revisited *composition*

Implementation Strategies for
Mobility Oriented Development
in Bandung, Indonesia

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MASTER THESIS

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Implementation Strategies for Mobility Oriented Development in Bandung, Indonesia

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Complex Cities and Urban Regions in Transformation

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content

summary

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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. 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 worsen 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.

A context chosen for this project is Bandung, Indonesia, the second largest cities in West Java, Indonesia. 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 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 and caused severe daily traffic jam.

As it has become apparent from the analyses, 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 lack of good governance.

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. Thus, the outcome of this project consist of a strategy and design, including development framework, structure vision, and development guidelines which are exemplified in a key project.

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introduction

INTRODUCTION

URBAN SPRAWL AND SUSTAINABLE URBAN DEVELOPMENT

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 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).

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).

"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)

Urban sprawl is one of the commonly renowned urban phenomena that 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. For almost the same reasons, urban sprawl is usually perceived as an unsustainable model for urban development.

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

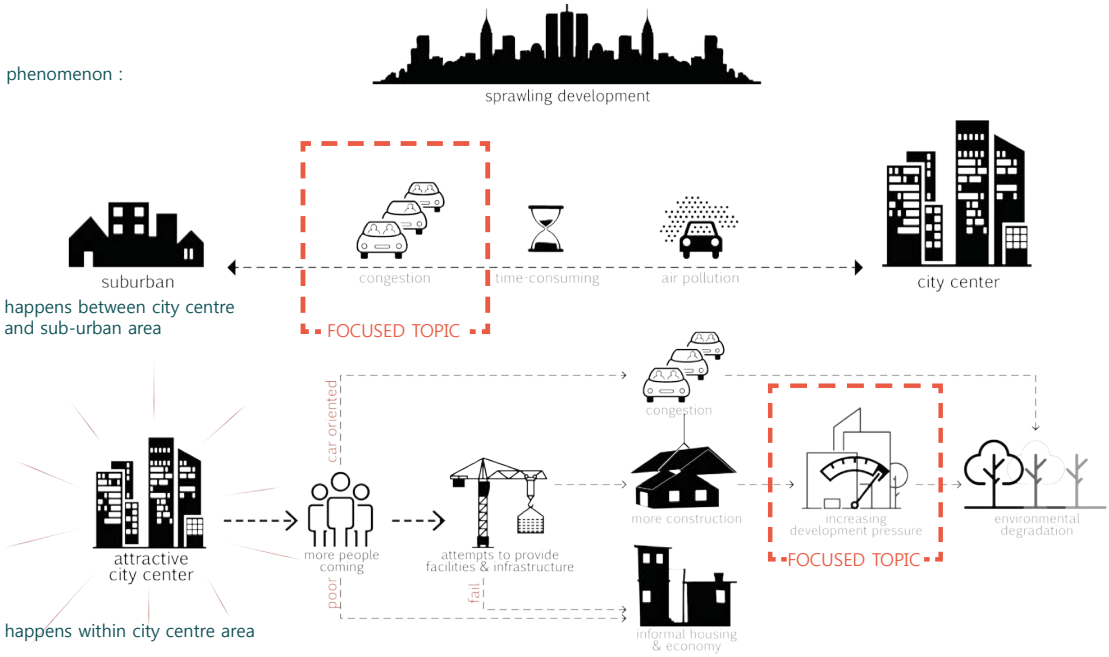

Diagram of interrelation between urban sprawl phenomenon and its effects to urban areas (source for icons: see reference)

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, fresh water, biodiversity, economic development, global economic partnership, as well as consumption and production patters.

Urban sprawl has triggered certain chained reaction, particularly in consumption and production patters, 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 (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 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 worsen 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 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 in 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

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 on 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 that 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 in 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 is publicly recognized. There are no personal interest, in term of profit, is aimed by 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 metropolitan scale.

In addition, as the municipality has already have numbers of 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 incorporate 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 is 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 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 on the first week of September 2015. Time-table 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 be used as 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
    - Phasing plan

2. Implementation of the strategy in smaller scale
    - Urban design guidelines
    - Map of possible interventions
    - Implementation strategies
    - Phasing plan
    - 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, and proposals on development framework, 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 on 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".

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theoretical framework

THEORETICAL FRAMEWORK

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 to be mono-functional. The possible structure may rise among the combination of 'nodal – multi-function', 'multi-nodal – 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).

URBAN SYSTEM	CONDITIONS		RESULT
Single	≥ 2 locations	AS > TV	Transformation
Multiple	≥ 1 location	TV joint system > AS > max. score of each system	Interference
Multiple	≥ 1 location	AS > TV each system separately	System Formation
(any)	1 location	AS ≥ 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)

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 urban area and the possible type of change is expressed through three logics as illustrated below.

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 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 urban design itself.

Polycentric Urban Region

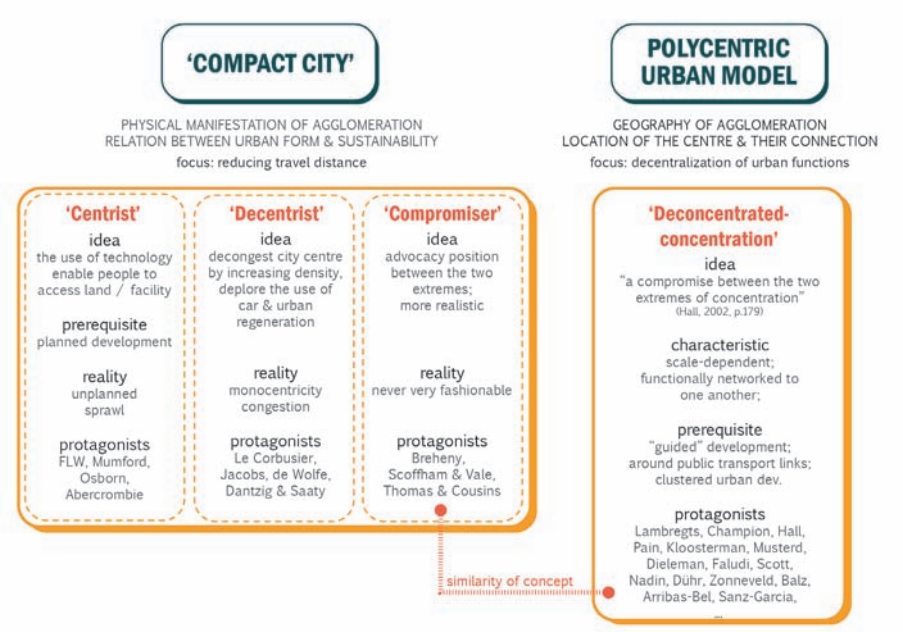
(Breheny, Champion, Hall, Kloosterman & Musterd, Lambregts, Dühr)

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 tool to encourage more sustainable urban 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 is presented. In addition, as 'compact city' concept is highly relevant to polycentricity, a concise review on 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 on possible strategies to promote more sustainable urban development.

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. 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 of this report.



Summary of the review on 'compact city' and 'polycentricity'

Bandung

BANDUNG

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

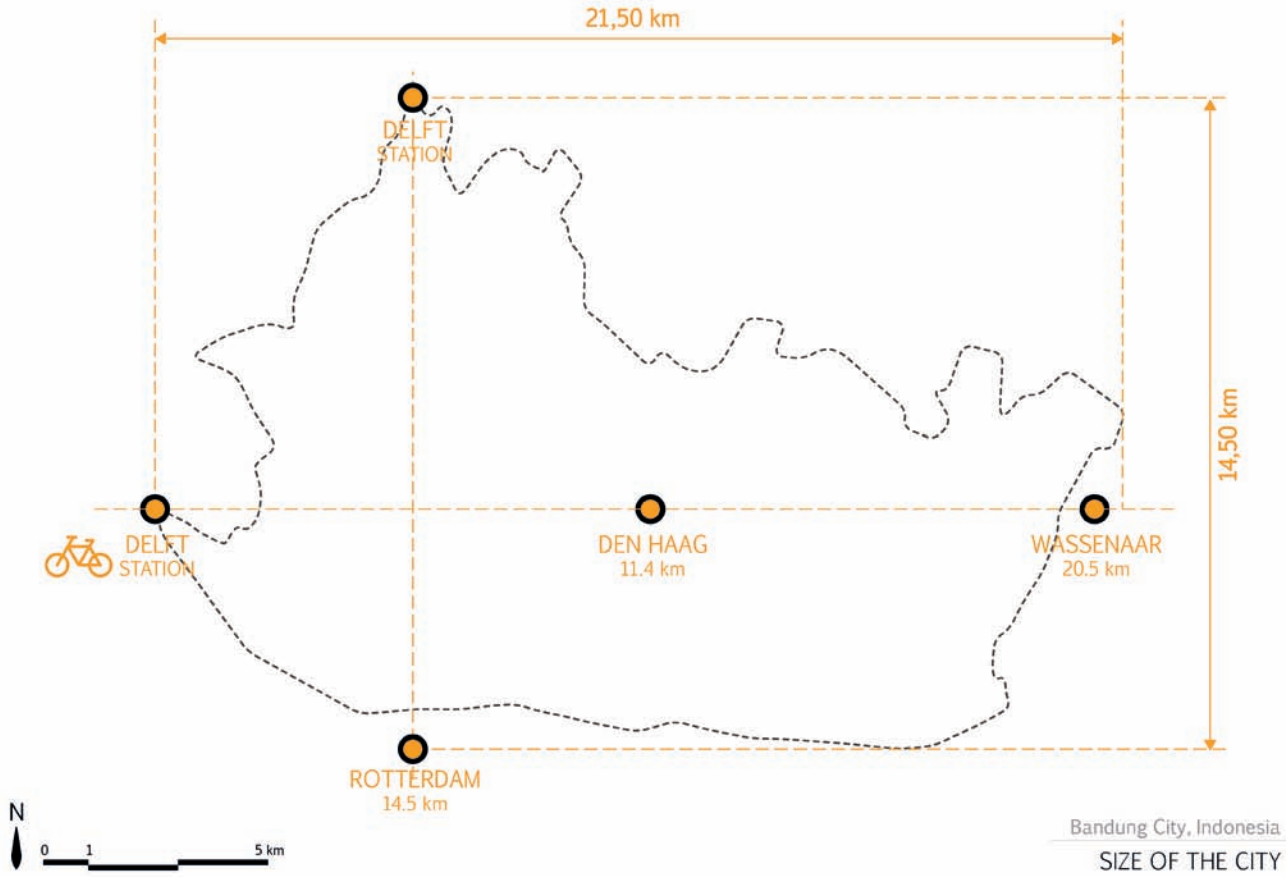
The city gained its city right (gemeenteschap) from VOC government on 1906. By that time, Bandung barely had

Position of Bandung City towards the nearest urban agglomerations (source: Google Maps, 2015)

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 rest its economy mostly on agriculture, especially tea plantation (Kunto, 1984).

