, urban sprawl is usually perceived as an unsustainable model for urban development.

The sustainable urban development comprises numbers of indicators and criteria. The Council of Sustainable Development (CSD) from the United Nations has posited 14 indicator themes in the field of sustainable development in their report, "Indicators of Sustainable Development: Guidelines and Methodologies" (Economic and Social Affairs, 2007). These indicators are including poverty, governance, health, education, demographics, natural hazards, atmosphere, land, oceans, sea and coasts, freshwater, biodiversity, economic development, global economic partnership, as well as consumption and production patterns.

Urban sprawl has triggered a series of chained reaction, particularly in consumption and production patterns, economic development, and land-use and land status changes. These changes not only have caused more vulnerability to natural hazards (for example, landslides and flooding) but also considered to contribute massively to the climate change, especially due to the excessive carbon footprint from the development (Brueggemann, 2005).

Numbers of reactions have been raised against the sprawl especially in the attempt to search more sustainable urban form, including the discourse of compact cities and polycentric urban model.

PROBLEM STATEMENT

Urban sprawl in many cities in the world tends to trigger severe urban mobility challenges because it is often not supported by adequate infrastructure. In addition, the monocentric characteristic

of the city worsens the fact that urban sprawl has encouraged massive commuting activities from peripheral areas to the city centre. In the case of high dependency to privately owned vehicles, as posed in both developed and developing countries in the world, traffic congestion have become inevitable vernacular reality.

As it has become apparent from the analyses (see chapter 4), there are three main development issues in Bandung, Indonesia to be addressed in this project, which are inefficient mobility, degradation of environment quality in the city, as well as the lack of good governance.

DESIGN GOALS

Research Questions

For this particular project, a main research question is posited, supported by several sub-research questions that will lead the design and research through iteration processes. This project is intended to address the question of:

“How could comprehensive planning in urban mobility help to promote sustainable urban development in Bandung City, Indonesia?”

This research question is supported by three sub-questions, which are:

1. What are the drivers of development in Bandung City through the time?
By knowing the drivers of development, it is possible to read the trends through the time. This question will be helpful in determining who the influential actors are to the urban development in Bandung City.
2. What is urban mobility? How to implement mobility based development?

This question is expected to lead the research in understanding mobility based development; not only its conceptual ideas and definition but also the tools that might be used to implement the idea.

3. How new physical structures (in this case, polycentric urban model) help to alleviate the development pressure?

This particular query will be answered through a design (and planning strategy), which will be the outcome of this project.

Objectives

The objective of this project is to promote sustainable urban development in Bandung City as a response to current development trend which, one way another, encourages urban sprawl.

Goals

This project attempts to explore certain questions through research and is intended to pose a proposal for implementation by means of a design. According to the previously mentioned objectives, the goals that will lead the design processes are including:

1. To provide the ease of access within the city centre and among the sub-centres.
2. To foster better environment quality, especially in providing green areas within the city and preventing floods.
3. To encourage participation from local stakeholders in planning and implementation processes.

RELEVANCE

Scientific Relevance

The city is a multifaceted entity where every single aspect is very much interrelated to another. Thus, I strongly

believe that in planning and urbanism practice a thorough analysis, as well as comprehensive understanding of the existing system (governance, economic, network, environment, etc.), will help to unravel the essential challenges for the city.

Considering this point of view, I take "Complex Cities" as a suitable research group to develop my project. I would like to delve into the governance and operability aspect of my project, supported by multi-layered and multi-scalar approach for the analyses; two things that are very much pursued in Complex Cities research group.

I see an opportunity to develop a project that is balancing research and design aspects. Moreover, this project could contribute to the governance as part of spatial planning strategy, especially within the context of developing countries. It would also provide new knowledge on the implementation of mobility-oriented development in Bandung City, Indonesia to both the university and the city itself.

Social Relevance

I would like to take this project as an opportunity to tackle actual problems in real life. The issues chosen for the project's focus is based on the day-to-day challenges found in Bandung, making it highly relevant to the socio-cultural need of the city. Through this project, I would like to explore the possibilities to provide alternatives to urban development of the city as a part of public education attempt. The publication will add up information and new knowledge, especially for the society in general, offering another possible vision for the city in the future.

Ethical Relevance

Aside from the fact that the project is highly driven by my personal motivation, I strongly believe that the urban development phenomena addressed in this project are publicly recognized. There is no personal interest, in term of profit, is aimed at developing this project. On the other hand, I see this project as an opportunity to express my contribution as part of civic society in Bandung City, both as a native inhabitant as well as a qualified professional who is educated and working within the associated field.

SCOPE & LIMITATIONS

The scope of study for this project is limited to mobility issues in Bandung City. Nevertheless, there are analyses that address metropolitan issues and therefore, the proposal might be posited in a metropolitan scale.

In addition, as the municipality has already had numbers of the spatial plan in urban mobility in Bandung City (as put forward in RTRW report, RDTR report, and Transportation and Mobility Master Plan), this project does not attempt to recreate the same outcome. In fact, this project is complementary to municipality's plan because it incorporates a methodology to materialize the spatial plan (which is mainly normative and prescriptive) into a spatial design which acknowledges the actual site condition.

METHODOLOGY

This whole graduation project is conducted through a research by design methodology. Various degrees of both research and design are performed throughout numbers of methods. In addition, I also try to take

an 'anthropocentric' perspective in developing this project; which means that in this particular project, people as the stakeholders are taken into account into the outcome.

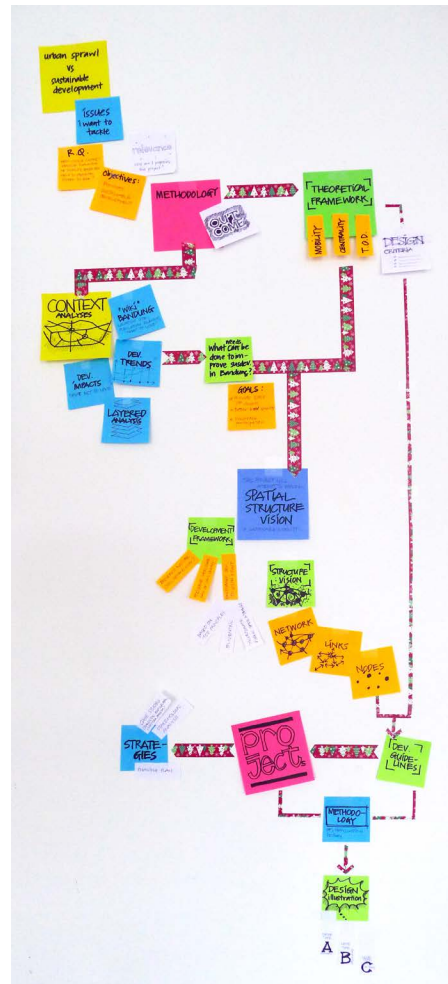
The research by design process for this project, by far, is done throughout several analyses, which then led to the central questions as guiding themes for further iteration in the analyses. The analytical processes are including:

1. problem analysis,
2. Dutch Layered Approach analysis on the existing,
3. literature review, and
4. critical analysis on case studies.

Besides, there are also several other exercises performed to support the analytical processes, such as:

1. brainstorming and SWOT analysis with fellow students from Bandung, Indonesia in Delft,
2. small survey through social media (Facebook, Twitter, Whatsapp Messaging) on how people perceive Bandung, Indonesia in general as well as the perceived current and foreseen future challenges in Bandung,
3. analysis on traffic congestion in Bandung City through WAZE mobile apps / real-time map on the website,
4. stakeholders interest analysis by mapping the current projects in Bandung, which is done (or initiated) by several different actors, and
5. pitch presentation in 'Pecha Kucha' style with other fellow students from Urbanism and Landscape Architecture graduation lab.

All of the researches and exercises were done based on various kind of data which was collected through different channels. The data involved in this project are



Line of thoughts in developing the project

mainly in form of:

1. document data (statistical data, reports, newspaper articles, research projects, master thesis, etc),
2. surveys (in this phase, mostly qualitative),
3. interviews and discussion with experts and actors,
4. observation and self-documentation, and
5. workshop result.

In order to support the desk analyses done in the university, a site visit is also to be done during the ideation process. The site visit is meant to gather actual information, especially those unavailable or inaccessible through the internet. It is also important to have a hands-on interaction with the actual stakeholders in order to propose an operable strategy. Several research and design actions to be done during the site visit are including interviews, focus group discussion with the stakeholders and site observation.

The whole research and design processes for this graduation project is expected to be done within 42 weeks (including presentation weeks) starting from the first week of September 2015. The timetable below is showing the proposed time working schedule in developing this project. The presentation weeks are as highlighted.

EXPECTED OUTCOME

The intended outcome of this project consists of interventions in two different scale, i.e. city scale and neighbourhood / district scale. Both products will be complementary and used as an evaluation tool to one another. More detailed list of intended outcome of this project is as followings.

1. Strategy for redistribution of development pressure from the city centre in city scale
 - Vision for Bandung City 2040
 - Spatial development framework
 - Expected impact map
 - Stakeholder map

2. Implementation of the strategy in smaller scale
 - Urban design guidelines
 - Example of possible interventions
 - Implementation strategies
 - Visualization

REPORT'S STRUCTURE

This report is divided into eight main chapters, started with this Introduction chapter and followed by chapters portraying the theoretical framework, context of the study, analyses on the issues and the context, proposals on development framework and implementation strategies, as well as the key project to exemplify the design. Closing this report is the conclusion and reflection on this project in general. Attached to the Appendix chapter is the review paper submitted for Theory of Urbanism course, entitled "Dispersed Concentration: A review on the polycentric urban model and 'compact city' concept".

theoretical framework

CONTENT

urban centrality, multinodal urban structure, transit oriented development

WHAT MAKES URBAN CENTRALITY?

The urban centre is one of the most researched topic in the urban planning and urban geography fields whether it is related to the definition of urban centre, its urban form, or the discourse between monocentrality and polycentrality. The Chicago School and The L.A. School have been widely recognized as two main schools of thought around the issue of urban genesis. The Chicago School posited that the city grows from the centre and expanding more to its peripheries. On the other hand, The L.A. School believes that the hinterlands determine what remains in the city centre, thus, the city is growing from the peripheral areas.

A "centre", as often refers as "node" or "core", can be defined as "... a place where activity is concentrated" (Dickinson, 1947; Lynch 1981 in Jacobs, 2000). Lynch (Lynch, 1981 in Jacobs, 2000, p. 16) defines it as "... a point where the entire world seems within reach".

"Urban centres are crucial to the functioning of the world economic order."

(Elkin et al., 1991 in Jenks et al., 1996)

In his dissertation, Jacobs (2000, p. 14) defines a node as "... a concentration of collective activities". While Polydorides (1983) refers it as "... a particular area of the city in which urban activities and flows of people, vehicles, goods, and messages are most concentrated".

On the following paragraphs, Polydorides also indicated that urban centre is usually functioned as the central focal point of the city where the land values, density, employment opportunities are the highest. It is the place where most activities are located and transport network is focused (Polydorides, 1983).

DEFINITION	KEYWORDS	PLAUSIBLE DEFINING ASPECTS
<i>"a concentration of collective activities"</i>	concentration collective activities	Density Variety Production Commercial / trading Education / knowledge Service Leisure & cultural activities Mixed use
<i>"a point where the entire world seems within reach"</i>	within reach	Ease of access Connectivity Mobility infrastructure Variety
<i>"particular area of the city in which urban activities and flows of people, vehicles, goods, and messages are most concentrated"</i>	urban activities flows concentrated	(see collective activities) Mobility infrastructure Network Information technology Urban metabolism (see concentration)

Matrix of plausible defining aspects of centrality

The definitions of an urban centre are, however, remained vague as it is difficult to give the concept of "centre" a robust and exact definition (Jacobs, 2000). However, as suggested by Jacobs (2000), it is possible to give a meaning to the urban centrality by referring it directly to the nature of existing centre. For example, Lynch's definition might well be interpreted as "... a contiguous area with collective functions, bounded by the reach of pedestrians" (Jacobs, 2000, p. 16).

In this project, an assumption based on previously mentioned definitions of the urban centre is used to determine the plausible features of urban centrality, as illustrated in the matrix above.

MULTINODAL URBAN STRUCTURE

Multinodal Urban Structure

(Marc Jacobs)

As posited by Marc Jacobs in his doctoral dissertation, the term of 'multi-nodal' refers to "the presence at a specified level of scale of more than one concentration of collective activities that pertain to that scale" (Jacobs, 2000, p. 16). Furthermore, in order to be called polycentric, these centres must meet two criteria: "It must be part of a daily urban system, and the centres must distinguish themselves by their specialization" (Cortie, 1994 in Jacobs, 2000, p. 16). He emphasized that these centres do not necessarily be mono-functional. The possible structure may rise among the combination of 'nodal – multi-function', 'multi-nodal

URBAN SYSTEM	CONDITIONS		RESULT
Single	≥ 2 locations	$AS > TV$	Transformation
Multiple	≥ 1 location	$TV \text{ joint system} > AS > \text{max. score of each system}$	Interference
Multiple	≥ 1 location	$AS > TV$ each system separately	System Formation
(any)	1 location	$AS \geq TV$	Presence of urban and/or regional centre

Note:

AS = Accessibility Score

TV = Threshold Value; 80 % of the maximum accessibility score the urban area

(as derived from Jacobs, 2000, pp. 191–192)

– mono-function’, ‘multi-nodal – multi-function’, ‘multi-nodal – mono-function – multi-function’ (Jacobs, 2000, p. 19).

Jacobs distinguished the multi-nodal urban structure based on the ways it is emerging, which are:

1. Multinodality, that is when the structure is predetermined by design or has been the original structure when the city was founded;
2. Transformation, as a nodal structure changes into multi-nodal structure; and
3. Emergence of conurbation, when two or more urban systems amalgamate to form a new multi-nodal structure (Jacobs, 2000, p. 18).

Jacobs’ thesis was developed around the motivation to resolve the relationship between accessibility and the functional structure from the perspective of urban design (Jacobs, 2000, p. 201). After series of case studies on multi-nodal urban structures such as Minneapolis – Saint Paul, South Wing of the Randstad, Dallas – Fort Worth, and Frankfurt am Main – Wiesbaden – Mainz, Jacobs drew several hypotheses around the notion of the necessary conditions for a change in the distribution of the “distribution

of collective activities”. The first and foremost hypothesis is that the change in the relative accessibility in urban areas is required for the change. Furthermore, the relationship between the change in the relative accessibility in an urban area and the possible type of change is expressed through three logics as illustrated above.

Although Jacobs has come up with a formula that might be helpful in determining the functionality of a polycentric urban structure, he also posed an equally relevant question by the end of his research. He questioned the role of urban modeling in the urban design itself; whether or not it should play a bigger role and whether or not we need to rethink the elaboration of design research in the urban design itself.

Polycentric Urban Region

(Breheny, Champion, Hall, Kloosterman & Musterd, Lambregts, Dühr)

The theoretical framework for this project is mainly built upon the notion of ‘compact city’ and ‘polycentricity’. Thus, a review paper on both concepts was put forward. This paper was developed in five chapters, including the introductory

part, brief description on 'compact city' discourse, an understanding on 'polycentricity', critical analysis on several case studies, and a concluding remark on the correlation between both concepts.

The focus of this review paper is generally on the polycentric urban model as one of the alternative tools to encourage more sustainable urban development. It aims to summarize the basic understanding of polycentric urban model in order to be able to implement the concept in urban development strategies. In order to do so, a review of theories and discussions on the polycentric urban model is presented. In addition, as 'compact city' concept is highly relevant to polycentricity, a concise review of this concept is also exposed. It is important to see both concepts side by side and in a complimentary way to comprehend relation of both concepts and get a thorough understanding of possible strategies to promote more sustainable urban development.

From a thorough exploration of polycentric urban model and 'compact city' concept, there are three essential conclusions to be drawn. Firstly, the notion of polycentricity as a scale-dependent concept is highly important. The second conclusion comes from the understanding of 'compact city' concept, which is considerably applicable to be implemented within polycentric urban model because both are encouraging centralized development around an urban core. Lastly, as remarked by Hall, transportation & mobility infrastructure is one of the key components in promoting polycentricity.

The full paper is indexed under the Appendix A of this report.

Transit Oriented Development

(Peter Calthorpe)

For as long as the history of the urban planning, there is a strong tendency for us, the people, to seek for a better quality of life. The city centre has been loved, hated, wanted, abandoned, gentrified, decayed, and redeveloped for many times in life. On 1950's and 1960's not only the post-war strategies has brought people to live in the peripheral suburban areas (Calthorpe and Fulton, 2001), the advancement of transportation technology has also allowed us to live further away from the city centre.

The term "mobility" is highly related to the flow and movement of people, information, materials, goods, and waste. "The central point to the mobility paradigm is that it is both possible and productive to interpret cities as organized through multiple forms of movement, rhythms and speeds" (Latham, 2009, pp. 33). Consequent to the trend of living in such a distance from the city centre and the urban sprawl phenomenon, the number of urban mobility in and out the city is increasing.

As mentioned earlier in the review paper on the concepts of "polycentricity" and "compact city", both concepts were emerging from the necessity to define the criteria of a sustainable city. Both concepts promote efficient public transport, slow-traffic friendliness, compactness, concentrated – deconcentration, and self-sufficiency (Elkin et al., 1991; Haughton & Hunter, 1994; Newman, 1994; Nijkamp & Perrels, 1994; Owens, 1986; Owens, 1992 in Jenks et al., 1996).

On 1993, Peter Calthorpe introduced a new design concept called "transit-oriented development" (or T.O.D.) in his

book: "The New American Metropolis". In this concept, Calthorpe proposed to "... reorienting the region around a system of light-rail lines emanating from a central city hub" (Calthorpe and Fulton, 2001, p. xviii). This type of development shares more common principles to as well as enriches the "polycentric urban model" and "compact city" because it also promotes compact development, mixed use, pedestrian-oriented design, and attention to civic uses (Dunphy et al., 2003, p. viii).

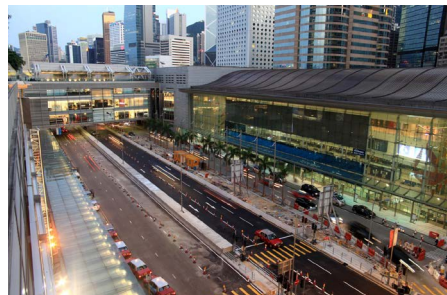
Dunphy, et al. (2003, p. viii) suggest that the successful development around transit also demands "... a new form of community building that not only supports and encourages transit use but also transforms the surrounding area into a place that is so special and irresistible that people will invest there, live there, and visit again and again". In short, they insist on creating a place instead of a mere space.

As described thoroughly in their publications, Dunphy, et al. (2003, 2004) posited ten principles for successful transit-oriented development, i.e.

Make it better with a vision,

1. Apply the power of partnership,
2. Think development when thinking about transit,
3. Get the parking right,
4. Build a place, not a project,
5. Make retail development market driven, not transit driven,
6. Mix uses, but not necessarily in the same place,
7. Make buses a great idea,
8. Encourage every price point to live around transit, and
9. Engage corporate attention.

Among the most-referred T.O.D. projects are in Southern Randstad (The Netherlands), Curitiba (Brazil), Hong Kong (Hong Kong), and Montreal (Canada).



*Mass transport in Montreal, Canada (top), Curitiba, Brazil (middle), and Hong Kong (bottom)
source: multiple; see reference*

BANDUNG



Bandung

CONTENT

*general information, history & city genesis,
socio culture, economy, role in metropolitan region*

GENERAL INFORMATION

Bandung is the capital city of West Java province, Indonesia. It is located approximately 150 km south-east Jakarta. Nearly 3 million people residing within 17,000 Ha areas inhabit Bandung. Located on 700 m above sea level, Bandung is very notable for its comfortable climate with breezy fresh air and cool temperature. Most of the people who are coming to Bandung are longing for its refreshing tranquillity.

Bandung has become Jakarta's backyard since the Dutch occupation era and later on emerged to be one of the most prominent conurbations in Indonesia. Shown on the opposite page is the illustration of Bandung City's position towards other neighbouring major cities. Jakarta, Bandung, and Cirebon are three of the main urban agglomeration in West Java and DKI Jakarta provinces with the indication of the distance to one another.

Recently claiming itself as a creative and smart city, Bandung has attracted a lot more people to the city. Its attractiveness has been amplifying since the establishment of several new infrastructures within the last decade, especially Cipularang Highway and Pasopati Flyover established in 2005.

HISTORY & CITY GENESIS

The city gained its city right (*gemeenteschap*) from VOC government on 1906. By that time, Bandung barely had 40,000 inhabitants within the city. However, it has been recognized as the weekend-getaway destination especially for VOC's higher rank officers residing in Batavia (Jakarta) back in the dawn of 20th century. In its early development, Bandung rests its economy mostly on agriculture, especially tea plantation (Kunto, 1984).

In 1911, the city was prepared to replace Batavia as the capital city of Dutch East-Indie. Numbers of important



buildings, including military clusters and government buildings, were established in Bandung (Siregar, 1990). The city reached its golden era on 1920's, with the area around city centre (Alun-Alun, Groote Postweg, and Braga Street) as its urban core. Later on 1923, a spatial expansion plan to the northern part of the city was proposed. The plan is commonly renowned as 'Uitbreidingsplan Bandoeng-Noord', consists of the idea of providing more living space around Dago Street. The plan was, however, only partially established due to world-wide political turmoil in 1940's (Siregar, 1990).

The Republic of Indonesia claimed its independence on 1945, followed by several revolts between 1946 and 1950. On one of the revolts in 1946, almost half of the city – the southern part of the railway – was set on fire. On 1950's, DI/TII revolts in neighbouring villages triggered massive migration to Bandung City. Within this era, people from neighbouring villages and regencies were moving to Bandung to seek for the safe place. They

started to squatter and reside on an unoccupied piece of land, such as those along Cikapundung River (Siregar, 1990).

Bandung City's economic driver started to shift towards industries from 1960's on. Numbers of manufacture were established on the southern part of the city. This trend was followed by a construction boom on 1971 when the government started to introduce large-scale housing project commonly known as 'Perumnas' (Siregar, 1990). Among many others, the milestone of government's housing project in Bandung is often related to social housing in Sarijadi (1977) and housing complex in Sukaluyu. The real estate projects by private sectors were following this trend on 1980's with the housing projects in the suburban area, slightly outside the city border. On 1987, the municipality of Bandung expanded the city border to the east, merging Bandung City with adjacent Ujung Berung region (Siregar, 1990).

1825-1882 0 850 1700 2550 m



1882-1905 0 850 1700 2550 m



1905-1924 0 850 1700 2550 m



1924-1935 0 850 1700 2550 m



1935-1945 0 850 1700 2550 m



1945-1952 0 850 1700 2550 m



1952-1976 0 850 1700 2550 m



1976-1981

0 850 1700 2550 m

LEGEND:
 ■ EXISTING
 ■ BEING BUILT
 ■ WITHIN THE PERIOD



Development of built environment in
 Bandung City 1825 - 1981
 (source: Siregar, 1990)

Bandung survived the national economic crisis and political turmoil in 1998 by nurturing micro economy. During the recovery time, there were numbers of local clothing distribution store, small restaurants, and other home industries emerging in the city.

ECONOMY

From the economical point of view, Bandung is one of the main contributors in West Java's Gross Domestic Regional Product (GDRP), with the GDRP of 130 trillion rupiahs (or approximately 7 billion Euros) in 2013 (Central Bureau of Statistic for Bandung City, 2014). Also highlighted in the report is the main economy sector: commercial, trading, hotel, and restaurant sector (42.4 %), industry and manufacture sector (13.3 %) and services sector (8.8 %).

Images on the previous page portray the vibrant images of Bandung City as well as the location of economy centres (commercial and industrial areas) in the city.

SOCIO-CULTURAL

Bandung City is the most densely populated city in West Java. Most of the inhabitants belong to Sundanese ethnicity. Among the most notable socio-cultural qualities in Bandung City qualities that give a pleasant impression of the city are friendliness, cozy cool climate, valued heritage buildings, also creative and lively communities (Dinas Perhubungan Kota Bandung, 2014). Moreover, Bandung is also infamous of its rich culinary tradition, which has become one of destination for both domestic and international tourists.

ANALYSES



analyses

CONTENT

urban development trend in Bandung City, layered analysis

URBAN DEVELOPMENT TREND IN BANDUNG CITY

The urban development trend in Bandung has been driven mainly by demands created by the real estate developers through land speculation, especially in the peripheral areas of the city. The developer has been taking advantage of the low land price of the areas outside the city centre. By doing so, they are able to acquire the most profit from the market price. Their approach has set the development trend in at least past 20 years, which leads to a massive unstructured urban sprawl, mainly to the east and southeast part of the city. Shown on the following page is the illustration of Bandung City's urban development and city border expansion as investigated by Siregar (1990).

Regretfully, this development has outpaced government's effort in providing adequate infrastructure in order to connect the new (housing) complexes to the existing urban core, or in providing a

new urban core nearby instead. The more new housing complexes established, the further away they are from the city centre, the harder it is to reach the city centre. This phenomenon has established certain tension between the newly developed area and the existing centre, in terms of proximity to facilities and services, which then caused an increase in private vehicle use on the street to compensate accessibility, whether it is a car or a motorbike.

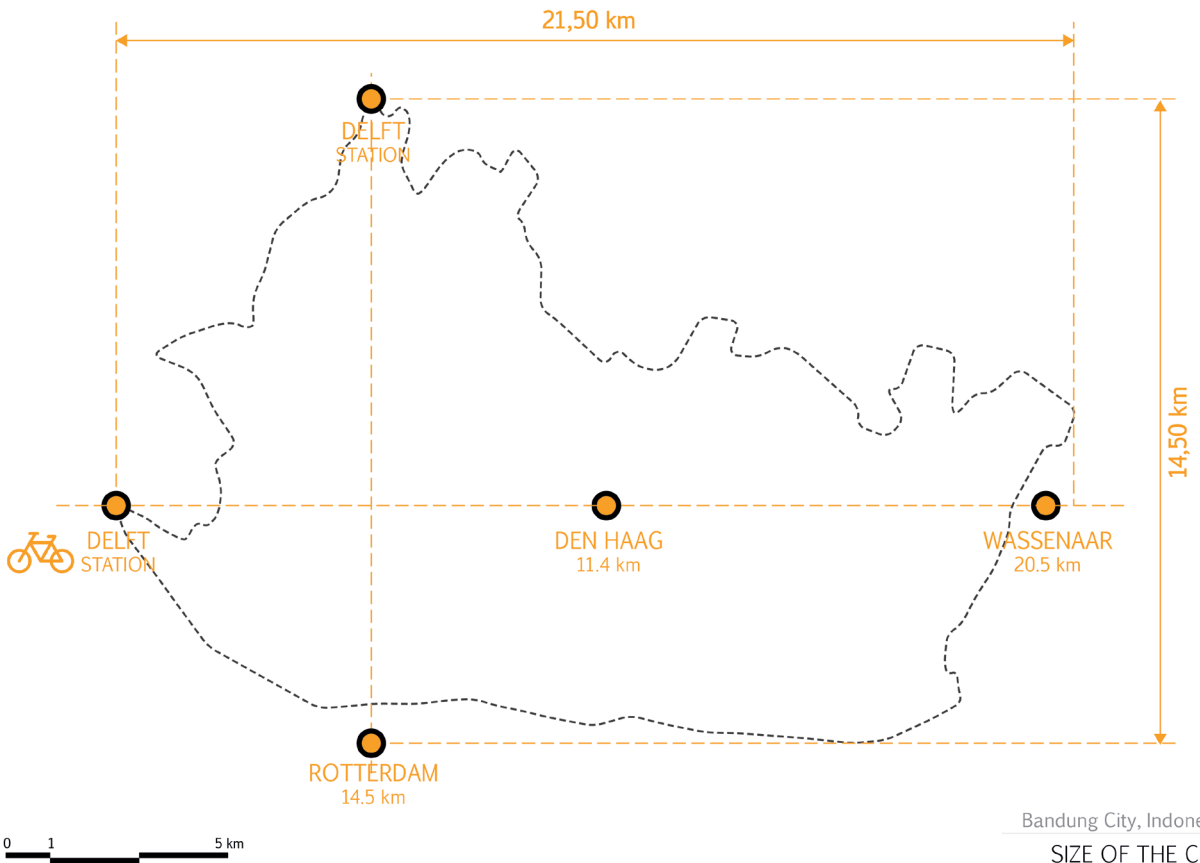
The growth of vehicle numbers in Bandung reached 10% every year (Polwiltabes Kota Bandung, 2006). The significant increase in the numbers of cars and motorbikes in Bandung within the past 20 years has triggered more mobility problems in the old city centre such as traffic jam and lack of parking space. Most of the central areas of Bandung were planned as a garden city according to Thomas Karsten's 'Uitbreidingsplan Bandung-Noord' in 1920's (Siregar, 1990). Despite the fact that the garden city part of Bandung is such a nice place to live



1. Traffic jam in Pasar Baru
2. Uncontrolled development & urban sprawl
3. Informal settlements
4. Development in historical area
5. Proposal for new development from real estate developer
6. Light flooding due to inadequate drainage system
7. Annual flooding in Baleendah, Regency of Bandung
8. Garbage pile on Taman Sari Street (2008)



Images portraying development issues and challenges in Bandung (source: multiple, see reference)



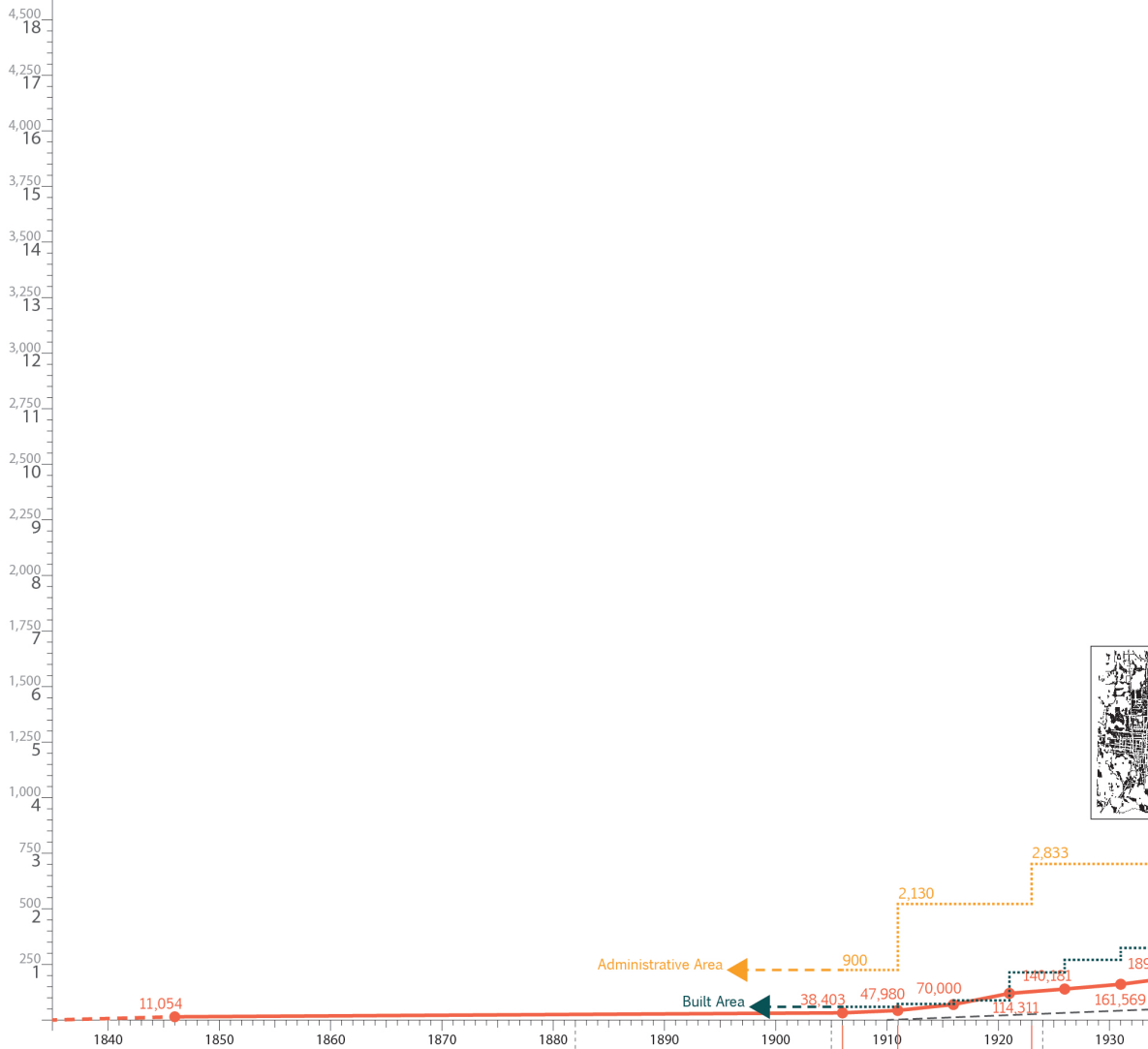
– ample front yard, spacious nice house, shaded streets, and cosy ambience – the nature of garden city's urban structure is somewhat more organic, with narrow and winding streets. The urban structure has been one of the challenges in coping with the massive load of vehicles and the need for parking spaces. In short, the urban structure of Bandung's old city centre has become obsolete and incompatible to the current demand.

The old city centre has been trying to cope and catch up with these advancements by widening some streets and compromising property lines. However, the growth of vehicle numbers

has outpaced the mobility infrastructure by more than 400% in 2006 (Polwiltabes Kota Bandung, 2006). The efforts to cope with the development trends, which also include the attempts to provide more space for economic activities and services in the old city centre, have cost major physical changes in the city. Within the past 10 years, there are more heritage buildings demolished and altered into a new function than revitalized. The old city centre of Bandung is slowly losing its assets, character, and charm.

The municipality has been trying to transfer some of the city centre's burdens by decentralizing several education

population x1,000 inh.
area x1,000 Ha

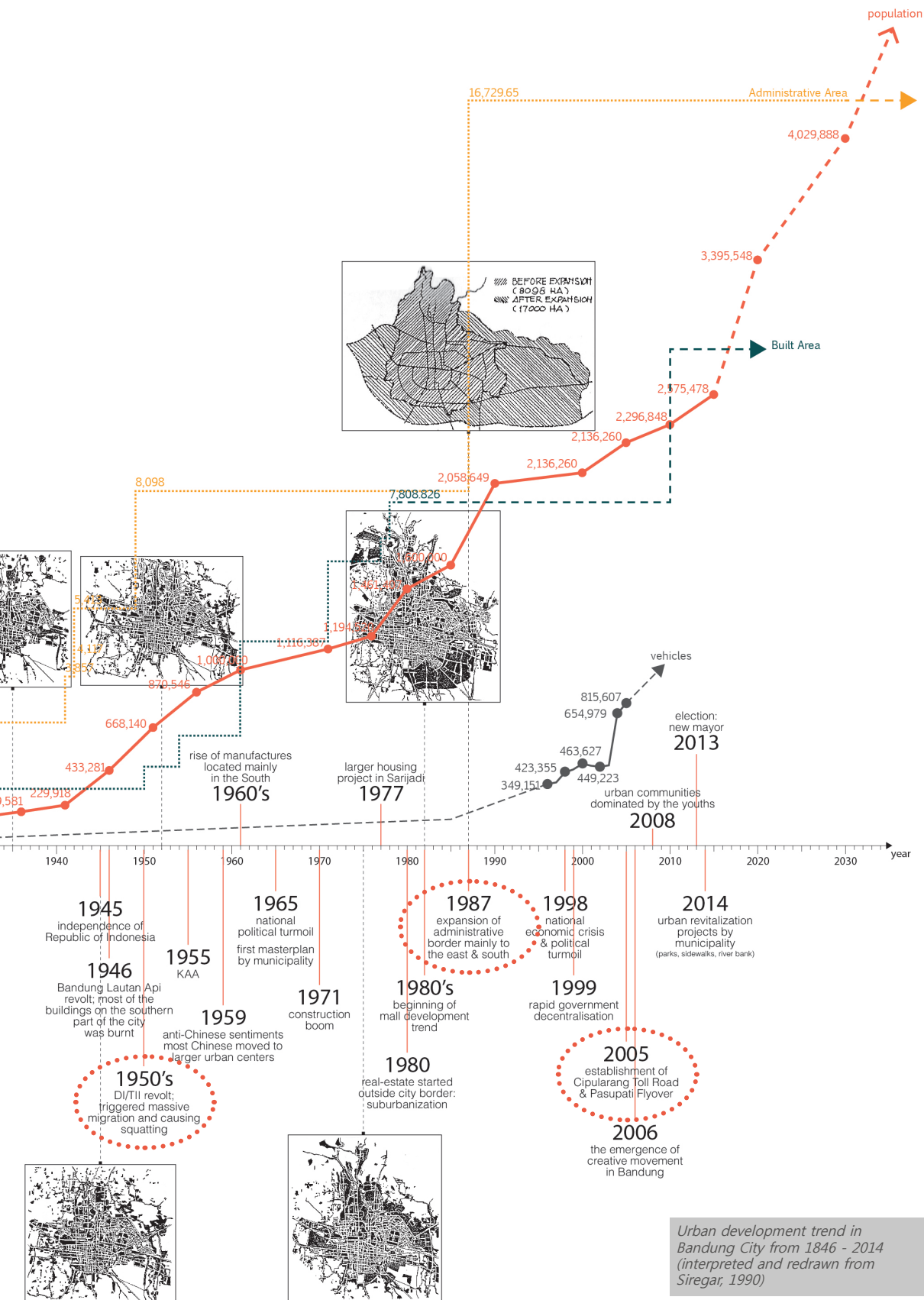


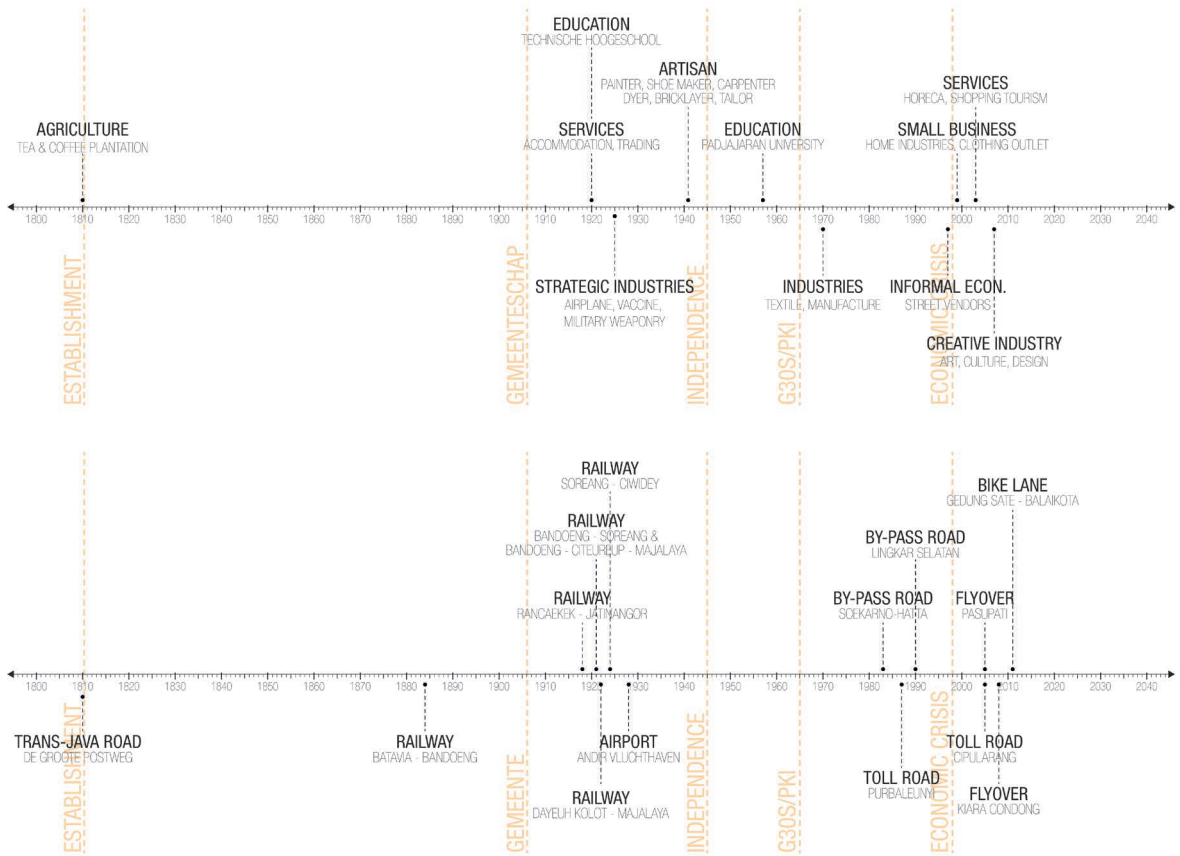
1906
Bandung received its
city right (gemeente)

1911
prepared as capital
city replacement
for Batavia
(Jakarta)

1923
Uitbreidingsplan
Bandoeng-Noord



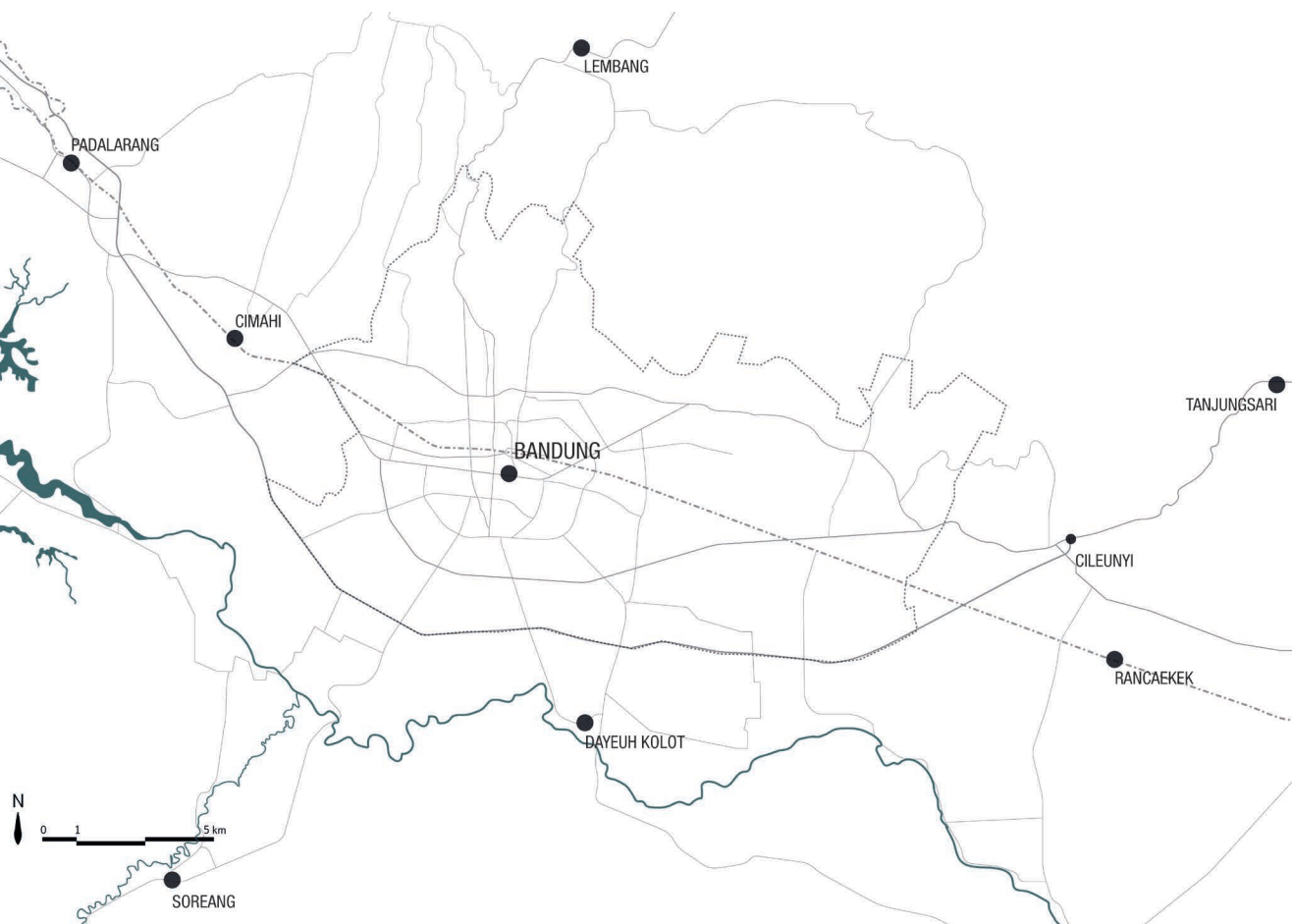




Changes in main economic driver in Bandung through the time (top) and the infrastructure development milestones (bottom) (source: Siregar, 1990; Dienaputra, 2015)

facilities, offices, and commercial facilities and induce new sub-centres in the suburban area. However, they seemed to have less impact on de-magnetizing the existing city centre. The municipality's plan to develop a new massive sub-centre on the southeastern part of the city (Gede Bage) has encountered a tremendous setback ever since the land speculation takes control. The land price in Gede Bage has increased immensely since it was announced to be developed up until today when the development never took place.