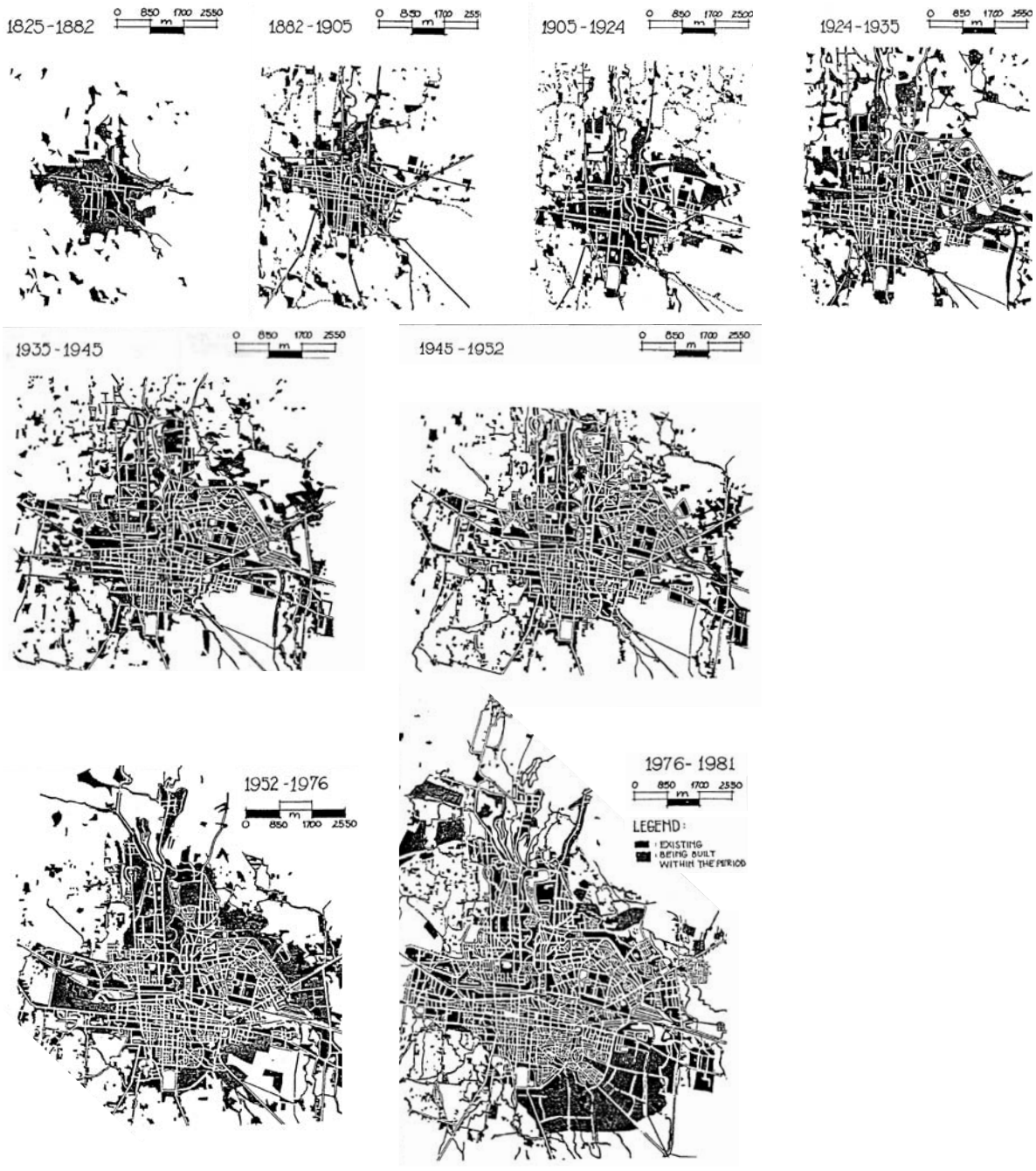
In 1911, the city was prepared to replace Batavia as the capital city of Dutch East-Indie. Numbers of important buildings, including military clusters and government buildings, were established in Bandung (Siregar, 1990). The city reached its golden era on 1920's, with the area around city centre (Alun-Alun, 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).

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



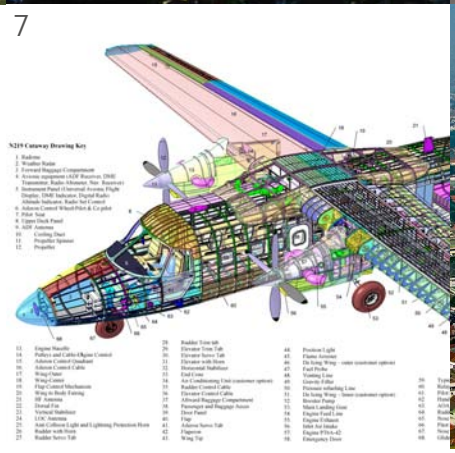
migration to Bandung City. Within this era, people from neighbouring villages and regencies were moving to Bandung to seek for the safe place. They started to squatter and reside on unoccupied piece of land, such as those along Cikapundung River (Siregar, 1990).

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 on suburban area, slightly outside the city border. On 1987, the



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

1. Skywalk in Babakan SIliwangi urban forest on community's initiatives
2. Kemilau Nusantara parade
3. Gedung Sate, one of the historical landmarks
4. Situation of Bengawan street
5. Pasupati Flyover at night
6. M. Ridwan Kamil, the current progressive mayor
7. N219 aircraft produced by PT Dirgantara Indonesia
8. Aerial view of the city centre



The face of Bandung City
(source: multiple, see reference)

municipality of Bandung expanded the city border to the east, merging Bandung City with adjacent Ujung Berung region (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.

analyses

ANALYSES

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 on the peripheral areas of the city. The developer has been taking advantage from 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 for 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.

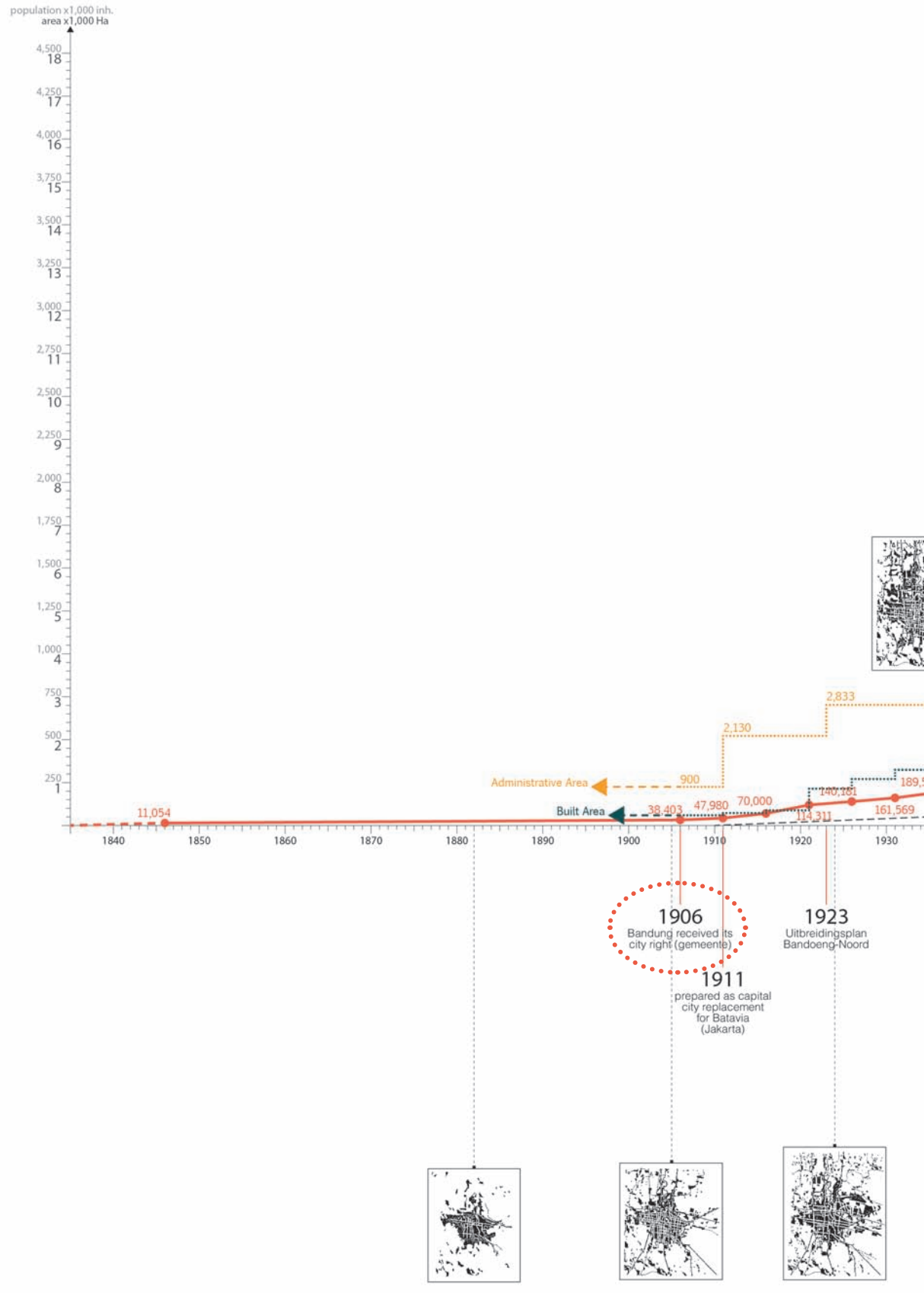






1. Traffic jam in Pasar Baru
2. Uncontrolled development & urban sprawl
3. Informal settlements
4. Development in historical area
5. Proposal for new development from real estate developer
6. Light flooding due to inadequate drainage system
7. Annual flooding in Baleendah, Regency of Bandung
8. Garbage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