Nowadays, there are more developments happening in the city centre, ranging from minor makeover to accommodate the changes of building a function to numerous constructions for new apartment towers and hotels. Despite its incompatibility in coping with rapid development and numbers of urban transformations, the city centre is still the place to be, where people invest most of their assets. Meanwhile, plenty of development potentials in the suburban area remain disregarded.

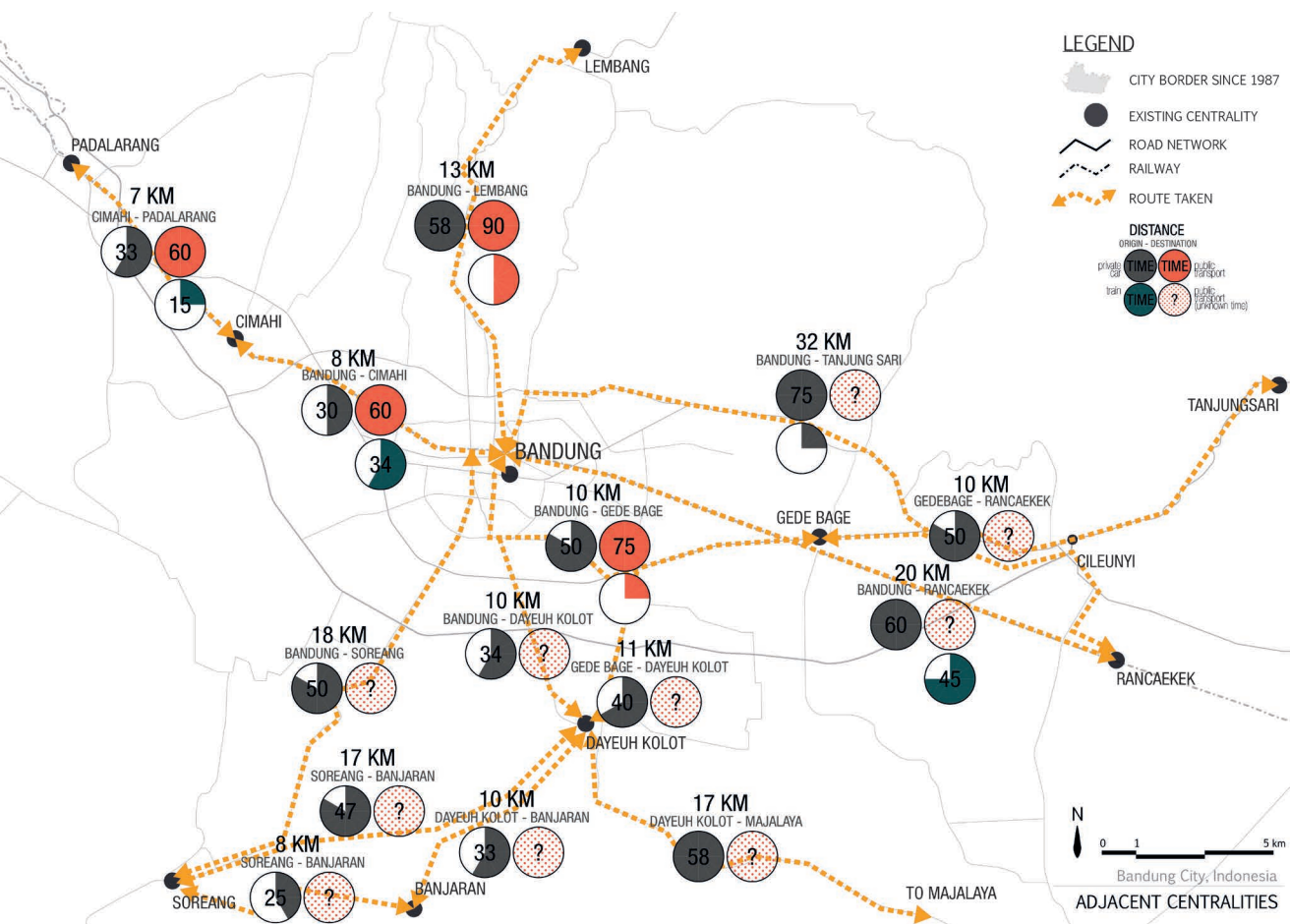


Position of Bandung City towards other centralities in Bandung Metropolitan Area

'Rencana Tata Ruang Wilayah Kota Bandung' – the spatial plan for Bandung City area – seemed to have minimum impact on guiding the development of the city. Although the plan is translated to several more detailed planning instruments such as zoning regulation and urban design guidelines, the complicated bureaucracy and the inability of the government's planners to foresee future development trends are among the main challenges in setting the boundaries for development.

BANDUNG METROPOLITAN AREA

Bandung City belongs to Bandung Metropolitan Area, along with other cities and regencies such as Bandung Regency, Western Bandung Regency, Cimahi, and three districts in Sumedang Regency (Jatinangor, Cimanggung, and Tanjung Sari). However, like any other metropolitan in Indonesia (e.g. Jabodetabekpunjur (Jakarta), Mebidangro (Medan), Kedungsepur (Semarang), Gerbangkertosusila (Surabaya) and Sarbagita (Denpasar)), the metropolitan status does not have any say in



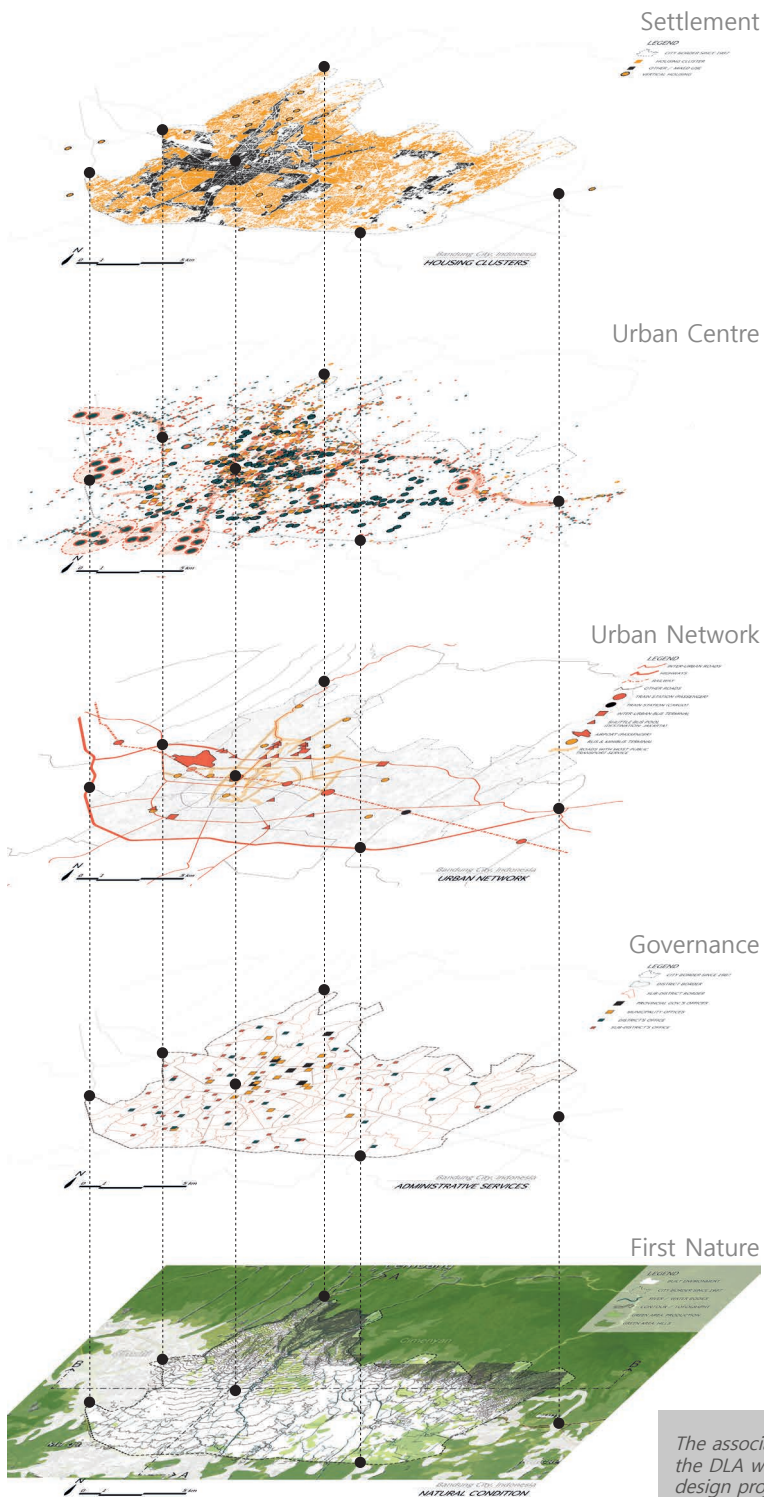
administrative and jurisdictive governance.

There are approximately 8.5 millions of people inhabit this metropolitan area. Dayeuh Kolot, Rancaekek, Cimahi, Soreang, and Lembang are among the main contributors for urban mobility to and from Bandung City (Bappeda Kota Bandung, 2015).

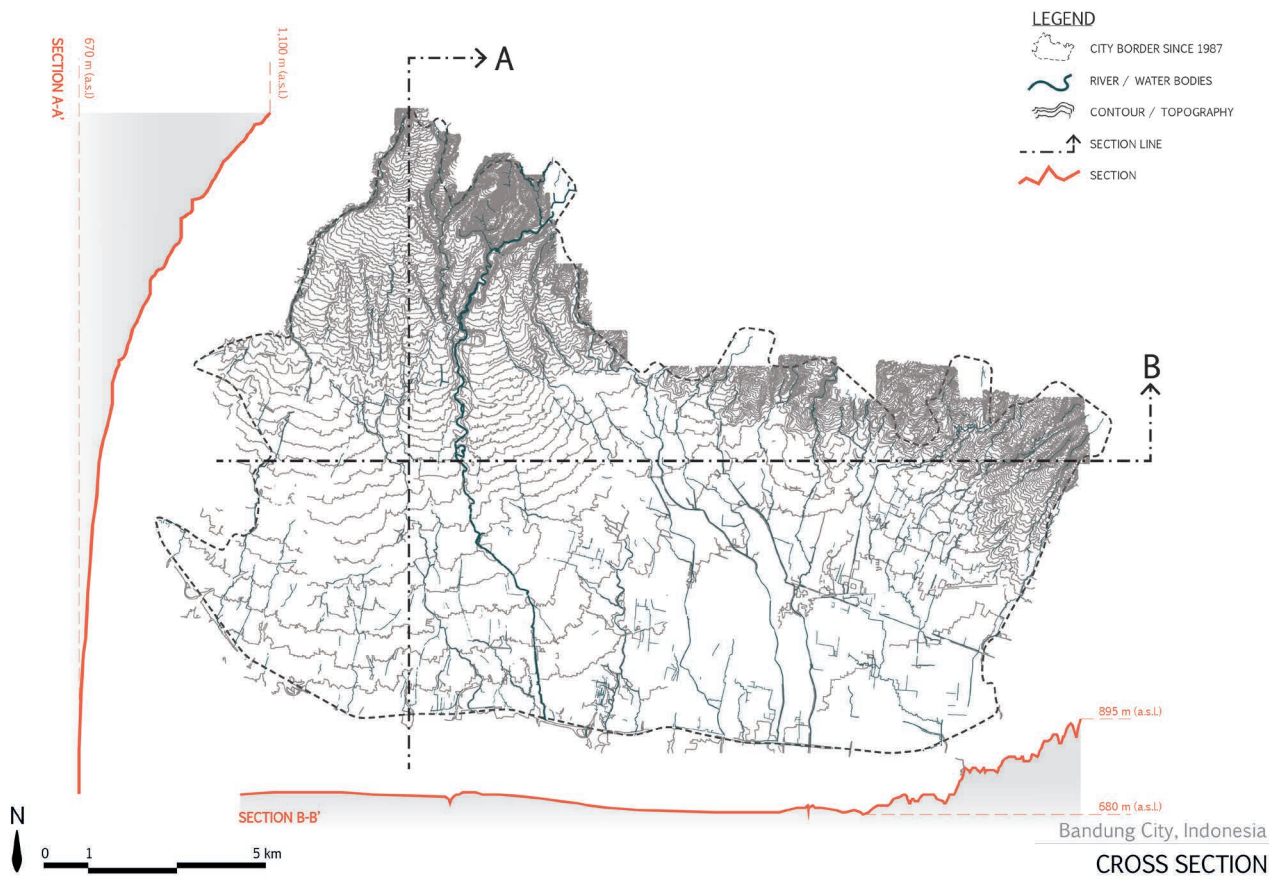
The image above illustrates the main centralities adjacent to Bandung City with the accessing routes and travelling time from one centrality to the others both by car and by public transport.

LAYERED ANALYSIS

The Dutch Layer Approach (DLA) is used as one of the analytical tools in this project due to its robustness in unravelling the complexity of the city by presenting each relevant issue in a different layer. There are five main layers analyzed in this project, which are the natural condition, governance, urban network, urban centre, and settlement. These layers are important because they represent the main features of the context, in this case, Bandung City, Indonesia. Illustration and other supporting images are presented after the description.



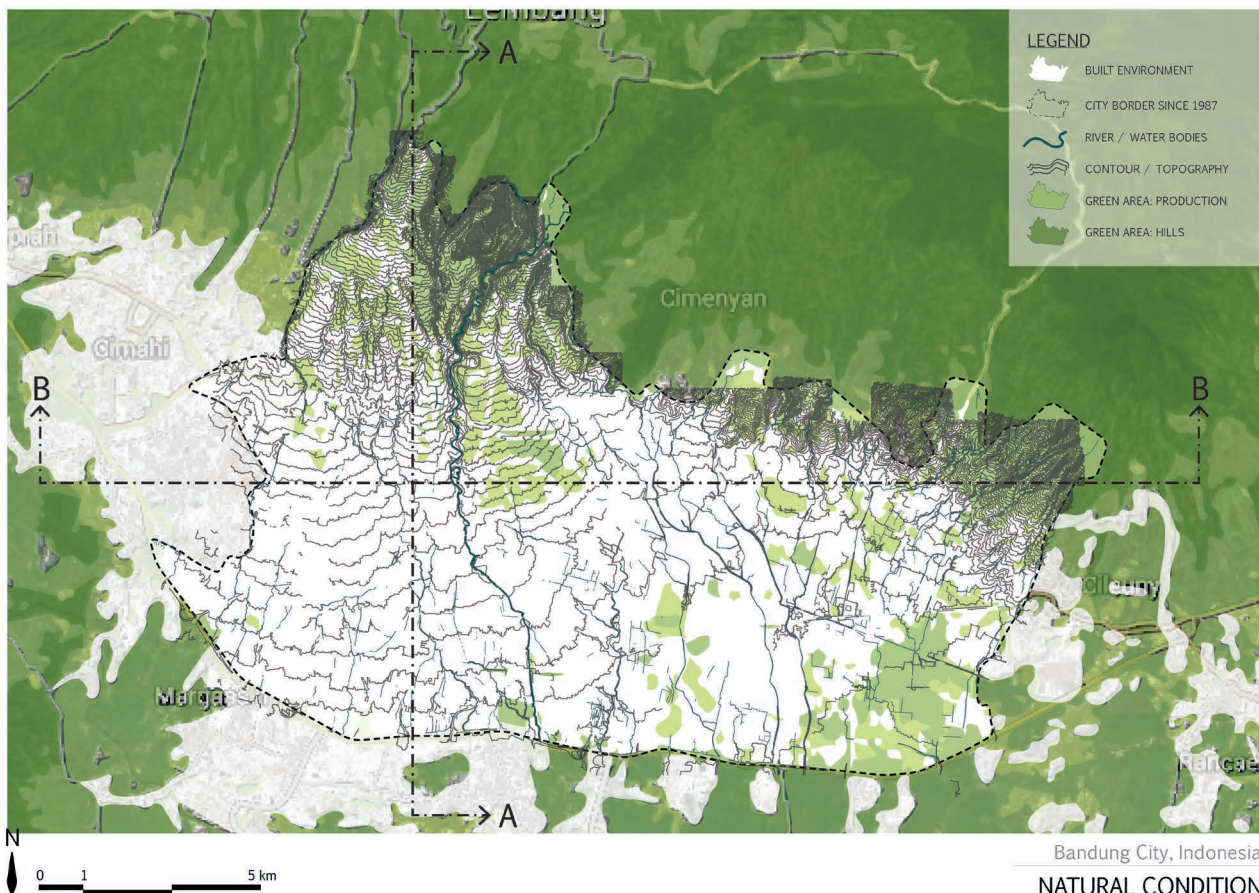
The associated layers explored using the DLA within this research and design project



Natural Condition

Analyzed in this layer is the natural condition of the city, which consists of topography, water bodies, and green area around the city. Bandung is located on a plateau, with the lowest point around 670 meters above sea level on the south and the highest point of 1,100 meters above sea level on the north-most part of the city. It is surrounded by mountains, placing the greater metropolitan area in a basin. Cikapundung River, which flows from north to south, is dividing the city into two and has become one of the most notable natural features in the city.

During VOC occupation in Indonesia, the northern part of Bandung is resolved as preserved area, with a natural reserve located adjacent to the northern city border. However, the current development has affected this area. Some of the hills are now filled with luxurious housing complexes. The green buffer adjacent to Cikapundung River started to transform into (informal) settlement complexes after 1960's when the first wave of migration struck Bandung.



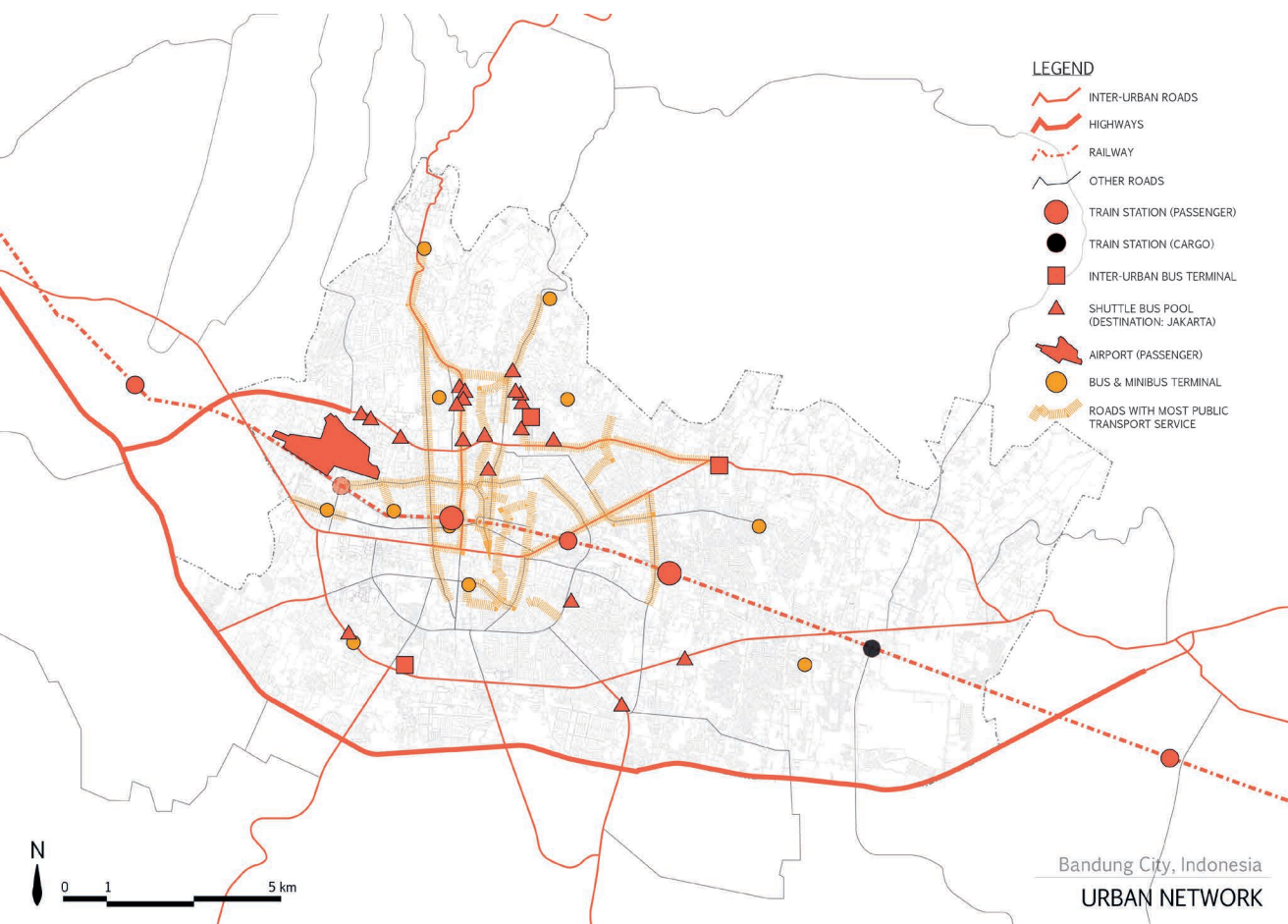
The green area within the city is rarely to be found, more particularly outside the historical area of the city. Although several neighbourhood play fields may exist, they are mostly functional and rarely provide natural environmental quality.



1. Airplane to/from Hussein Sastranegara International Airport
2. Train to/from Station Bandung, with some intermediary stops at smaller stations
3. Inter-city bus to/from Cicaheum & Leuwi Panjang terminal
4. Shuttle bus
5. Local bus
6. Mini bus ('angkot')
7. Taxi
8. Ride sharing ('ojek')



*Inter- and Intraurban transportation modes in Bandung City
(source: multiple, see reference)*



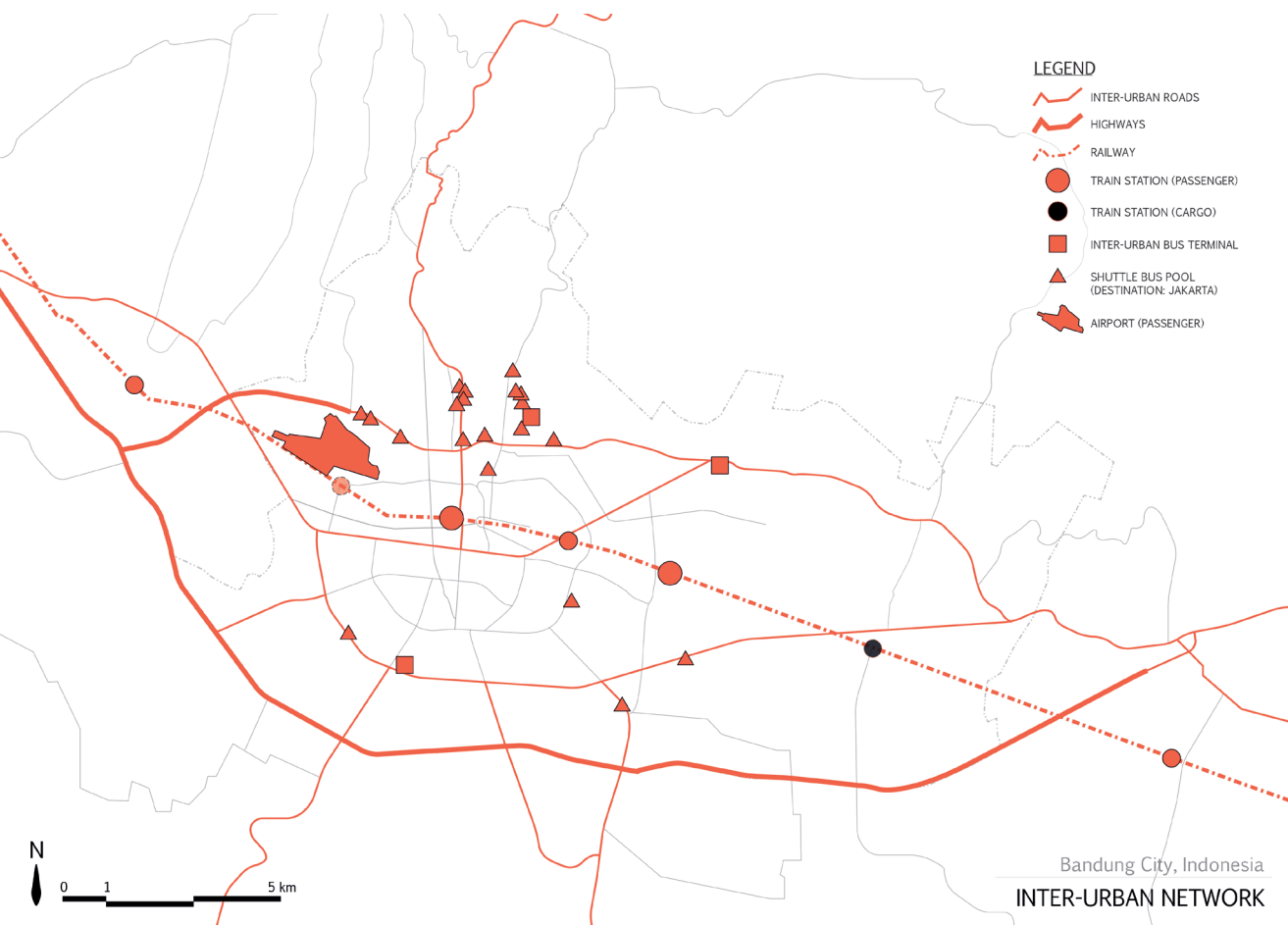
Urban Network

The urban network in Bandung City consists of two main systems, i.e. the inter-urban network, which connects Bandung to other adjacent cities and regencies, such as Cimahi, Bandung Barat Regency, Bandung Regency, Jatinangor, and Jakarta; and the intra-urban network, which mainly connects areas within the city border.

Bandung City is reachable from its neighbouring regions through the highways (with six exits) or the railway. The inter-urban public transport consists of the regional train, inter-city bus, and the 'travel' shuttle bus. There are four

train stations in Bandung City; all of them are currently in use for daily commuting. The two bus terminals (Leuwi Panjang and Cicaheum) are also fully functioned as the entry points to the city.

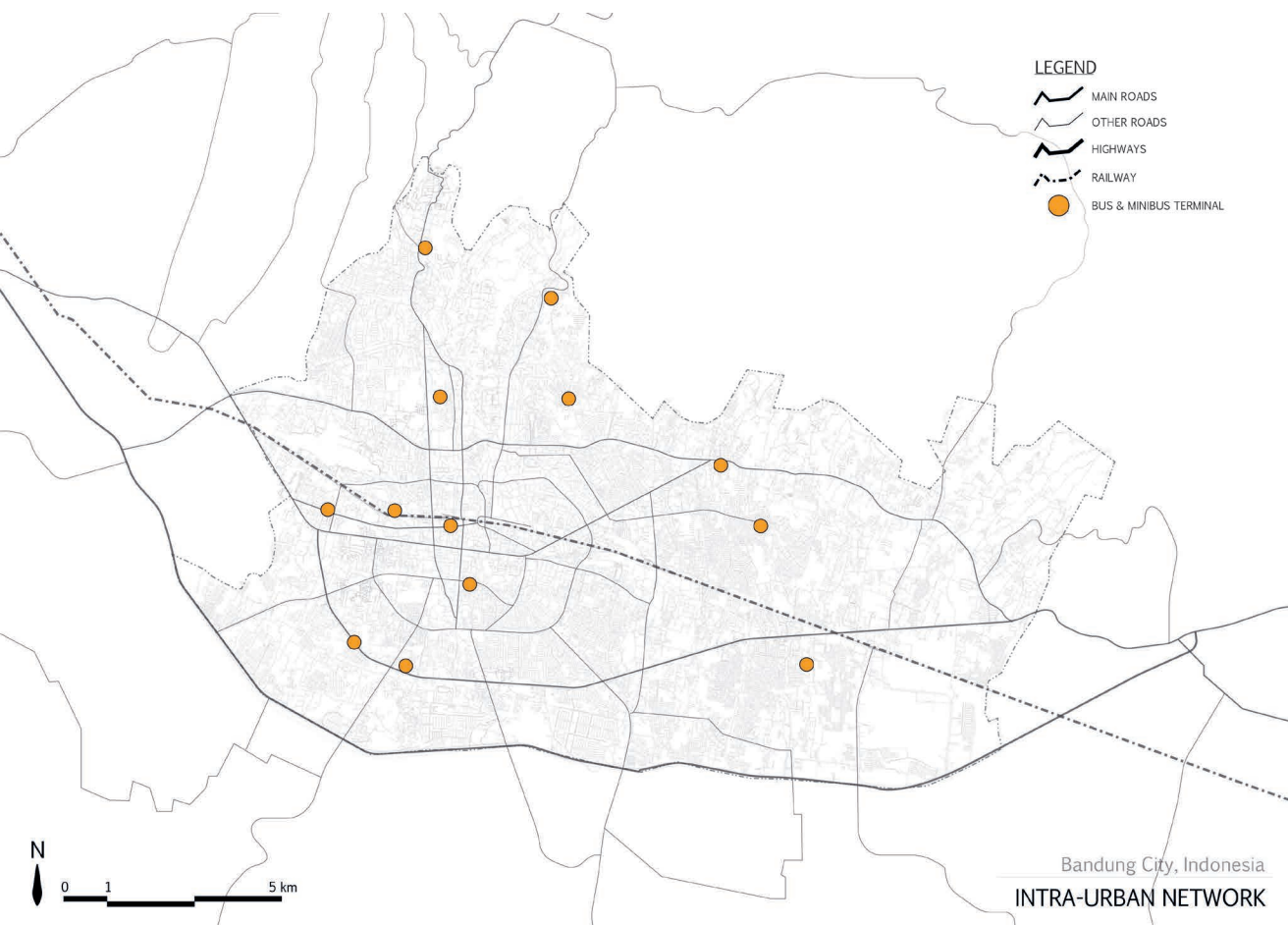
After the establishment of Cipularang Highway and Pasupati Flyover, there was an increasing demand for shuttle transportation from Bandung to Jakarta, and vice versa. The demand was mainly coming from the university students (who were originally from Jakarta but was studying in Bandung) as well as the businesspersons (whose office are in Bandung but demanded to travel to Jakarta for meetings, or vice versa).



Numbers of private transportation companies saw it as a business opportunity and started Bandung – Jakarta shuttle services for an affordable price. The shuttle service is considerably convenient because of its regular schedule, lack of delay, affordable, and reliable services.

On a day-to-day basis within the city, Bandung is served by public transport network consists of “angkot” or the minivan, and the buses. “angkot” is the most popular public transport in Bandung City. It comes in a form of a minivan with a capacity of 12 – 15 people. There are 5,521 units of “angkot” serving 38

routes in Bandung City (Aminuddin, 2008). “angkot” is usually privately owned or leased by the owner to the driver. Although there is an association for “angkot” drivers, such as Kobanter Baru, Kobutri, and Kopamas, the drivers are self-employed. Their earnings depend on numbers of passenger they have per day. However, these driver associations have very strong position in terms of negotiation with the local government. They are highly dominant and resistant, especially against the development of urban transportation infrastructure, which threatens their being (Aminuddin, 2008). According to Aminuddin (2008), this attitude leads to ‘low-cost low-quality’

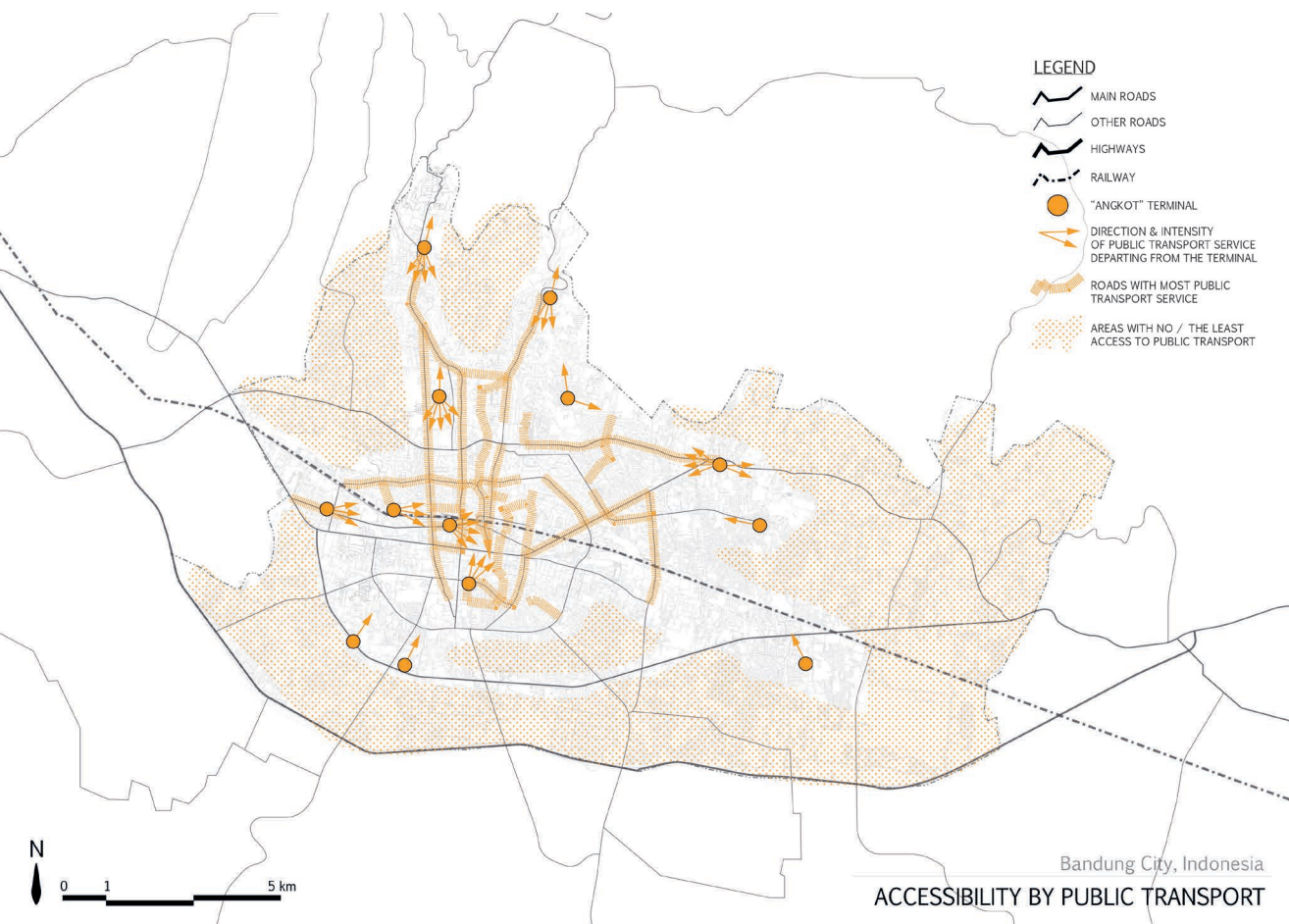


equilibrium when it comes to public transportation matter in Bandung City.

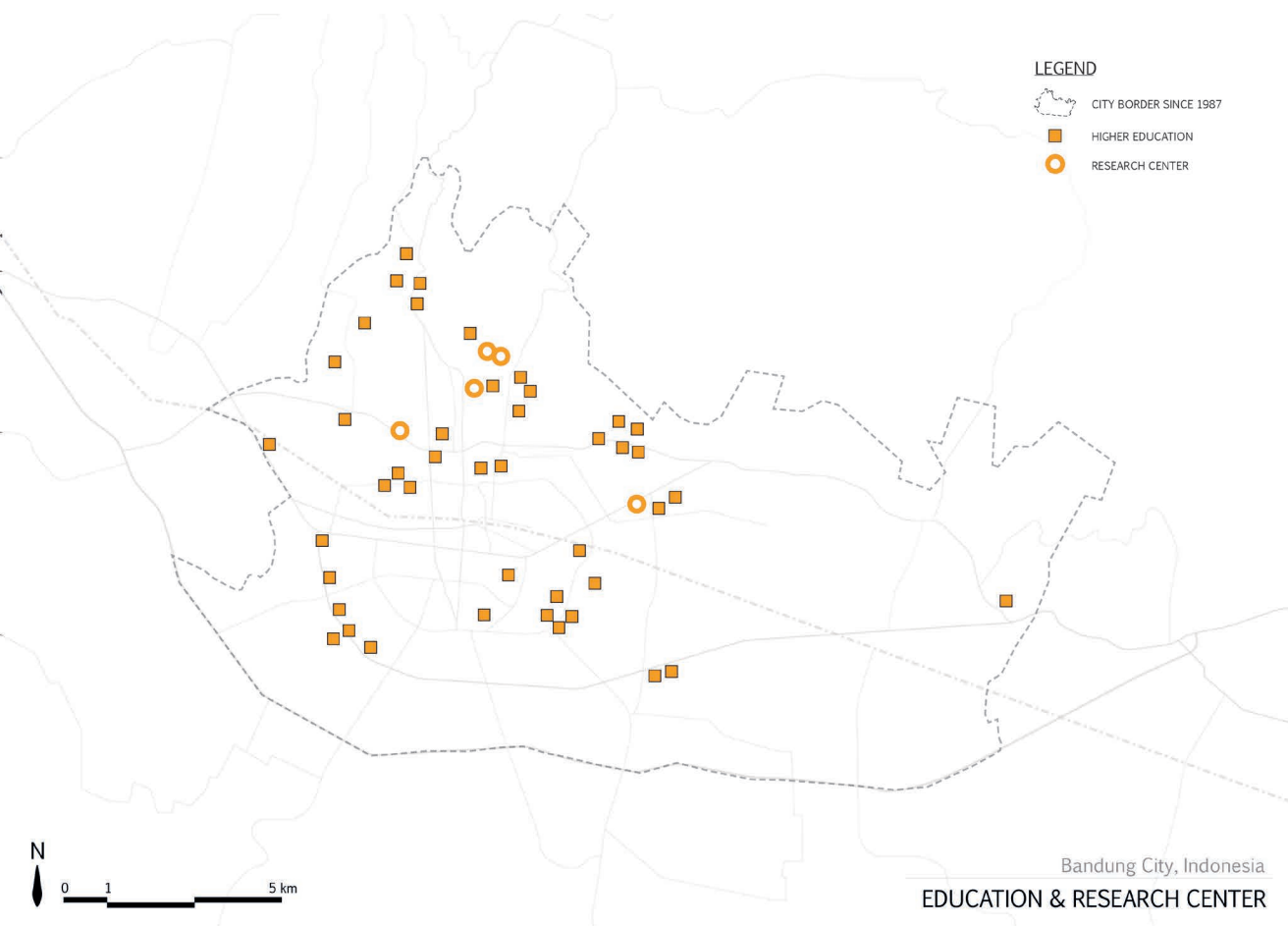
Aside from “angkot”, buses are also operating in Bandung. There are 214 buses serving 11 routes. The capacity of each bus varies from 40 – 62 seated passengers. The current municipality program to promote public transport includes free bus ride for students with uniform every Monday and Thursday.

There are some areas, mostly housing clusters, which are not serviced by any public transport. People living in these areas are usually either travelling with privately owned vehicles or using

‘ojeg’ as a feeder to get to the nearest public transport services. ‘Ojeg’ is a public transport with a motorbike as the transportation mode. The concept is quite similar with a taxi. However, despite the service price, which usually is quite expensive, ‘ojeg’ service is quite robust and reliable.



As implied in the research conducted by Ofyar (2014), there are more than 70% areas of Bandung City which is not connected to the public transport system. Based on the analysis on the existing "angkot" and bus route, most of this area is located on the eastern and southern part of the city. Most of these areas were developed after the municipality expanded their city border in 1987. Apparently, the expansion of the urban area is not well supported by adequate public transport network.

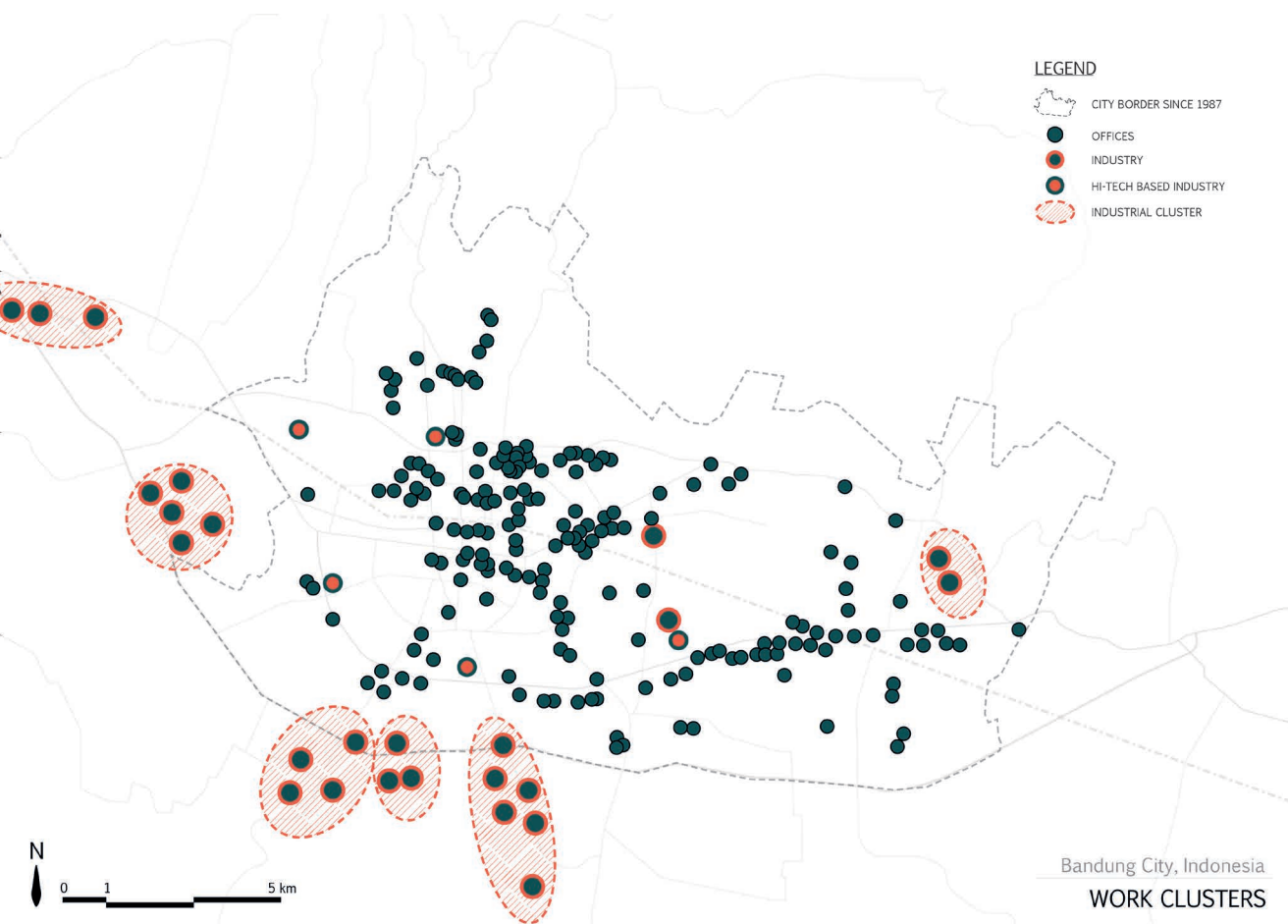


Urban Functions

This particular layer shows the location of working clusters (offices and industries), commercial area (including hotels, cafe, and restaurants), as well as higher education and research institutions. The analysis has shown that most of these functions are located in the old-town of Bandung. Although there are clusters of offices and industries in the southern and eastern part of the city, most of the working clusters are situated in the heart of the city.