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


population x1,000 inh.
area x1,000 Ha
4,500
18
4,250
17
4,000
16
3,750
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250
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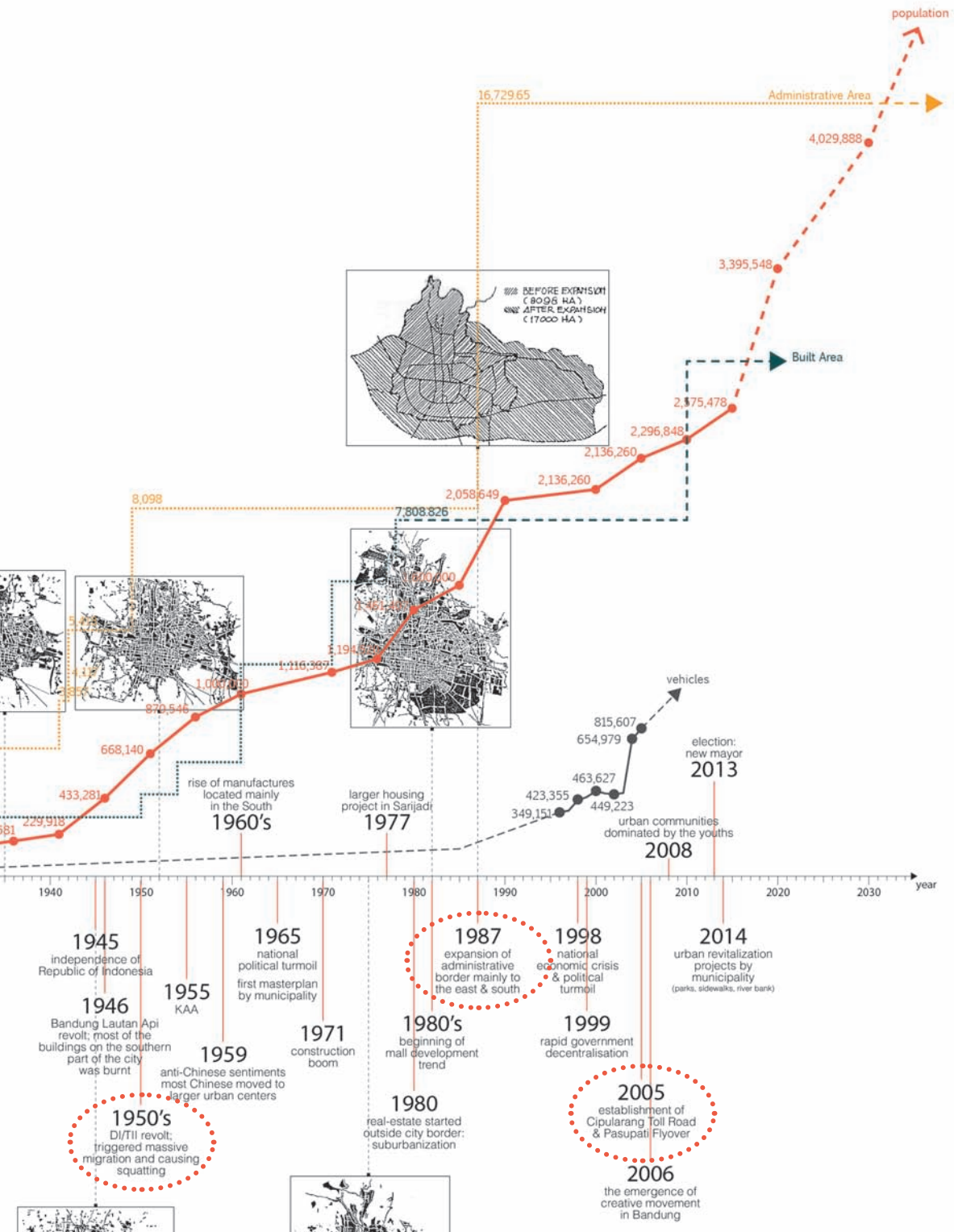
1840
1850
1860
1870
1880
1890
1900
1910
1920
1930
Administrative Area
Built Area
11,054
900
2,130
2,833
38,403
47,980
70,000
114,311
140,181
161,569
189,5
1906
Bandung received its city right (gemeente)
1911
prepared as capital city replacement for Batavia (Jakarta)
1923
Uitbreidingsplan Bandoeng-Noord



Urban development trend in Bandung City from 1846 (interpreted and redrawn from Siregar, 1990)

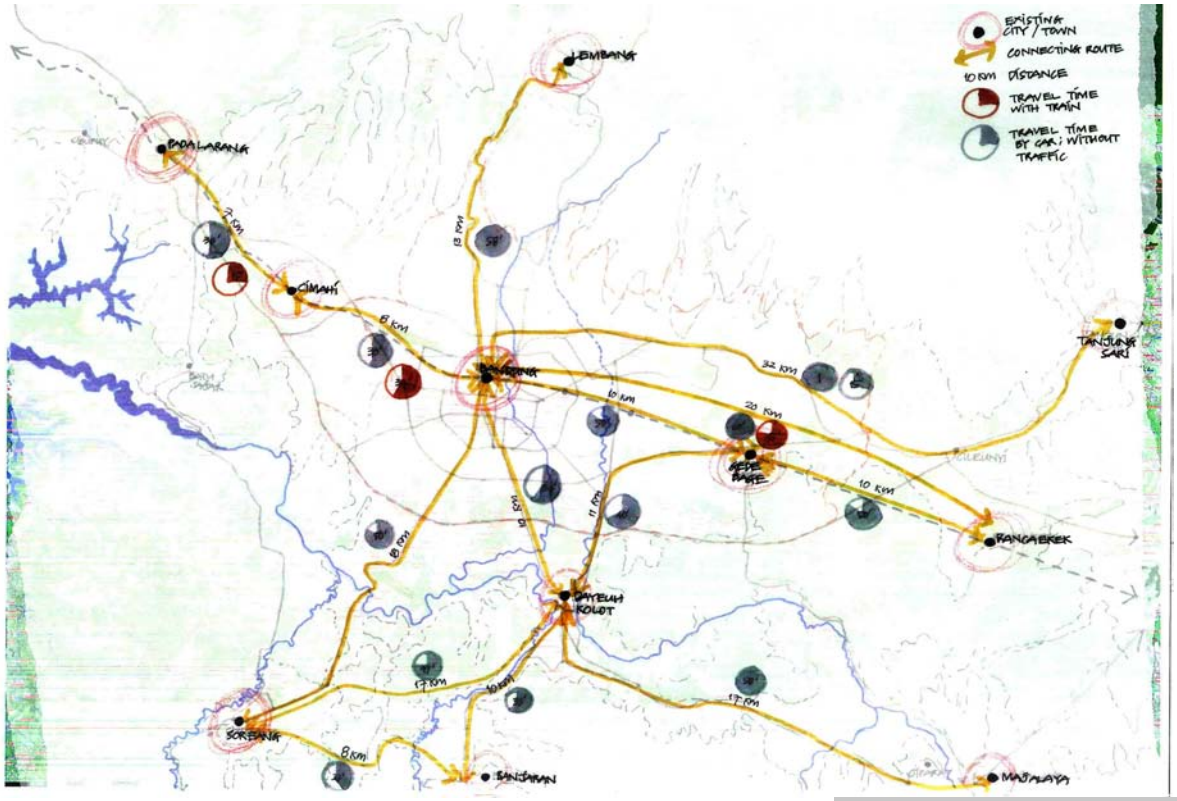
The growth of vehicle numbers in Bandung reached 10% every year (Polwiltabes Kota Bandung, 2006). The significant increase in the numbers of cars and motorbikes in Bandung within the past 20 years has triggered more mobility problems in the old city centre such as traffic jam and lack of parking space. 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 – 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 of 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 to be demolished and altered into a new function than being 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 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 south-eastern 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 make-over to accommodate the changes of building 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 are remained disregarded.

'Rencana Tata Ruang Wilayah Kota Bandung' – the spatial plan for Bandung City area – seemed to have minimum impact on