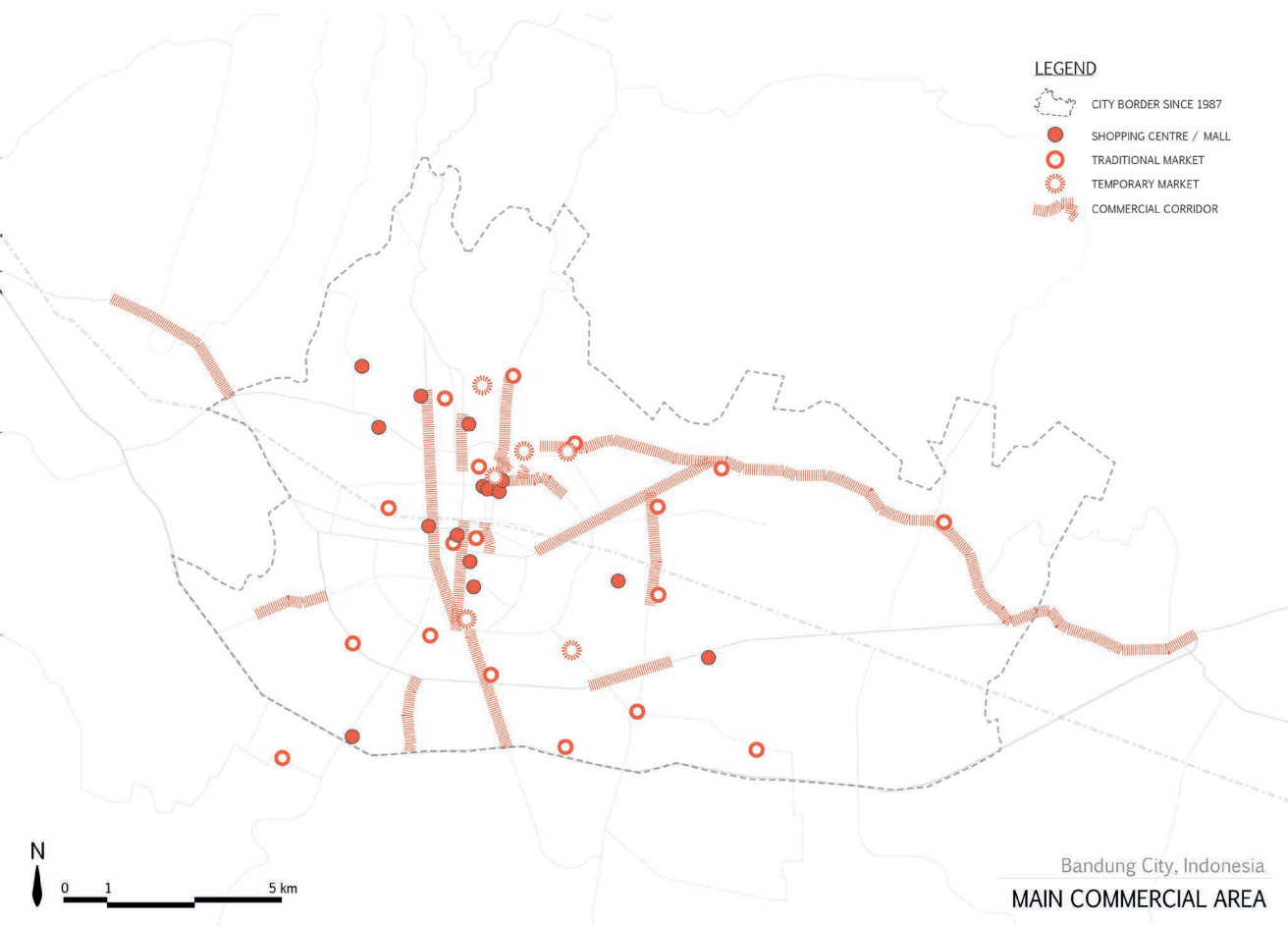
The illustration above is showing the location of higher education facilities, which are mostly located in the northern

part of the old city. Several industries, which are very much integrated with certain research institutes) are also found nearby the education facilities, for example, BioFarma (pharmacy) and Hasan Sadikin Regional Hospital, PINDAD (military-grade weaponry industry), PT Dirgantara Indonesia (aircraft and aerospace engineering), PT INTI (electronic engineering and IT). Other industries, mostly textile, and garments, are located in the southern part of the city, if not outside the city.



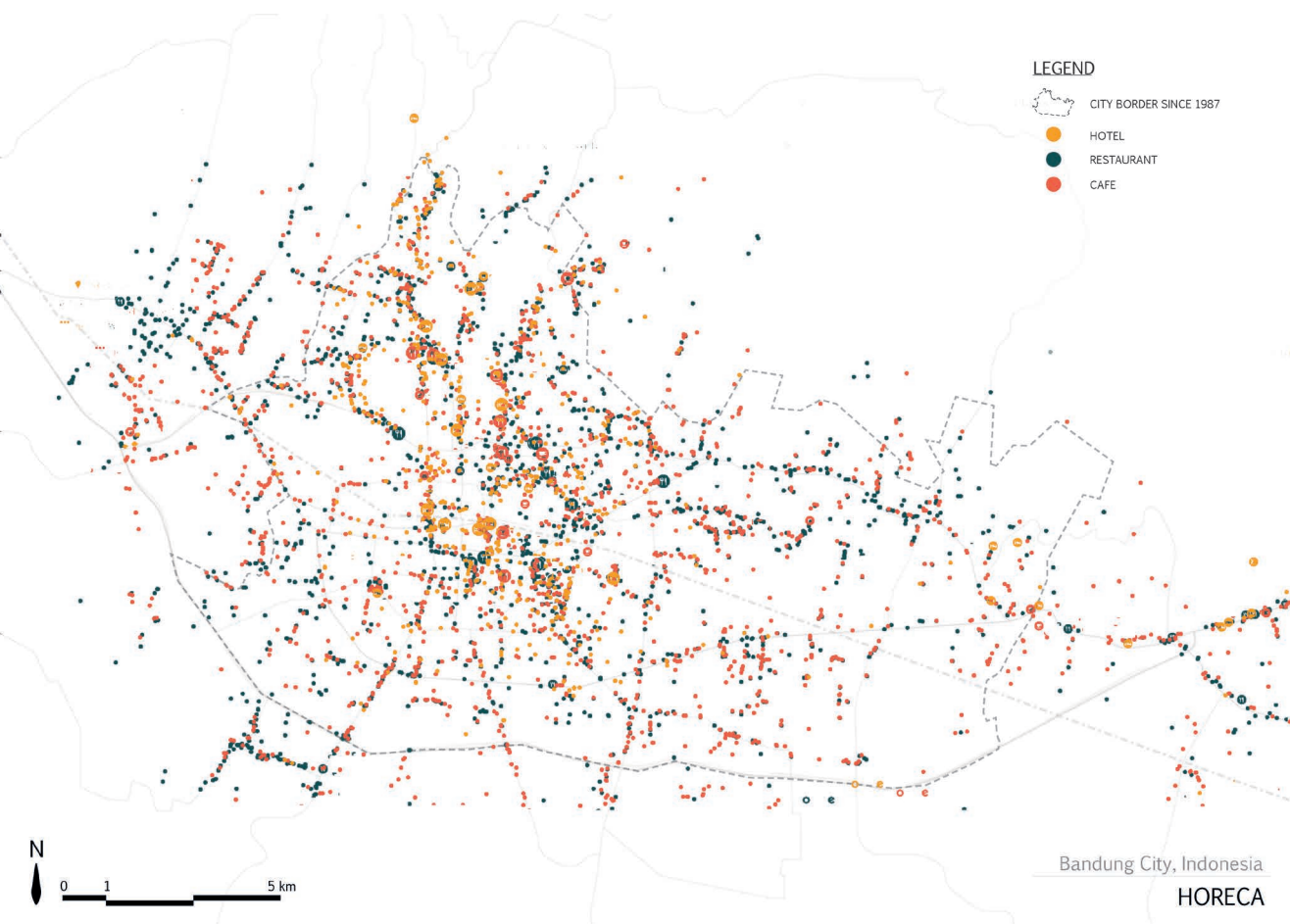
On the later decades, offices, public services, and (automobile) showrooms arise along Soekarno Hatta Avenue.

The commercial function consists of a traditional market, shopping malls, shopping street, and HORECA. A strong commercial corridor is visible on the northeast side of the city and on north-south direction starting in the city centre.



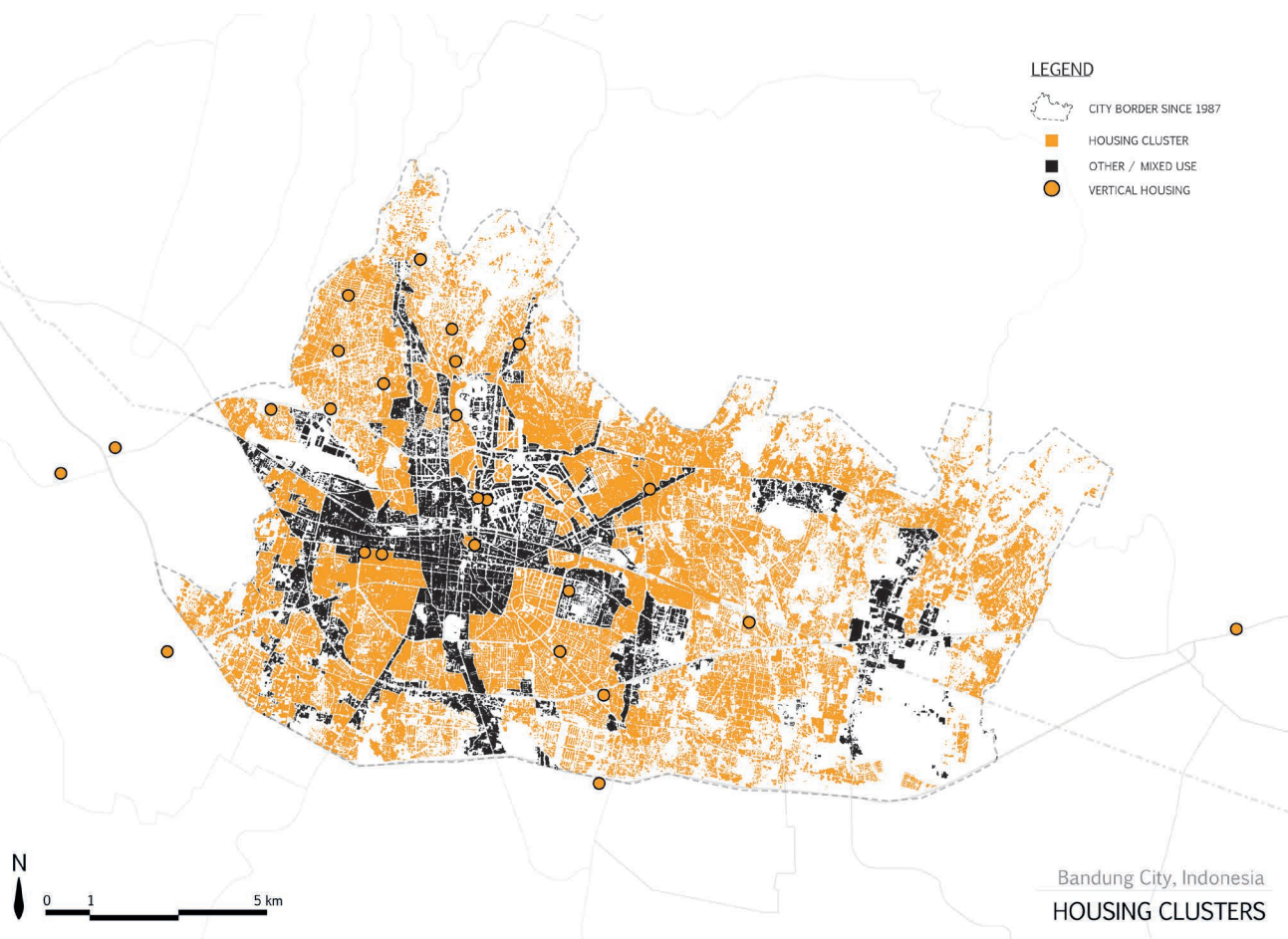
The traditional markets are usually located adjacent to transit facilities, more specifically to “angkot” terminals. Shopping streets like those found in Braga Street, Kosambi, Pasar Baru, and Otista were mostly established on the 1920’s. Cihampelas shopping street was the established later on and specialized in jeans clothing centre until nowadays. On the late 1980’s to early 2000’s, there were more mall developments in various locations. One of the first malls established was the one adjacent to Alun-Alun Bandung.

On the late 1990’s, after and during the recovery from the 1998’s financial crisis, there were more local distribution stores (distro) and factory outlets (FO) for clothing emerged mostly in Riau Street and Dago areas. These stores remain operational until today. The emergence of the distros and FOs has attracted people to come to and shop in Bandung City. Domestic tourists from Jabodetabek were dominating the market at its earlier time (late 1990’s until early 2000’s), while international tourists, especially from Malaysia, are most likely to be found nowadays. This trend was followed by the development of amenities, especially hotels, to cater the tourists’ need of



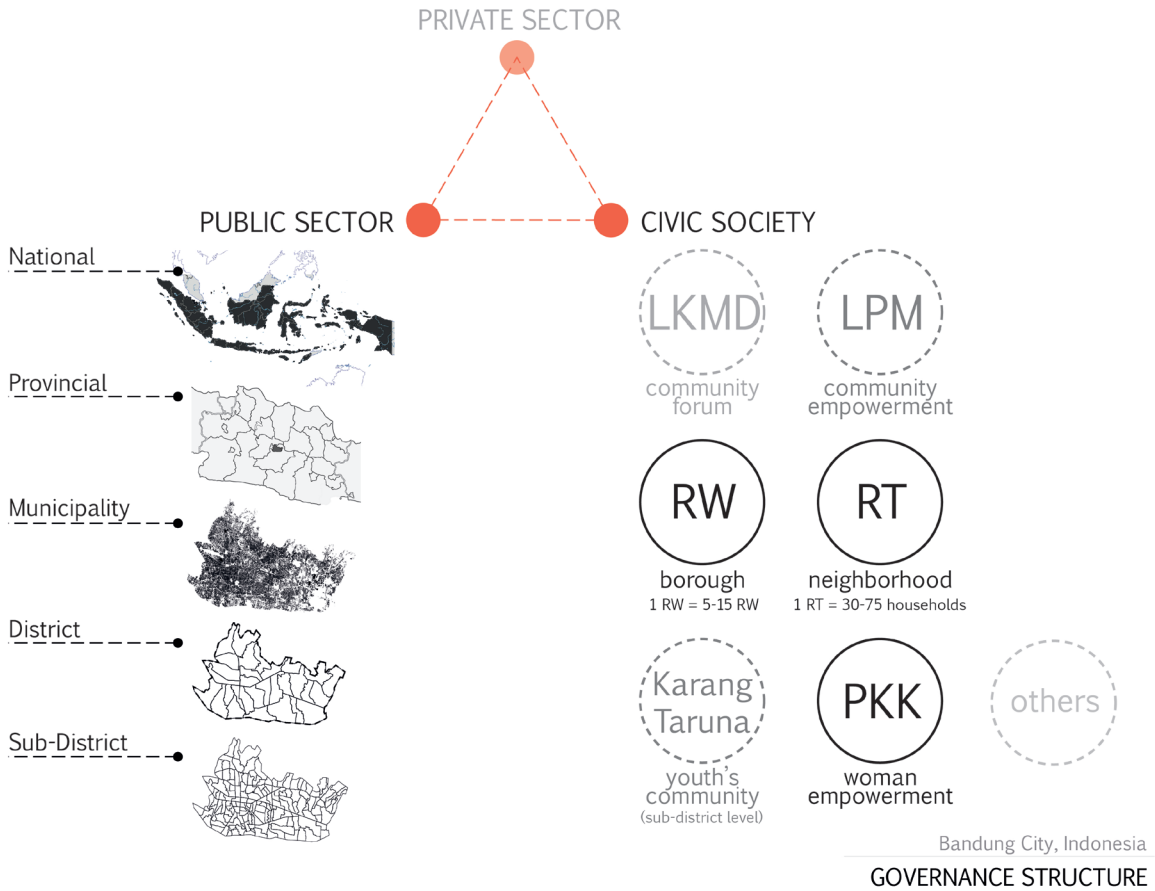
accommodation. Consequently, there are also numbers of hotels and cafe (or restaurants) found adjacent to these new shopping areas.

The location of these functions has confirmed the monocentric nature of Bandung City, where most of the economic activities happen in the city centre.



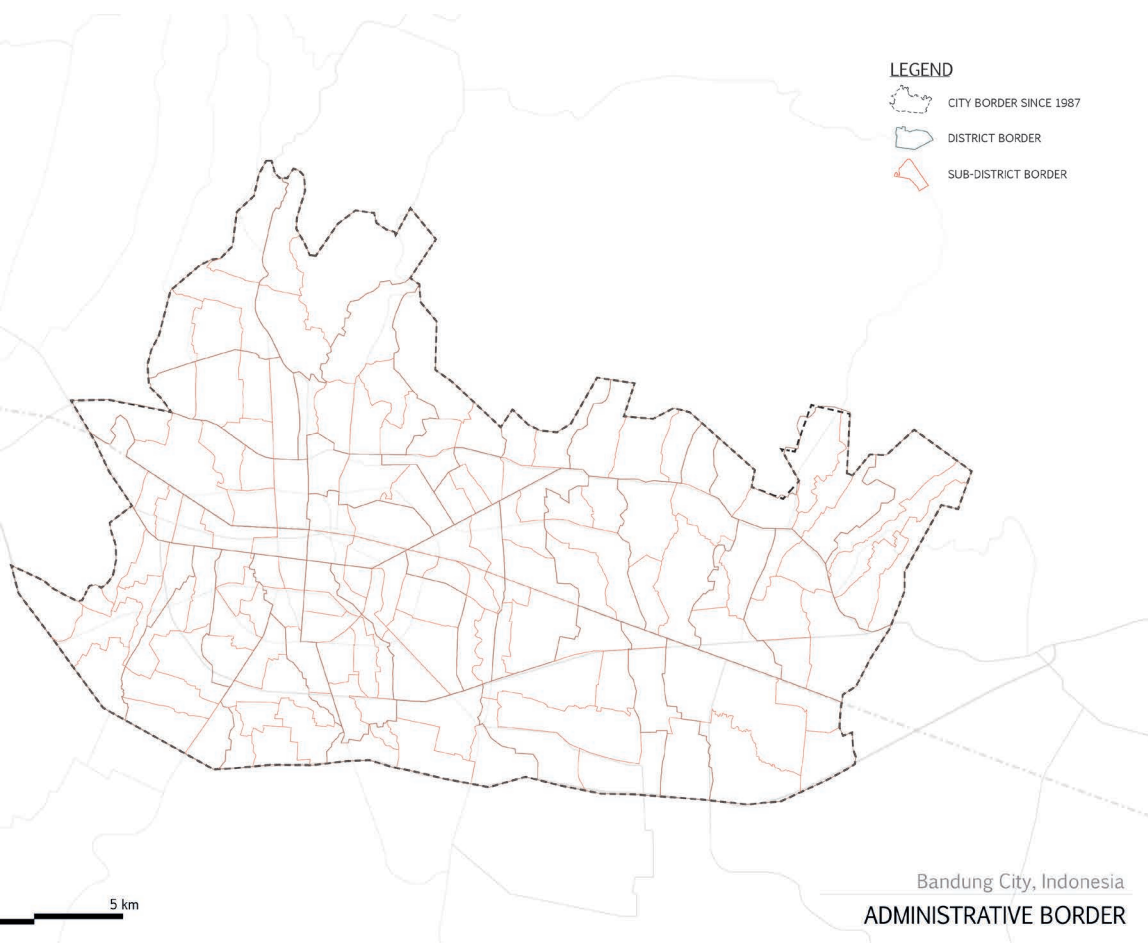
Contrary to the location of economic urban functions, housing and settlement clusters in Bandung City is dispersed to the peripheral areas. New housing complexes are situated further away from the city centre. The map indicated that the development on the eastern and southern part of Bandung is mainly low density and that there might be some reserved lands owned by private sectors in both areas. Numbers of vertical housing are also found in Bandung. Most of them are currently established, in the form of the mid-high class apartment.

However, there are also some vertical housing dedicated to people with mid-low economy level; one of them is the oldest vertical social housing in Bandung built in 1970's.



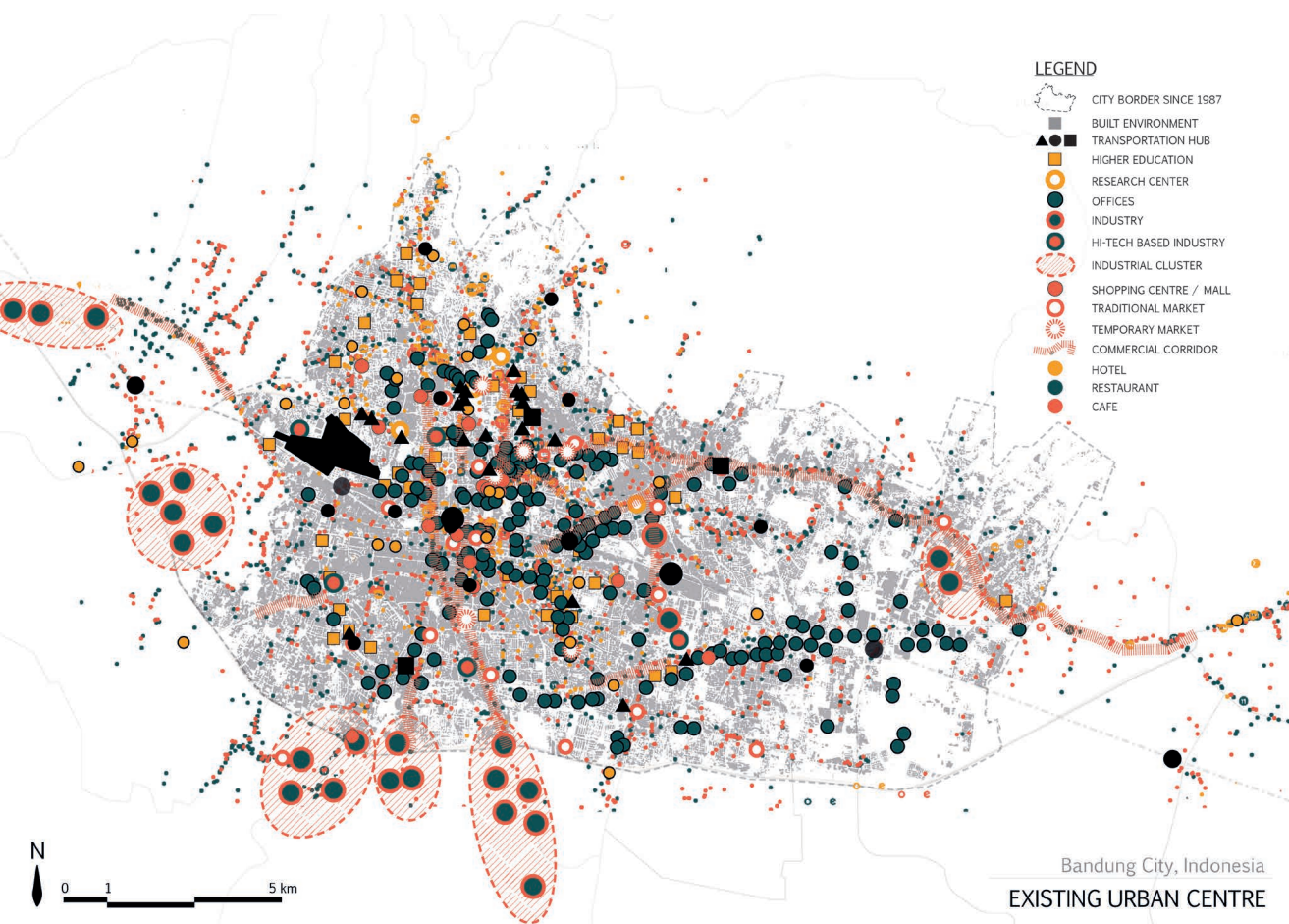
Governance

As mentioned earlier on the problem analysis part, Bandung City is the capital city of West Java Province. Several provincial offices, including the Governor's office, are located in the city itself. Bandung City is divided into 30 districts (Kecamatan), which later on divided into 153 sub-districts (Kelurahan). However, on the planning instruments (such as Spatial Planning Documents for City Scale (RTRW Kota)), the city is sub-divided into 8 main sub-urban regions. The sub-urban regions are made up of several districts (Kecamatan).



As any other cities in Indonesia, the governance structure in Bandung is actually divided into three main categories, i.e. private sector, public sector (provincial, municipal, district, sub-district), and civic society (community forum, community empowerment service, borough, neighbourhood, youth & community forum, and women empowerment services).

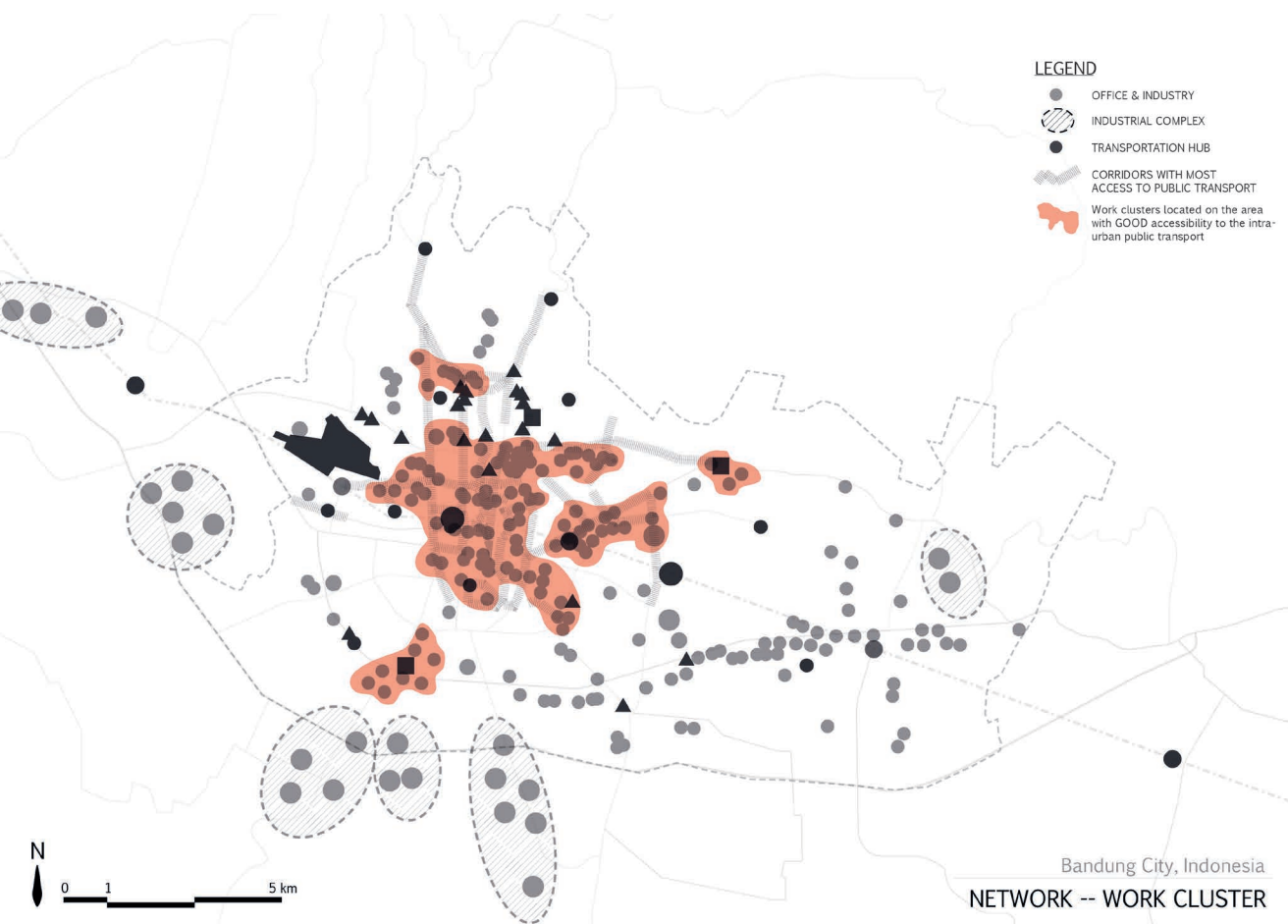
Although the division was meant to decentralise the power and decision-making processes (as well as the fact that the smaller unit should act as a supporting entity to a larger unit), the role and function of each unit are often overlapping and unsynchronized.



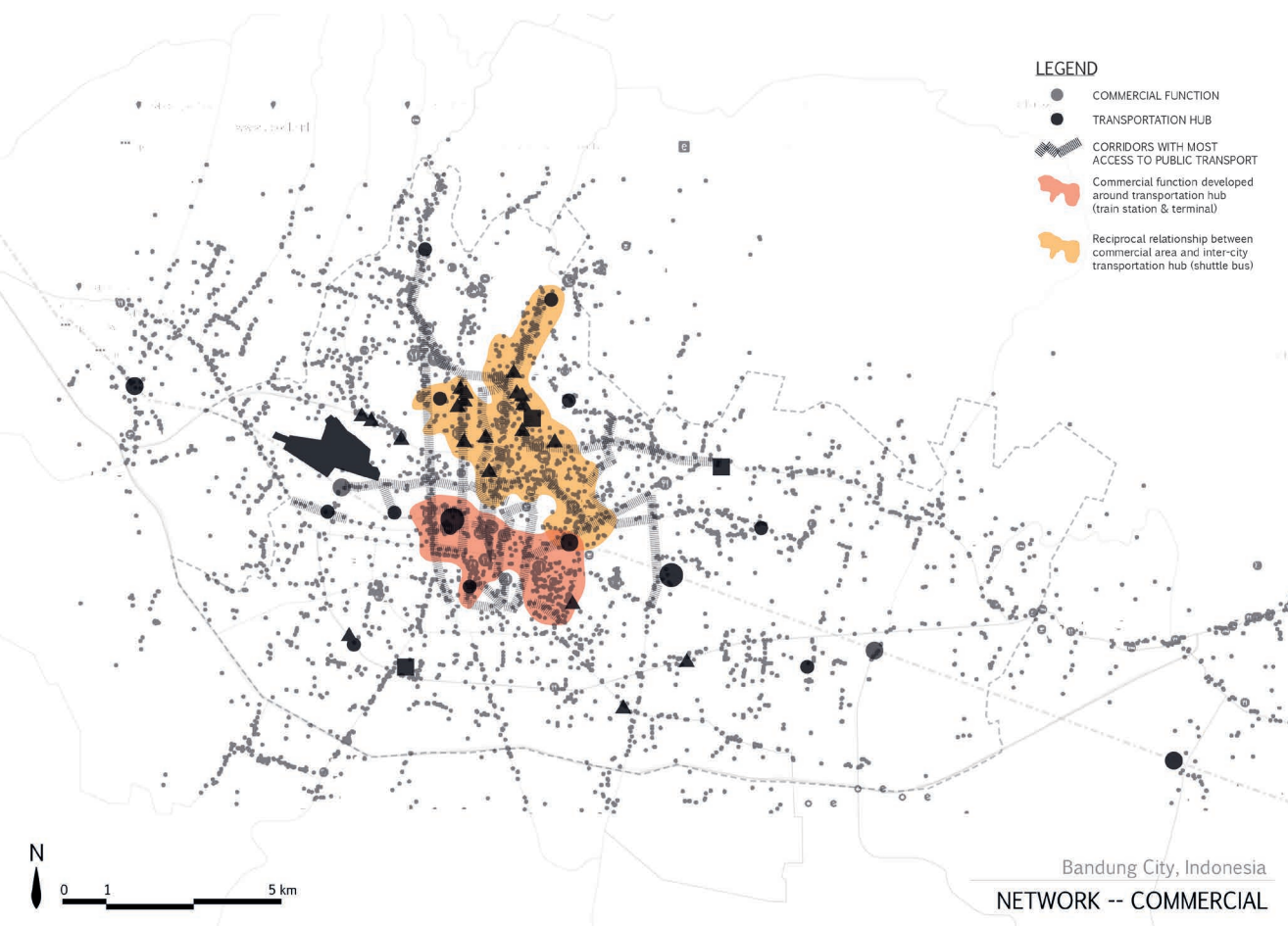
CONCLUSION OF THE ANALYSES

By combining one layer with another, or the five layers altogether, there are several conclusions to be drawn from this analysis. The conclusions, provided with description and illustrations, are shown on below.

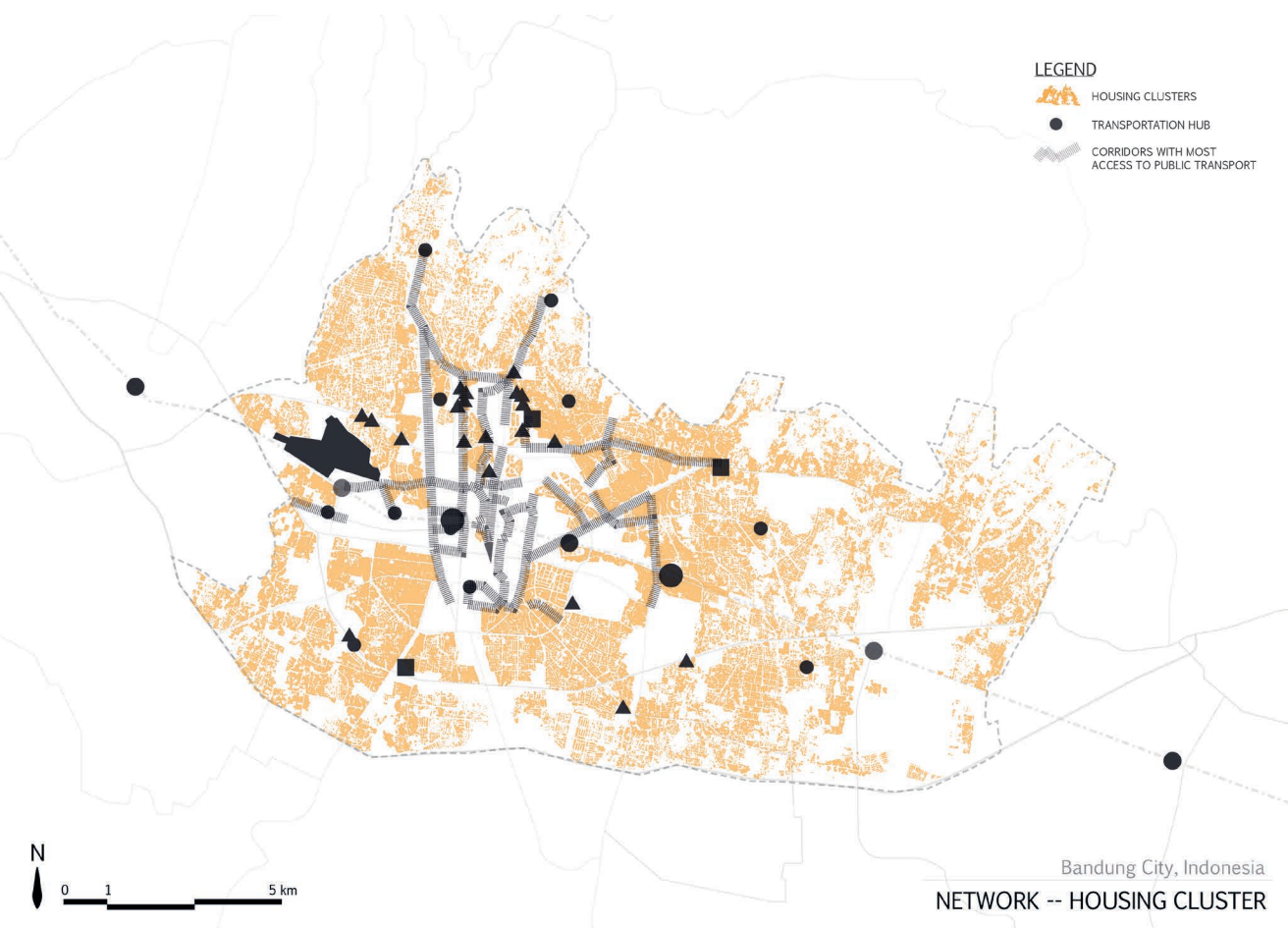
1. The fact that most of the urban facilities and services are located in the city centre confirms the monocentricity nature of Bandung City.



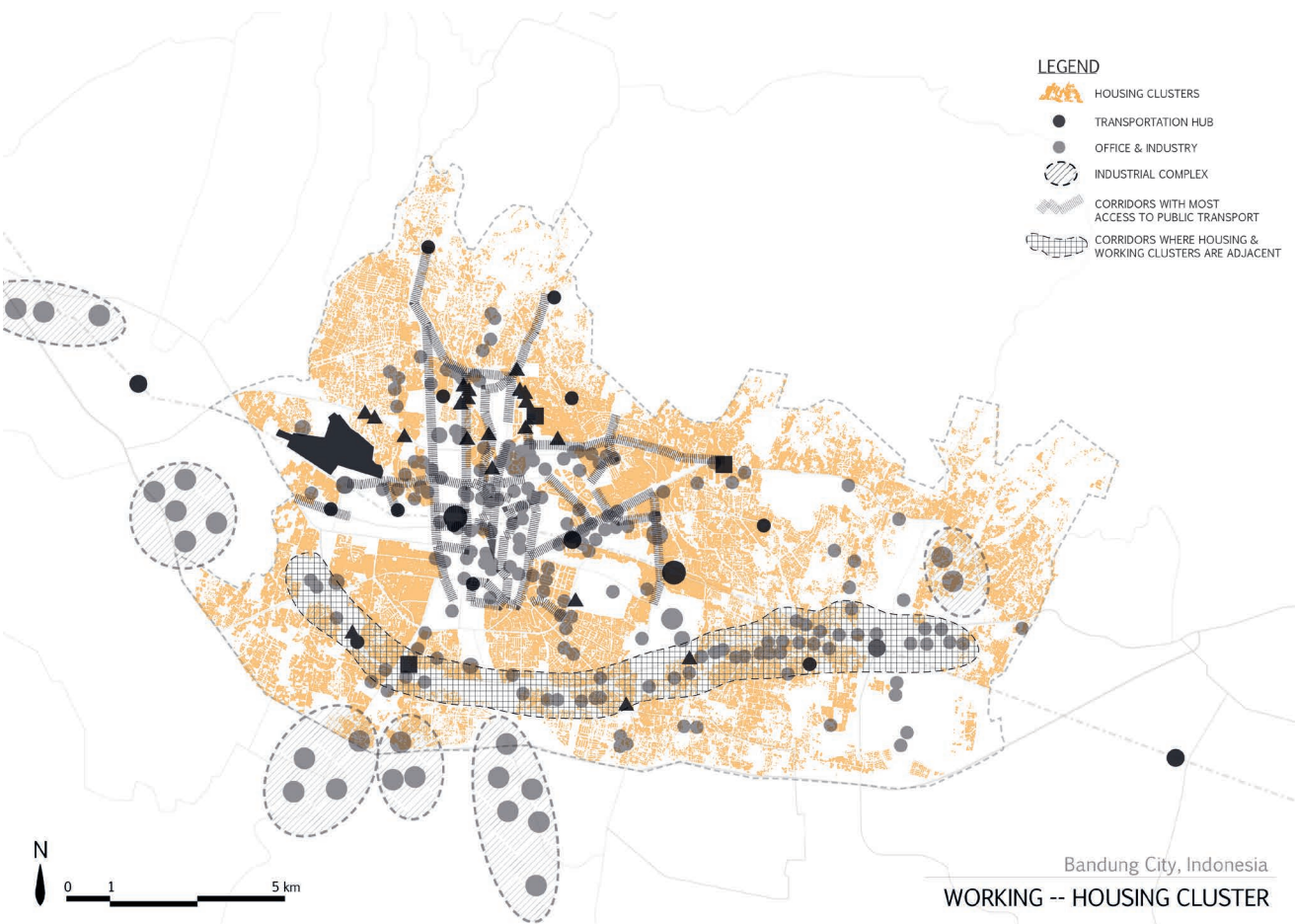
- Although most of the working-clusters are located in the city centre and around the area which is well-served by public transport, most of the industrial areas are located 'off-grid'. Furthermore, there is also an indication on linear development of offices along Soekarno-Hatta corridor. Most probably, people working in these offices are using private vehicles or utilizing the two public transport routes passing through this corridor.



3. In its relation to mobility infrastructure, the commercial facilities are divided into two groups. The first one is located around Central Station, with high accessibility by public transport. The second cluster is situated along and around Dago Street and Cihampelas Street. Although this cluster are also well-served by the public transport, the presence of Bandung – Jakarta shuttle services adjacent to the commercial areas are expected to have reciprocal influence to each other.



- Most of the housing clusters are not fully connected to the public transport service. 'Ojeg' (and probably rickshaw) has become one of the key transportation modes in connecting the housing clusters to the public transport hubs.

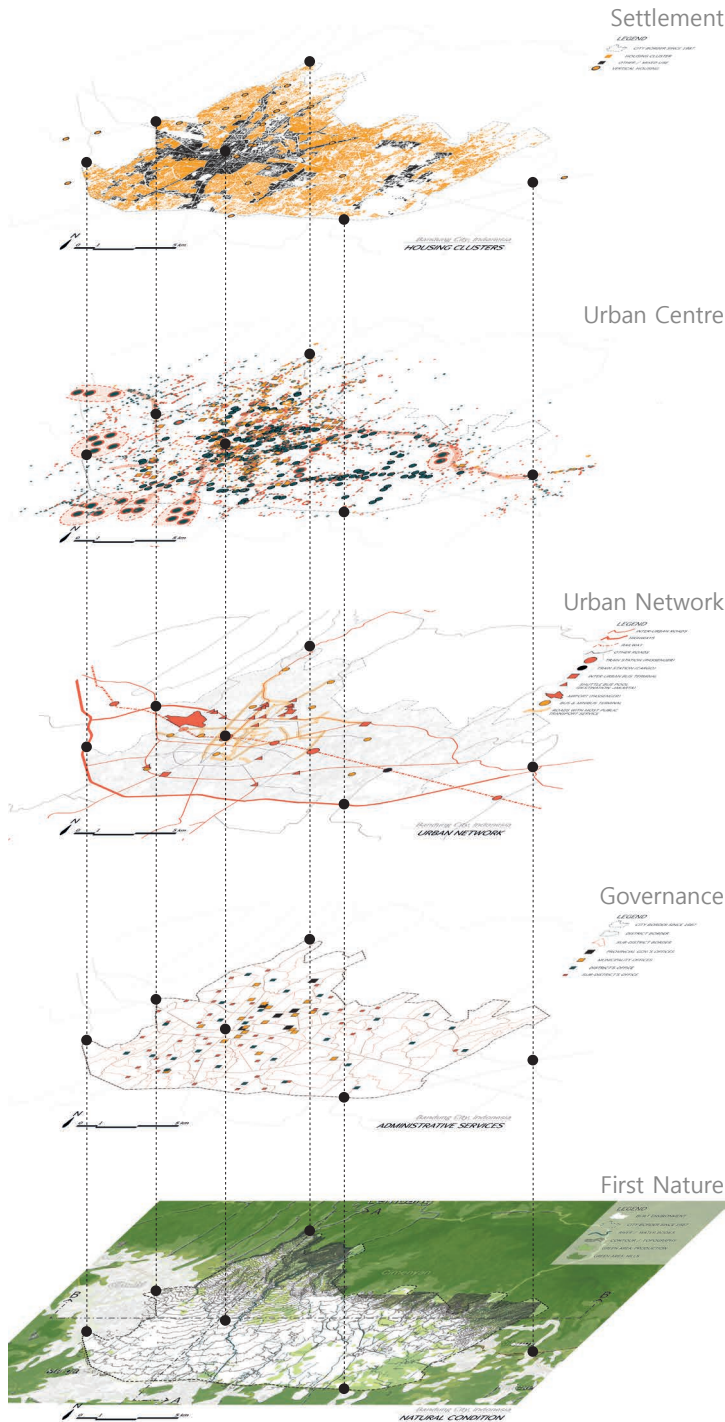


- The city centre consists of mixed land use, which may vary from private function (housing) to public functions (offices, shops, etc.). On the other hand, housing clusters surrounding the city centre seems to be more mono-functional. The working cluster along Soekarno-Hatta avenue seems to be a buffer zone between the existing housing complexes and the new development on the southern part of the avenue.