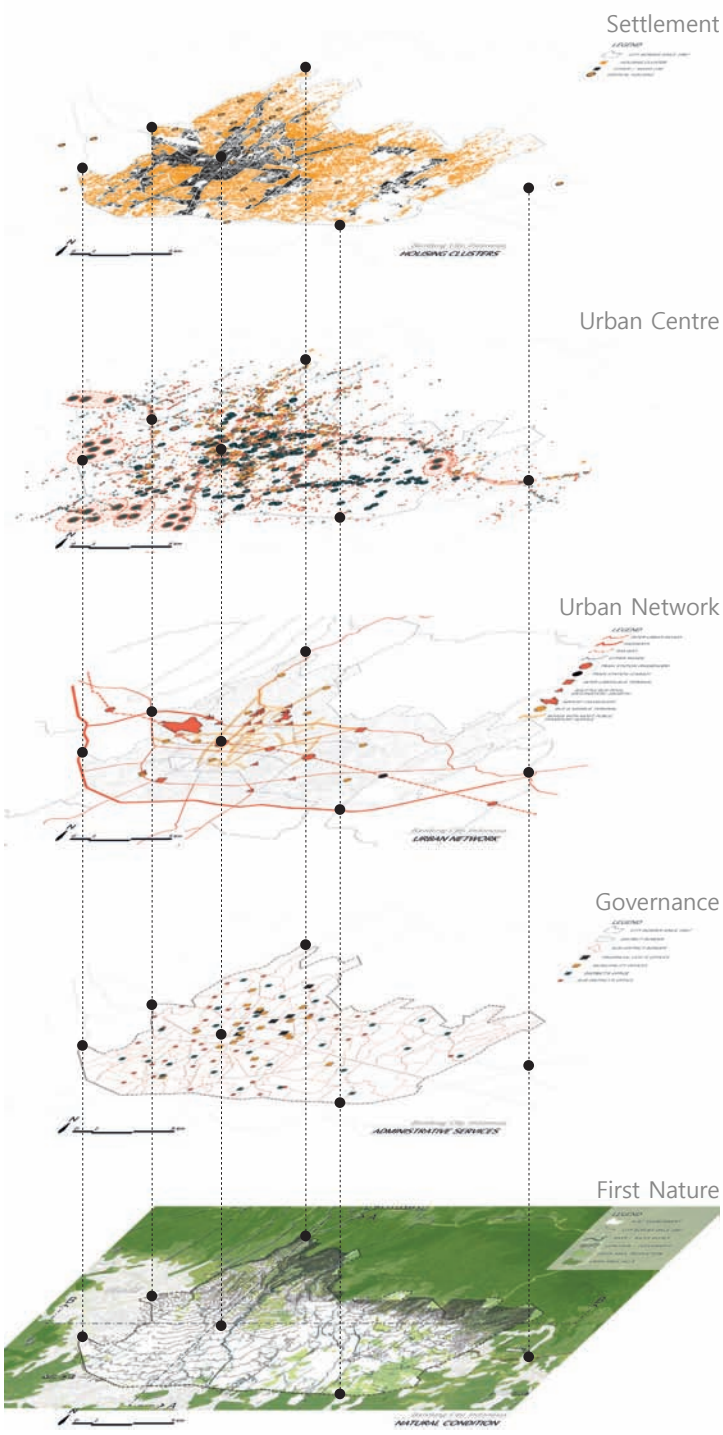


Distance between existing towns & cities adjacent to Bandung City

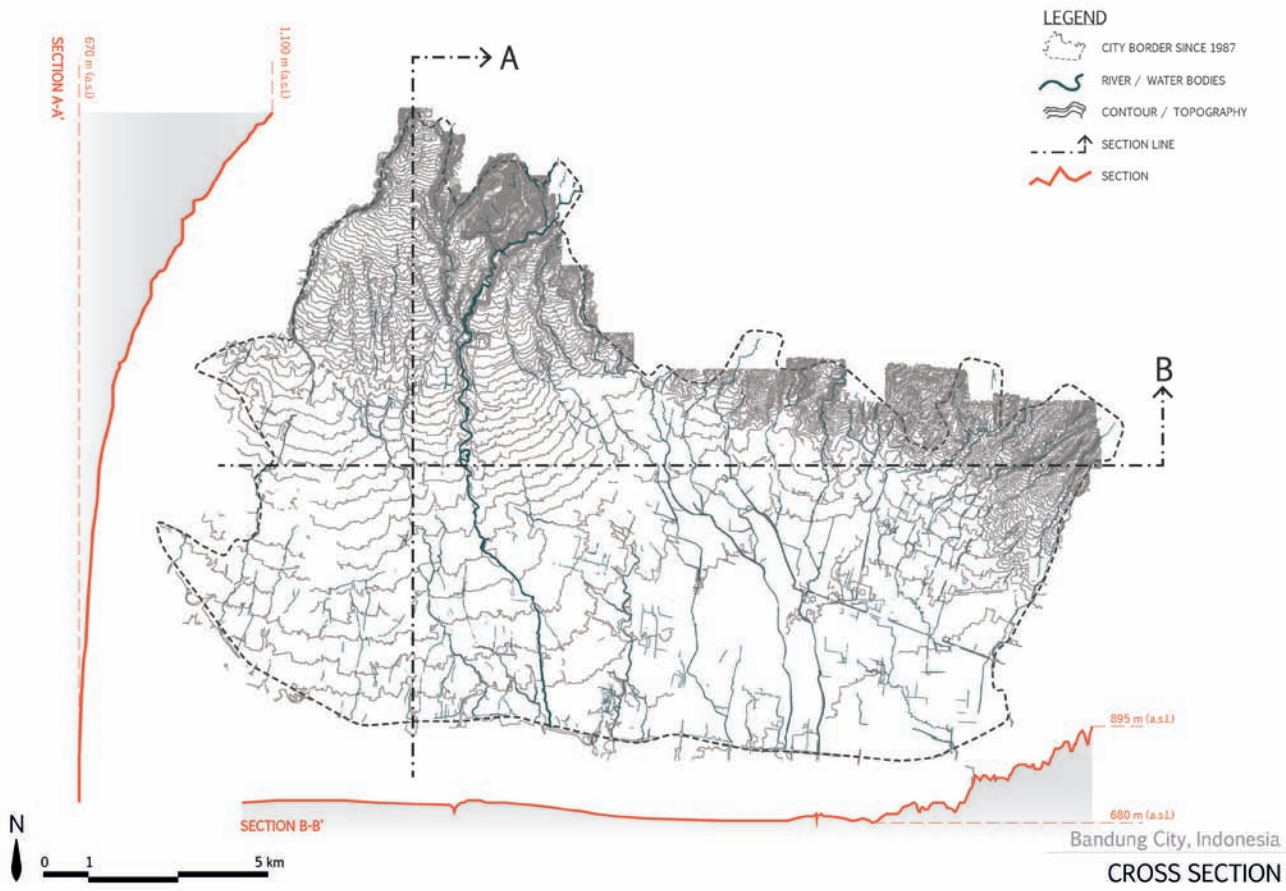
guiding the development of the city. Although the plan is translated to several more detailed planning instruments such as zoning regulation and urban design guidelines, the complicated bureaucracy and the inability of the government's planners to foresee future development trends are among the main challenges in setting the boundaries for development.

LAYERED ANALYSIS

The Dutch Layer Approach (DLA) is used as one of the analytical tool in this project due to its robustness in unravelling the complexity of the city by presenting each relevant issue in 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.



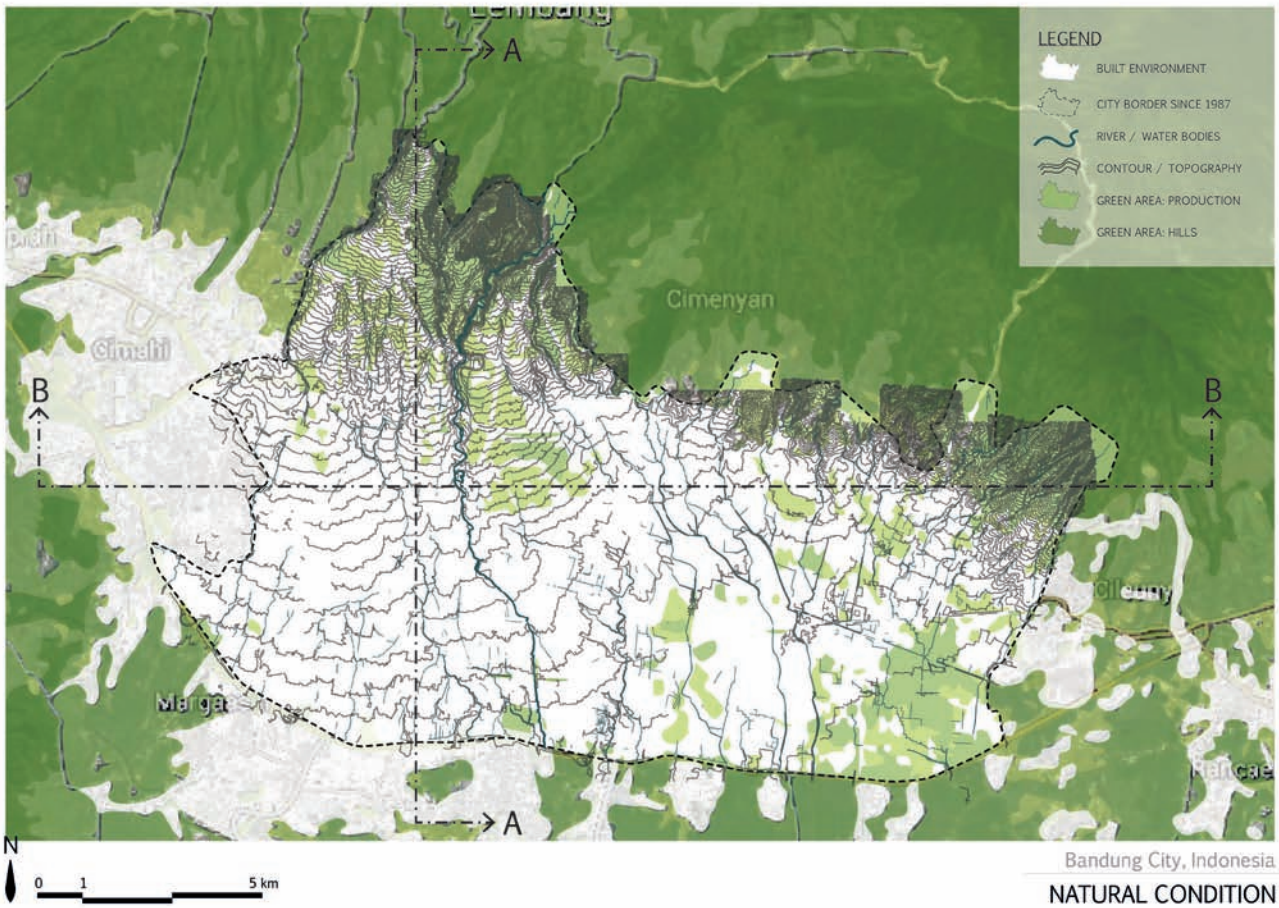
The associated layers explored using the DLA within this research and design project



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 meter 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 areas adjacent to Cikapundung

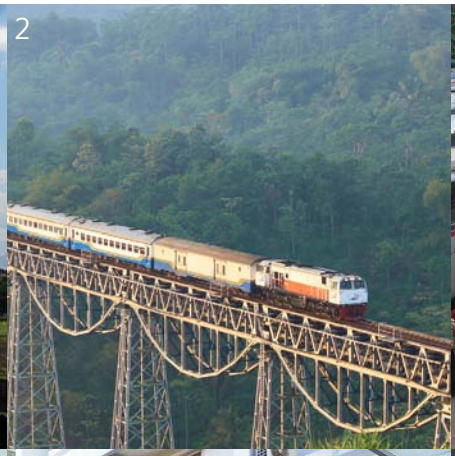


Bandung City, Indonesia

NATURAL CONDITION

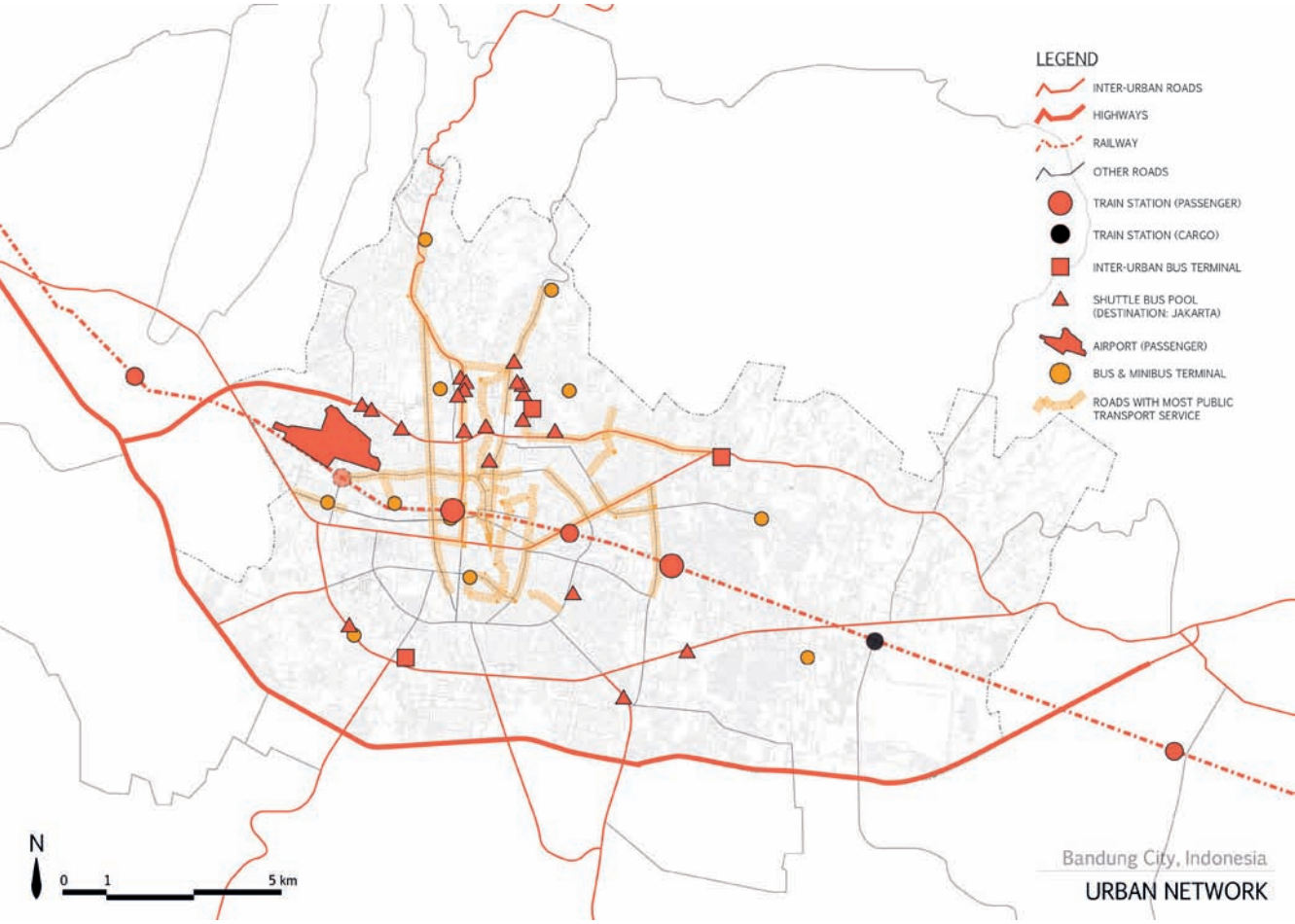
River started to transform into (informal) settlement complexes after 1960's, when the first wave of migration struck Bandung.

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 be existed, 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 ('ojeg'

Inter- and Intraurbanransportation modes in Bandung City (source: multiple, see reference)

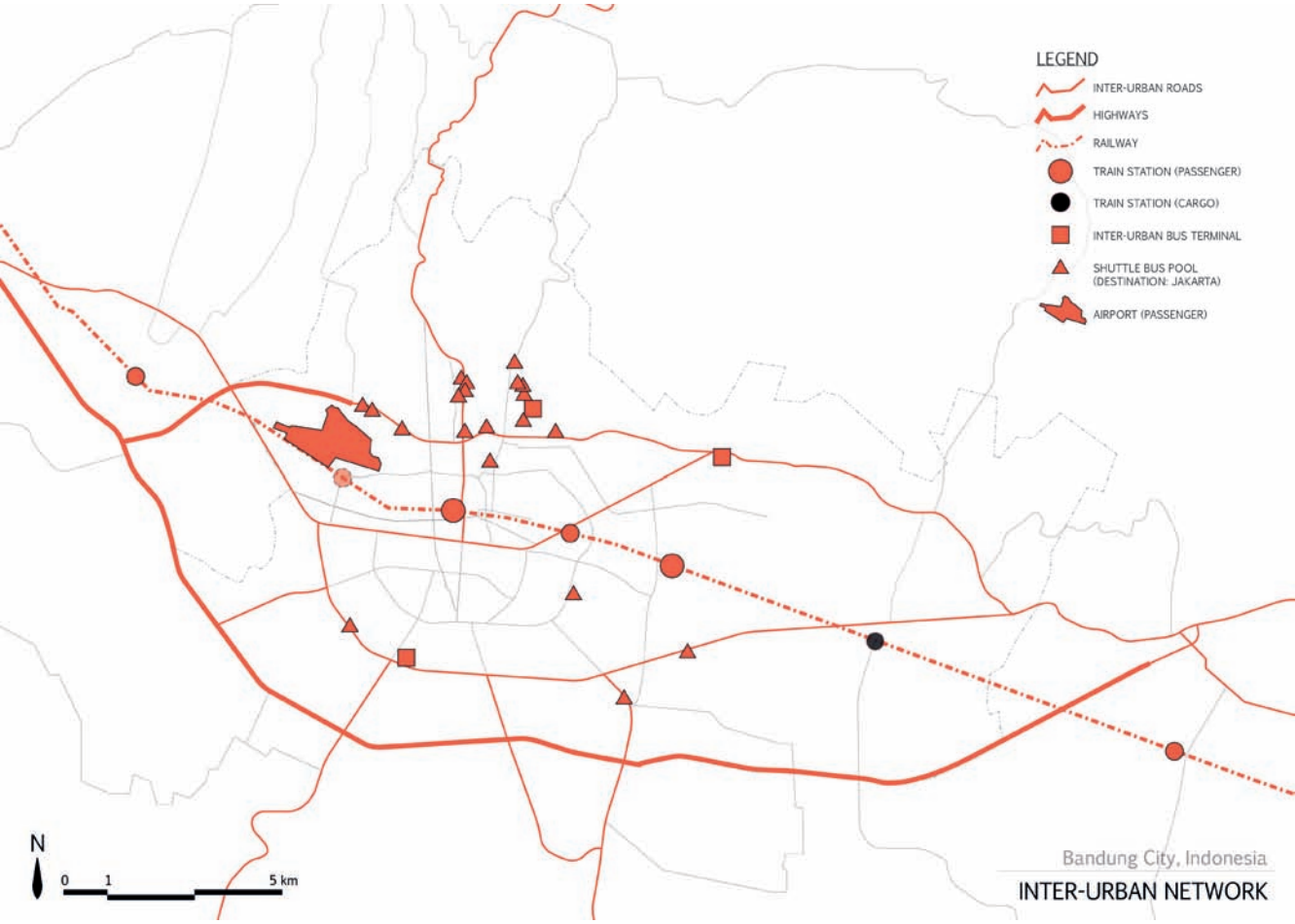


Urban Network

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.