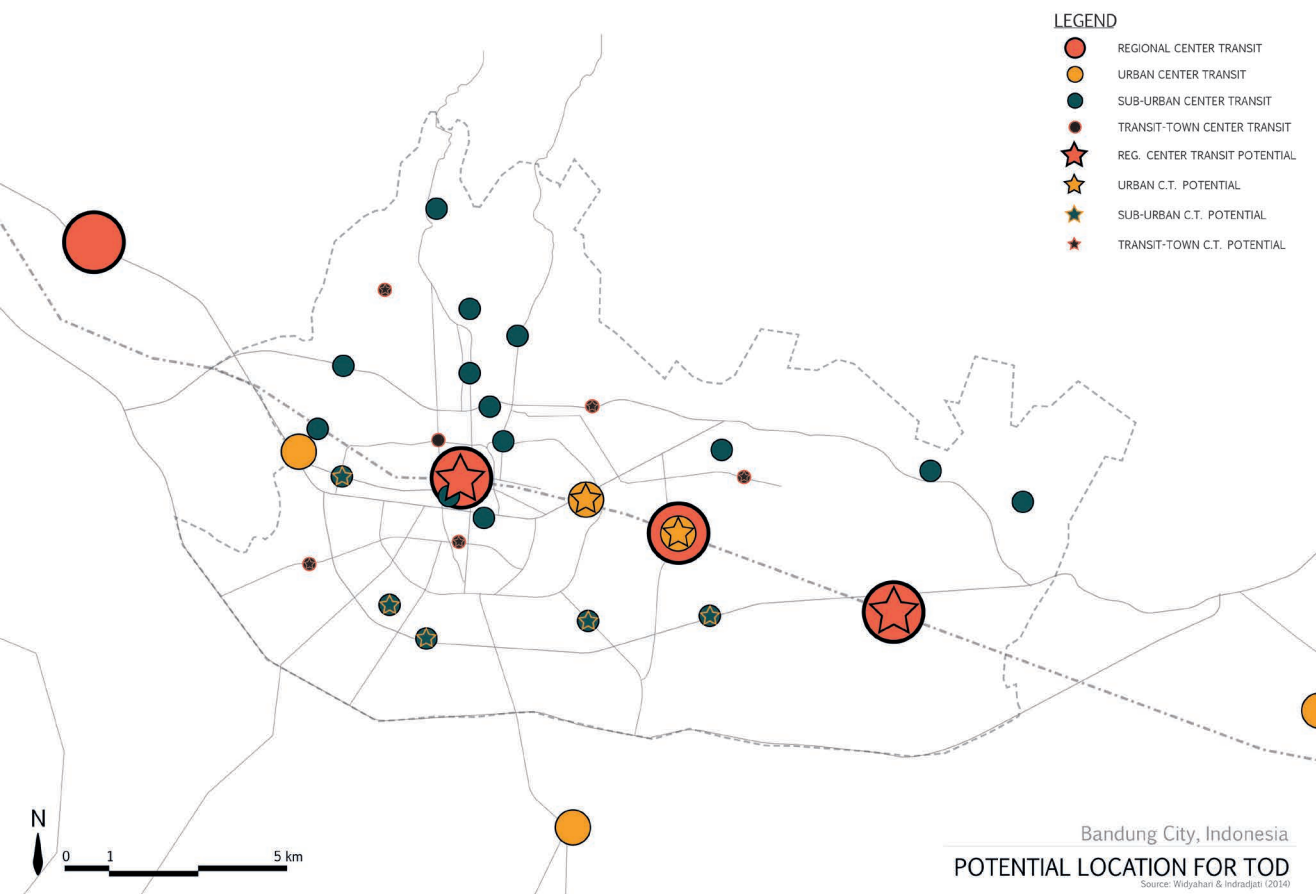
POTENTIAL LOCATION FOR FUTURE DEVELOPMENT

Aside from the analyses on existing condition, literature review on urban development potentials in Bandung City (and Bandung Metropolitan Area) was also taken. Among the studies within this topic are the critical analysis on the possibility of technology-oriented development cored in Bandung by Bimarsono (2009) and a study on Transit-Oriented-Development (TOD) potential and opportunity in Bandung Metropolitan Area by Widyahari and Indradjati (2015).

Bimarsono (2009) posited that despite the presence of existing hi-tech research-



Conclusions of the layered analysis



based industries in Bandung City, the key driver in economic development in Bandung City still relies on textile industry and services.

Nonetheless, Widyahari and Indradjati (2015) argued that there are strong potentials for TOD in Bandung City, especially in metropolitan scale. They examined the existing transit mode and transit frequency combined with mixed of land-use, building density, and retail characteristics in four different urban centres, i.e. regional centre, urban centre, sub-urban centre, and transit-town centre.

The study shows that most of the transit locations are situated within Bandung City area and all of the 14 potential locations are within Bandung City area. Although this research doesn't take the existing socio-cultural condition into account, it has been a sound foundation to base a planning strategy upon. Illustrated on the map on facing page is the location of the potential TOD points according to Widyahari and Indradjati.

DEVELOPMENT STRATEGIES



development strategies

CONTENT

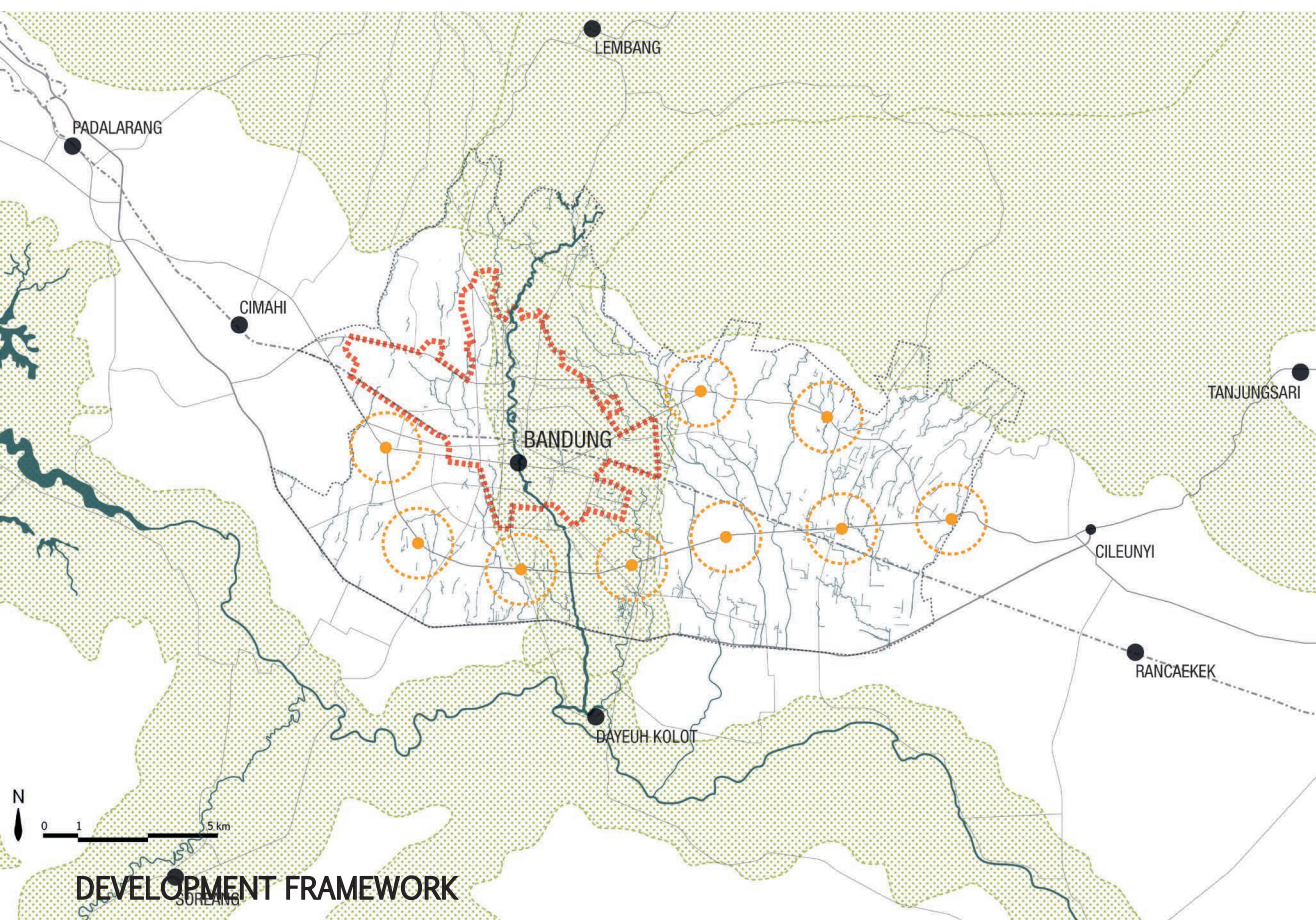
*development framework, structure vision,
development guidelines, implementation strategies*

After series of analyses on urban development and urban centralities in Bandung City, Indonesia, several findings will be explored further on. The analyses have shown that Bandung City is developing following monocentric pattern around the old city centre, which size has been growing massively in the past 20 years. This monocentricity triggered massive mobility from people living in the suburban areas and in adjacent smaller cities and resulted in congestion. As in environmental aspect, the lack of green structure within the city as well as the land use change from the forest and agricultural field to settlement areas in the uplands has influenced the rise of flood risk and calamity on the southern part of the city.

Sustainable urban development has been a renowned jargon in spatial planning in Indonesia. Nevertheless, the implementation of the jargon is another thing. Most of the spatial plans have been done more in a non-participatory manner. Often, if not always, stakeholders

are not involved (or informed) of the decision-making process. The municipality of Bandung City has been trying to implement another approach recently. They are more prone to collaboration with different stakeholders, including among the municipality's services themselves. Some of these collaborative projects involved CSR funds from private companies, a partnership with real estate developers, association with numbers of local architects, as well as cooperation with other municipalities and ministries, both in domestic and international scale.

In terms of spatial planning, the municipality has provided detailed spatial plans in city scale, supported by urban design guidelines for several districts. Other than that, they have developed a master plan for transportation infrastructure within the city. According to the current planning policies, the municipality is willing to direct the development in Bandung City towards TOD.

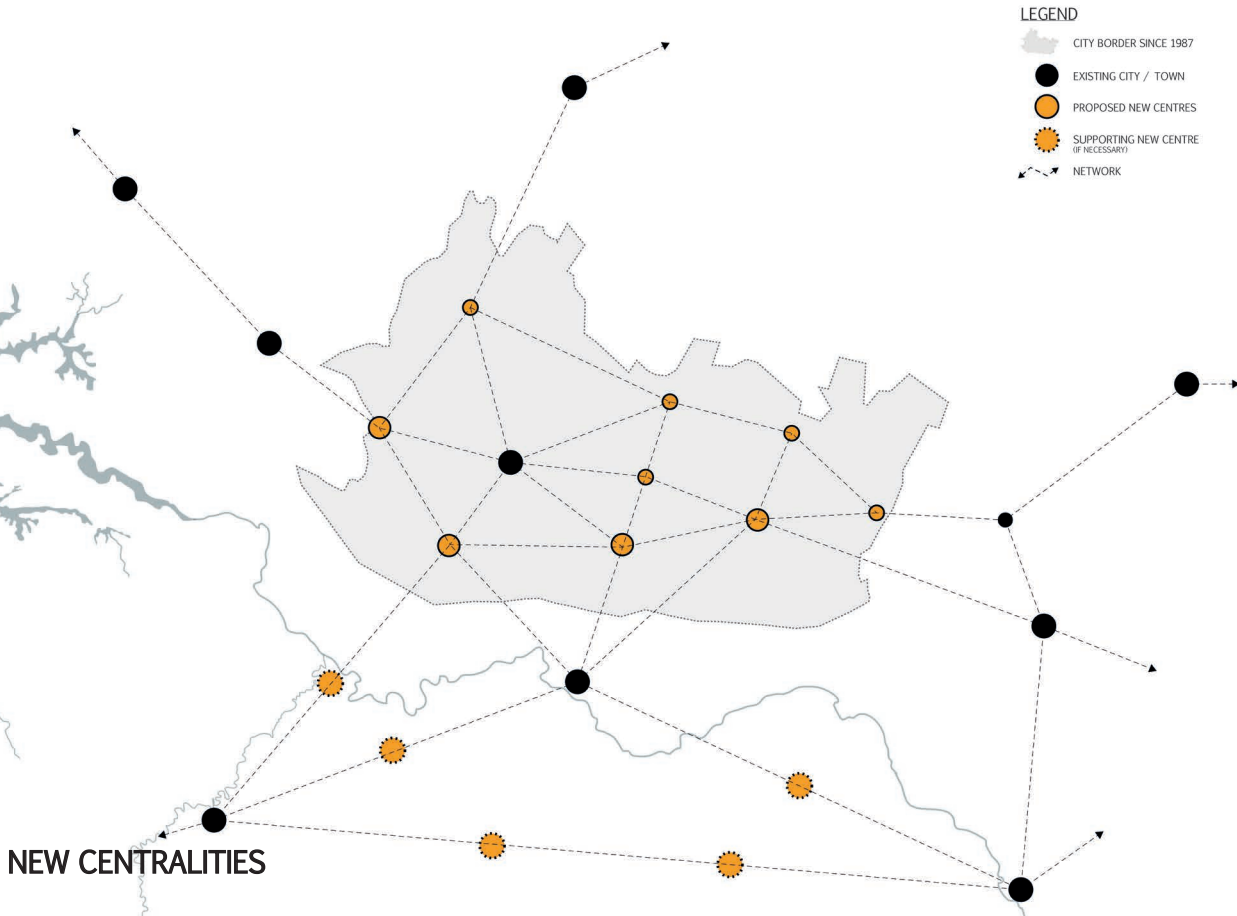


Aside from all of the good intentions from the municipality, this project aims to add missing layers to their plans, which are a spatial vision and robust regulations that will be used to base the development on. This vision will be manifested in a strategic plan consists of the development framework, structure vision, development guidelines, and implementation strategies.

DEVELOPMENT FRAMEWORK

The development framework is set to give certain ground rules for development that will perform as a directive tools. In this framework, the vision will be translated into several rules, which are:

1. Preservation of uplands, river basin, and river banks for water conservation and water safety issues.
2. Preservation of built heritage as a part of urban identity and cultural conservation efforts.
3. Stimulate multinodal development, especially on the southern part of the city, based on TOD principles.
4. Encourage participatory planning in different scale and different capacity.

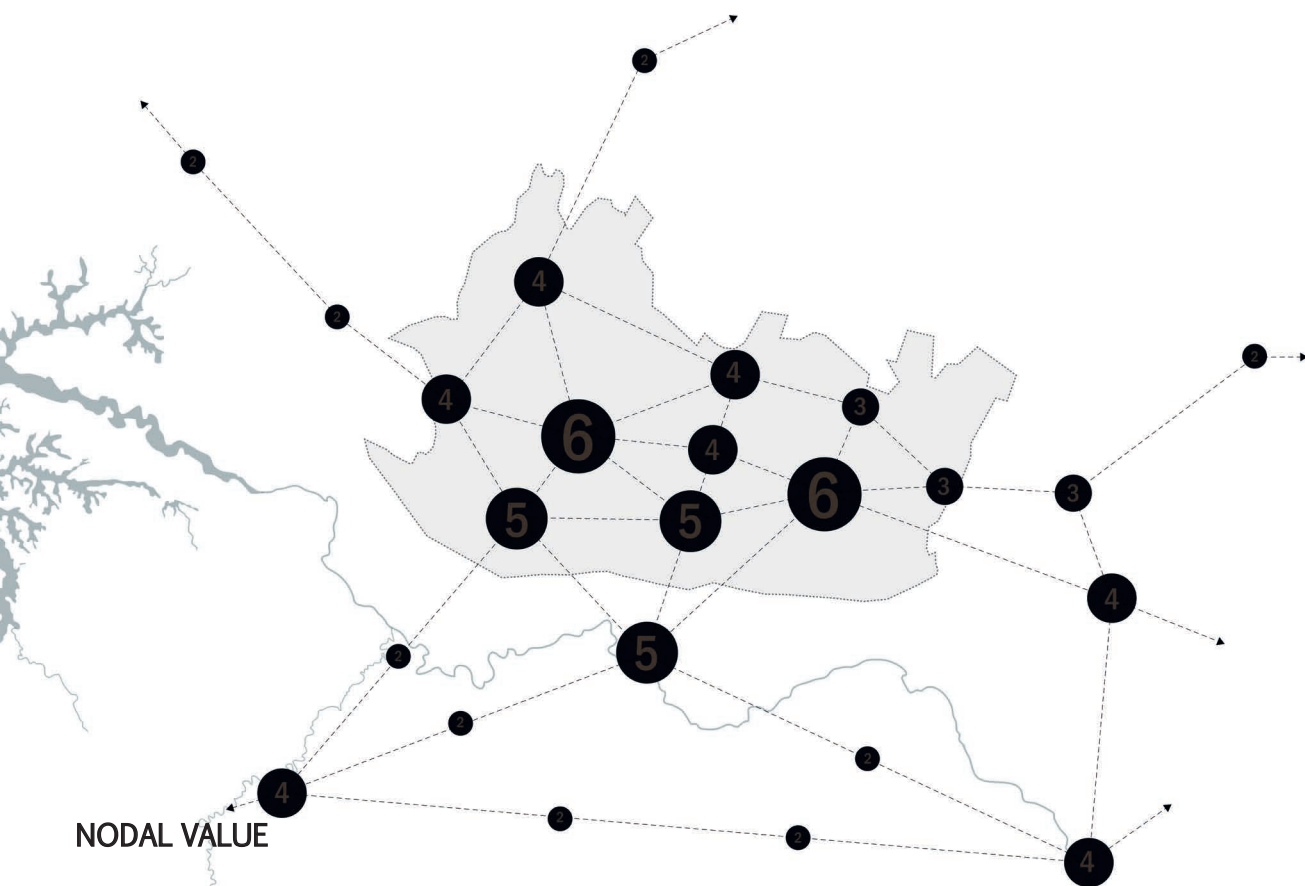


The development framework is proposed to be implemented on a larger scale, for example metropolitan scale, because both water and mobility issues affect larger spatial unit and require thorough treatment in each scale.

STRUCTURE VISION

Structure vision is a strategic spatial policy on the direction of development. In this particular project, structure vision is especially used to illustrate the rule number 3 in development framework, which is stimulating multinodal development based on TOD principles. The structure vision contains the proposed location for new centralities as well as the size of the centralities based on its degree of connectivity.

The image on above illustrates the location of new centralities, which are mainly located between two existing centralities. The new centres are proposed



to perform as an intermediary centre to minimize travel distance (both in kilometres and in time) from one area to a centre.

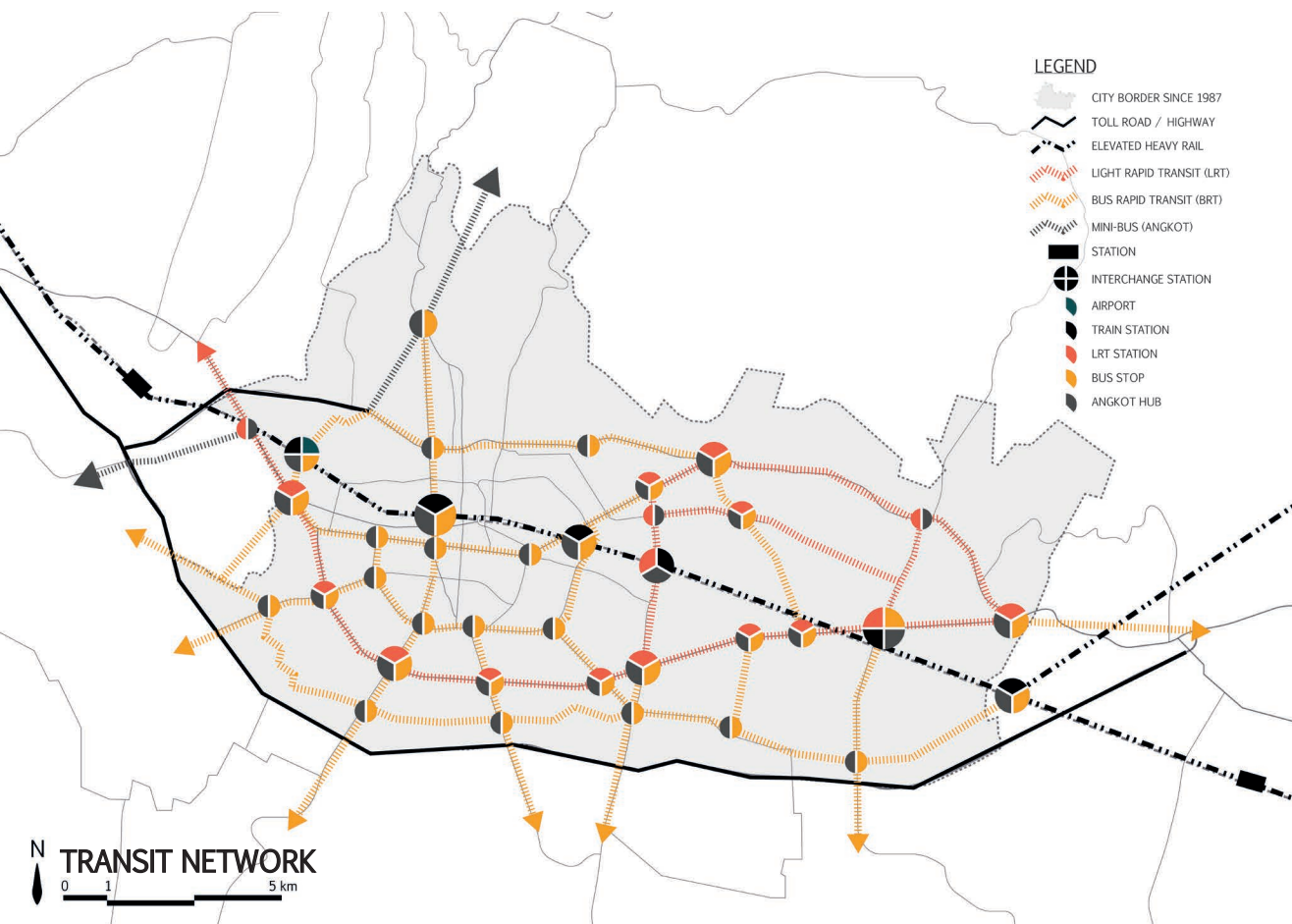
All of the centralities are expected to be connected by a certain network, most preferably by the public transport network. The nodal value shown in the illustration above indicates the possible centrality size based on the number of network connection going in and out of it. The more connections a centre has, the higher its degree of connectivity, the more opportunity to develop a more advanced centre there.

DEVELOPMENT GUIDELINES

The structure vision is supported by a development guideline, which provides more detailed indications of the type of network, links, and program to be implemented within this structure.

Network

The new structure will be connected by a physical network in the form of roads and railways, whether it is the existing infrastructure or new. In order to perform better in this structure, several existing infrastructure might need some improvement. Advancement in roads' quality as well as capacity, especially for



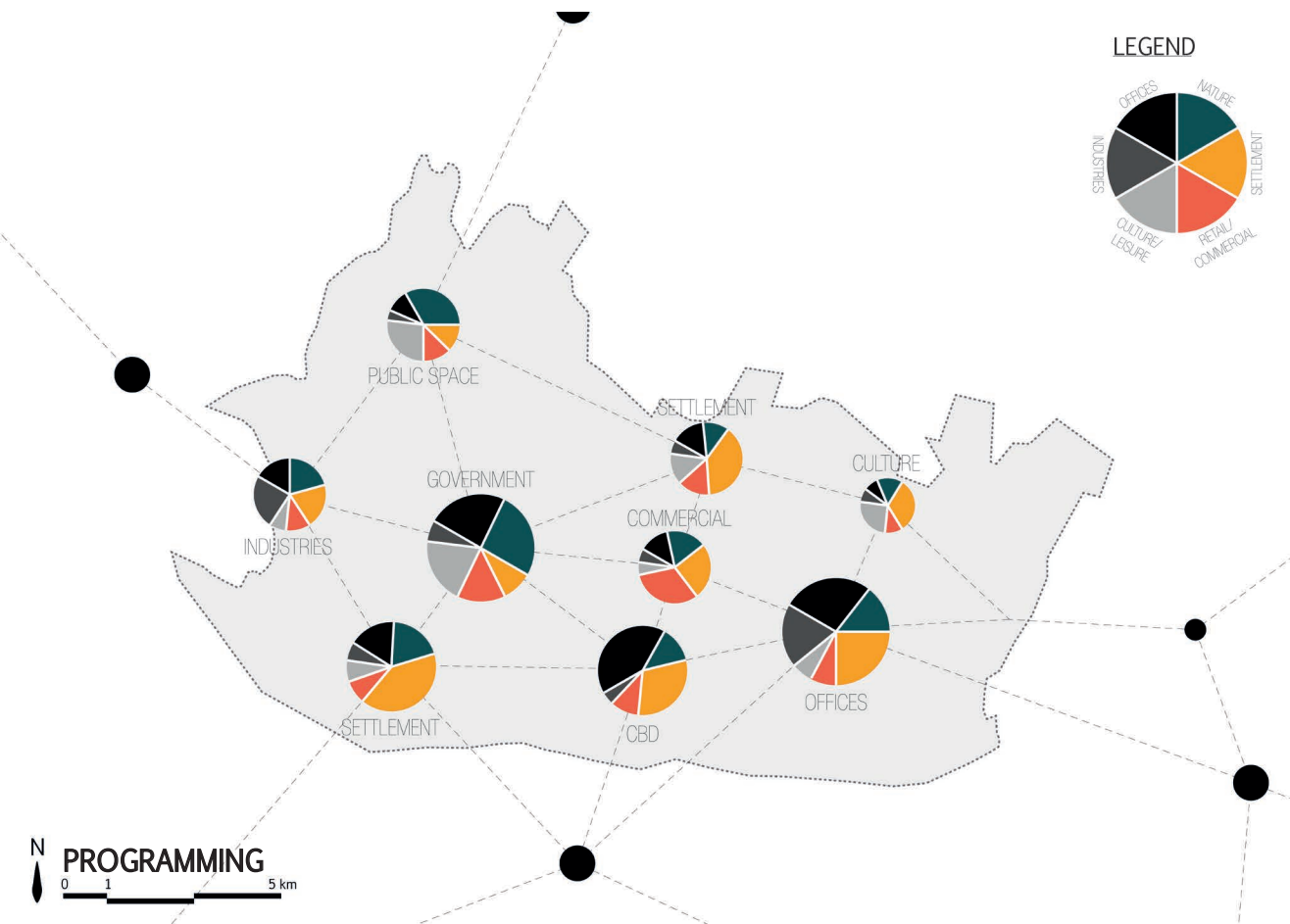
the inter-urban routes (such as Jalan Raya Bojong Soang, Jalan Raya Kopo Sayati, Jalan Moch. Toha, Jalan Raya Soreang – Ciwidey, Jalan Raya Banjaran, Jalan Raya Cibabat, and Jalan Raya Cinunuk), might be required to allow more buses coming through.

Link

On the other hand, new public transport network consists of Bus Rapid Transit (BRT) and Light Rapid Transit (LRT) will be implemented within the city itself. The priority for new BRT and LRT routes implementation will be on the southern and eastern part of the city. The idea is to add network density to these areas in

order to be able to allow ease of access. The new network will be reinforced with and integrated to the existing public transport system which has been in operating mostly in the city centre.

Numbers of interchange stations are located along the routes and will be used as the main hubs of the TOD. Each circle on the image above indicates the location of the transit hubs. Those circles are divided into several parts, which indicates the number of connections at each hub. Each color denotes different transportation mode.



Nodes

The guideline on the development nodes is very much related to the development theme and program of functions. The structure has clearly shown the potentiality of Gede Bage area as an additional primary centre in Bandung City, supported by secondary centres such as Cicaheum, Kopo, and Buah Batu. Jacobs (2000) suggested that one of the criteria of polycentricity is that the centres must perform a certain degree of specialization. By combining this understanding with principles of TOD, which includes – among others – land-use mix and transit access (Dunphy et al., 2004), as well as the existing land-use on site, a direction

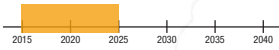
of specialization is posed as followings.

1. Primary centre City Centre: Government
2. Primary centre Gede Bage: Offices and industries
3. Secondary centre Buah Batu: CBD
4. Secondary centre Kopo: Settlement
5. Secondary centre Elang: Industries
6. Secondary centre Setiabudi: Public space
7. Secondary centre Cicaheum: Settlement
8. Tertiary centre Kiara Condong: Commercial
9. Tertiary centre Ujung Berung: Culture & performance art.

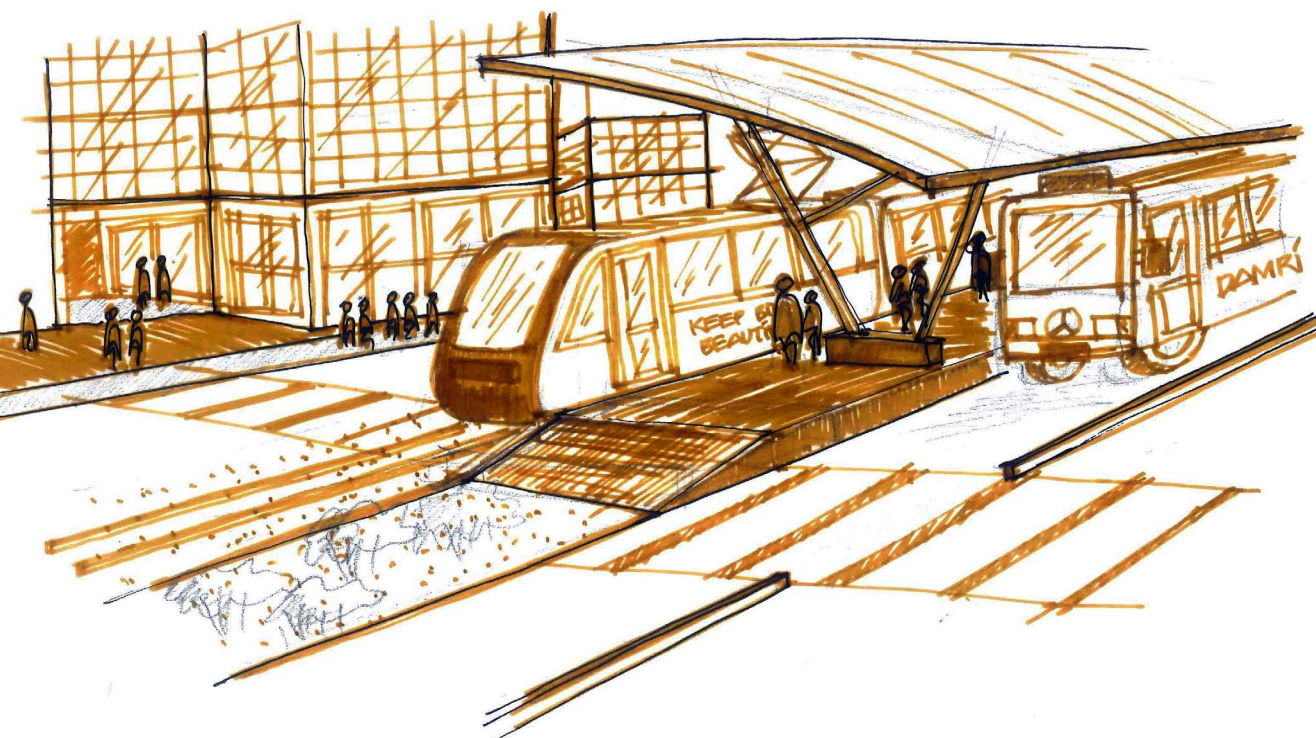


GEDE BAGE NEW DEVELOPMENT

- TRANSIT NODE
- MIXED-USE
- "HIGH-TECH VALLEY"

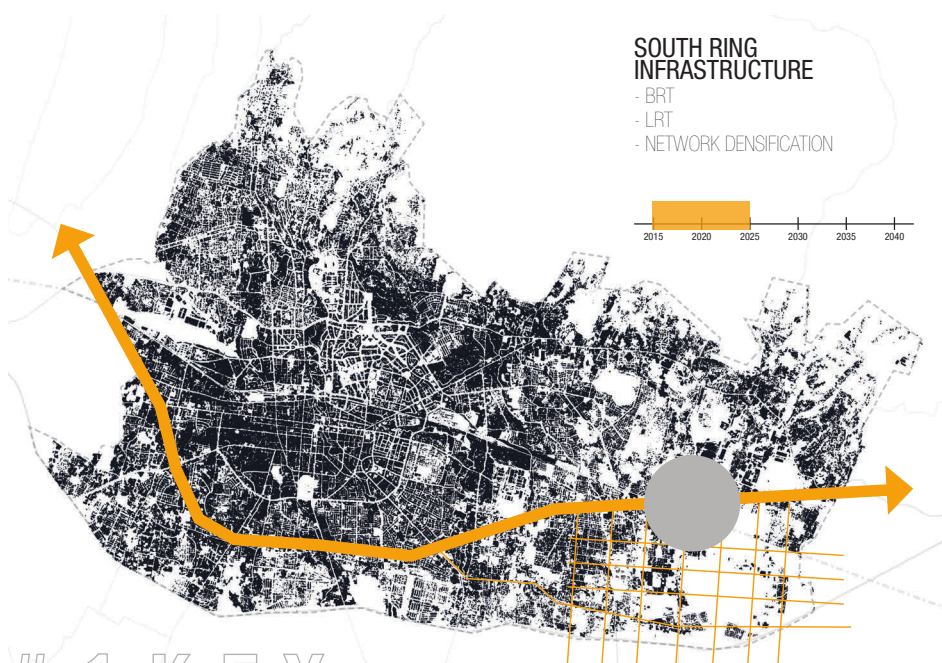
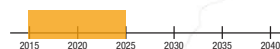


TRIGGER
PROJECT



SOUTH RING INFRASTRUCTURE

- BRT
- LRT
- NETWORK DENSIFICATION

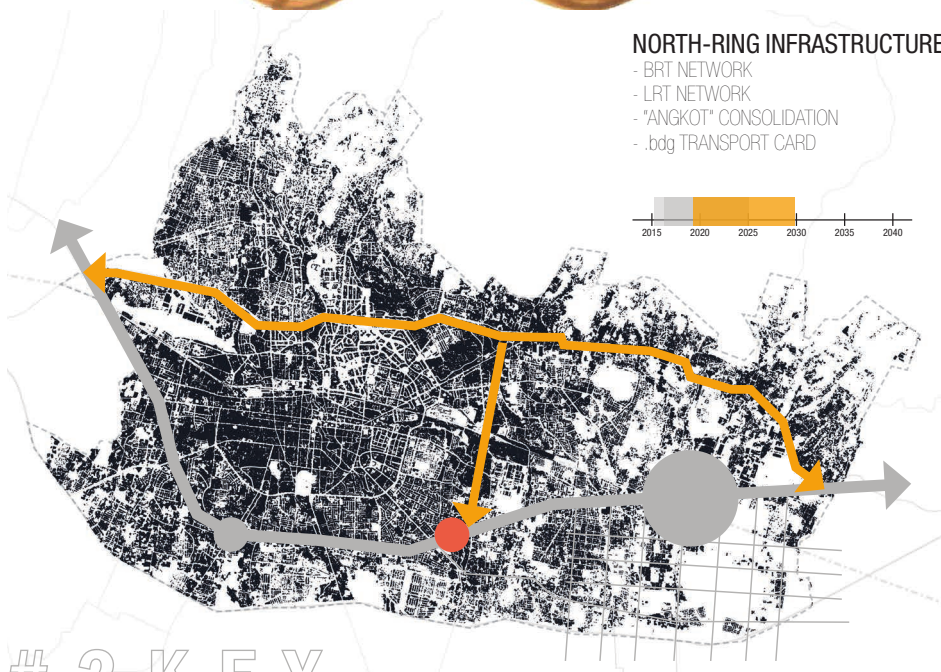
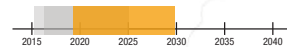


1 KEY
PROJECT

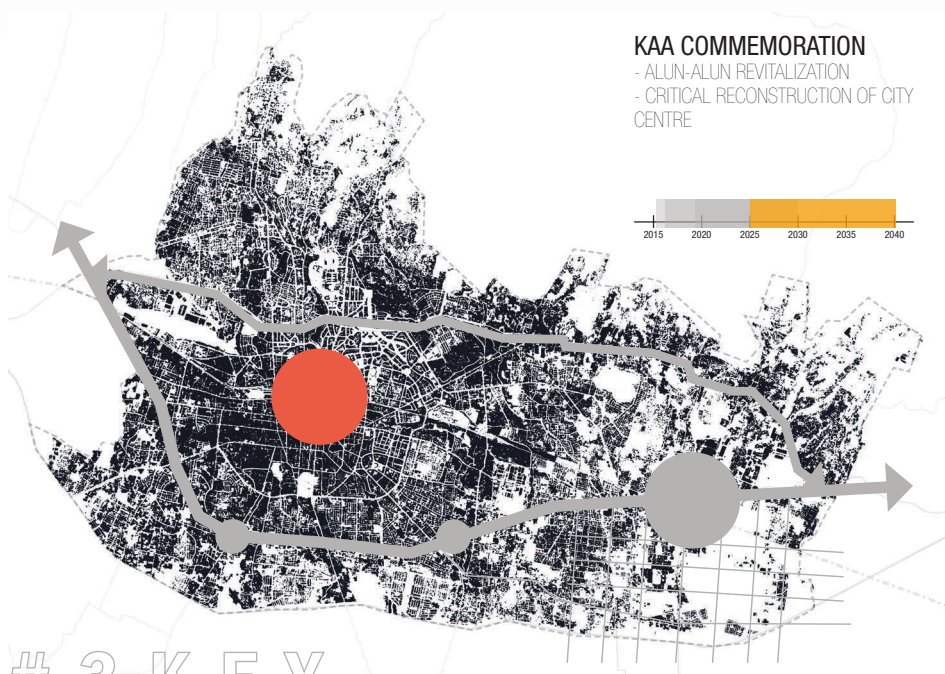
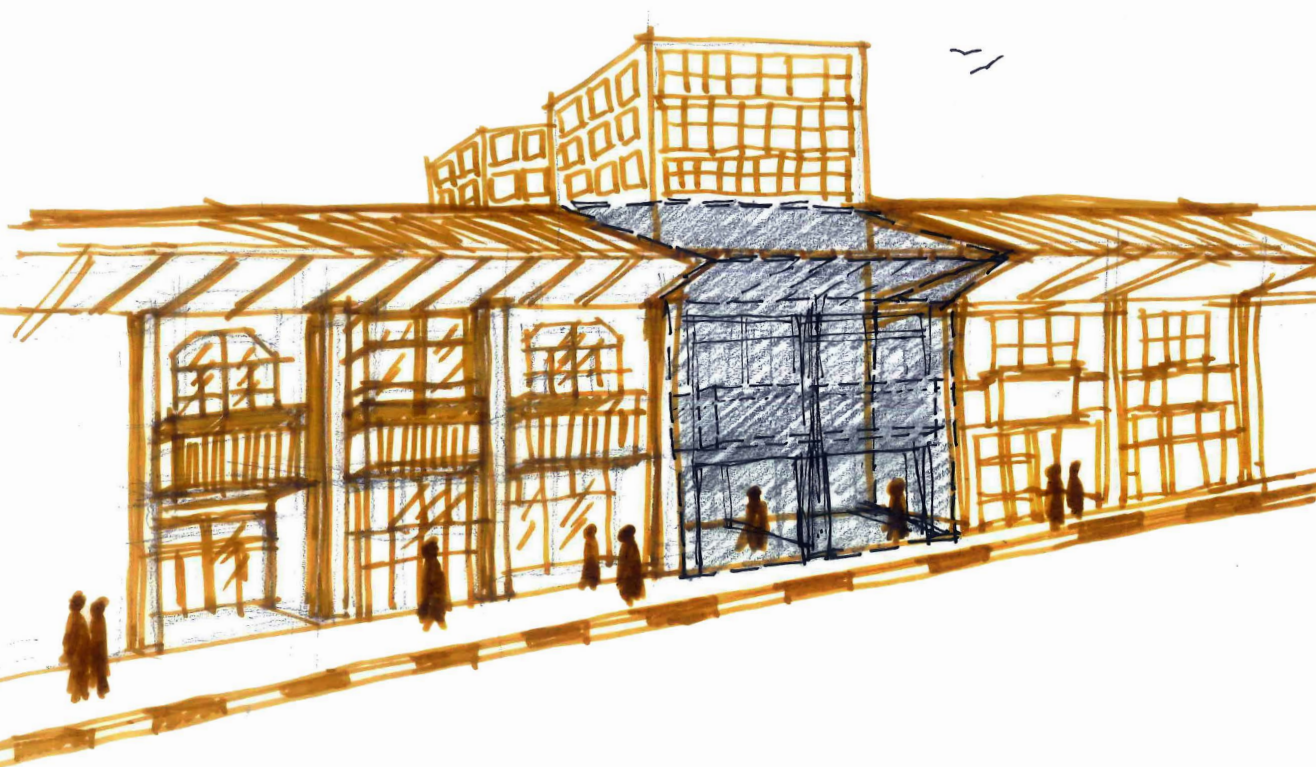


NORTH-RING INFRASTRUCTURE

- BRT NETWORK
- LRT NETWORK
- "ANGKOT" CONSOLIDATION
- .bdg TRANSPORT CARD



2 KEY
PROJECT

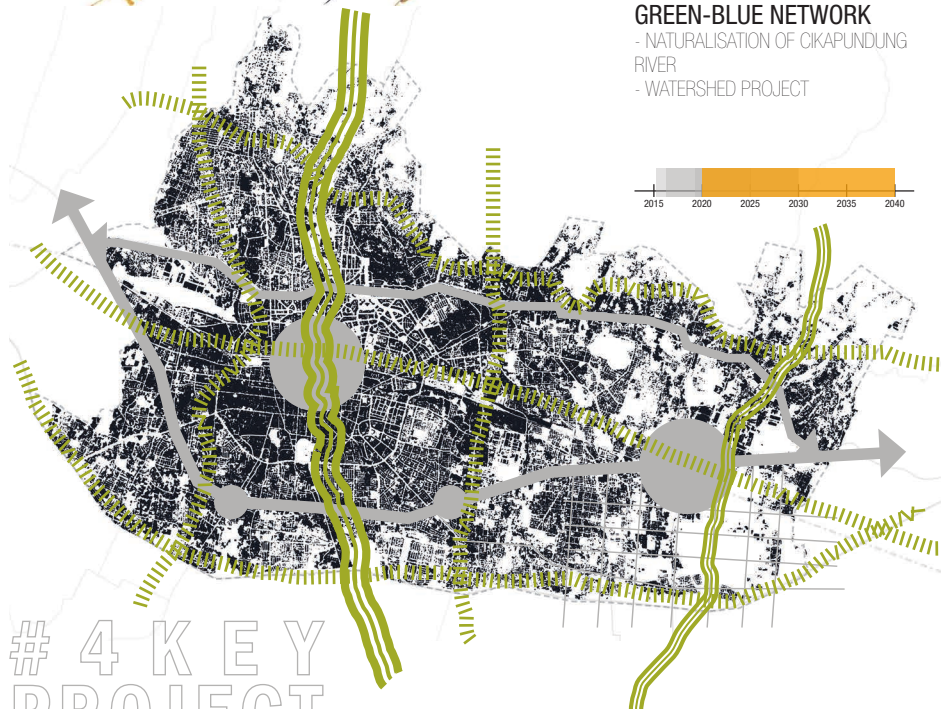


3 KEY PROJECT



GREEN-BLUE NETWORK

- NATURALISATION OF CIKAPUNDUNG RIVER
- WATERSHED PROJECT



4 KEY
PROJECT

CONCEPTUAL DESIGN



conceptual design

CONTENT

*the role of design, Gede Bage district, analysis on project's site,
design proposal, design evaluation*

The trigger project for this particular proposal is located in Gede Bage area, on the south-eastern part of Bandung City. This area is projected to be the new primary centre of the city. In this project, the impacted area involves three sub-regions including Gede Bage Sub-Region, Kordon Sub-Region, and Ujung Berung Sub-Region within approximately 16 km². However, the key project is focused within the radius of 800 m at a certain TOD node.

Gede Bage district is projected to be the new centre of development by the municipality of Bandung City. This area has been promoted as the new centre for nearly 10 years, but the development has never taken place. The government is currently set a development theme for this district: "Technopolis". In this particular project, the theme will be interpreted differently. Hi-tech valley concept for this area leans more towards the idea of knowledge-based economy and industries, such as education, research centre, creative industries, and

business incubator for small to medium sized start-ups.

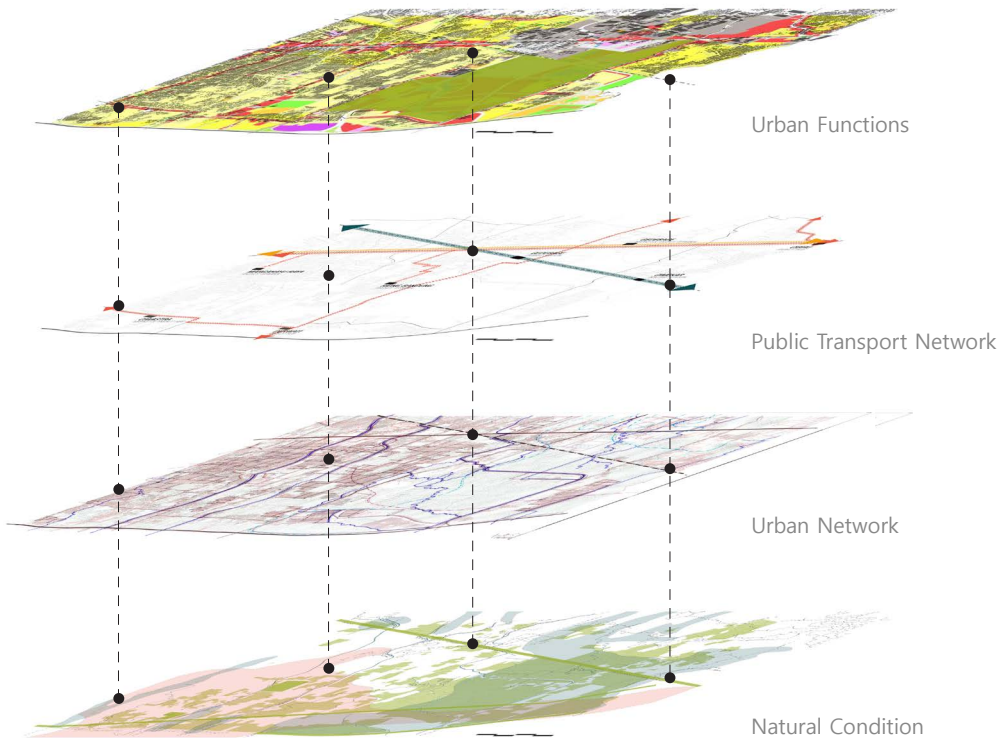
GEDE BAGE DISTRICT

Natural Condition

Located in the lower part of Bandung City, Gede Bage suffers from annual floods, which worsens every year. The analysis on watershed in Bandung and its surrounding areas indicates that the floods are also caused by ground water harvesting for industries, which later sagged the soils in this area (Noviantari, 2012). Gede Bage used to be an area with a vast agricultural land in the form of rice fields. Most of the rice fields are located in the lowest area and suffered from flood risk. The flood risks remained unnoticed until numbers of settlements were built in Gede Bage.

Urban Network

Gede Bage is accessible through Soekarno Hatta Avenue as well as Padalarang – Cileunyi Highway. Despite



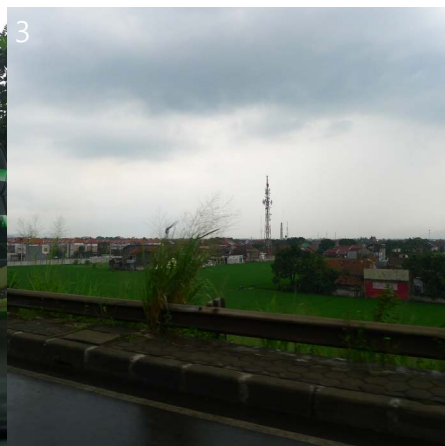
Layered analyses on Gede Bage District

the facts that public transport service is available in this area, the coverage of public transport remained low. The buses are only available along Soekarno Hatta Avenue, and "angkot"s are found mostly on the main collector roads. This does not mean that travelling and navigating by private vehicles is easier as well. Dead-ends are commonly found, especially in the housing estates.

There are two main terminals in Gede Bage, one for passengers (Gede Bage "angkot" terminal) and another one for goods (Gede Bage dry port). An inactive train station is also found approximately 1 kilometre to the east from Gede Bage dry port.

Urban Functions

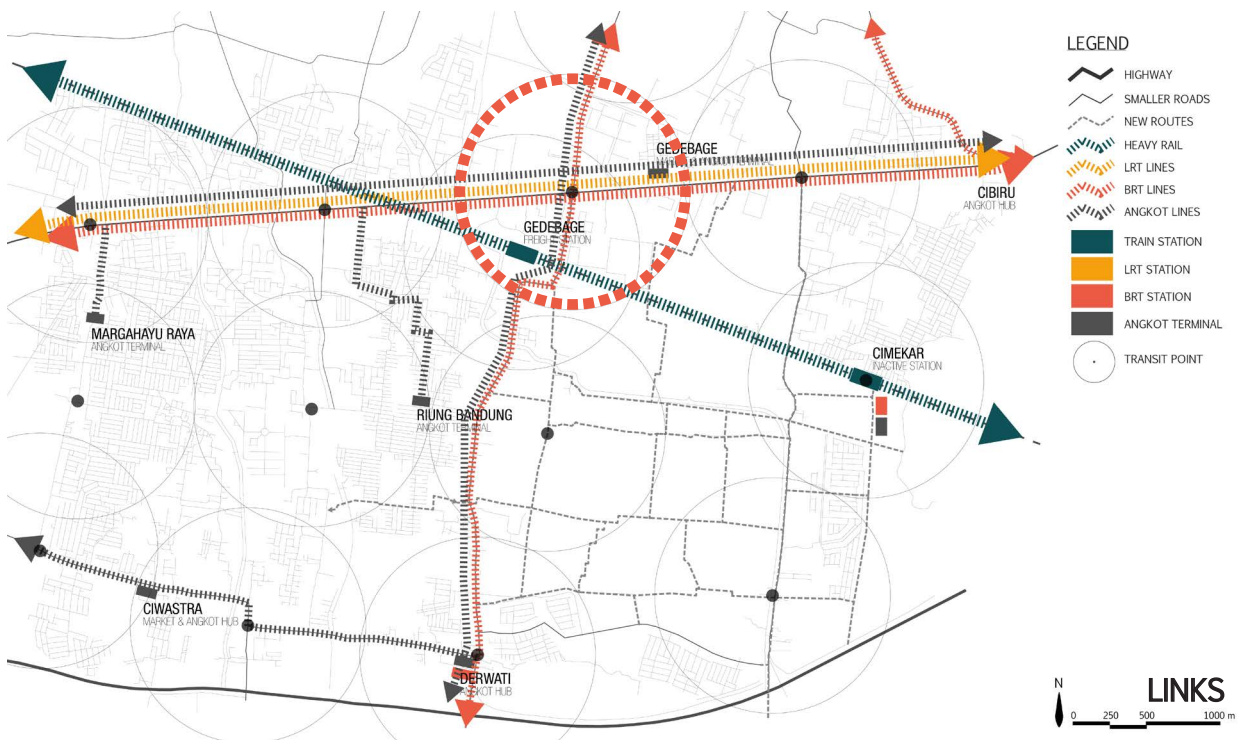
Offices, small retail spaces, showrooms occupy most of the land-use along Soekarno Hatta Avenue, and other services (insurance, bank, etc.) and settlements are found in the "pockets" behind these buildings. Informal retailers are likely to be found on the building lot's perimeter, adjacent to the sidewalk. The (public) building density is relatively low, not only that the buildings are located quite distant from one another, but the building's height rarely reached more than four storeys.



1. One of smaller intersections in Gede Bage area
2. Gede Bage Selatan Street. The width is just enough for two lanes.
3. Some of the remaining rice field in Gede Bage
4. Gede Bage dry port
5. Soekarno Hatta Avenue
6. Small retails adjacent to the sidewalks
7. One of the buildings along Soekarno Hatta Avenue
8. The existing bus stop



Existing situation of Gede Bage area and its surrounding
(source: site visit, 2016)



DEVELOPMENT FRAMEWORK

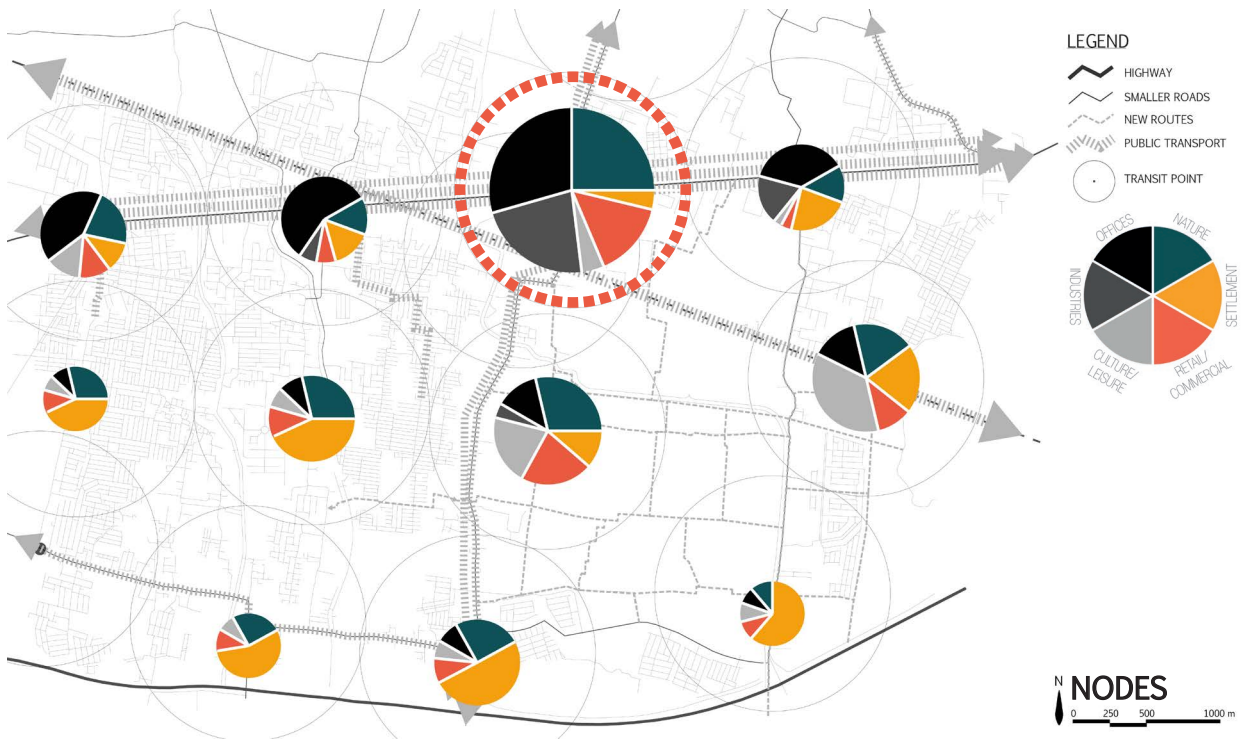
Urban development in Bandung city rarely ever has been driven by the strong business culture like Jakarta. Bandung, most of the times, rests its economic development to the services, innovation-based economy, and socio-cultural features such as art and culinary. Therefore, developing a CBD as the anchor programme of the new development might not be the best option in Bandung.

The hi-tech valley concept adopted for the development in Gede Bage leans more towards the idea of knowledge-based economy and industries, such as education, research centre, creative industries, and business incubator for small to medium sized start-ups. In addition to that, the proposed development in this area also seeks for

the balance between the built and unbuilt environment. Thus, the development in Gede Bage is not always about “where to build”, but also to counter-balance it with “where NOT to build”.

The development in Gede Bage District will be supported by an adequate transport facilities such public transport network (BRT and “angkot”) and new roads. The new roads are not only dedicated to cars but also included cycling paths and pedestrian routes. Smaller TOD nodes with interchange stations are distributed throughout the area. The railway network will be revitalized to support massive commuting from adjacent towns such as Padalarang, Cimahi, Rancaekek, and Cicalengka.

Each TOD nodes will be developed according to a certain programme. The programme is derived from both



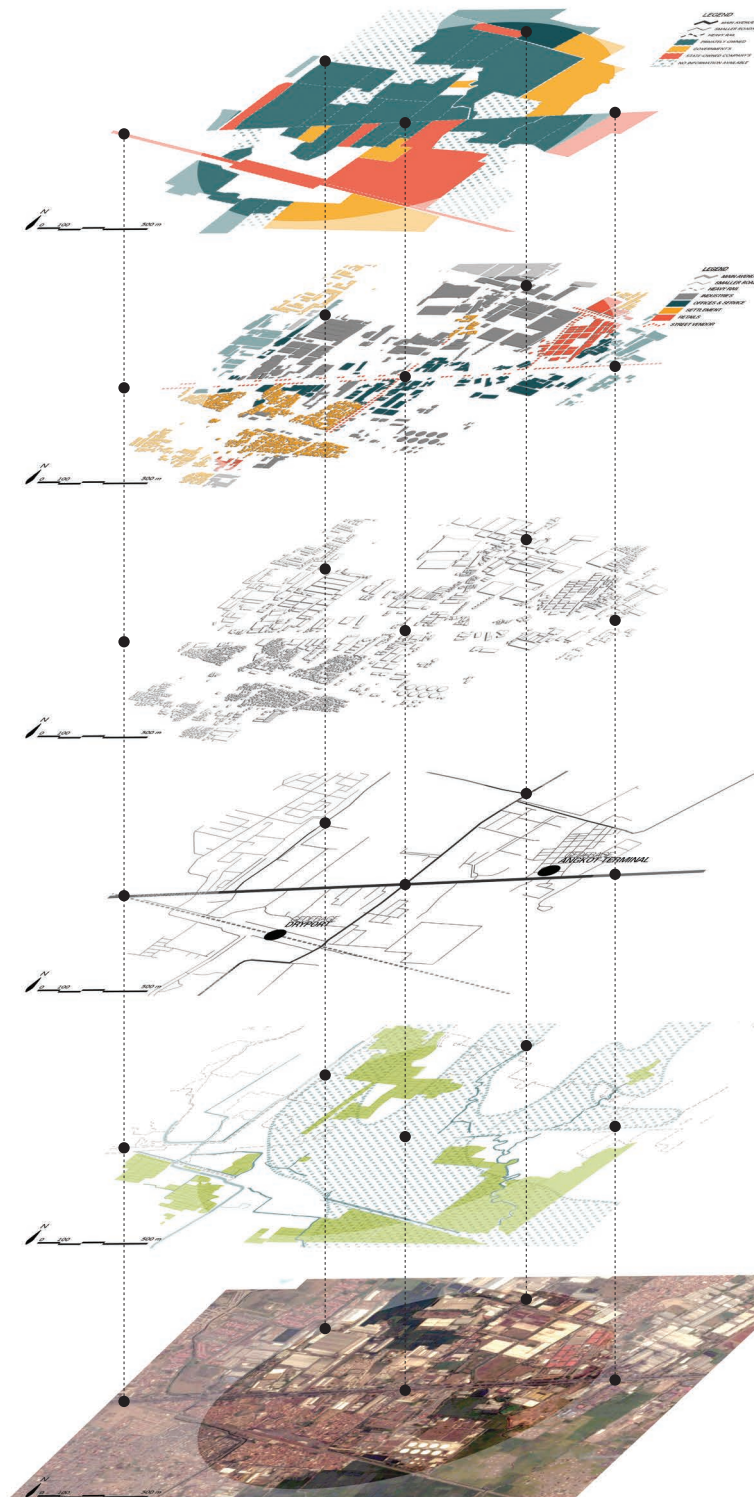
existing condition and potential for future development. For example, TOD nodes located along Soekarno Hatta Avenue will accommodate business-oriented functions such as offices, industries, and exhibition. Meanwhile, the nodes between the avenue and the highway are projected to accommodate domestic functions such as local shopping centres (or market), housing, and community centres. Each of the nodes is required to provide adequate (well-designed) open space that will perform socially and environmentally.

The circled node on the preceding illustration is the key intervention to be developed further on to exemplify the implementation of this plan.

GEDE BAGE INTERSECTION: THE NEW MELTING POT FOR IDEAS

The key intervention of this project is located at the intersection of Soekarno-Hatta Avenue and Gede Bage / Rumah Sakit street. In this trigger project, the larger framework and guidelines are translated into several design criteria and illustrated in a conceptual design for the site.

In order to do so, a layered analysis was done within the 800 m radius area, centred to the intersection. Similar to the layered analysis in the city scale, at this scale, the same five key layers are used, including the natural condition, network, built environment, building functions, and land ownership as part of the governance aspect.



LAND OWNERSHIP

Private's
Government's
State-owned companies'
Unknown

FUNCTION

Industries
Offices & Service
Retails / Commercial
Dwellings

BUILT ENVIRONMENT

Buildings

NETWORK

Roads
Railways
Terminals

NATURAL CONDITION

Topography
Water bodies
Rice fields
Flood risk

BASE MAP

Google Earth image

Layered analysis on trigger project's
site: Gede Bage Intersection

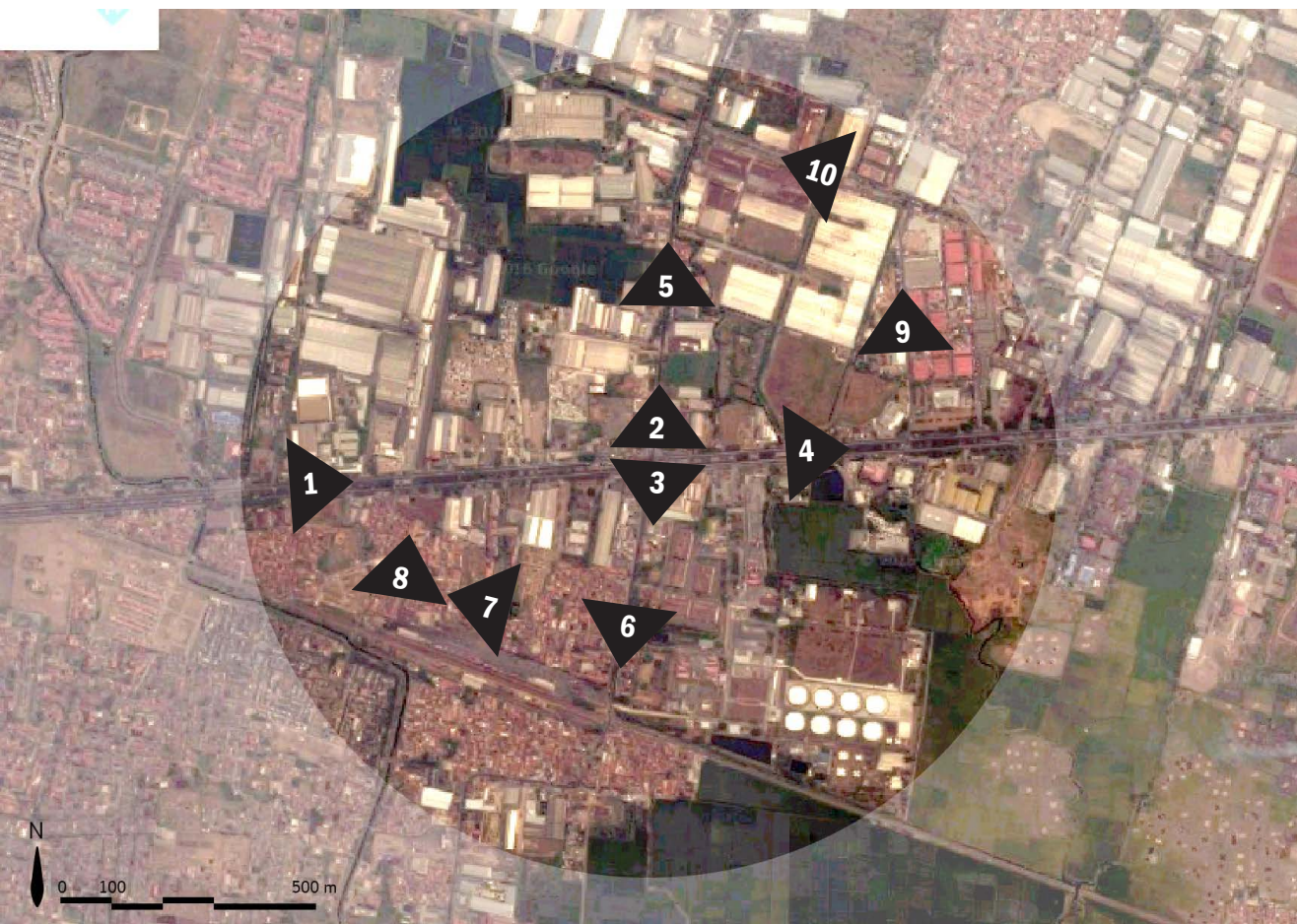


The Site

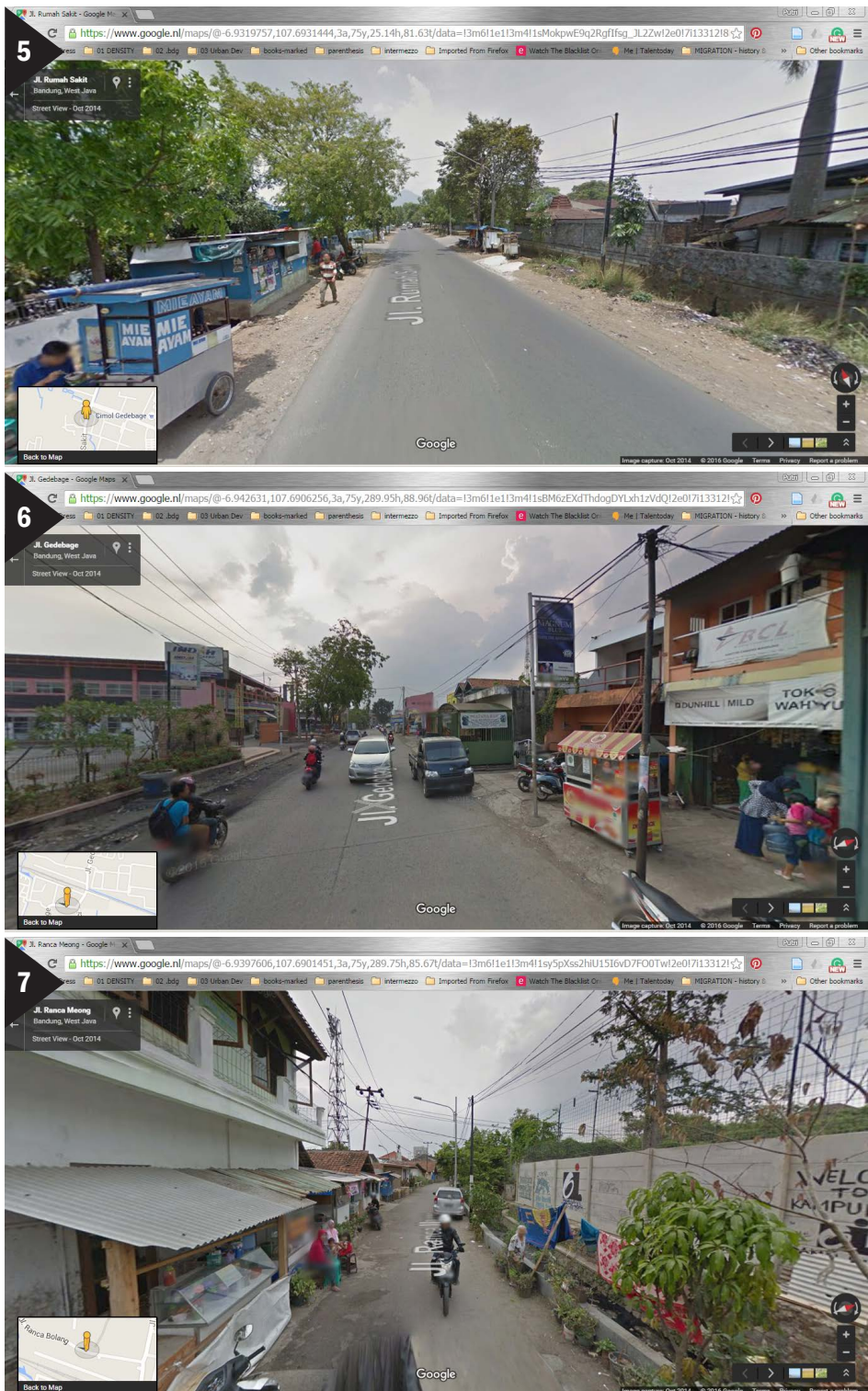
Gede Bage used to be one of the backyards of Bandung City, serves the industrial activities such as textile and garment industries and pharmaceutical industries. On the south of Soekarno-Hatta avenue, a vast land filled with rice field is used to be found. The municipality of Bandung once announced their plan to develop this area into a new urban centre in circa 2000. The development was hardly ever taken place. However, it never stops the real estate developers to establish housing estates in this area,

exchanging the rice fields with vast landed-housing projects.

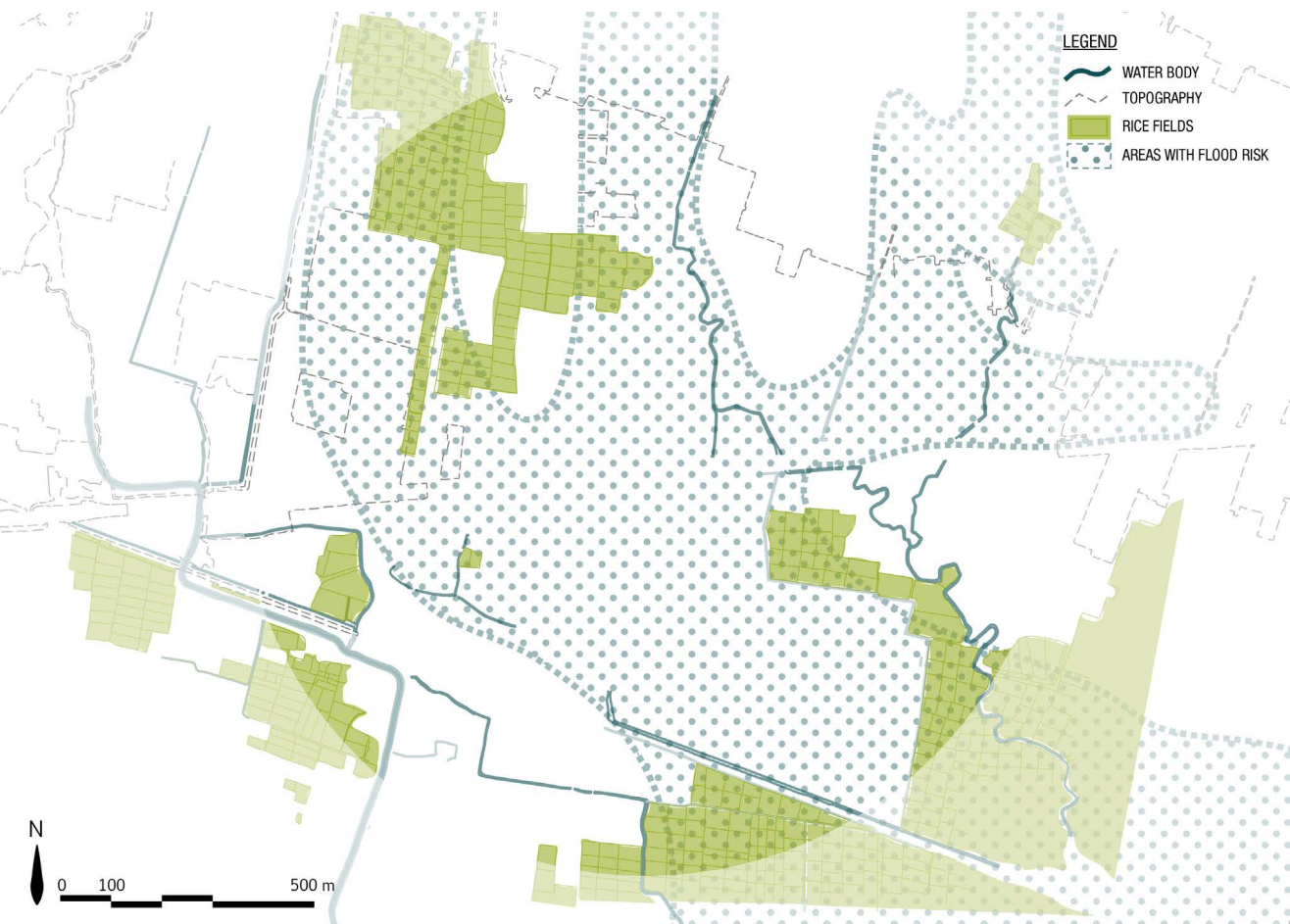
Presented on the following page is the "Google Street View" of this area. Although the Street View is inaccessible in some areas, it already gives an impression of the area itself. The Street View taken to portray Gede Bage intersection area includes those along Soekarno-Hatta Avenue, Rumah Sakit Street, Gede Bage Selatan Street, Ranca Bolang Street (adjacent to the railway), and around Gede Bage traditional market.







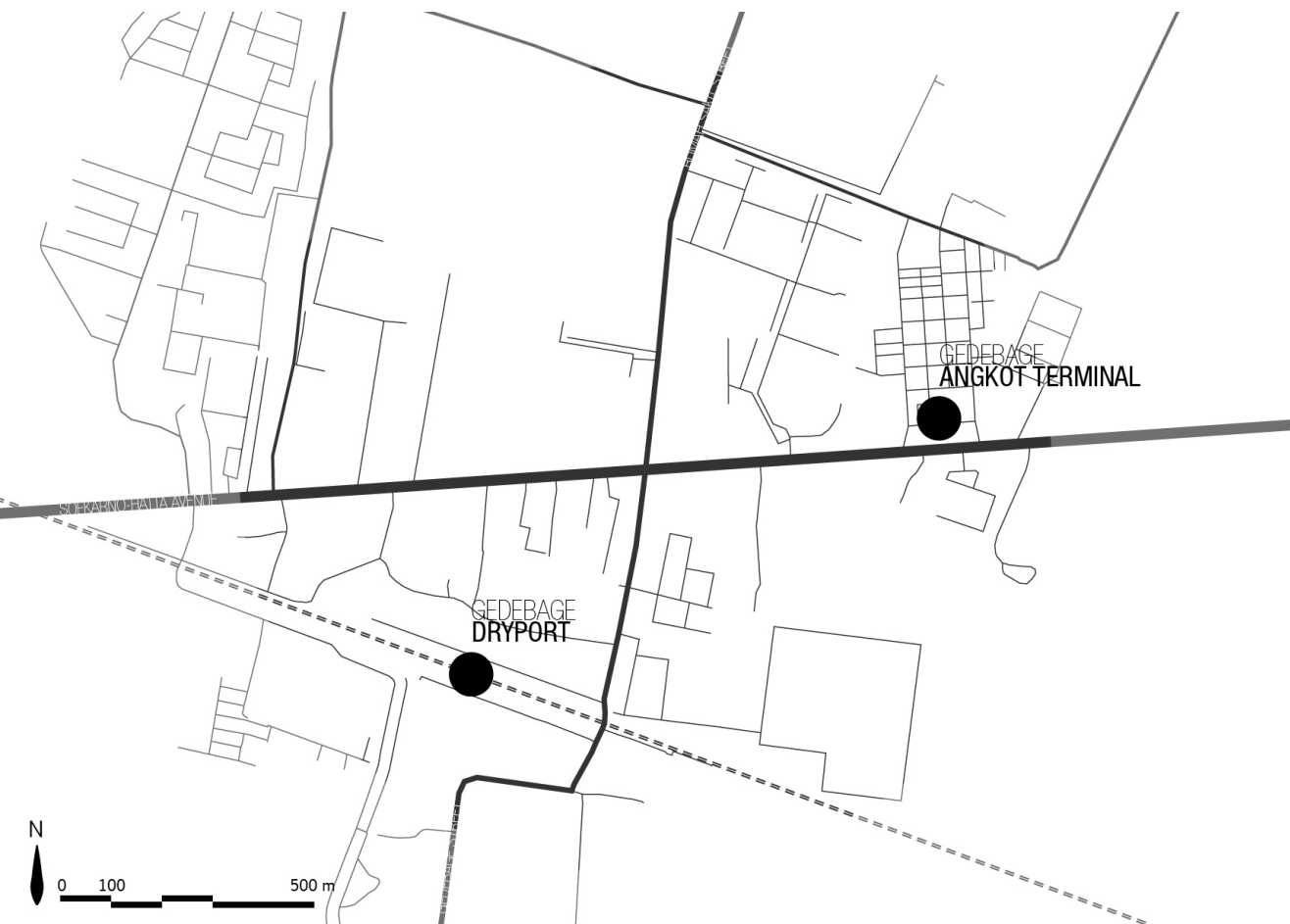




Natural Condition

The illustration above highlights the natural features of Gede Bage intersection area. Numbers of water channels and smaller rivers are streaming through this area. Most of them are used for the rainwater channelling as well as for the rice field irrigation. The presence of water bodies is also important for the industrial estates within this area. However, the extensive use of natural water by the industries has led to land subsidence in some areas.

Gede Bage is located in one of the lowest terrain of Bandung City and prone to flood risk. As a matter of fact, this area suffers from annual floods which worsen every year, especially when the rainfall volume is exceeding normal. The local term used to define the flooding condition is "Cileuncang" flood, i.e. where the flood is actually caused by the streaming run-offs coming from the higher ground of the city. The flood risk remained unnoticed until recently after a lot of housing estates were established.



Network

Gede Bage area is highly accessible both from the city centre of Bandung and from the neighbouring centralities such as Dayeuh Kolot, Cileunyi, and Sumedang through Soekarno Hatta Avenue and the highway. However, the public roads in a lower hierarchy are rarely to be found other than in the housing estates in this area. The illustration above portrays the streets in this area, as mapped by the municipality's Spatial Planning officials. Most of the direct access from Soekarno-Hatta Avenue belongs to private ownership (office, industrial areas,

or housing estate), while some others – which are accessible to public – are not wide enough to serve as a public connection. These smaller roads often lead to a cul-de-sac ending as well.



Built Environment

Based on the municipality's map dated on 2010, the total built-up area within this area is approximately 850,000 m² out of 3,497,190 m² of the total analyzed area. This number is excluding the roads and built-up open spaces. Among the buildings, 2,155 of them are houses inhabited by approximately 3.8 people per household (Badan Pusat Statistik Kota Bandung, 2010).

The building types varied from single story to multi storeys. Most of the dwellings are built in the range of one to two storeys and with a pitched

roof. Public buildings and other offices, especially those located along Soekarno-Hatta Avenue take more vertical space, with the average of three storeys, and some hotels even exceed ten. Naturally, the building's setback along Soekarno-Hatta Avenue is larger than those along the other streets: approximately 16 – 18 m. On the smaller roads, the building's setback could vary from 0 – 8 m.



Existing Land-Use

There are five main land-use found on this site, i.e. industries, offices and services, settlement, commercial, and rice fields or open space. Industries occupy most of the areas, followed by offices and settlements. The industrial estates are located mostly on the north side of Soekarno-Hatta Avenue. The industry varies from textile to milk factory. The industrial facilities located adjacent to the existing dry port are the gasoline reserve facility belongs to Pertamina, a state-owned company, and the warehouse facilities belong to Indonesian Bureau of Logistics.

The housing clusters adjacent to the station is mainly in the form of “kampong”, a densely built and populated area, which was emerged naturally and less planned. These “kampongs” occupied some clusters at the back of the offices stripe.

Street vendors are likely to be found, especially in the market and other public facilities. Their commodities diverge from foods to clothing; some even offers mechanic services such as tire repair and selling other motorcycle’s spare-parts.



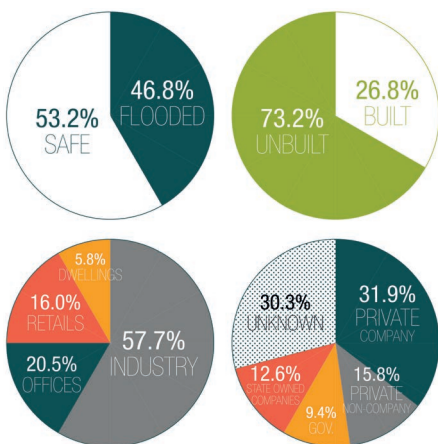
Land Ownership

The land on this site belongs to numbers of stakeholders; either they are private owners such as private companies and individuals, government, or state-owned companies. The private companies who own the industries are including but not limited to P.T. H.M. Sampoerna, P.T. Mepro Hall Pharmaceutical, P.T. Vastex and Nobel, P.T. Paeco Agung, MaxOne Hotel, Platinum Ceramic, Cipaganti Group, and P.T. Huge Trading Industry. Other properties belonged to the state-owned companies such as P.T. Kereta Api Indonesia, Pertamina, Perum Damri, and Perum Jamkrindo. While the government

services found in this area are including properties of Ministry of Religion Affairs, P.D. Pasar, and Municipality of Bandung City. Shown in the illustration above is the map of estimated land ownership based on information available online.



2,155 houses
3.8 people / household
8,189 inhabitants

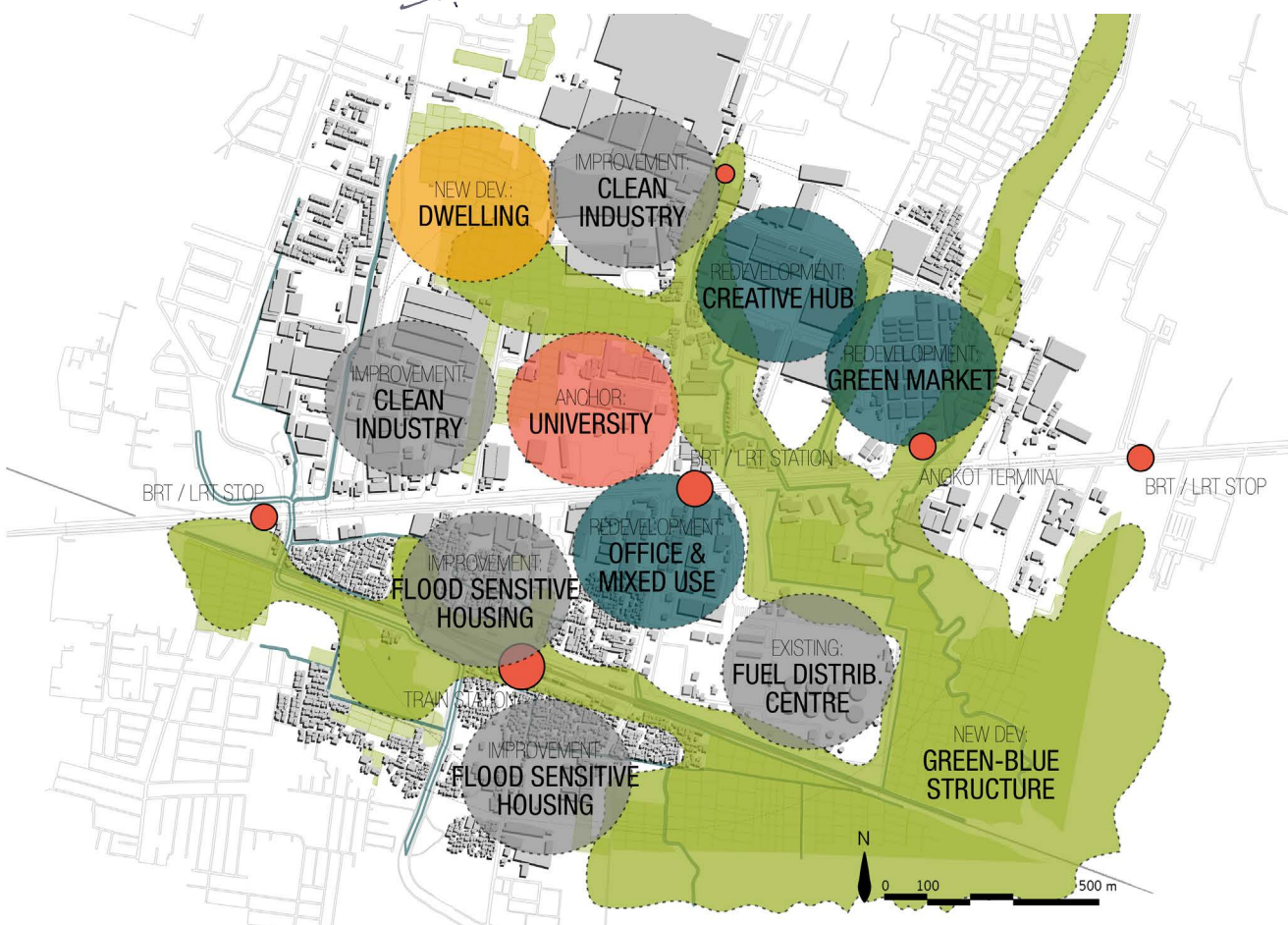


Conclusion

Gede Bage area is currently among the least populated areas in Bandung City, Indonesia with only 24 inhabitants per hectare compared to the gross density of the city (147 inhabitants per hectare). The fact that this area is prone to flood risk, far and not well connected to the city centre are plausibly the main reason for people not to live in this area. The unbuilt area makes 73.2 % of the total analyzed area, leaving ample space for either development or nature. The industrial estates occupy more than half of the area, where most of the land plot belong to private ownership.



**THE NEW
MELTING POT FOR
IDEAS**



Vision & Programming

As mentioned previously, this particular project will interpret the “technopolis” theme a little bit differently with the municipality. Hi-tech valley concept for this area leans more towards the idea of knowledge-based economy and industries, such as education, research centre, creative industries, and business incubator for small to medium sized start-ups. Thus, the proposed vision for this area would be “The New Melting Pot for Idea”, where the academician and young business start-ups can interact with each other as well as with the creative communities.