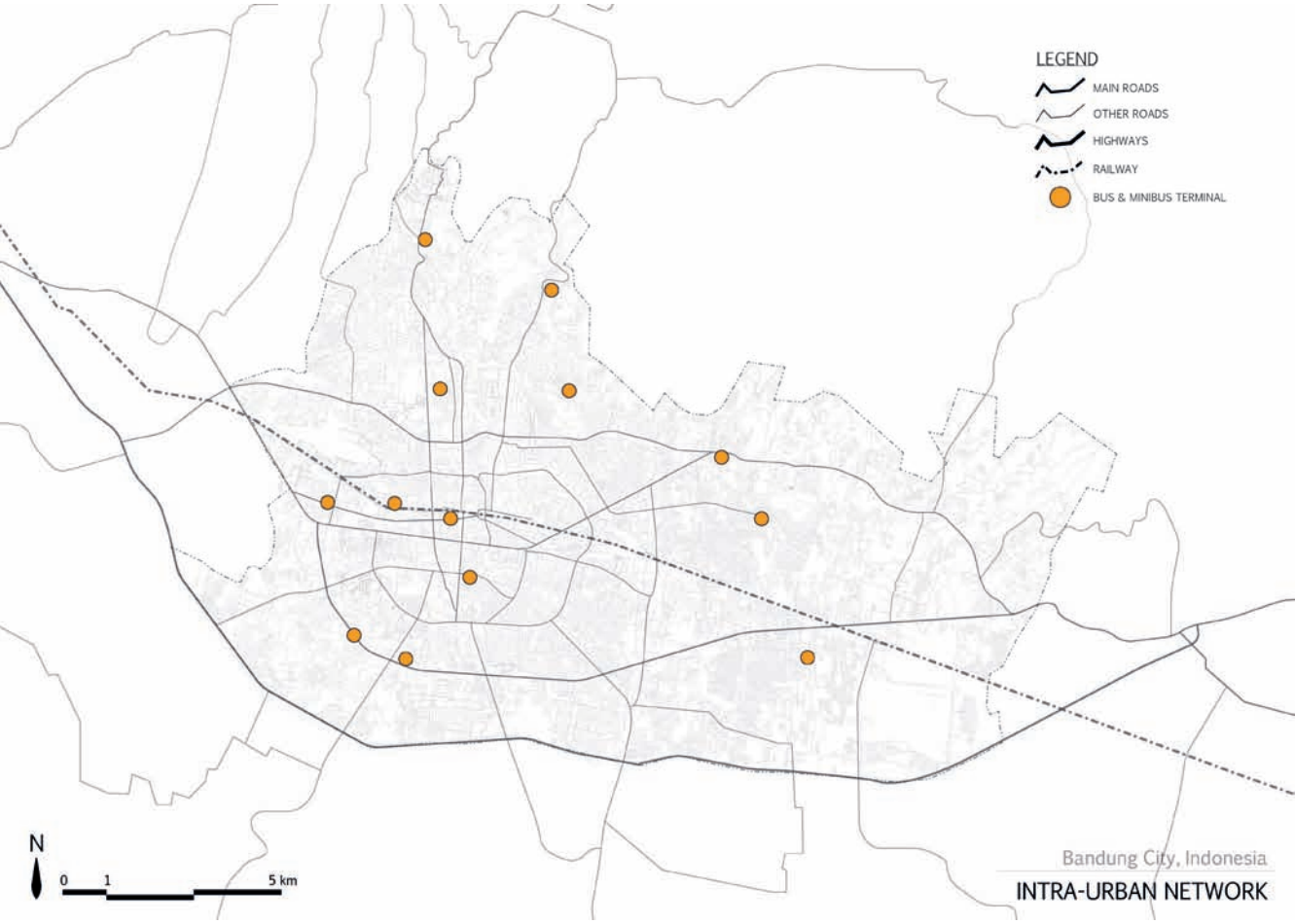
Bandung City is reachable from its neighbouring regions through the highways (with six exits) or the railway. The inter-urban public transport consists of regional train, inter-city bus, and the 'travel' shuttle bus. There are four train stations in Bandung City; all of them are currently in use for 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 on shuttle transportation



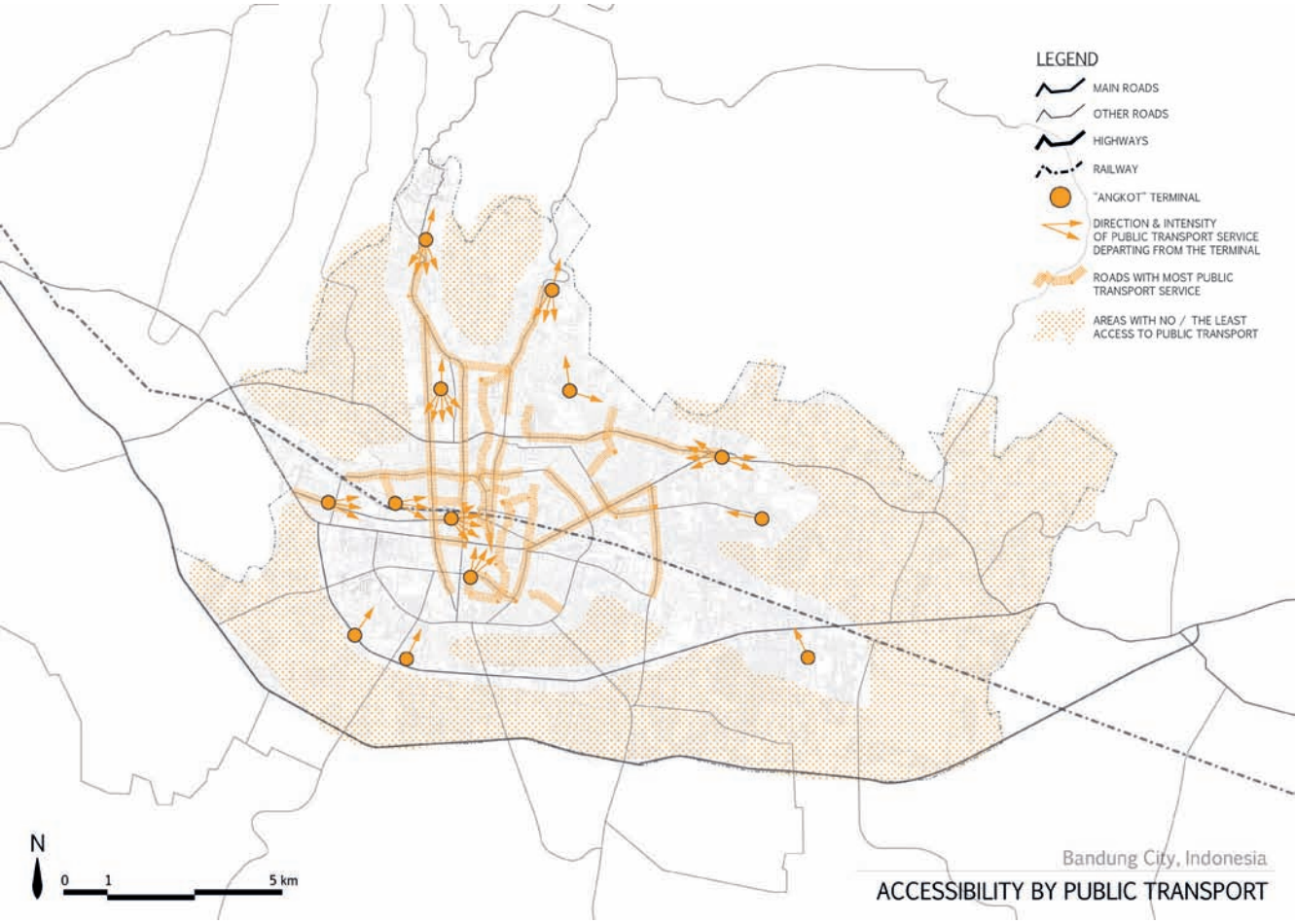
from Bandung to Jakarta, and vice versa. The demand was mainly coming from the university students (who were originally from Jakarta but was studying in Bandung) as well as the businesspersons (whose office are in Bandung but demanded to travel to Jakarta for meetings, or vice versa). Numbers of private 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 mini-van, and the buses. 'Angkot' is the most popular public transport in Bandung City. It comes in a form of mini-van 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



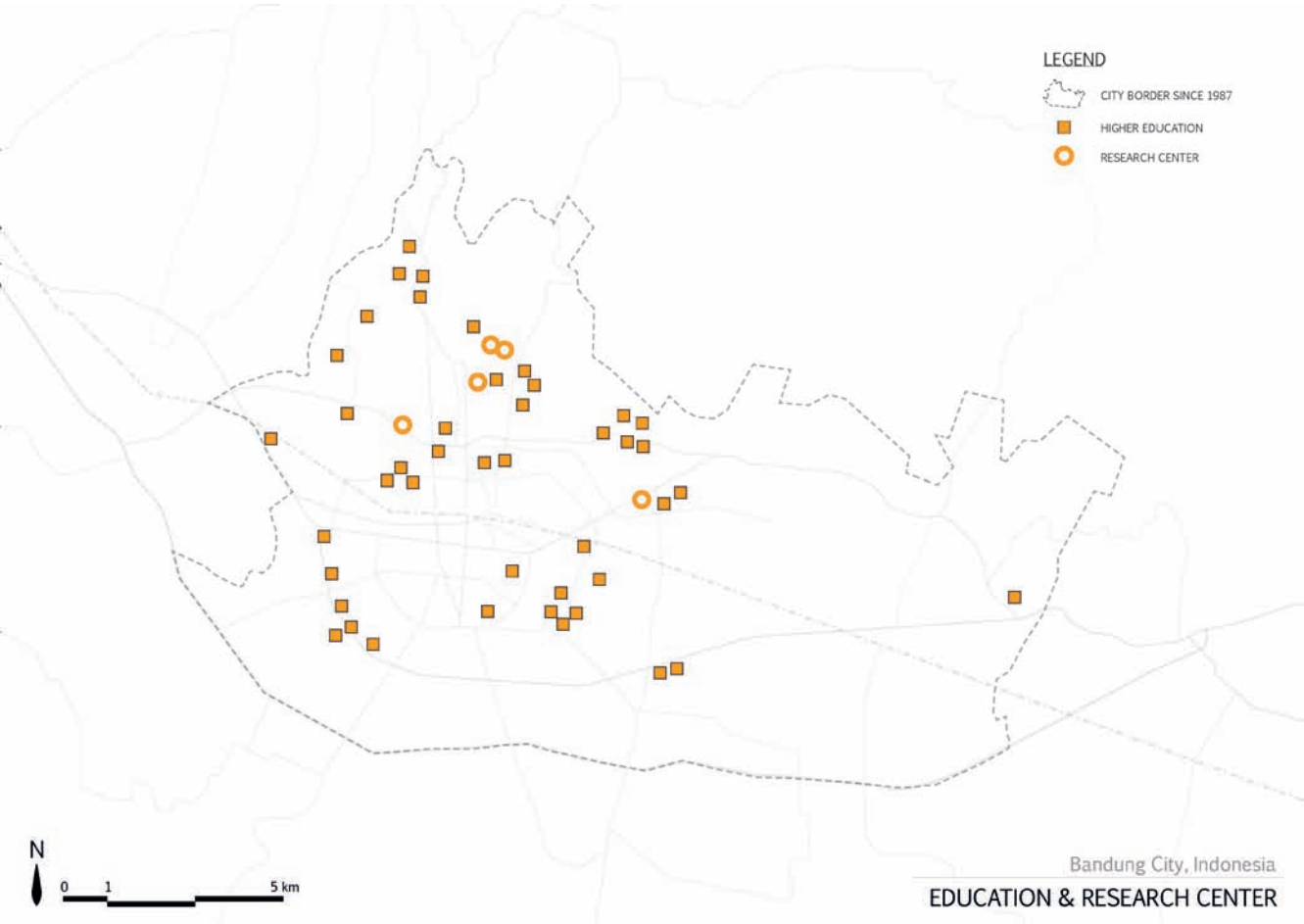
privately owned or leased by the owner to the driver. Although there are association for 'angkot' drivers, such as Kobanter Baru, Kobutri, and Kopamas, the drivers are self-employed. Their earnings depend on numbers of passenger they have per day. However, these driver associations have very strong position in terms of negotiation with local government. They are highly dominant and resistant, especially against the development of urban transportation infrastructure, which threaten 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 motorbike as the transportation mode. The concept is quite similar with taxi. However, despite the service price, which usually is quite expensive, 'ojeg' service is quite robust and reliable.