The new programming on this site is derived from the optimization of existing land-use and functions. New transit node will be established between the existing terminal and the railway station (which currently is not servicing passengers). This node will be highly connected to a university and offices and other business facilities around it. Land consolidation is required to allow this development to happen.

The spatial regulation from the municipality allows the floor area ratio (FAR) to reach up to ten times the building plot. In spite of it, although the land intensification will take the municipality's guidelines into account, it is not planned to reach that volume. Most of the redeveloped buildings, especially those adjacent to Soekarno-Hatta Avenue, will be three to four storeys high, with the exception of the main education facility or research institute (which can reach up to eight storeys high). Green network in this area is established by providing green strips along the streets, parks, green pockets in the existing settlement areas, and green corridors along the water bodies.

The spatial regulation from the municipality allows the floor area ratio (FAR) to reach up to ten times the building plot. In spite of it, the new development and redevelopment of Gede Bage intersection is not planned to reach that volume. Most of the redeveloped buildings, especially those adjacent to Soekarno-Hatta Avenue, will be three to four storeys high, with exception on the main education facility or research institute (which can reach up to eight storeys high).

Design Principles

In order to allow the vision to materialize, the development will be based on several design principles, which was derived from the development framework and development guidelines in the city scale. The design principles consist of four points, addressing the main objectives of the project as well, which are:



To provide better mobility network,



To define and re-define the space for development,

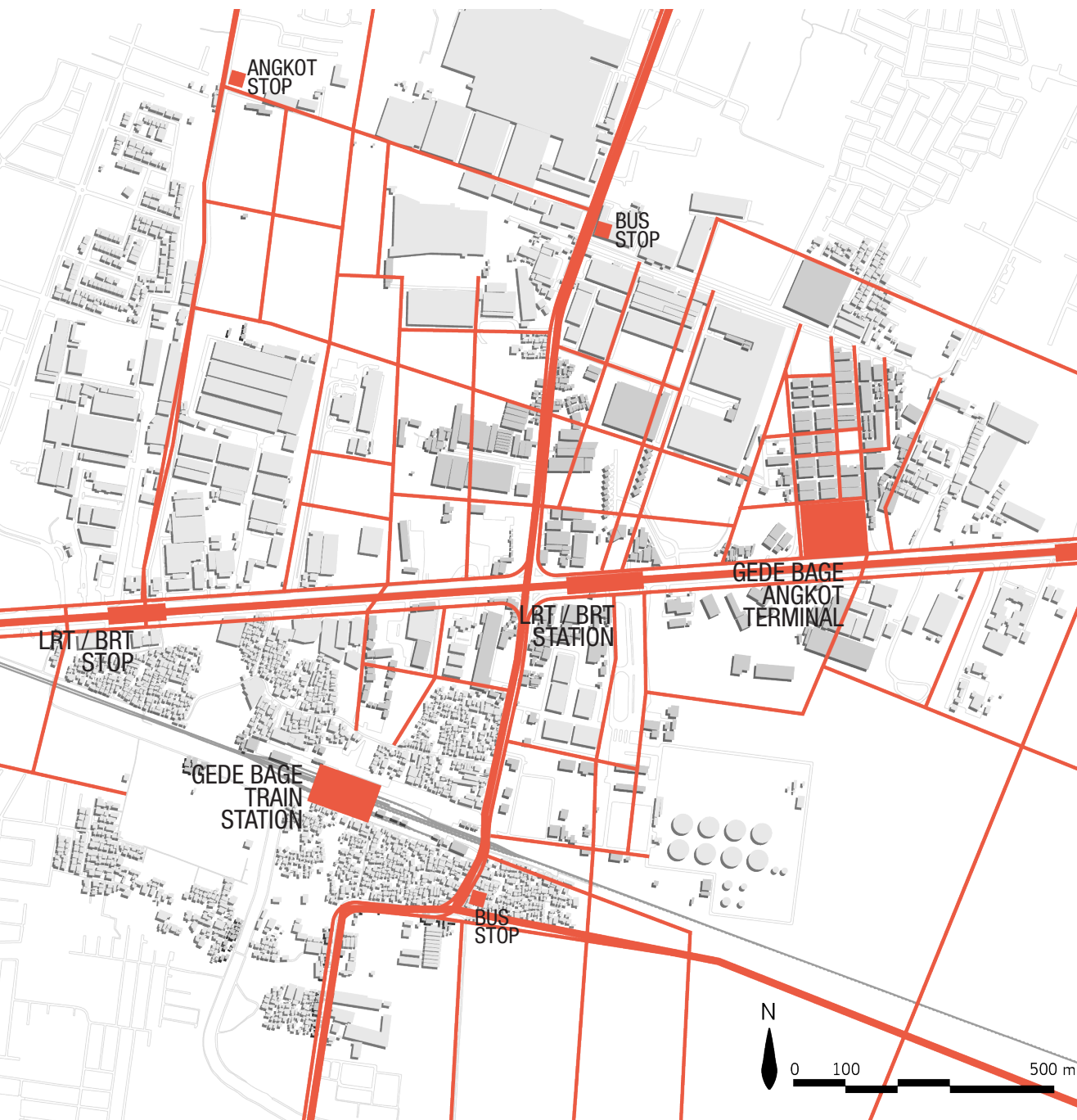


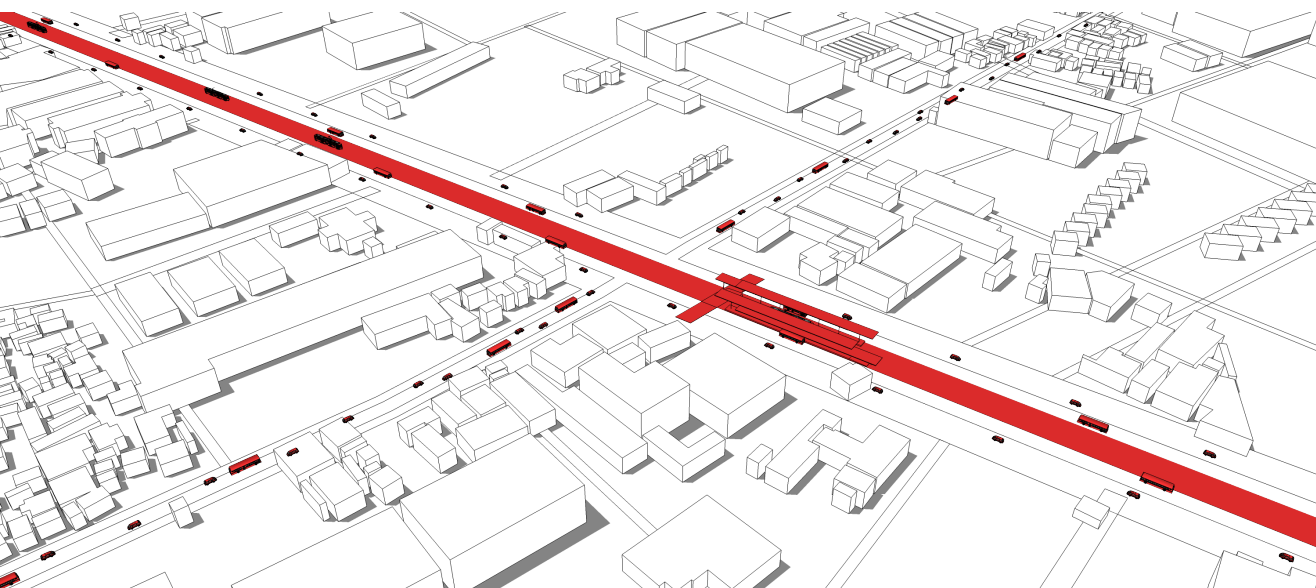
To offer better environmental quality by providing space for nature,



To encourage participation through the appropriation of the public space.

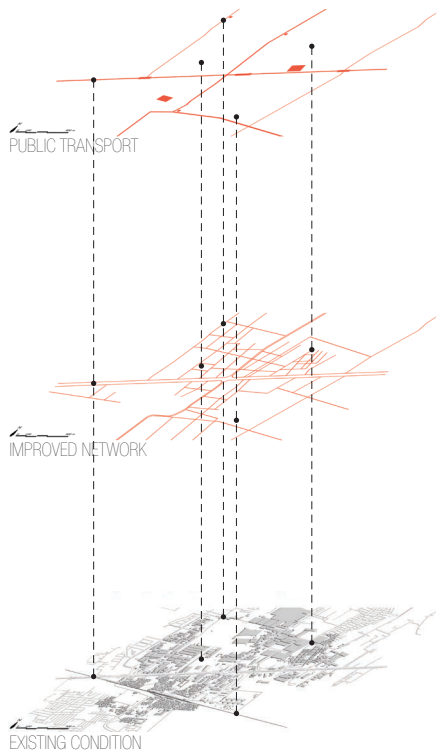
The more detailed illustrated explanation of each design principles is presented on the following pages.



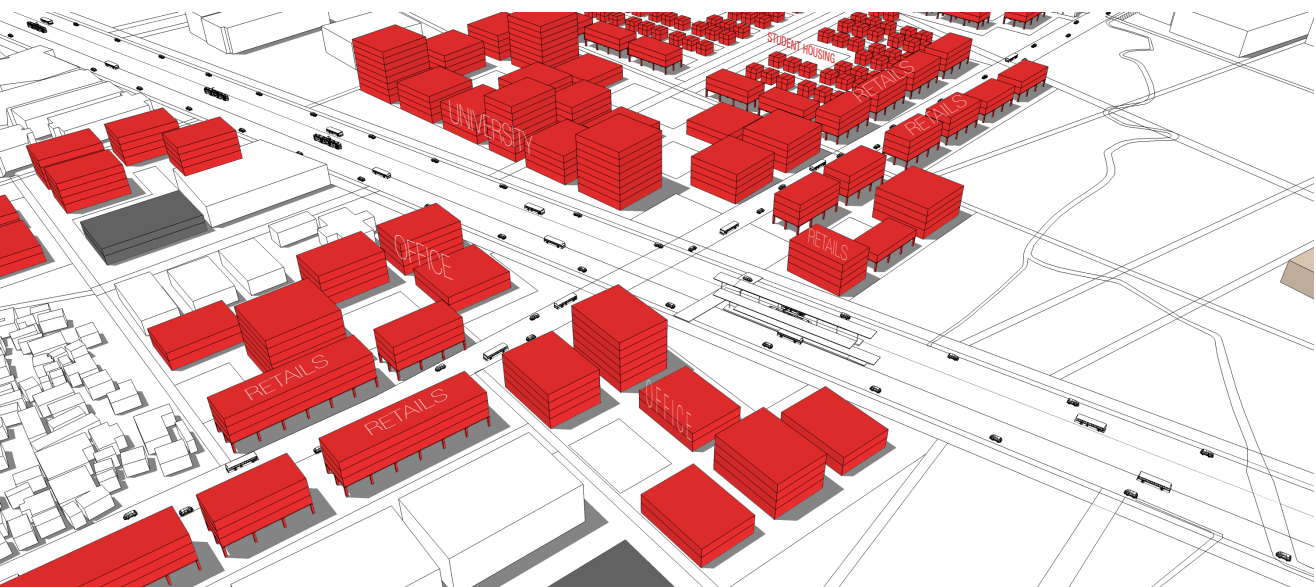


#1 better mobility network

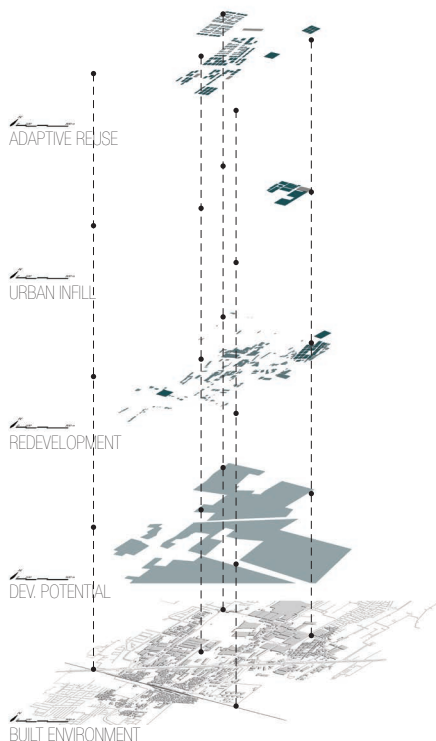
A better mobility network is expected to be achieved through network densification, more specifically by adding slow traffic networks like pedestrian ways and bicycle lanes aside from smaller public roads. In addition to that, several existing street will need to be widened, especially along the new BRT routes. The establishment of new public transport routes such as the LRT lines and BRT lines will go along with the improvement of the existing mobility infrastructure (on a dedicated lane in Soekarno Hatta Avenue). Besides, "angkot" will also be serving most of the main roads, both existing and proposed roads.





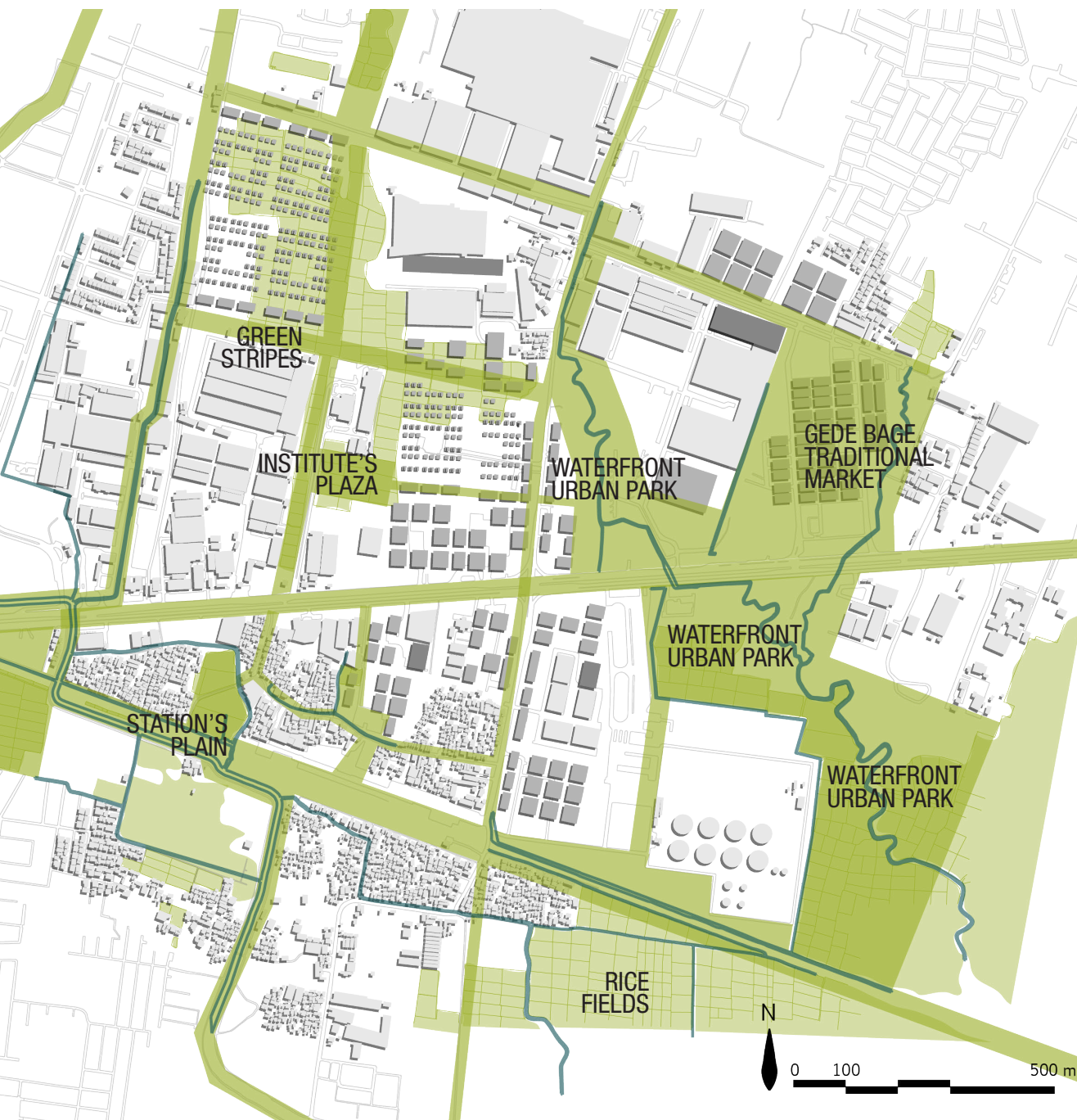


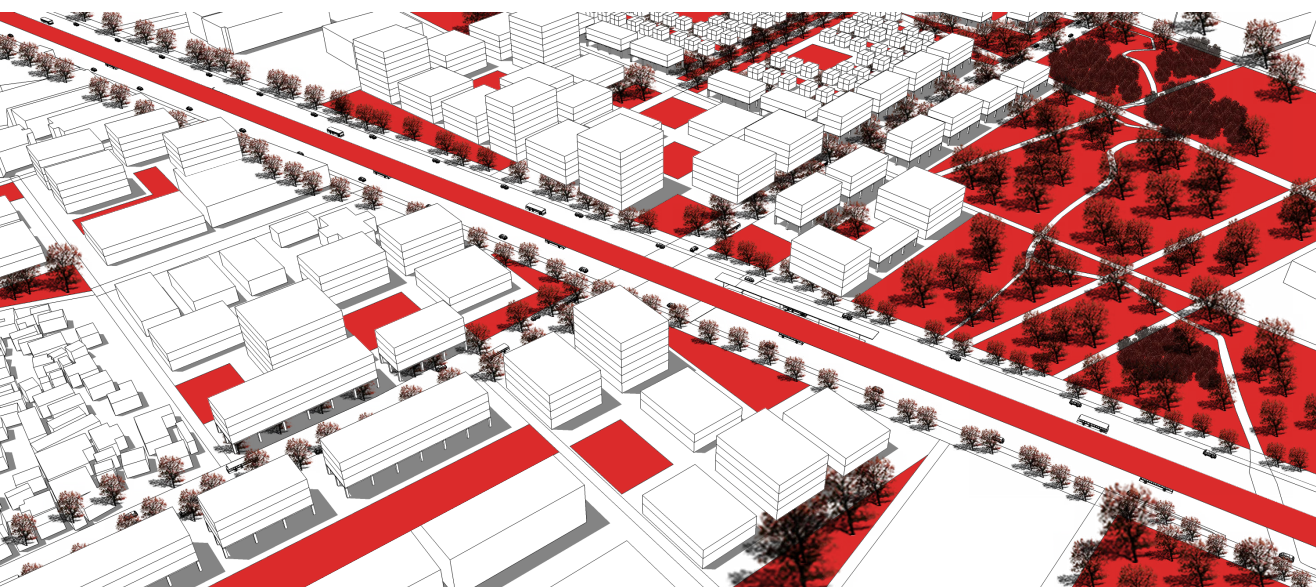
#2 space for (re-)development



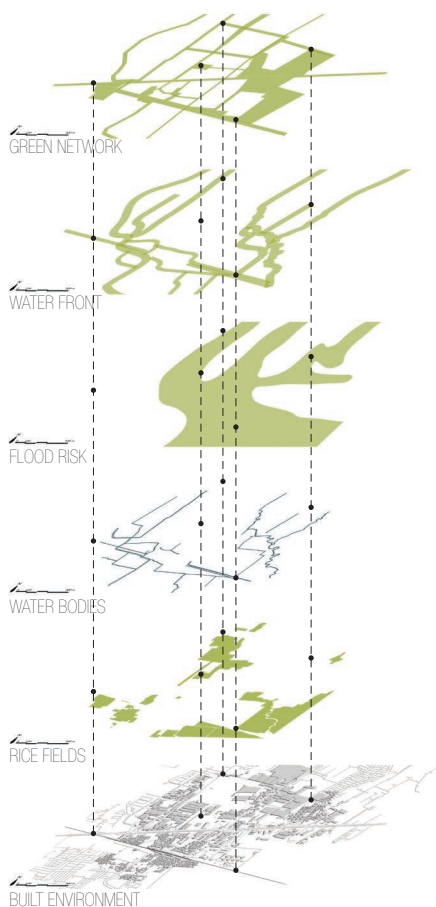
Although most of the areas within 800 m radius from the intersection are already built, some vacant space patches are likely to be found. Aside from the new development, there are also several building plots that could (and would) be consolidated for urban redevelopment. The highlighted areas on the illustration above indicate the possible new development, which consists of redevelopment and urban infill to the existing built environment.

The existing industrial area is proposed to be relocated elsewhere in the outskirts of the city because the industrial activities are considerable harmful to the environment. Thus, only clean industries will remain within this area. The relocation of industrial facilities leaves an ample vacant building lot as well as large buildings. The vacant lots will be transformed into public spaces and business parks, while the ex-industrial building could be used for other functions such as exhibition space, creative workshop studios, etc.



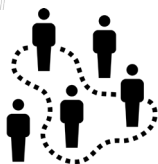
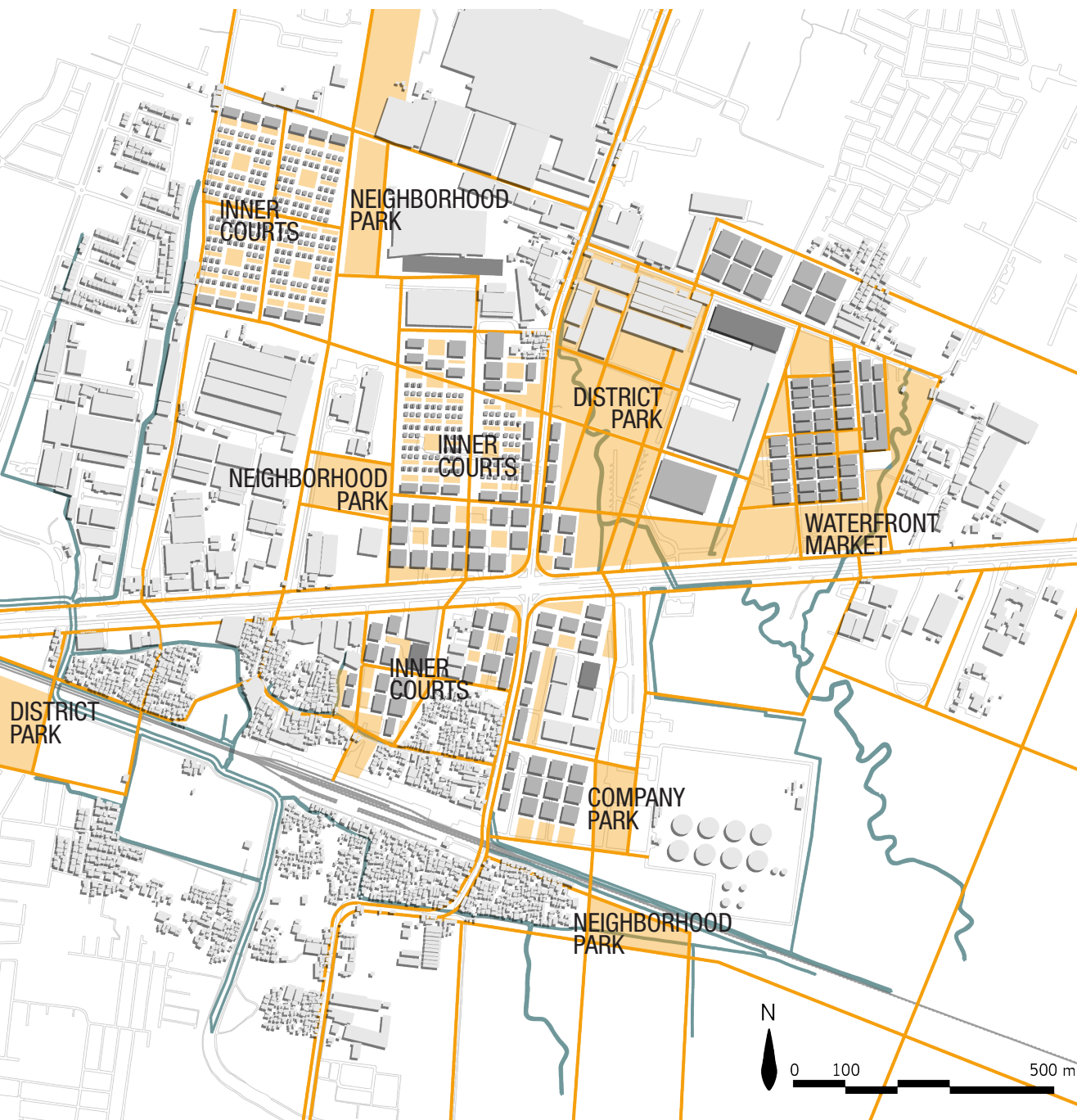


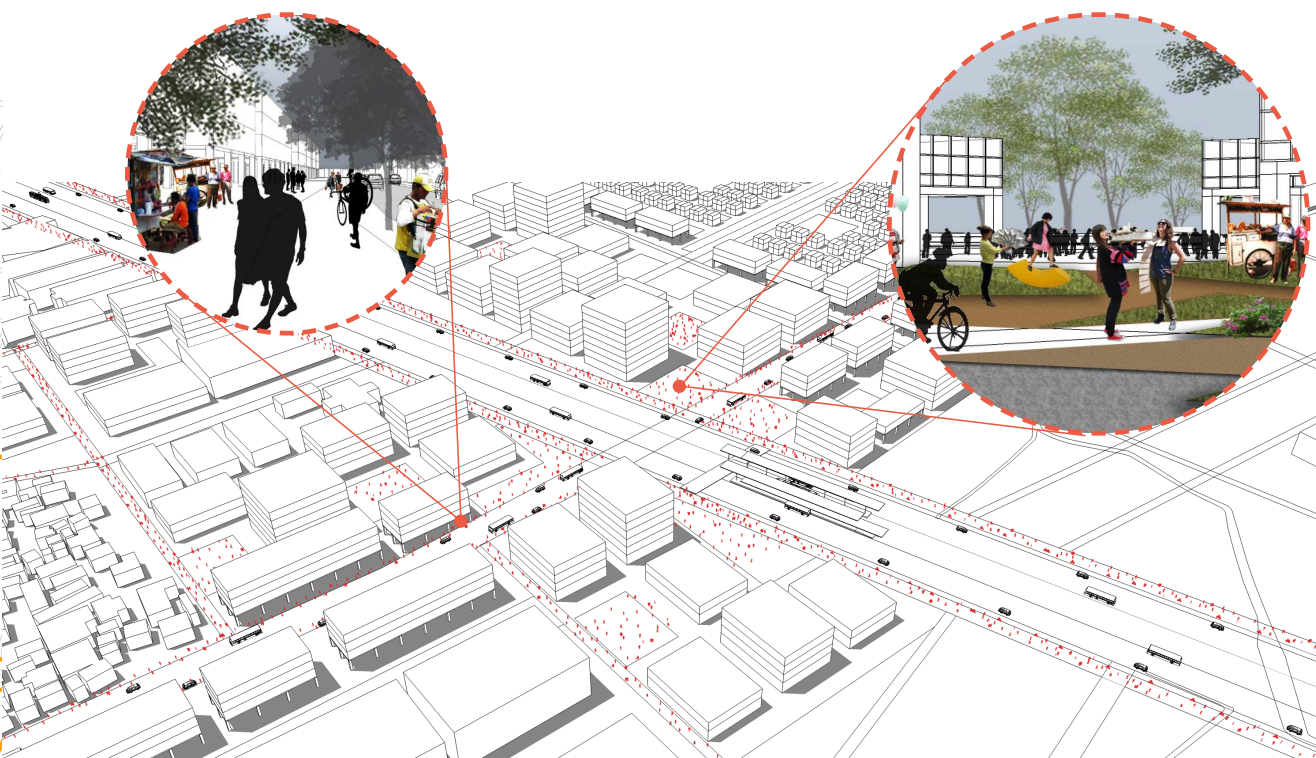
#3 room for the nature



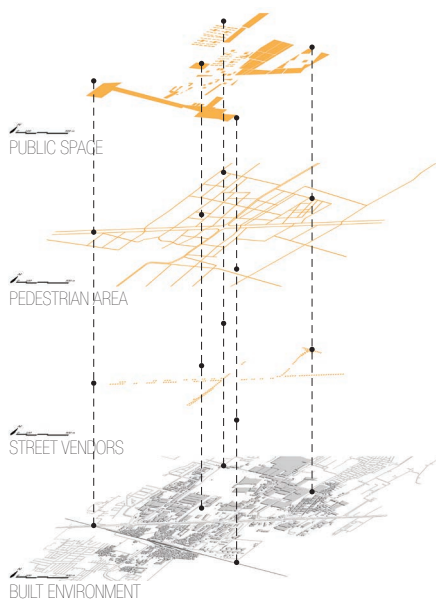
The environmental quality in Gede Bage area is considerably low. Not only that it is prone to flooding, a green open space is also rarely found. The rice fields, which characterized the area, are also vulnerable to the land-use change. The aim of this design principle is to provide better environmental quality through green-blue network establishment and preservation as well as providing parks for social purposes.

The idea of giving some room for nature is also including giving space for the water, for example by providing floodplain adjacent to the main water bodies, which in spite of its ecological function, can also perform as a social space both for the area and the city.





#4 room for the people



Stakeholders are one of the most important elements in planning. This last design principle attempts to address the people as the user of the space. The spatial design of this area is intended to be able to host as many variations of the user as possible, including the street vendors as one of the most distinguished urban element in Bandung City, if not in most of the cities in developing countries. Inclusiveness is expected to emerge gradually, started by providing space for different interest and activity groups in different time.



Design Proposal

All the above-mentioned principles are illustrated in a design exercise in the same location. Both the images on the facing page and above illustrate the conceptual plan for Gede Bage area. However, unlike a master plan, this proposal actually requires more

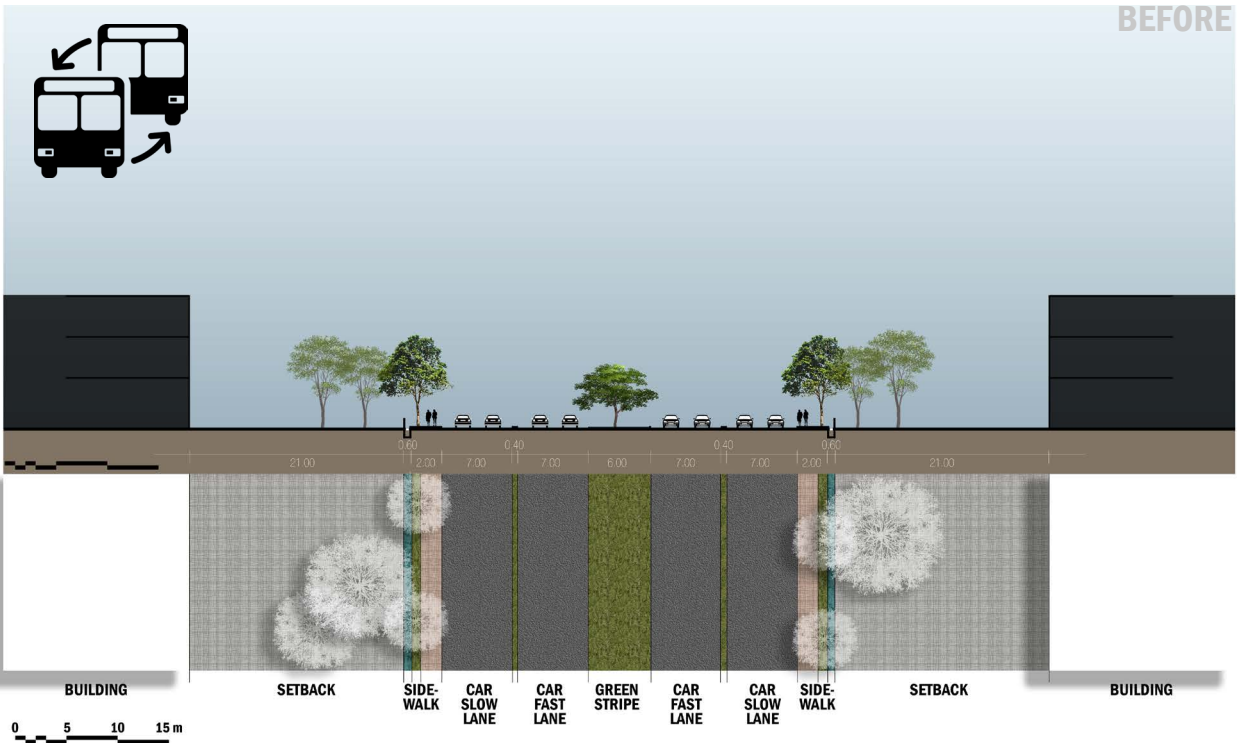
detailing in its design, which will be left open to the architects and designers' interpretation. Presented in the following table is the new program of this area, including its volume in square meters, followed by the before-after illustration of the intervention at and around Gede Bage intersection.

PROGRAM	TYPE OF REDEV.	MAX DEV. VOLUME	PLAUSIBLE STAKEHOLDER
University	A, B	67,968 m ²	Joint programme ITB and Unpad
Leased office	A, C, E	77,824 m ²	BCCF, Riset Indie, Labtek Indie, new start ups, urban communities, government, Pertamina
New housing	A, B	16,128 m ²	University, private individuals, real estate developer & agencies
Traditional market	D	66,043 m ²	PD Pasar, existing merchants, street vendors
Retail & services	A, B, C, D, E	74,522 m ²	Supermarket, convenient stores, kiosk, restaurants, cafe, street vendors, hotel, AirBnB
Workshop & Exhibition	A, D, E	67,938 m ²	BCCF, Riset Indie, government, private companies
Transit	A, B, D	11,520 m ²	PT Kereta Api, Perum Damri, Trans Metro Bandung, Kobanter Baru, apps-based transportation services (Uber, Go-Jek, etc).
Green space	A, B, E	241,352 m ²	all stakeholders
Public space	A, D, E	4,853 m ²	all stakeholders

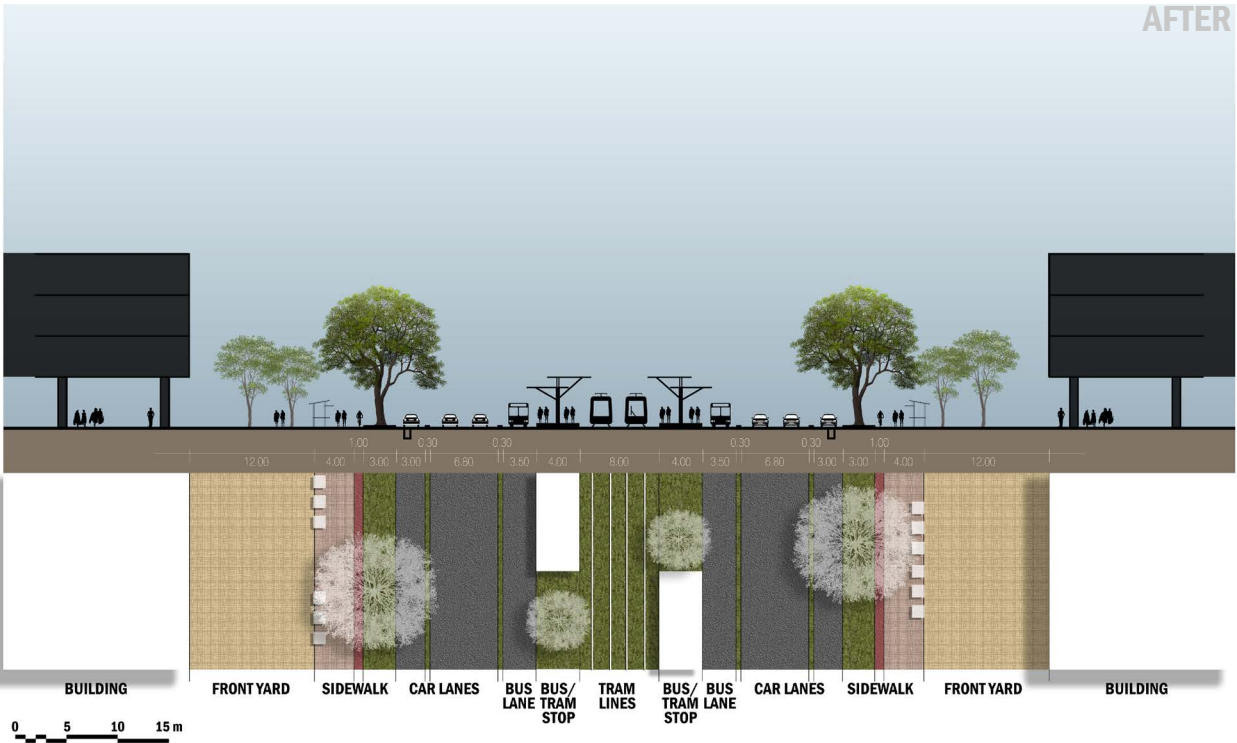
Type of redevelopment:

A: Land Consolidation, B: New Development, C: Urban Infill, D: Redevelopment; E: Adaptive-reuse

BEFORE



AFTER

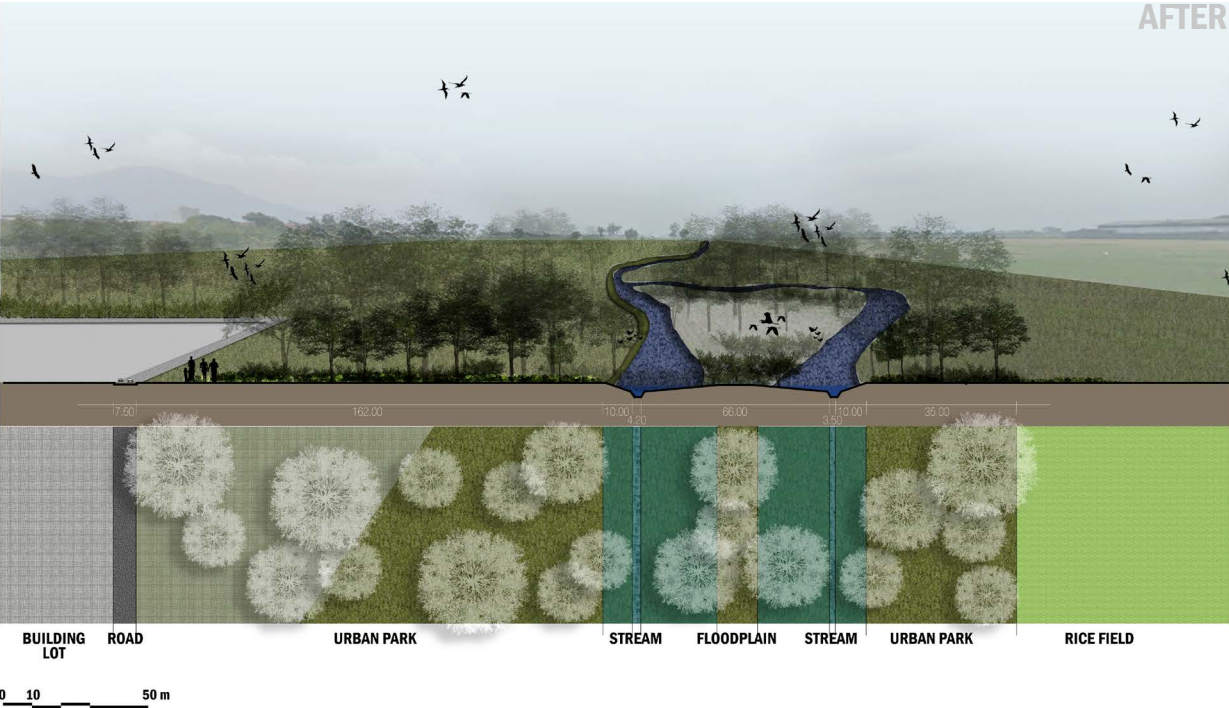
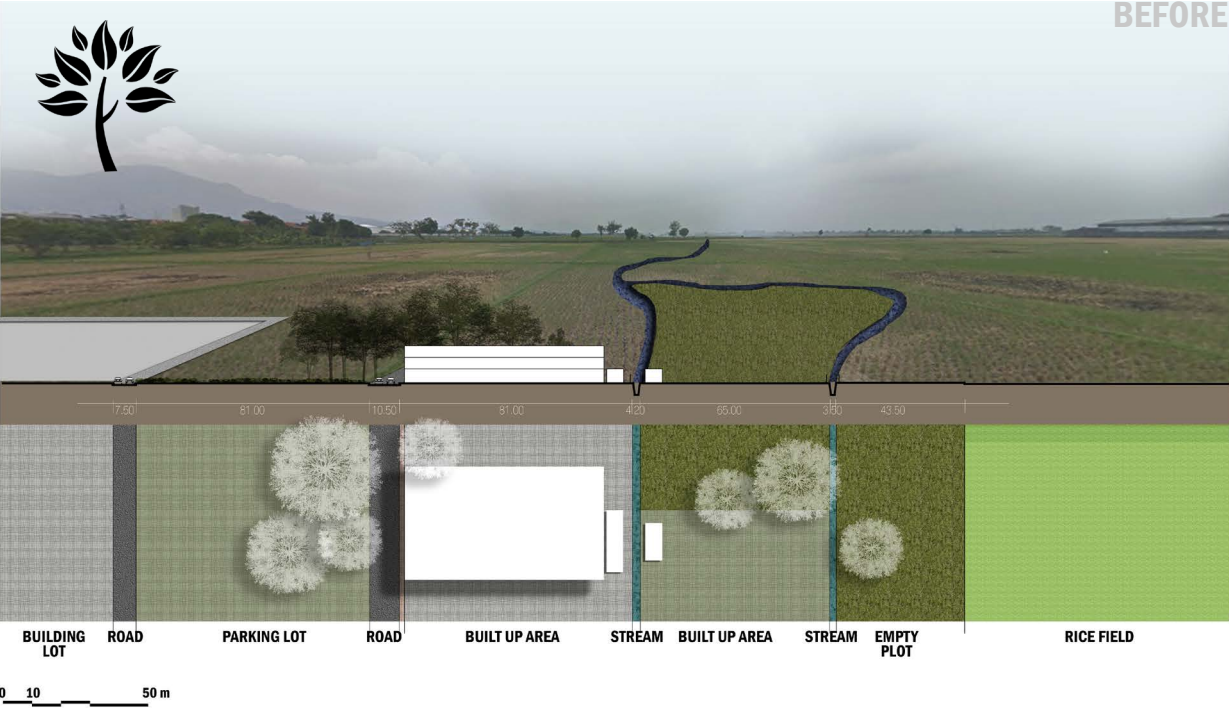


BEFORE



AFTER



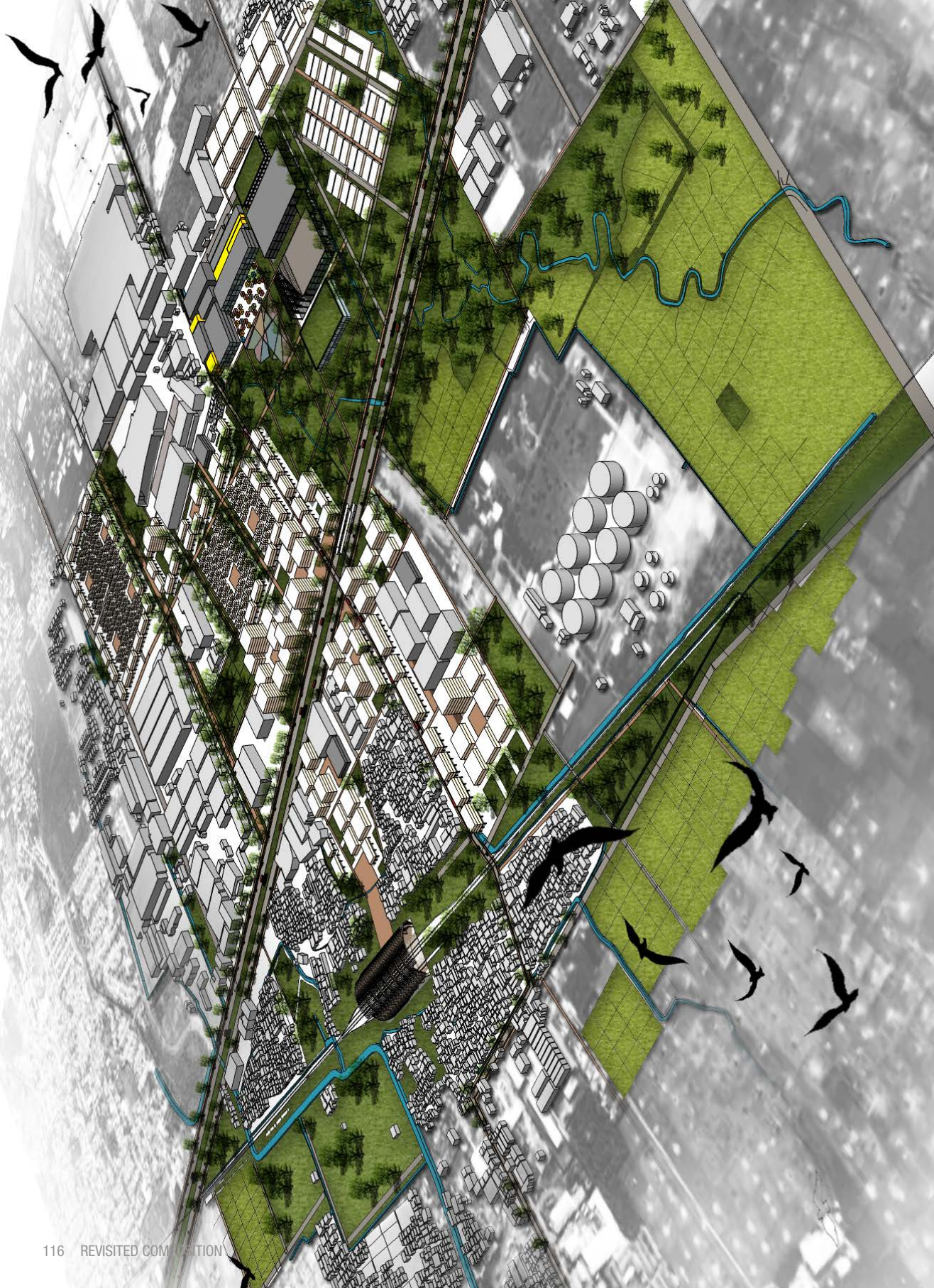




BEFORE



AFTER



REFLECTION



reflection

CONTENT

conclusion, further research, reflection on the thinking process,

CONCLUSION

This research tries to address the question on promoting sustainable urban development through a comprehensive planning in mobility-based development in Bandung City, Indonesia. After series of research and design process, there are several conclusion that can be drawn from this project.

Firstly, as far as this research concern, mobility-based development can (and must, one way or another) be implemented in Bandung City to promote more sustainable urban development; and to do so, a comprehensive planning emerges as an essential necessity. The mobility-based development is highly contextual and suitable for Bandung because the current urban development trend in Bandung could not provide an adequate infrastructure to get from a peripheral area to the city centre, and vice versa. However, the implementation of mobility-based development has to be combined with a shift in

urban structure, from monocentric to polycentric. A combination of mobility-based development and polycentric urban development is exemplified by the "Transit-Oriented Development" (TOD) concept, which could possibly be adapted as a development framework.

In the second place, the proposed development framework has to perform as a leading theme of the development. Therefore, the development framework should be comprehensive, as it addresses multiple fundamental issues (such as mobility, environment, and governance). In order to do so, a common vision to base the framework on is also crucial. In spite of the municipality's effort in providing a comprehensive plan nowadays, the current planning process and planning document in Bandung City (and in Indonesia generally) are still lacking a concrete vision that can be translated into spatial interventions. Not only that the current planning documents are often ambiguous in its direction, they are also less anticipative to any future

dynamics. Although the future is cannot be predicted, a plan (and a design) should be able to address current trends and foresee beyond the trends. By doing so, the government could regain their role and position as a leading agent in development.

The third finding from this research and design project would be about the role of design itself. This particular project shares an understanding about the importance of design in urban planning, as it has been demonstrated by a lot of research and practice. There are numbers of definition about design from time to time. Among the main keywords are "devising courses of action", "change", "invention", "response to function", "desirable and foreseeable future", "imagination", "goal-oriented", "constrained", "decision-making", "exploration", and "contextual". Both design and planning processes are complementary, overlapping, synergistic, and continuous (General James N. Matthis in Banach et al., 2012). Therefore, the design part of this project aimed to exemplify and be a part of the planning itself. Other than that, developing a conceptual design for the plan would enable to urbanist to evaluate the strategy as a part of the iterative process. As a translation of the strategy, the design could also improve the quality of the strategy by giving feedback to the strategy's limitations, especially when implemented in a much smaller context.

Lastly, as community participation is obviously not an instant process, this goal should be treated as a process rather than an end-product. Both the strategy and design should address the important aspects to enable participation. However, the participatory practice should also be able to develop through the time. The government and planning agencies could

escalate the degree of participation from time to time, for example, providing transparent information about the plan for the next 25 years would already be a good start. It may then be followed by the consultation with the citizen, placation, and partnership. What is important in generating community participation is to gain each other's trust and to be consistent. Thus, reaching a consensus is more significant than reaching the top of participation ladder.

REFLECTION ON THE THINKING PROCESS

This project was firstly developed based on my curiosity on densification in Bandung City, Indonesia. However, the initial problem analysis has shown that density might not be the core problem of the city. Instead, the unsustainable model of development might be. Thus, the project shifted to a more fundamental question of sustainability and urban development. As mobility emerged as one of the most apparent challenges in urban development in Bandung City, Indonesia, the project has then developed around three main issues: sustainability, mobility, and centrality.

At the very beginning of the graduation year, I chose Complex Cities as the main research group. I see my project as a multidimensional project, which will affect and involve numbers of different stakeholders at different scales. Moreover, I would like to delve into the planning process and the planning instruments in order to be able to deliver a different perspective in planning the urban development in Bandung, Indonesia. I notice that the current planning instrument tends to be reactive than proactive to the development. On the other hand, it also provides too many

normative indications than directive or visionary attributes, which leads to redundancy in different scale of planning documents. In addition, the excessively detailed regulations that were formulated in ambiguous terms (for example minor exceptions, specifications, and categorisation in land use plan, zoning regulation, and urban design guidelines) leads to manipulation and malfunction of the regulation itself.

I would like to develop this project as an alternative planning instrument which methodology can be used and replicated in other cities. I intended to develop a strategy and development guidelines for the city that go together with visualization of the implementation possibilities in a smaller scale. In order to do so, I was considering that I would need both strategic planning and urban design insights, which later became the main rationale for choosing my mentors for this graduation project. Although this is not my first multi-scalar project, I am still facing some difficulties in switching between the scaled, most possibly because I tend to avoid too many assumptions to base my design on.

I found that the "Layer Approach" – where the city is seen as a stack of different entities such as natural features, network, socio-cultural, economy, and built environment – to be very helpful in understanding the complexity of the city. By using this approach, it is possible to choose layers that are relevant to my project and to analyze them separately. There are numbers of personal assumptions and premises that has been proved to be valid by performing this analysis. For example, the low accessibility of the southern part of the city compared to other areas, the development potential along Soekarno

Hatta Avenue, and the need of green public space within the city. However, I think it is highly important to be selective when it comes to choosing relevant layers. Although there are a lot of things which might seem to be relevant, not all of them are important and at the same priority level when it comes to analysis. The governance layer, for example, is relevant to the implementation strategy and helpful in understanding the planning process, but might not be as important as the network and activities layers when it comes to determining a potential location for Transit Oriented Development nodes.

Although I have been experiencing Bandung City for approximately thirty years, I still have certain hesitations to believe my own judgement about the city. Yet, trained as an architect and worked as an urbanist, I am professionally capable of doing so. It is possible that my understanding of the city, which I see as an active complex unpredictable organism with many different interests, is the one that stopping me from believing my own judgement. Therefore, in order to comprehend the urban processes, I sought for evidence. The evident based research based on a questionnaire, statistical data, surveys, and interviews have helped me to formulate a more objective point of view to an issue. However, as much as I rely on the idea that an urbanist should plan in an objective manner, I also strongly believe that design and research are always subjective. It depends on us to determine the focus of the research and, thus, the design itself. Accordingly, in evident based research, data selection is also inevitable.

In this particular project, I would take "design" to a larger context and understanding, more than mere urban design in human scale. I am convinced

that it is important to set a development framework on a larger scale (metropolitan or city scale) so that the smaller scale interventions could take place accordingly. Hence, in this project, “design” is interpreted in several ways, including the spatial structure, sets of implementation strategies, as well as the visualization of development guidelines.

Even though the formulated line of thought has proven to be effective in leading my research and design project, there are several things that I would like to improve. Firstly, I believe that my current line of work is not yet accommodating the stakeholders, which at the beginning of this project was intended to be one of the central factors in both planning process and implementation. Although it might not be ideal, the stakeholder aspect can still be included in the implementation strategy, especially at the smaller scale. Despite the fact that the layered approach got me far with the analyses on built environment and network, the socio-cultural part of this project remained vague at this stage. The socio-cultural processes of the city are not well documented in any research. Thus, the assumptions on these processes are mainly based solely on my own observation. Despite the fact that the stakeholder’s real interests might not be addressed well in this project, it is possible to reproduce and improve the proposed inclusion strategies to the real life condition.

Secondly, given the fact that I am working on a site 12,000 km away from the university and especially with the limited amount of time, there are things that I cannot observe thoroughly during the site visit. The site visit, which was conducted after P2 presentation, was somewhat ineffective in terms of

stakeholder analysis. Of course, it was very fruitful when it comes to first-hand information from the municipality, planning documents, and interview with experts. However, it was only possible to identify several key actors and presume their interests in urban development and mobility infrastructure in Bandung, Indonesia. Furthermore, had I narrow down my focus to a specific site earlier during the analysis phase, I might be able to go more in depth when I went for the site visit. For example, I might be able to determine more precisely of what kind of observation is needed within the selected area, or what kind of specific data I need to look for during my site visit, or even to explore the possibility of organizing a workshop with the stakeholders.

Another thing that turned out to be something I did not expect actually is the case study phase. I initially planned to analyze several cities in the world that have been implementing Transit Oriented Development one way or another. I expected the analysis to be more elaborated, with the investigation of their strategies, transportation modes, and so on. Although I attempted still to do so, I would like to break down the analysis into several key issues to make it more manageable. The case study will then only focus on the success stories and for specific issues. For example, I tried to see how the structure vision in the Netherlands is presented and what are the efforts undertaken to promote TOD, especially in Randstad Metropolitan Area. On the other hand, I am also going to take a close look at the attempt to put the integration of public transport system into practice, especially in Curitiba and Hong Kong.

The research conducted this far has proved numbers of personal assumptions,

especially on the causality (or effects) or urban development trend in Bandung City, Indonesia. In several cases, it feels like I am reinventing the wheel because most of the planning documents are not supplemented with adequate information on the rationale of the plan itself. Not that it was not done by the office who were working on the plan; the fact that the rationale is not published along with the plan is what makes it a little bit difficult to follow the municipality's line of work. Besides, apparently the municipality is currently working towards the same direction with what my research and design project posited, which has made it more challenging to give this project an edge and distinction in order for it to be able to give an added value to the discourse.

However, I believe that this project is still relevant and has distinct relevance (both to academic and social communities). I would say that a comprehensive planning is something that is easier said than done. Not only because it is a multidisciplinary effort, but also because it involves almost too many interests at the same time. This project can be a starting point for further

research on urban mobility and centrality, especially in Bandung City. I strongly believe that spatial planning, especially in urban mobility and water management themes, cannot be done only at the city scale. Thus, this project offers a more thorough and multi-scalar perspective in dealing with spatial planning. In the long run, it is important to also see how the city is related to other urban regions, what are the functions and the role of this city within the larger constellation, and how the development of this city is influential to others.

FURTHER RESEARCH

There are numbers of further research that can be done both to enrich the discussion on T.O.D. and polycentricity as well as to improve the end-product of this project. The research could be conducted in a framework of T.O.D. and polycentric urban development, socio-cultural processes of the city, or even specifically on the Asian cities context. Presented in the following matrix is the possible theme and keywords for the further research.

THEME	POSSIBLE TITLE	KEYWORDS
T.O.D. and polycentricity	Acknowledging the Governance Aspect of T.O.D. in Design	T.O.D., implementation strategy, stakeholder analysis, participatory planning, collaborative planning
	T.O.D. Design Evaluation through Digital Simulation	T.O.D., design simulation, GIS, agent-based modelling, Space Syntax, serious gaming
	Assessing Environmental Impact of T.O.D.: Challenging the Compact City Concept	T.O.D., compact city, design evaluation, environmental impact
Socio-cultural processes	Addressing the Socio-cultural Aspect of Public Transport in Urban Design	Public transport, experience-based design, designing experience, city at eye level

THEME	POSSIBLE TITLE	KEYWORDS
	Street Vendors: The Dynamics of Urban Street Life	Inclusive planning, street vendor, informal economy, street level, human interaction
	The Future of Knowledge-Based Economy in Developing Countries	New economy, knowledge-based economy, creative industry, education, triple-helix
	The Conformity of Space in Bandung City, Indonesia	Conviviality, streetscapes, public space, people's place, space appropriation
Asian cities context	A Preferable Development Model for Post-Colonial Asian Cities	Heritage management, post-colonial city, urban planning, Asia
	Reliving the City Centre: Critical Conservation of the Historical Quarters of the City	Heritage management, design simulation, critical conservation, old town, city centre
Smart city and smart mobility	How Does Smart Mobility Concept Affect the Vernacular Mobility System in the Cities in Developing Countries?	Smart city, smart mobility, development impact, developing countries, mobility
	The Role of Private Vehicles in the Public Transport Oriented Future	Private vehicle, road appropriation, public transport

REFERENCES



references

LITERATURE

- Adaptieve Agenda Zuidelijke Randstad 2040 Een uitnodigend perspectief van Rijk en regio voor markt en samenleving*, 2013.
- Aminuddin, 2008. *Pola Operasi Angkutan Umum Perkotaan Ditinjau dari Perspektif Perilaku Pengemudi Studi Kasus Trayek Angkot Cicaheum - Croyom Kota Bandung* (Master thesis). Institut Teknologi Bandung, Bandung.
- Arribas-Bel, D., Sanz-Garcia, F., 2014. *The validity of the monocentric city model in a polycentric age: US metropolitan areas in 1990, 2000 and 2010*. Urban Geogr. 35, 980 – 997. doi:10.1080/02723638.2014.940693
- Badan Pusat Statistik Kota Bandung, 2010. *Sensus Penduduk 2010 - Kota Bandung* [WWW Document]. BPS. URL <http://sp2010.bps.go.id/index.php/site?id=3273000000&wilayah=Kota-Bandung> (accessed 11.4.15).
- Bappeda Kota Bandung, 2015. *Rencana Induk Transportasi Kota Bandung (Peraturan Walikota Bandung No. 1175)*. Bandung.
- Beckmann, M.J., McPherson, J.C., 1970. *City Size Distribution in a Central Place Hierarchy: An Alternative Approach**. J. Reg. Sci. 10, 25–33. doi:10.1111/j.1467-9787.1970.tb00032.x
- Berry, B.J.L., Garrison, W.L., 1958. *Recent Developments of Central Place Theory*. Pap. Reg. Sci. 4, 107–120. doi:10.1111/j.1435-5597.1958.tb01625.x
- Bimarsono, A., 2009. *Bandung als Wachstumspol. Eine kritische Analyse der Möglichkeiten technologieorientierter Regionalpolitik in Entwicklungsländern* (Master thesis). Institut für Regionalwissenschaft Universität Karlsruhe (TH), Karlsruhe.
- Boyko, C., 2014. *Misunderstanding density: why we are building the wrong sort of cities*. The Guardian.
- Bruegmann, R., 2005. *Sprawl: A Compact History*. The University of Chicago Press, Chicago and London.
- Calthorpe, P., Fulton, W., 2001. *The Regional City*. Island Press, Washington DC, USA.
- Champion, A.G., 2001. *A Changing Demographic Regime and Evolving Polycentric Urban Regions: Consequences for the Size, Composition and Distribution of City Populations*. Urban Studies 38, 657 – 677. doi:10.1080/00420980120035277
- Devas, N., Rakodi, C. (Eds.), 1993. *Managing Fast Growing Cities New Approaches to Urban Planning and Management in the Developing World*. Longman Scientific & Technical, New York.

- Dinas Perhubungan Kota Bandung, 2014. *Bandung Urban Mobility Project*. Dinas Perhubungan Kota Bandung, Bandung.
- Dühr, S., 2005. *Potentials for polycentric development in Europe: The ESPON 1.1.1 project report*. Plan. Pract. Res. 20, 235–239. doi:10.1080/02697450500414728
- Dunphy, R., Myerson, D., Pawlukiewicz, M., 2003. *Ten Principles for Successful Development Around Transit*. ULI-the Urban Land Institute, Washington DC.
- Dunphy, R.T., Cervero, R., Dock, F.C., McAvey, M., Porter, D.R., Swenson, C.J., 2004. *Developing Around Transit: Strategies and Solutions That Work*. ULI-the Urban Land Institute, Washington DC.
- Economic and Social Affairs, U.N., 2007. *Indicators of Sustainable Development: Guidelines and Methodologies*, 3rd Edition. ed. United Nations publication, New York.
- Economische Programaraad Zuidvleugel* [WWW Document], n.d. . EPZ Econ. Programaraad Zuidvleugel. URL <http://www.epzuidvleugel.nl/index.asp> (accessed 4.6.16).
- Eidlin, E., 2010. *What Density Doesn't Tell Us About Sprawl*. ACCESS Mag.
- Firman, T., 2004. *Major issues in Indonesia's urban land development*. Land Use Policy 21, 347–355. doi:10.1016/j.landusepol.2003.04.002
- Gilbert, A., Gugler, J., 1982. *Cities, Poverty, and Development: Urbanization in the Third World*. Oxford University Press, New York.
- Hall, P., 2009. *Looking Backward, Looking Forward: The City Region of the Mid-21st Century*. Reg. Stud. 43, 803–817. doi:10.1080/00343400903039673
- Hall, P., 2002. *Urban and Regional Planning*, 4th ed. Routledge, London.
- Hall, P., Pain, K., 2006. *The Polycentric Metropolis Learning from Mega-City Regions in Europe*. Earthscan, London, UK.
- Jacobs, M., 2000. *Multinodal Urban Structures A Comparative Analysis and Strategies for Design*. Delft University Press, Delft.
- Jenks, M., Burton, E., Williams, K. (Eds.), 1996. *The Compact City A Sustainable Urban Form?* E & FN Spon, London, UK.
- Jenks, M., Jones, C., 2010. *'Issues and Concepts', in: Jenks, M., Jones, C. (Eds.), Dimensions of the Sustainable City, Future City*. Springer Netherlands, pp. 1–19.
- Keiner, M., Koll-Schretzenmayr, M., Schimid, W.A. (Eds.), 2006. *Managing Urban Futures*. Ashgate, Hampshire, England.
- Kloosterman, R.C., Musterd, S., 2001. *The Polycentric Urban Region: Towards a Research Agenda*. Urban Studies 38, 623–633. doi:10.1080/00420980120035259
- Krugman, P., 1998. *What's new about the new economic geography?* Oxf. Rev. Econ. Policy 14, 7–17. doi:10.1093/oxrep/14.2.7
- Kunto, H., 1984. *Wajah Bandoeng Tempo Doeloe*. P.T. Granesia, Bandung.
- Lambregts, B., 2006. *Polycentrism: Boon or Barrier to Metropolitan Competitiveness? The Case of the Randstad Holland*. Built Environment 32, 114 – 123. doi:<http://dx.doi.org/tudelft.idm.oclc.org/10.2148/benv.32.2.114>
- Levang, P., 2003. *Ayo ke tanah sabrang: transmigrasi di Indonesia*. Kepustakaan Populer Gramedia, Jakarta.
- Morales-Schechinger, C., 2015. *SPS Seminar: Carlos Morales (IHS) – Financing plans and projects with land value | Spatial Planning - TU Delft*.
- Moser, C.O.N., 1998. The asset vulnerability framework: Reassessing urban poverty reduction strategies. World Dev. 26, 1–19. doi:10.1016/S0305-750X(97)10015-8
- Noviantari, 2012. *Perencanaan Jejaring Ruang Terbuka Hijau Sebagai Infrastruktur Pengendali Air Larian Riparia Studi Kasus: Rehabilitasi Permukiman Padat Tamansari, Bandung*. Institut Teknologi Bandung, Bandung.
- Palat, R.A., 2008. *A new Bandung?: Economic growth vs. distributive justice among emerging powers*. Futures, Emerging Futures 40, 721–734. doi:10.1016/j.futures.2008.02.004
- Pertumbuhan Kendaraan di Bandung 11% Setiap Tahunnya* | Bandung [WWW Document], n.d. . Bisnis.com. URL <http://bandung.bisnis.com/read/20130816/5/415221/pertumbuhan-kendaraan-di-bandung-11-setiap-tahunnya> (accessed 10.22.15).
- Poerbo, H.W., 2009. *Coping with The Commodification of Culture in Bandung: An Urban Design Control Approach*.
- Polydorides, N., 1983. *Concept of Centrality In Urban Form and Structure* (European University Studies)(V. 2). European University Studies, Bern.

- Siregar, S., 1990a. *Bandung - The Architecture of A City in Development Urban Analysis of a Regional Capital as a Contribution to the Present Debate on Indonesian Urbanity and Architectural Identity Volume I*. KU Leuven, Leuven, Belgium.
- Siregar, S., 1990b. *Bandung - The Architecture of A City in Development Urban Analysis of a Regional Capital as a Contribution to the Present Debate on Indonesian Urbanity and Architectural Identity Volume II*. KU Leuven, Leuven, Belgium.
- Sustainable Cities Index 2015*, n.d. . Arcadis. *Tactical Urbanism* [WWW Document], n.d. . Issuu. URL http://issuu.com/streetplanscollaborative/docs/tactical_urbanism_vol_2_final (accessed 9.12.15).
- Taylor, J.L., Williams, D.G., 1982. *Urban Planning Practice in Developing Countries*. Pergamon Press, New York.
- The World Bank, 2014. *Urban Population (% of Total)*.
- Walker, M., 1991. *Decentralized Planning for Sustainable Development: The Case of Indonesia*. Rev. Urban Reg. Dev. Stud. 3, 94–102.
- What mobility really means* [WWW Document], n.d. . Planetizen Indep. Resour. People Passionate Plan. Relat. Fields. URL <http://www.planetizen.com/node/42323> (accessed 6.5.16).
- Widyahari, N.L.A., Indradjati, P.N., 2015. *The Potential of Transit-Oriented Development (TOD) and its Opportunity in Bandung Metropolitan Area*. Procedia Environ. Sci., The 5th Sustainable Future for Human Security (Sustain 2014) 28, 474–482. doi:10.1016/j.proenv.2015.07.057
- Wiryoono, S.K., Susatyo, H., Utomo, S., Suryanta, B., Sudrajad, O.Y., Lazuardi, K.M., Yuanita, H., 2015. *Risk Mapping on Dynamics Creative Industry: Case Study at Bandung City, Indonesia*. Procedia - Soc. Behav. Sci., The 6th Indonesia International Conference on Innovation, Entrepreneurship, and Small Business (IICIES 2014) 169, 125–130. doi:10.1016/j.sbspro.2015.01.292

ICON

The Noun Projects, 2015. <http://thenounprojects.com>
Contributors: Raf Verbraeken, flyartur, Carla Gom Mejorada, Evan Remington, Luis Prado, Alexander Wiefel, Bob Holzer, Mateo Manenti, Anton Scherbik, Yorimar Campos, Bybzee, Rutmer Zijlstra, Khaleel, shimaru, Nick Dominguez, Oliviu, Milky - Digital Innovation, Phan Thi Dieu Linh, Yu Luck, Cristiano Zoucas, Pascal Conil-Lacoste, Oliviu Stoian, Francielly Constantin Senra, Castor & Pollux, Richard de Vos, Creatorid'immagine, Berkay Sargin, Musket, Jared Adams, Alex Auda Samora, Juan Pablo Bravo, Yorimar Campos, Bybzee, Creative Stall, Vicons Design, Chris Provins, Gregor Cresnar, Ralf Schmitzer, lastpark, Piotr Kolodziejski, Tara Swart

IMAGE

- | | |
|------|--|
| p.25 | <ol style="list-style-type: none"> 1. http://spacing.ca/montreal/wp-content/uploads/sites/5/2013/02/montreal-metro-caribb.jpg 2. http://www.eltis.org/sites/eltis/files/styles/threshold-992/public/casestudies/cur-pic_png_7.png?itok=BMk56x1O 3. https://upload.wikimedia.org/wikipedia/commons/6/6a/Hong_Kong_Station_Outside_View_2009.jpg |
| p.30 | Google Maps, 2015. http://maps.google.com |
| p.31 | Siregar, 1990. |
| p.32 | <ol style="list-style-type: none"> 1. Author, 2011 2. http://static1.squarespace.com/static/53722b44e4b065b57c0b59a5/t/541014a3e4b013294a578846/1410340004280/Bandung_Heritage_2014 3. Bandung Heritage, 2014 4. http://static.panoramio.com/photos/original/40151014.jpg 5. http://yourbandung.com/v3/wp-content/uploads/2014/12/pasupati-bridge1.jpg 6. MetroTV News, 2015. http://cdn.metrotvnews.com/dynamic/content/2015/05/14/126015/1bw49sJX4V.jpg?w=668; |

- p.32 7. <https://nvwmedia.files.wordpress.com/2011/04/n219-cutaway.jpg>
- p.38 1. <http://baju3500.com/wp-content/uploads/2014/03/Grosir-Pasar-Baru-Bandung.jpg> http://s21.postimg.org/lwdwrdlx3/14814776055_26f7628e80_o.jpg
2. <http://static.panoramio.com/photos/large/29491225.jpg>
3. <http://www.skyscrapercity.com/showthread.php?t=1337628&page=425>
4. <http://www.skyscrapercity.com/showthread.php?t=1337628&page=420>
5. <http://sp.beritasatu.com/media/images/original/20140303100107118.jpg>
6. Sembhada, R. 2014.
7. <https://shendiary.files.wordpress.com/2008/09/di-depan-itb.jpg>
- p.48 1. <https://statik.tempo.co/?id=359940&width=620>
2. https://adibaduts.files.wordpress.com/2014/10/14945167865_3153798a5e_k.jpg
3. <https://sebandung.com/wp-content/uploads/2014/04/Terminal-Bus.jpg>
4. <http://3.bp.blogspot.com/-LvOiIceSa7Y/VY0kYwagwnI/AAAAAAAAAG8/ItrCTx6E1Fs/s1600/daytrans.JPG>
5. <http://bandungjuara.com/wp-content/uploads/2015/10/img-20150821-wa0028.jpg>
6. <http://fathinashrullah.net/wp-content/uploads/2014/11/angkot.jpg>
7. <http://smg.photobucket.com/user/kyutifluti/media/bluebird.jpg.html>
- p.48 8. http://media.viva.co.id/thumbs2/2015/02/05/293824_tukang-ojek-bersama-penumpangnya-_641_452.jpg
- p.89 Google Maps, 2015. <http://maps.google.com>
- p.151 Waze, 2015. <http://www.waze.com/livemap/>

MOTION PICTURE

Hustwit, G., 2011. *Urbanized, Design Trilogy*. Swiss Dots, New York.

WEBSITE

- Akbar, A., Muftiadi, A., n.d. ANALISIS EKONOMI DAN SOSBUD KOTA BANDUNG. <http://andriakbar.blogspot.nl/2010/01/ekonomi-wilayah-sosial-budaya-kota.html>
- Badan Perencanaan Daerah Kota Bandung (Planning and Development Agency for Bandung City Region), <http://bappeda-bandung.go.id/>
- Bandung City's Online Traffic Camera, <http://www.bandung247.com/>
- Bandung Juara - Jadikan Bandung Bermartabat [WWW Document], n.d. . Bdg. Juara. URL <http://bandungjuara.com> (accessed 11.9.15)
- Central Statistical Bureau for Bandung City, <http://bandungkota.bps.go.id/>
- Dinas Koperasi UKM dan Industri Perdagangan, <http://www.pkl-bandungjuara.com/>
- InfoBandung, <http://infobandung.co.id/>
- Info Perumahan Bandung, <http://infoperumahanbandung.com/>
- Kantor Pertanahan Kota Bandung (Land and Agrarian Affairs Service for Bandung City), <http://kot-bandung.bpn.go.id/>
- Municipality of Bandung, <http://portal.bandung.go.id/>
- Pikiran Rakyat Online (online newspaper), <http://www.pikiran-rakyat.com/>

INTERVIEW

- Ade Sjafruddin, Prof. (Professor in transportation planning in ITB, February, 2016)
- Aji Bimarsono, S.T., M.Sc. (Chairman of Bandung Heritage Society, February 2016)
- Ermaula Assaseang, S.T., M.T. (Practicing urban planner, February 2016)
- Imelda Rosalin, S.T., M.T. (PhD. Candidate in Institute of Technology Bandung (ITB), February 2016)
- Nunun Yanuati, S.T., M.T. (Head of Infrastructure Planning Sub-Division, Bappeda Kota Bandung, February 2016)
- Seterhen Akbar (CEO, Riset Indie, February 2016)

- Shinta S. P. Prabonno, S.T., M.T. (Researcher and urban activist, Bandung Creative City Forum, February 2016)
- Tammi Lasmini, S.T., M.T. (Head of Urban Planning and Redevelopment, Dinas Tata Kota dan Cipta Karya Kota Bandung, February 2016)

APPENDIX A



dispersed concentration

A review on the polycentric urban model and 'compact city' concept

Delft University of Technology, Department of Urbanism
Graduation Lab Urbanism Conference
January 11th, 2016

Abstract – Urban sprawl, as one of the implication of city growth, is one of the commonly renowned urban phenomena which have drawn a lot interests, discourses, and criticisms. It is often addressed as a problem because of its tendency in deriving certain impacts such as massive land use change, low quality housing complexes, and severe traffic jam (Devas and Rakodi, 1993). For almost the same reasons, urban sprawl is usually perceived as an unsustainable model for urban development (Bruegmann, 2005). Numbers of reactions have been raised against the sprawl especially in the attempt to search more sustainable urban form, including the discourse of 'compact city' and polycentric urban model.

This paper will focus on the polycentric urban model as one of the alternative tool to encourage more sustainable urban development. Thus, it is developed around the question of "how polycentricity promotes sustainable development". It aims to summarize the basic understanding on polycentric urban model in order to be able to implement the concept in urban development strategies. In order to do so, a review on theories and discussions on polycentric urban model will be presented. Also, as 'compact city' concept is highly relevant to polycentricity, a concise review on this concept will also be exposed. It is important to see both concepts side by side and in a complimentary way to comprehend relation of both concepts and get a thorough understanding on possible strategies to promote more sustainable urban development.

Key words – *polycentric urban region; 'compact city'; development strategies; sustainable urban development*

INTRODUCTION

As of today, most of the world's population is living in urban areas. Large amount of people are either migrating or commuting to the city every day.

In developing countries like China and India, for example, the urban population percentage comes to 30 -50 % by the year of 2014 (The World Bank, 2014).

To cope with this migration wave, cities need to provide more living space.

These spaces are usually provided by promoting new development both within the existing built environment and in the vacant spaces around urban peripheries. The latter type of development is often recognized by the term of urban sprawl.

Although there is no single definition of 'sprawl', it is often defined as "low-density, scattered, urban development without systematic large-scale or regional public land-use planning" (Bruegmann, 2005, p. 18). In developing countries, urban population is growing more rapidly and often, if not always, put a lot of pressure to infrastructure and increasing demand on services. This rapid development has outpaced urban management efforts, causing both physical and socio-economic consequences (Devas and Rakodi, 1993).

Urban sprawl is often seen as the opposing force of sustainable urban development because of its tendency in deriving certain impacts such as massive land use change, which put more pressure on environmental sustainability (Bruegmann, 2005). Furthermore, in the urban areas where privately owned vehicles are the main transportation mode, urban sprawl has triggered massive traffic jam, especially between the urban centres and sub-urban areas.

Ever since it is noticed as one of the main challenge in urban development, urban

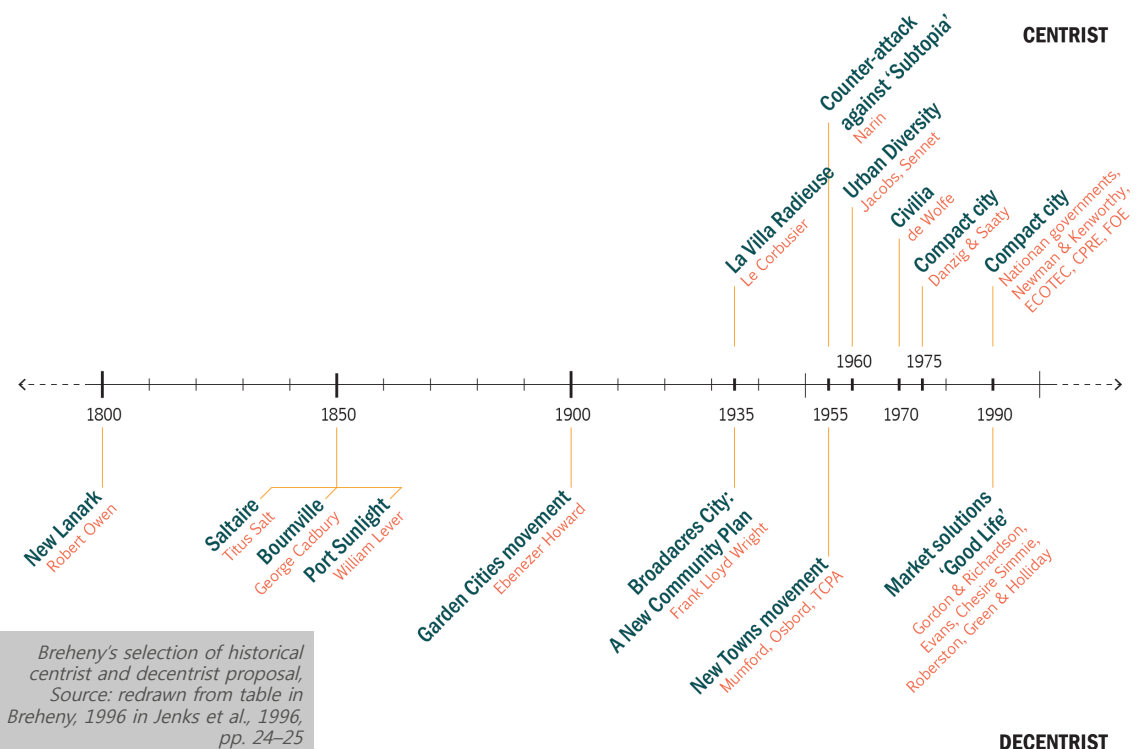
sprawl has raised a lot of interests and discourses, including criticism. Concepts such as 'compact city' and polycentricity have been actively promoted within the discourse of sustainable urban development. The 'compact city' concept puts two opposing point of views on sustainable urban form as its starting point, while polycentricity was initially focused more on urban economy and urban geography.

This paper will focus on the application of polycentric urban model as one of the working concept in encouraging sustainable urban development. The aim is to summarize basic understanding on polycentric urban model in order to be able to implement the concept in urban design and urban development strategies. In order to do so, a review on theories and discussions on polycentric urban model as well as 'compact city' concept will be presented.

Structure of this paper consists of an overview of the paper presented in this introduction, followed by a concise review on 'compact city' concept. The third part of this paper will delve into polycentricity and Polycentric Urban Region in general. Afterward, an overview on implementation of polycentric urban model will be offered. All of the comprehension will be summarized in a conclusion at the end of this review paper.

'COMPACT CITY': A DISCOURSE ON SUSTAINABLE URBAN FORM

As mentioned earlier, urban sprawl has not only triggered series of impacts in the city, it has also raised questions among the academia and practitioners. Discussions on the most sustainable urban form as well as the most suitable



urban model to be implemented have been going on for decades.

'Compact city' concept is basically tries to pinpoint the relation between urban form and sustainability. The concept is very much focused on "increasing the density of development, ensuring a mix of uses, containing urban 'sprawl' and achieving social and economic diversity and vitality" (Jenks and Jones, 2010, p. 1). Even though there has been research suggesting that there might be more than one sustainable urban form (Williams, et.al., 2000 in Jenks and Jones, 2010), the discussion on sustainable cities and urban form has been evolving around the above-mentioned issues. Furthermore, 'compact city' is particularly exercising the reduction of travel distances (Jenks et al., 1996).

Among the most arduous discourses is the one on urban concentration and centrality distribution. Breheny (1996) categorized these point-of-views into two: "decentrists", who favour urban decentralisation, largely as a reaction to the problems of industrial cities; and 'centrists', who believe in the virtues of high density cities and decry urban sprawl." (Breheny, 1996 in Jenks et al., 1996, p. 10). He later on added the third emerging category, i.e. the compromisers, whose position arose from their realistic stance, performing an advocacy role between centrists and decentrists (Breheny, 1996 in Jenks et al., 1996).

The 'compact city' theory in general aims for sustainability and often seen as a reaction to the unfavourable impacts of planning in the nineteenth-century

cities (Hall, 1988 in Breheny, 1996 in Jenks et al., 1996). Breheny (1996) took extreme examples such as Le Corbusier's La Ville Radieuse, Frank Lloyd Wright's Broadacre, and Ebenezer Howard's Garden City concepts to portray the stand points toward this matter. Breheny also summarized the ideas proposed by both Centrists and Decentrists through the time in following table.

The decentrists, represented by Wright's Broadacres plan, derived from a fundamental idea where the technology advancement can (and will) be used to enable people to access land and facilities even those located far away from where we are living. Wright saw technology, electricity and motor car, as a mean to enable people to reach to the countrysides. The decentralisation was, however, meant to be planned carefully. Although Wright's vision on technology advancement is proved to be correct, his idea on planned decentralisation was never happened. Thus, (physical) decentralisation tend to be perceived as the less sustainable urban form, as it is exemplified by the urban sprawl itself (Breheny, 1996 in Jenks et al., 1996).

Quite opposing to Wrigt, Le Corbusier's La Ville Radieuse was based on the idea that decongestion of the urban centres must be done by increasing density, demoting the use of private vehicles such as car, and promoting urban regeneration. Jane Jacobs is widely renowned among the most obstinate centrists over the century. However, application of this concept in current situation often leads to monocentricity, which causes more traffic congestion the tendency of quality of life degradation in the city centre. Furthermore, as Breheny (1995) proved with his experiment, should there had not

been any decentralisation occurred for the 30 years from 1961, such compaction will merely resulting 2.5% of national energy saving per week (Breheny, 1996 in Jenks et al., 1996).

On the other hand, despite the fact that the compromiser's point of view is rarely acknowledged as a "stand point", it is considerably attractive because it combines both point of view and pointed out certain realistic traits. The Compromisers' position may adopt the good sides of both centrist and decentrist point of view, such as centrist's "containment, urban regeneration strategies, and a whole range of new intra-urban environmental initiatives" (Breheny, 1996 in Jenks et al., 1996, p. 26) as well as embracing the idea of "controlled direction of inevitable decentralisation, ... takes into account the grain of the market without being subservient to it, ... allow for some development in the form of environmentally-conscious new settlements" (Breheny, 1996 in Jenks et al., 1996, p. 26). Breheny (1996) also argues that, in this manner, Ebenezer Howard is considerably a compromiser rather than the decentrist as many believes.

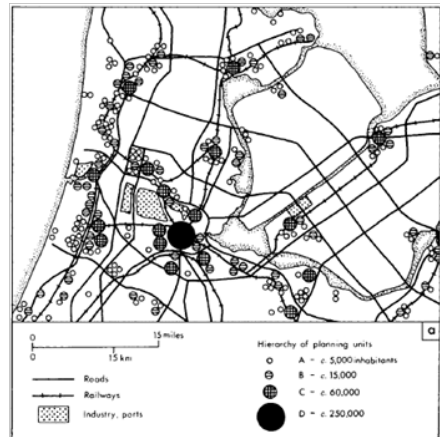
Each of these stand points has put forward their arguments, which basically aimed for sustainability and better quality of life in urban area. However, the application of each concept is somewhat lacking a controlling, or monitoring, tools which then leads to the failure to comply with the idea of sustainability itself. While the "Decentrists" positioned as the black sheep for urban sprawl, the "Centrists" themselves are equally guilty of promoting a single centre and causing congestion.

POLYCENTRICITY: FROM URBAN GEOGRAPHY CONCEPT TO PHYSICAL MANIFESTATION

While 'compact city' concept mainly concerns about the physical manifestation of an agglomeration, polycentricity focused more to the geography of agglomeration: where the centers are located and how they are connected. The concept is widely used especially in urban economy and urban geography. Kloosterman and Musterd (2001) addressed polycentricity to be characterized by existence of multiple centres in one area. However, "... more concrete operationalisations of polycentricity turn out to be rather diverse" (Kloosterman and Musterd, 2001, p. 623).

Although it seems to be a broader translation of what Breheny (1996) defined as "decentrists", polycentricity is also – at the same time – portrays the ideas of the "centrists", where (re-) development is done around certain urban core (Hall, 2009). Thus, it is likely to be addresses as "deconcentrated concentration", as posited in the Second Report on Physical Planning in the Netherlands (Hall, 2002). The term was introduced as a favourable solution which was "... a compromise between the two extremes of concentration – which would give high accessibility to jobs and services, but poor environment for living – and deconcentration, which would use too much space" (Hall, 2002, p. 179). The grouping of urban agglomeration, as described by Hall (2002), was mainly done to promote variety of living environments, i.e. urban, suburban, and semi-rural.

Polycentricity is often related with several other terms, including "'post-industrial cities' (Hall, 1997), 'polynucleated



Principle of 'deconcentrated concentration' as posited in the Second Report on Physical Planning in the Netherlands, Source: Hall, 2002, p. 180

metropolitan regions' (Dieleman and Faludi, 1998), 'polycentric urban regions' (Kloosterman and Musterd, 2001), 'global city-regions' (Scott, 2001), or 'mega-city regions' (Hall, 2014)" (Lambregts, 2006, p. 115). Although it might remain interpretative and ambiguous in a way, polycentricity concept has become more clear and more acceptable for both analysis and normative application (Lambregts, 2006).

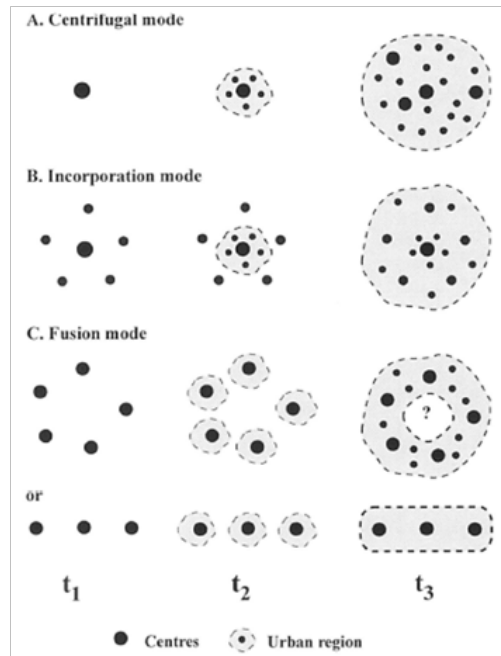
The concept of polycentricity was derived following the recently recognized phenomenon caused by globalization: decentralization of urban functions due to the technology advancement (Hall and Pain, 2006). As emphasized by Hall and Pain (2006), the shift in advanced economies, from manufacturing and goods handling towards more information and service handling, has affected multiple core activities happening in the city, such as the political, financial, cultural, professional, information, and consumption centre (Hall and Pain, 2006).

Polycentric Urban Region

Hall (2006) posited that the currently happening extended decentralization has triggered a new phenomenon of polycentricity towards what he addresses as 'Mega-City Region' (MCR). It is a constellation of several (physically) individual cities which functionally networked to one another (Hall and Pain, 2006).