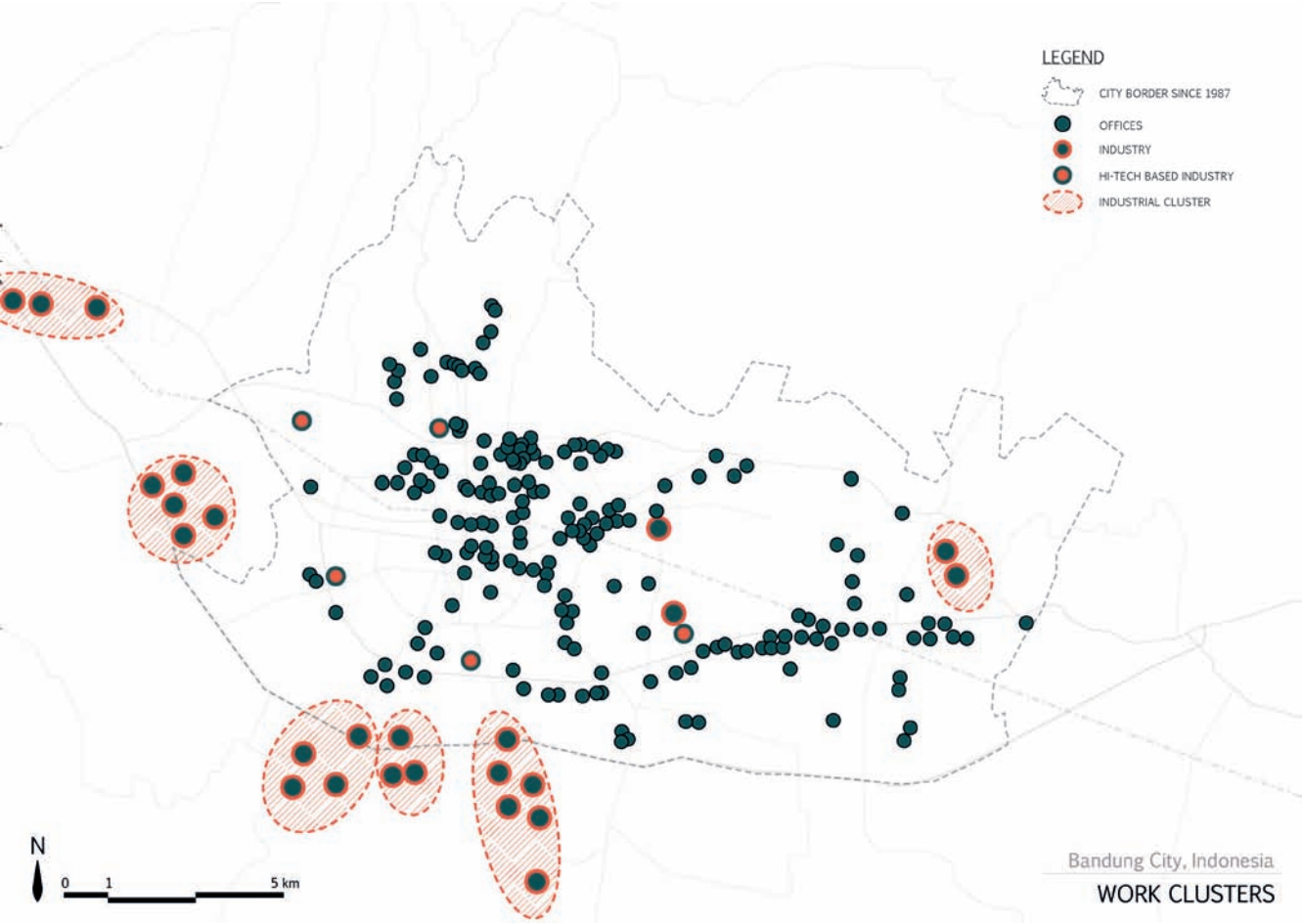
Urban Functions

According to Polydorides (1983), an urban core is

"... that particular area of the city in which urban activities and flows of people, vehicles, goods, and messages are most concentrated" (Polydorides, 1983, p. 12).

On the following paragraphs, he 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).

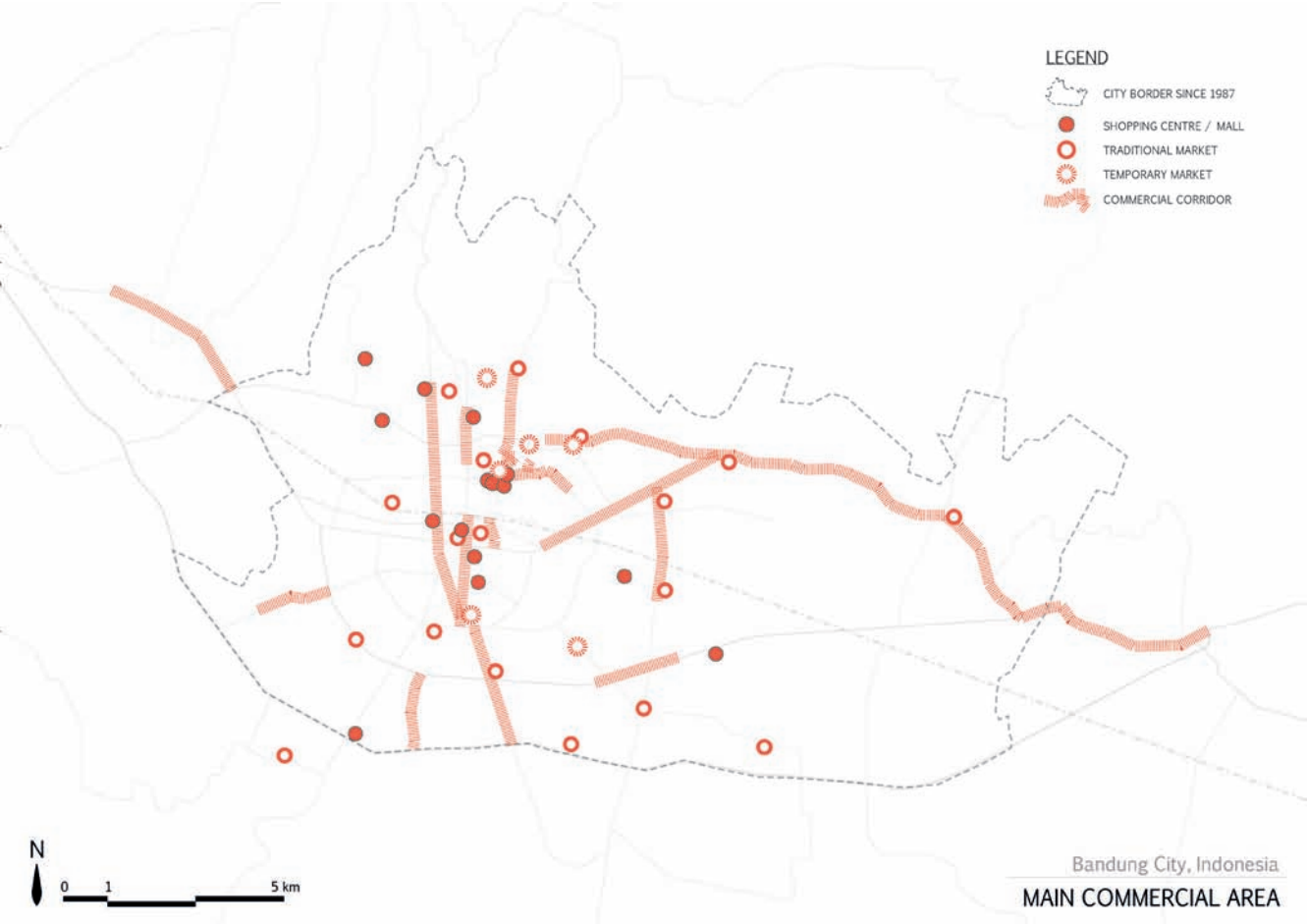
This particular layer shows the location of working clusters (offices and industries), commercial area (including hotels, cafe, and restaurants), as well as higher education and research institutions. The analysis has shown that most of these functions are located in the old-town of Bandung. Although 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 on previous page is showing the location of higher education facilities, which are mostly located on 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 on the southern part of the city, if not outside the city.