On the other hand, Champion (2001) brought up the idea of shifting from 'monocentric city' (MC) towards 'polycentric urban regions' (PUR) in its relevance to the impacts of demographic development and urban structure, which process happen consecutively. In order to develop this idea, he investigated the central question related to the form and structure of polycentric urban regions. Champion came up with three main problems in identifying PUR, including the degree of interaction between centres, the required degree of interaction and interdependence of urban centre, and the way the centres evolve. Therefore, albeit the multiple centres tend not to be identical, it remains less clear about their size and number (Champion, 2001).

Polycentric Urban Region might emerges in the form of individual metropolitan area (or city and its suburban and hinterlands), region containing certain number of equally dominant cities, or a polycentric pattern of several urban agglomerations at the macro level ('Megalopolis'). The first type of Polycentric Urban Region is mainly apparent in the North American context (Los Angeles, Portland, San Francisco), while the 'polynucleated metropolitan region' – as referred by Dieleman and Faludi (1998 in Champion, 2001)) – is commonly found in European context like Randstad Metropolitan Area in



*Champion's evolutionary model of polycentric urban region
Source: Champion, 2001, p. 665*

the Netherlands and Rhine-Ruhr Metropolitan Region in Germany. The last type of Polycentric Urban Region, the 'megalopolis', is actually a hypothetical classification posed by Dieleman and Faludi (1998 in Champion, 2001), who foresaw Rhine-Ruhr Metropolitan Region, the Randstad, the Flemish Diamond, and the current less urbanized areas to generate new form of polycentric urban region in the future.

In addition, Champion (2001) also posited that there are at least three ways in which a polycentric urban region can emerge and evolve through the time. This evolutionary modes have shown that polycentric urban regions are not developing from equally mature cores or from the same urban morphology

(Champion, 2001; Lambregts, 2006). Thus, the larger agglomeration is only as important as the urban cores within itself (Lambregts, 2006).

In this regard, Champion's and Lambregt's idea on these main configurations is aligned with what Nadin and Duhr posited: polycentricity is a scale-dependent concept, where polycentricity in smaller scale may resemble monocentricity in a larger scale (Nadin and Duhr, 2011; in Hall and Pain, 2006).

In addition to the discussion on dispersing centralities, Lang (2003), as mentioned in Arribas-Bel and Sanz-Garcia (2014), believes that polycentricity might only be an intermediary urban model between monocentric urban model, which seems to be less favorable nowadays, and the future urban model, which is beyond the existing models and unlikely to be predicted today.

When coming to researching a polycentric urban regions, Kloosterman and Musterd (2001) recommended to look further into four dimensions in which the manifestation is differ from 'urban configuration with a dominant city'. These dimensions are "physical or spatial form, political entity, functional relationships, and cultural identity and representation" (Kloosterman and Musterd, 2001, pp. 630–631).

IMPLEMENTATION OF POLYCENTRIC URBAN MODEL

Regardless the fact that the notion of polycentricity is commonly found in North American context, Arribas-Bel and Sanz-Garcia (2014) found out that the most predominant urban model found in the USA in 1990 – 2010 time frame remained the monocentric metropolitan

regions. On the other hand, polycentricity in European context also often comes up as an unsuitable urban model for many smaller towns due to lack of population which cause inefficient services (Hall, 2009). However, the aforementioned facts cannot deny the point that regions such as Randstad (the Netherlands), Rhine-Ruhr Metropolitan Region (Germany), Greater Dublin and South East England are exemplified as well-functioning polycentric urban region.

An overview on Hall's work in "Urban and Regional Planning" (2002) is essential to understand how the polycentric urban region works. Here he explained the concept of 'deconcentrated concentration' concisely yet thoroughly. He mentioned that this decentralization should be guided "... to a few selected development corridors along strong public transport links, including high-speed 'regional metros'" (Hall, 2002, p. 186). But instead of a linear development along the corridors, Hall suggested that the development should be in the form of clustered urban development at certain distance around transit facilities to provide proper accessibility, where some of the sites might be located up to 90 miles (150 km) from the central metropolitan city (Hall, 2002, p. 186).

Hall (2002) also put forward that the polycentricity should, additionally, aim to enhance and improve potential of 'regional capitals' and smaller 'county towns'. He prescribed for enhanced accessibility (both road and railways), investment in service infrastructure, systematic improvement of environmental quality, and strategic marketing to promote polycentricity for remote rural regions (Hall, 2002).

Stretton (1995 in Jenks et al., 1996), who

casts critique to the Australian urban compaction, also suggested that the urban consolidation has caused too much loss and that the reformation of transportation system is more important than the urban compaction itself.

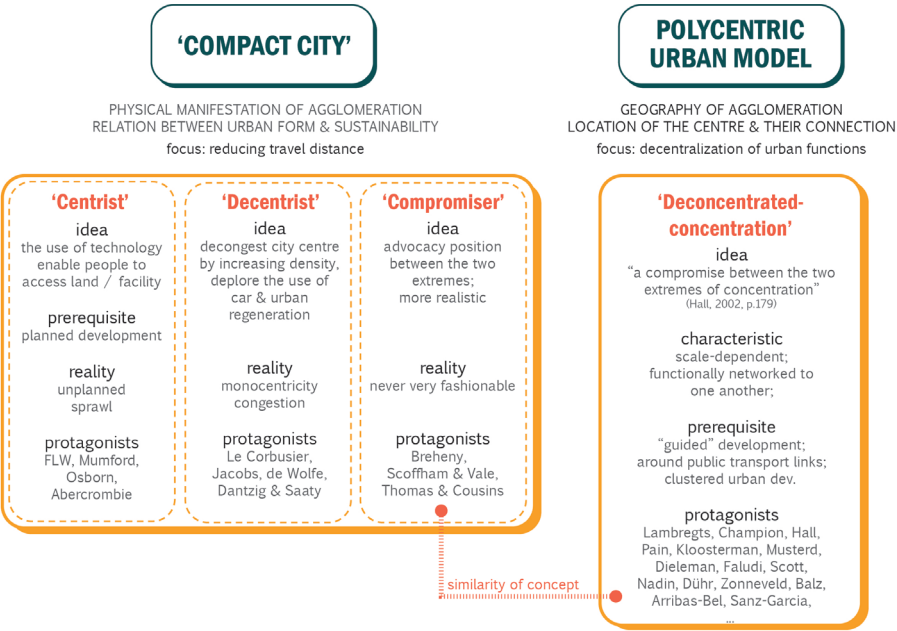
CONCLUSION

From a thorough exploration on polycentric urban model and 'compact city' concept, there are three essential conclusions to be drawn. Firstly, the notion of polycentricity as a scale-dependent concept is highly important. By realizing this conception, selection on scale and scope of work within a project will be one of the significant determining factors for the analyses and proposed implementation strategy. As polycentricity is often associated with the urban economy, the scale of polycentric urban

region will give a significant distinction especially to its socio-economic exposure and position.

The second conclusion comes from the understanding of 'compact city' concept. This concept is considerably applicable to be implemented within polycentric urban model because both are encouraging centralized development around an urban core. Although 'compact city' concept draws some concern on environmental aspect (especially on concentrated air pollution in the city centre), the application of 'compact city' concept is apparent in most of the polycentric urban model such as Randstad Metropolitan Area, the Netherlands and Paris Region, France.

Finally, the third remark will highlight Hall's suggestion that transportation



Summary of the basic understanding from reviewing 'compact city' and 'polycentricity' concepts, Source: author, 2016

& mobility infrastructure is one of the key components in promoting polycentricity. Accessibility, especially by public transport, is highly relevant to polycentric urban model because not only people should be able to move easily from one place to another in one centrality, the centralities themselves should be conveniently located and reachable from one another. Improvement (or establishment) of transportation infrastructure will allow ease of access. However, ideally, each of the centralities should be equally powerful in terms of attractiveness to continuously serve as a centrality, which can be achieved by providing diverse economic environment or specializing in certain function within larger context (Kloosterman and Musterd, 2001).

Shown on the diagram below on the facing page is the summary of both 'compact city' concept and polycentric urban model as reviewed earlier.

RECOMMENDATION ON FURTHER RESEARCH

This theory paper has posited three main conclusions which drawn from numbers of literature. However, in order to be able to implement polycentricity concept in an urban planning and/or urban design strategy, further investigation on implementation strategies – especially those related to transportation and mobility infrastructure, such as Transit Oriented Development – as well as more in depth critical analysis on case studies are essential. Among case study options that can be investigated in the critical analysis are Randstad Metropolitan Region (the Netherlands), Paris Region (France), Hong Kong, Singapore, Curitiba (Brazil), South East England, and Portland (Oregon, USA).

REFERENCES

- Arribas-Bel, D., Sanz-Garcia, F., 2014. The validity of the monocentric city model in a polycentric age: US metropolitan areas in 1990, 2000 and 2010. *Urban Geogr.* 35, 980 – 997. doi:10.1080/02723638.2014.940693
- Beckmann, M.J., McPherson, J.C., 1970. City Size Distribution in a Central Place Hierarchy: An Alternative Approach*. *J. Reg. Sci.* 10, 25–33. doi:10.1111/j.1467-9787.1970.tb00032.x
- Berry, B.J.L., Garrison, W.L., 1958. Recent Developments of Central Place Theory. *Pap. Reg. Sci.* 4, 107–120. doi:10.1111/j.1435-5597.1958.tb01625.x
- Bruegmann, R., 2005. *Sprawl: A Compact History*. The University of Chicago Press, Chicago and London.
- Champion, A.G., 2001. A Changing Demographic Regime and Evolving Polycentric Urban Regions: Consequences for the Size, Composition and Distribution of City Populations. *Urban Studies* 38, 657 – 677. doi:10.1080/00420980120035277
- Devas, N., Rakodi, C. (Eds.), 1993. *Managing Fast Growing Cities New Approaches to Urban Planning and Management in the Developing World*. Longman Scientific & Technical, New York.
- Dühr, S., 2005. Potentials for polycentric development in Europe: The ESPON 1.1.1 project report. *Plan. Pract. Res.* 20, 235–239. doi:10.1080/026974505000414728
- Hall, P., 2009. Looking Backward, Looking Forward: The City Region of the Mid-21st Century. *Reg. Stud.* 43, 803–817. doi:10.1080/00343400903039673
- Hall, P., 2002. *Urban and Regional Planning*, 4th ed. Routledge, London.
- Hall, P., Pain, K., 2006. *The Polycentric Metropolis Learning from Mega-City Regions in Europe*. Earthscan, London, UK.
- Jenks, M., Burton, E., Williams, K. (Eds.), 1996. *The Compact City A Sustainable Urban Form?* E & FN Spon, London, UK.
- Jenks, M., Jones, C., 2010. Issues and Concepts, in: Jenks, M., Jones, C. (Eds.), *Dimensions of the Sustainable City, Future City*. Springer Netherlands, pp. 1–19.
- Kloosterman, R.C., Musterd, S., 2001. *The Polycentric Urban Region: Towards a Research Agenda*.

- Urban Studies 38, 623–633.
doi:10.1080/00420980120035259
- Lambregts, B., 2006. Polycentrism: Boon or Barrier to Metropolitan Competitiveness? The Case of the Randstad Holland. *Built Environment* 32, 114 – 123. doi:<http://dx.doi.org.tudelft.idm.oclc.org/10.2148/benv.32.2.114>
- Morales-Schechinger, C., 2015. SPS Seminar: Carlos Morales (IHS) – Financing plans and projects with land value | Spatial Planning - TU Delft.
- Polydorides, N., 1983. Concept of Centrality In Urban Form and Structure (European University Studies)(V. 2). European University Studies, Bern.
- The World Bank, 2014. Urban Population (% of Total).
- Walker, M., 1991. Decentralized Planning for Sustainable Development: The Case of Indonesia. *Rev. Urban Reg. Dev. Stud.* 3, 94–102.

APPENDIX B

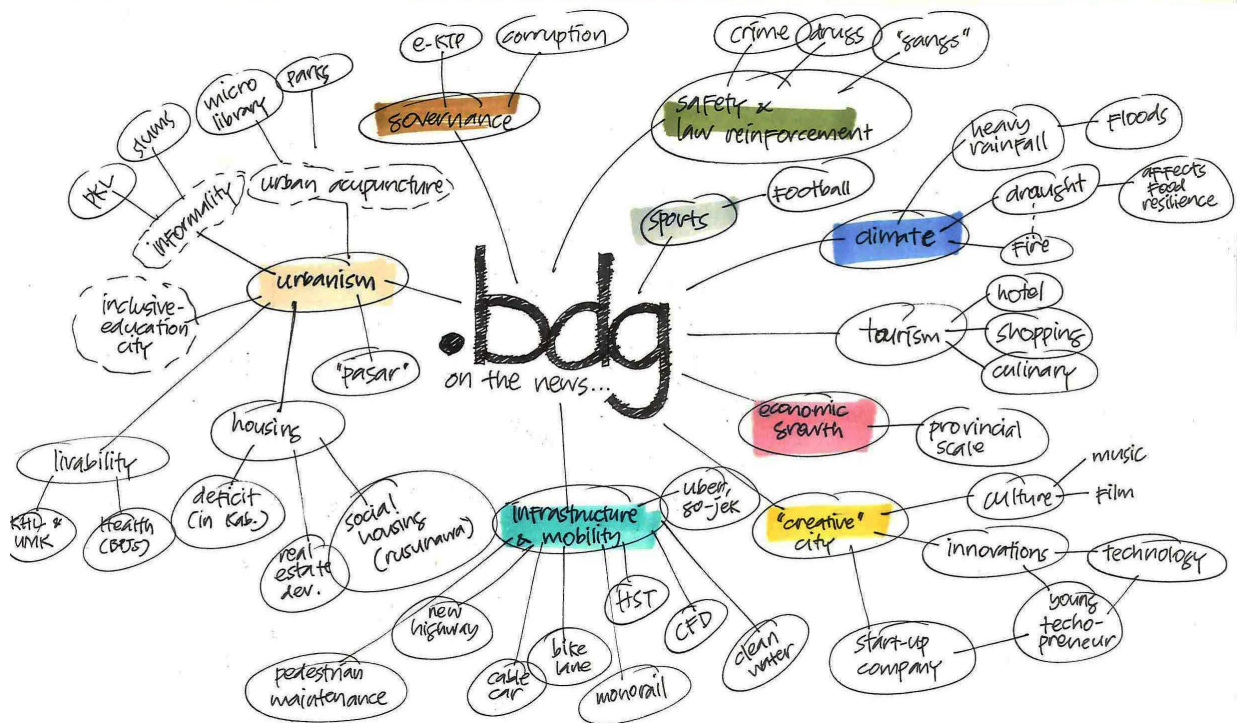


thinking process

INITIAL RESEARCH & ANALYSES

As mentioned previously on the methodology part, several exercises were also conducted along with the analytical processes in this project. These exercises were used as an analytical tool, mainly in problem analysis phase, which was very helpful in determining and clarifying the problems from other's point of view.

Detailed description and complete result of the exercises are shown on the following pages.

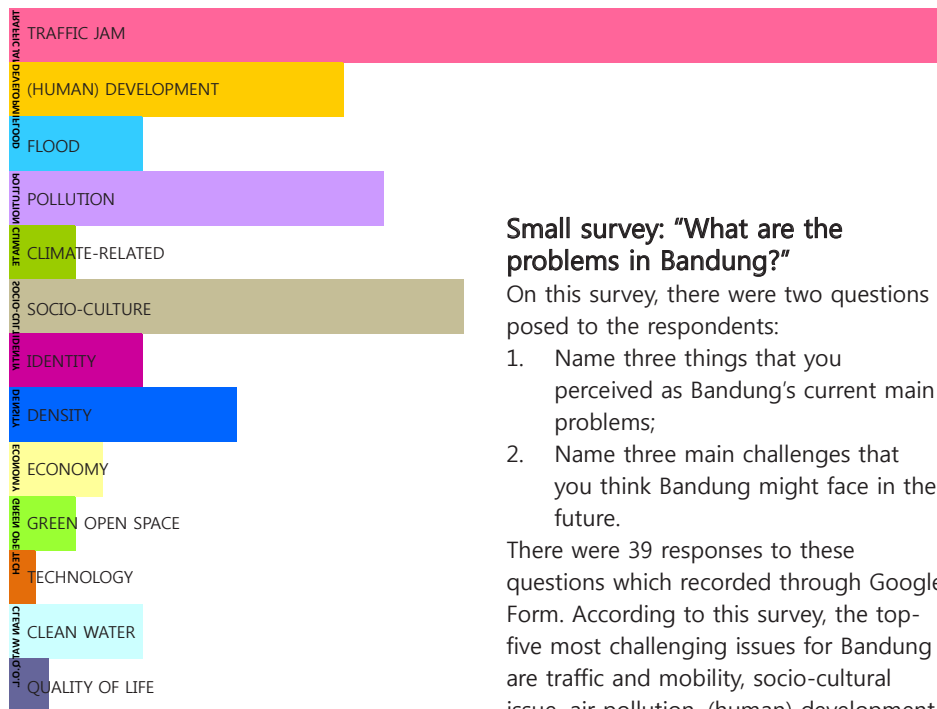


Bandung on the News

The exercise was done by observing the issues coming into view on the first 20 pages of Google News with "Bandung" as the keyword as per September 15th, 2015. There are 9 main topics emerged from the observation, i.e. urban development, infrastructure and mobility, discourse on 'creative city', governance, safety and law reinforcement, sports, tourism, economic growth, and climate-related topics. This exercise was conducted as a part of the problem analysis and determining societal relevance of the issues addressed in this project in actual condition. The sum up of this exercise is presented in a mind-map consists of the issues found on the news.

Ada Apa di Bandung? (Responses)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Sex	Age Group	Residency	Current Problem #1	Current Problem #2	Current Problem #3	Expected Future Problem	Expected Future Problem	Expected Future Problem	Explanation										
Perempuan	23 - 30 tahun	Delft	pembangunan berlebih	kemacetan	percemaran udara	over population	water contamination	macet											
Laki-laki	23 - 30 tahun	Jakarta	kemacetan	Banjir di daerah selatan	Kesamarataan fasilitas	Kemacetan	Banjir	Ketimpangan sosial											
Laki-laki	31 - 40 tahun	Tangerang	Transportasi massal	Transportasi massal	Pengaturan lalu lintas	Willayah alternatif pengen	Membuka lebih banyak d	Narkoba, free sex?											
Perempuan	31 - 40 tahun	Kota Bandung	Macet	Sampah dan sanitasi per	Konservasi bangunan tua	identitas kota yang tidak	akan terlalu mahal untuk	polusi											
Laki-laki	23 - 30 tahun	Delft hania	macet	macet	smart city technology	munculnya banyak perum	ke-hipsteran												
Laki-laki	23 - 30 tahun	Jakarta	kelelahan	Kepadatan Penduduk	Sampah	Air Bersih	Polusi Udara	Korifk penggunaan lahan											
Laki-laki	19 - 23 tahun	Yogyakarta	Macet	Premianisme	Pendidikan kurang merata	Lonjakan penduduk	Kompetisi dengan kota b	Air bersih											
Laki-laki	31 - 40 tahun	Kota Bandung	Macet	Kotor/Sampah	Mall/FO	Macet	Kotor/Sampah	Mall/FO	Akhimya										
Perempuan	23 - 30 tahun	Jakarta	Kurang anggaran untuk p	Masyarakat heterogen be	Sarana transportasi & inf	Kepadatan penduduk & k	Sampah & kemacetan yg	Tdk aman dan nyaman bagi wargan											
Laki-laki	23 - 30 tahun	Delft	Macet (dari B Sabu, Mng	Gank Motor	Angkot ngitem seaneak	Macet dan dalam Bandung	Kurang lahan karena urbi	Harga properti mahal											
Perempuan	23 - 30 tahun	Jakarta (tapi pernah	alih fungsi tata guna lahan	umiah kendaraan melebihi	penyediaan air bersih (pr	kawasan tergenang maki	frekuensi dan intensitas r	konflik antara pendatang	Semanga										
Laki-laki	19 - 23 tahun	Kota Bandung	transportasi massal	macet jalan	kesadaran hukum	macet	kurang lahan pemukiman	degradasi "keramahan"	agak susi										
Laki-laki	23 - 30 tahun	Kota Bandung	Banjir	Macet	Kualitas SDM	Kesenjangan ekonomi	Overpopulasi	Kualitas lingkungan											
Laki-laki	23 - 30 tahun	Kota Bandung	pembangunan hotel yang	transportasi	sanitasi	over population	macet	banjir											
Laki-laki	19 - 23 tahun	Kota Bandung	kemacetan	Pendidikan belum merata	Tidak ada TPA	Kepadatan penduduk	Polusi udara	Polusi cahaya											
Laki-laki	19 - 23 tahun	Delft	Sampah	Rawannya sekitar sungai	Kemacetan	Sampah	Rawannya sekitar sungai	Kemacetan	Weekend										



Small survey: "What are the problems in Bandung?"

On this survey, there were two questions posed to the respondents:

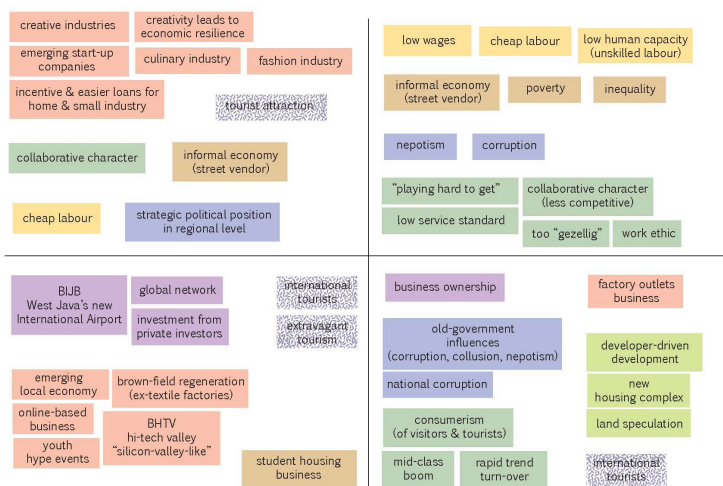
1. Name three things that you perceived as Bandung's current main problems;
2. Name three main challenges that you think Bandung might face in the future.

There were 39 responses to these questions which recorded through Google Form. According to this survey, the top-five most challenging issues for Bandung are traffic and mobility, socio-cultural issue, air pollution, (human) development, and density.

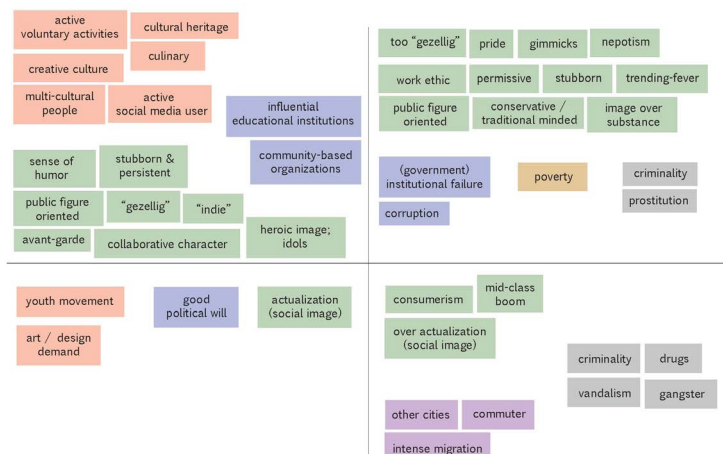


Workshop: Collective SWOT Analysis

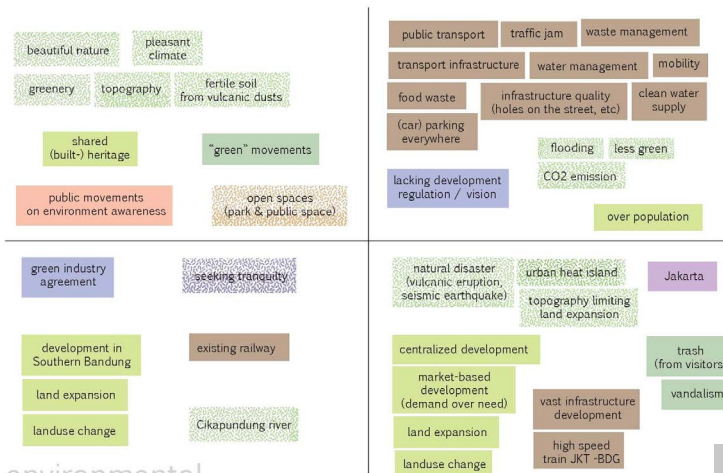
The collective SWOT analysis workshop was done with several other fellow TU Delft students from Bandung, Indonesia. The animated workshop aimed to brainstorm anything perceived as strength, weakness, opportunity, or threat for urban development in Bandung City in general. This brainstorming session was conducted within sustainability corridor. Thus, there are three issues addressed in this SWOT analysis, i.e. economy, socio-cultural, and environmental issues. Shown on the following images are the documentation and the result of this SWOT analysis workshop.



economy

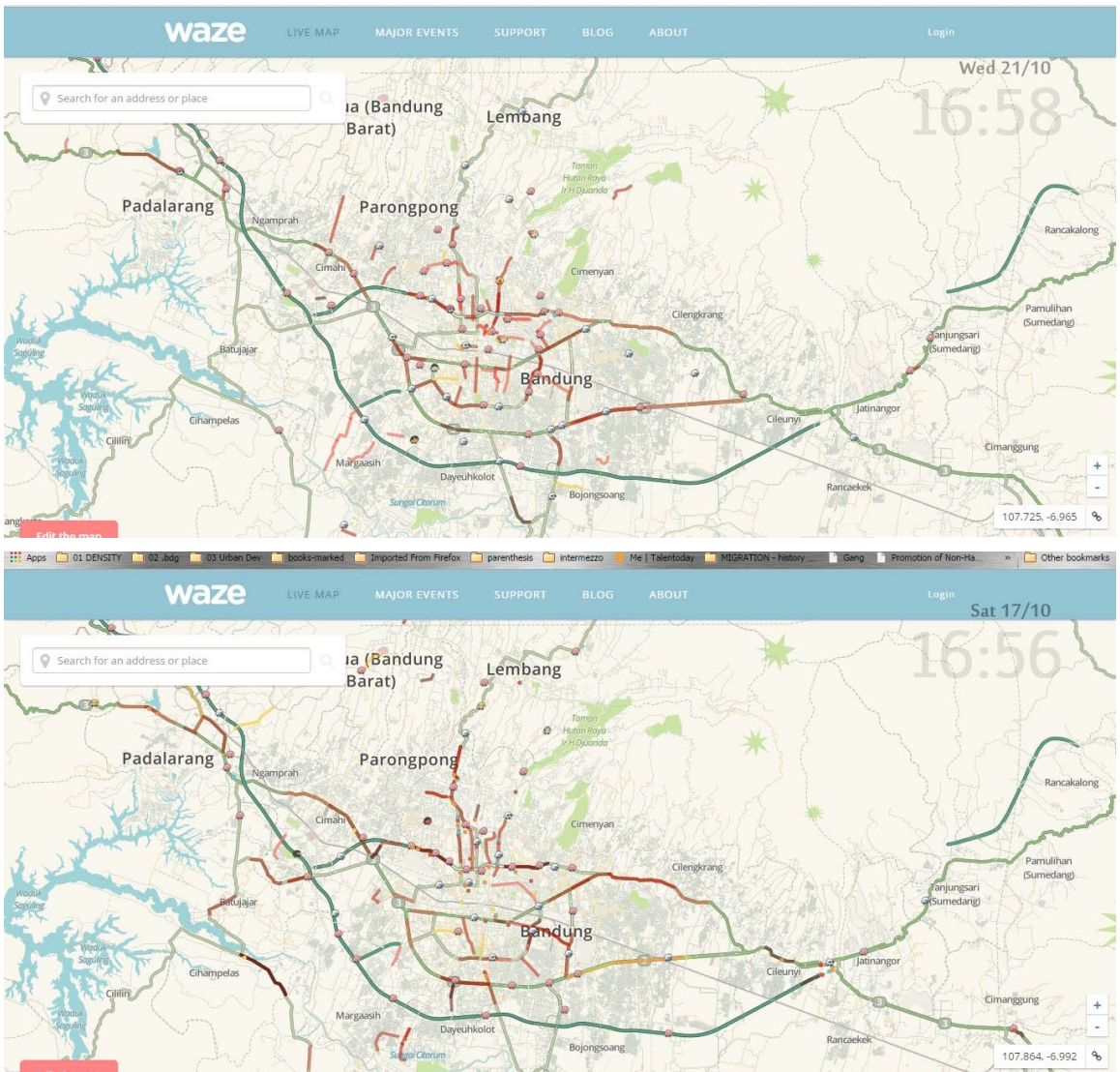


socio-cultural



environmental

Compiled result of the collective SWOT analysis



WAZE Traffic Observation

This exercise was conducted in order to gain initial insight on urban mobility in Bandung City. By recording Waze live map provided from www.waze.com/livemap, there is some recognizable mobility pattern from housing cluster to the city centre. The recording was done mostly during the peak hours in the morning, afternoon, and evening (GMT +7.00), both during weekdays and weekends.

The observation shows different mobility pattern on weekend and weekdays. During weekdays, most of the urban mobility happens from the peripheral area to the city centre, resulting traffic congestion in several main corridors. However, during weekends, most of the traffic congestion happens around the highway exits and commercial facilities in the city centre.



Pecha Kucha Presentation

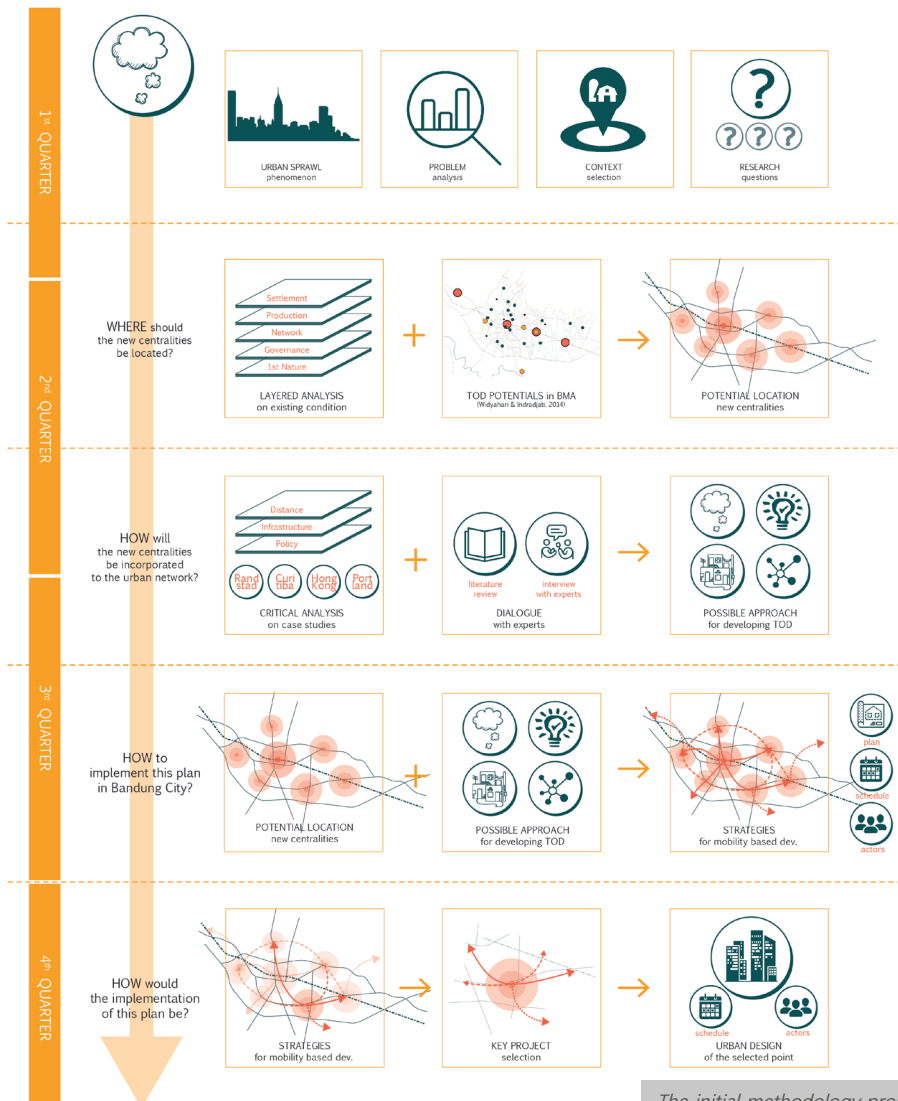
The presentation was organized along with other fellow graduation studio students both from Urbanism and Landscape Architecture. There were 20 presenters, presenting their graduation ideas in 20 slides; each slide must be presented only within 20 seconds. It was a fun and interesting exercise because the presenter is forced to reduce the information he/she presented into the essence of it.



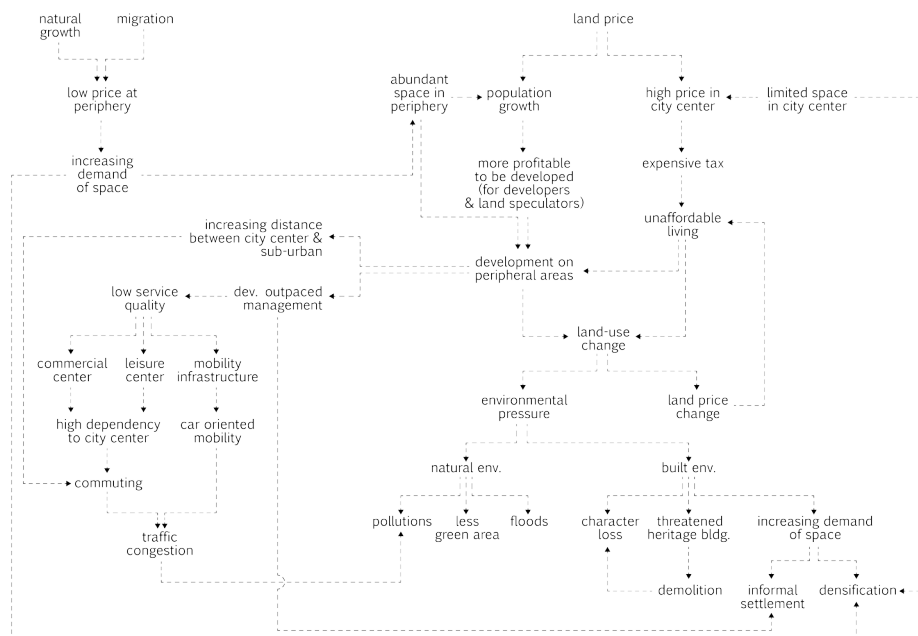
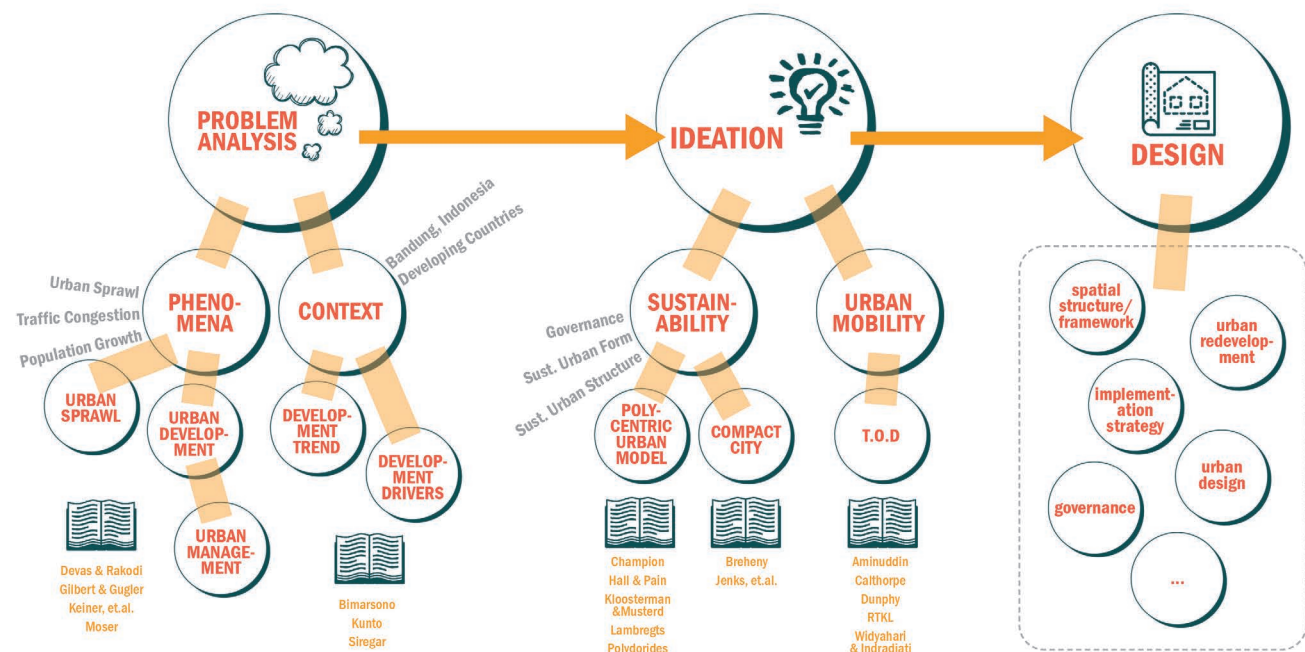
Documentation of the pecha kucha presentation with fellow urbanism & landscape graduation students

SUPPORTING ACTIVITIES

Other than the directly-related academic activities, I have made several other exercises as well during my graduation project, including interviews and discussions with the experts in Bandung City, documenting the thinking process, and keeping a record of my mental state throughout the year. The followings illustrations are among the above-mentioned documentation.



The initial methodology proposed for the graduation project





Tammi Lasmini
Spatial Planning and
Human Settlements Office

according to the official planning document: two primary centres (Alun-Alun and Gede Bage)

Alun-Alun -- controlled development (limitation of large scale investment)

Gede Bage -- promoting new development (providing UDGL, coop. with private sectors, move the municipality offices (and city hall) to Gede Bage, developing technopolis)

(built environment) intensity -- depends on sub-region, TOD / not TOD, etc. it's basically TDR

add new stations -- not possible; properties are owned by Indonesian Railway Company (PT KAI); they don't have any plan to do so.



Aji Bimarsono
KFA / Bandung Heritage /
City Planning Committee

desirable: distribution of activity / new development supported by infrastructure

old centres (as in Uitbreidingsplan): Alun-Alun, Gedung Sate, Rancabadak Hospital, ITB

be clear: which kind of development is undesirable? why is it unsustainable?

might be useful to take a look at the home-work / home-shop pattern through the time to assess the mobility



Ermaula Aseang
PT. Teknoplan Nusantara
Consultant
(Urban Planner)

one of Bandung's main assets: its people

potential for human resource based economy -- intellectuals & high skilled workers

the existing spatial structure needs to be evaluated -- what kind of structure is suitable for Bandung (now and in the future)

three main problems: status quo, omission, over crowding



Seterhen Akbar
Angkot Day /
Riset Indie

Angkot Day = one day event; social experimentation & observation

condition:

1. all angkot drivers were paid
2. all angkots went according to fixed schedule

reaction from users:

this is a preferable condition

no further follow up activities conducted yet on the observation result



Imelda Rosalin
PT DSI (architecture
consultant)/ PT Sarana
Infrastruktur Indonesia /
PhD Candidate (ITB)

PhD thesis on Governance aspect of TOD because I've seen that a lot of infrastructure based projects are obstructed by political / governance forces

analyses on TOD (by definition), stakeholders of infrastructure projects in Bandung



Nunun Yanuati
Office for Urban
Development Plan
in Bandung City

municipality / government offices tend to work sectorally

we do have Masterplan for Transportation Development in Bandung City -- consists of plans for:

1. bus & angkot
2. LRT, cable car
3. park & ride spots

supported by studies on urban mobility -- focus on public transport (bus, LRT, cable car); based on RTRW, incl. evaluation on possible payable costs

integrated plan with provincial government: high speed train.



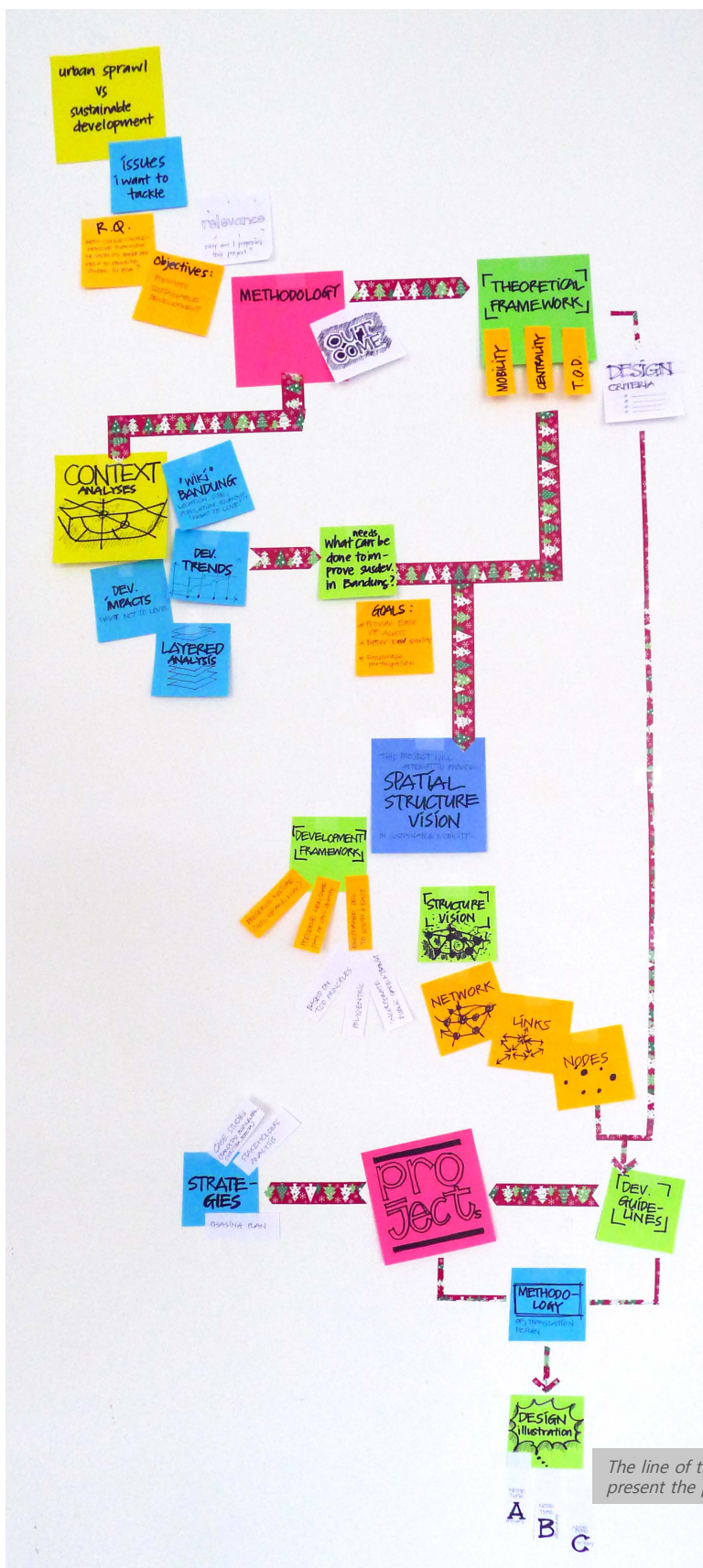
Prof. Ade Sjafruddin
Civil Eng. (ITB)

Bandung = distribution centre in provincial / metropolitan scale

underdeveloped transportation system due to budget issue

all of the transportation services are supposed to be integrated; bottle neck for implementation: politics

*Summary of the interview result
done in Bandung, Indonesia
(February 2016)*



The line of thoughts followed to present the project



Chair of Spatial Planning and Strategy
Department of Urbanism
Faculty of Architecture and the Built Environment
Delft University of Technology