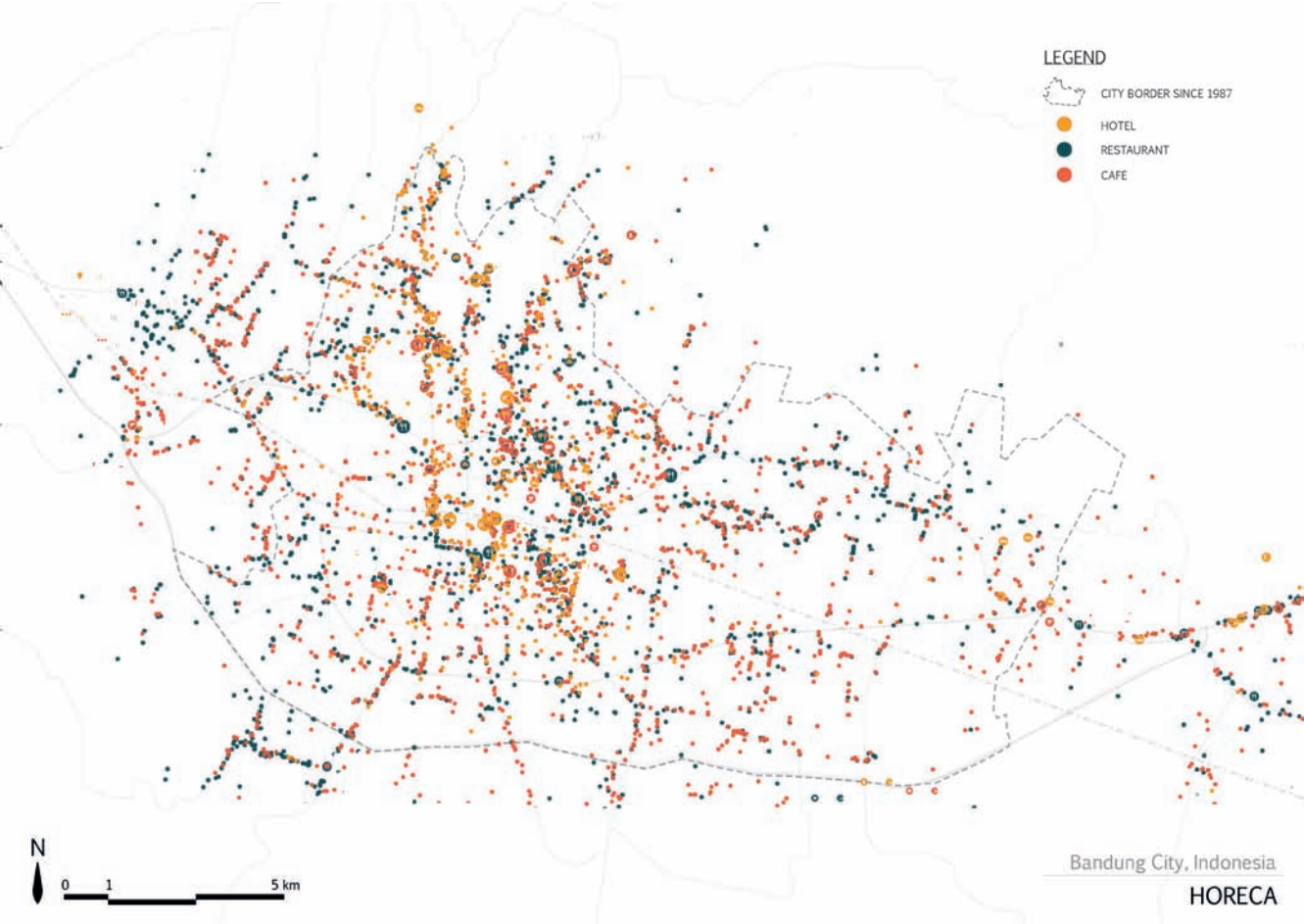
On the later decades, offices, public services, and (automobile) show rooms are arisen along Soekarno Hatta Avenue.



Commercial function consists of 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.

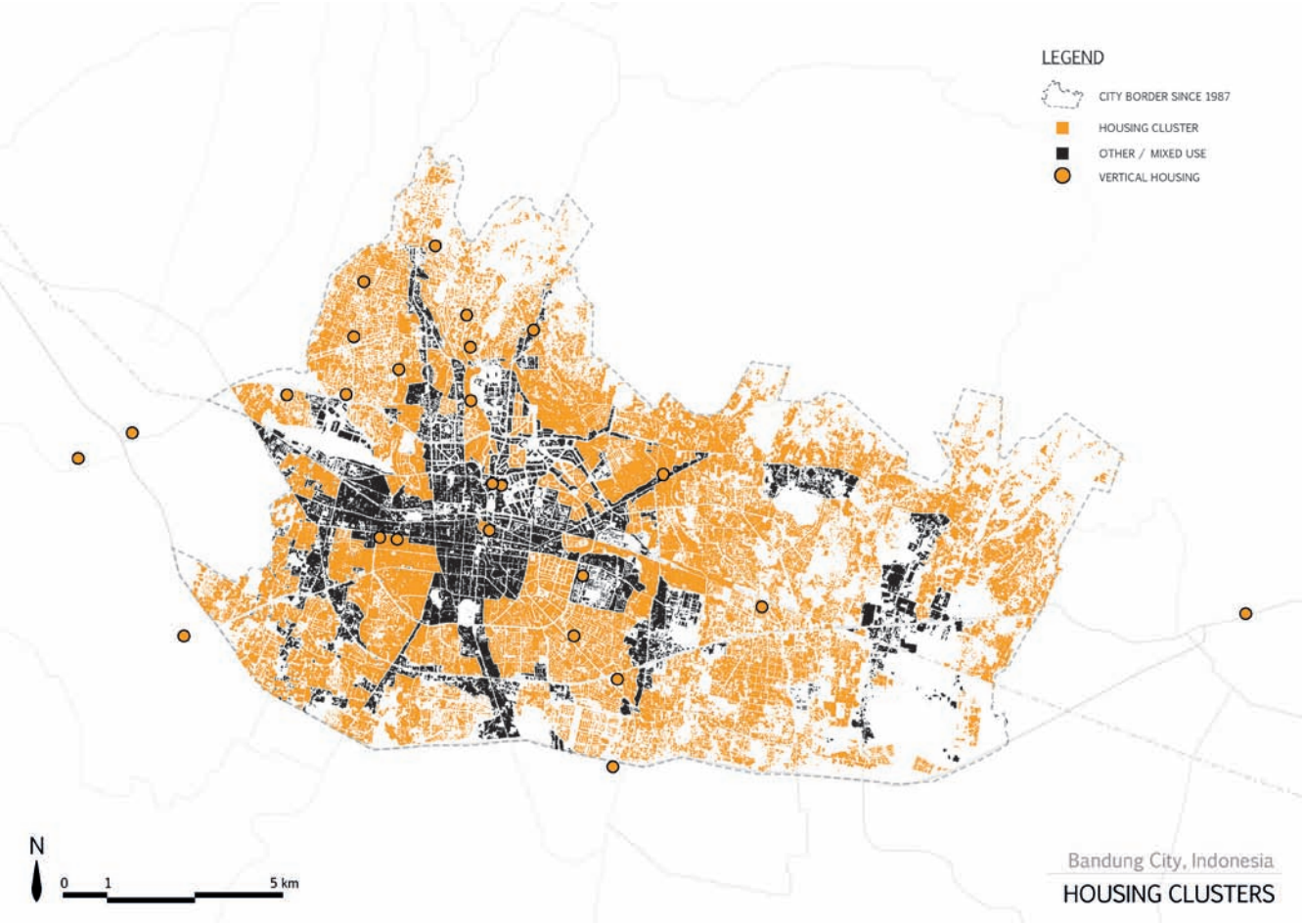
On the late 1990's, after and during the recovery from the 1998's financial crisis, there were more local distribution stores (distro) and factory outlets (FO) for clothings



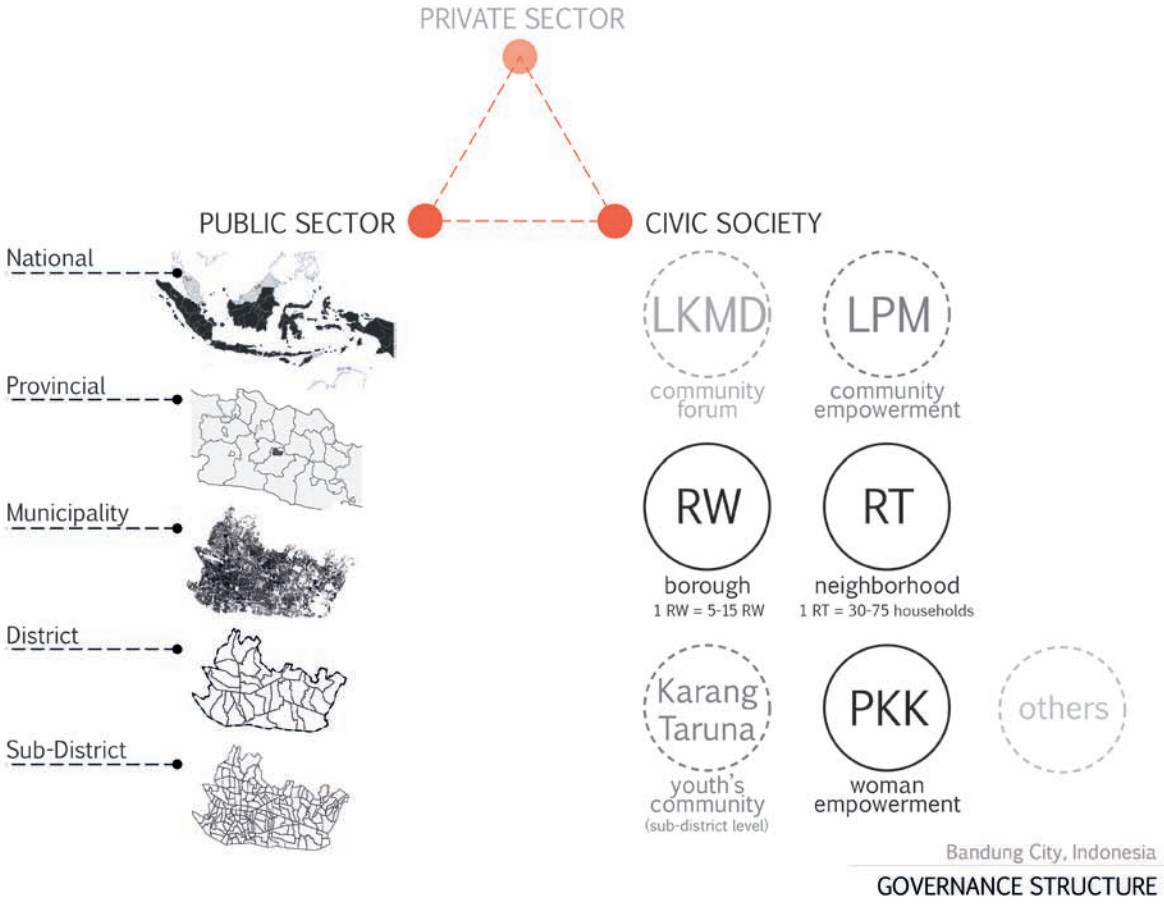
emerged mostly in Riau Street and Dago areas. These stores remain operational until today. The emergence of the distros and FOs has attracted people to come to and shop in Bandung City. Domestic tourists from Jabodetabek were dominating the market at its earlier time (late 1990's until early 2000's), 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 monocentricity 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 form of 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.

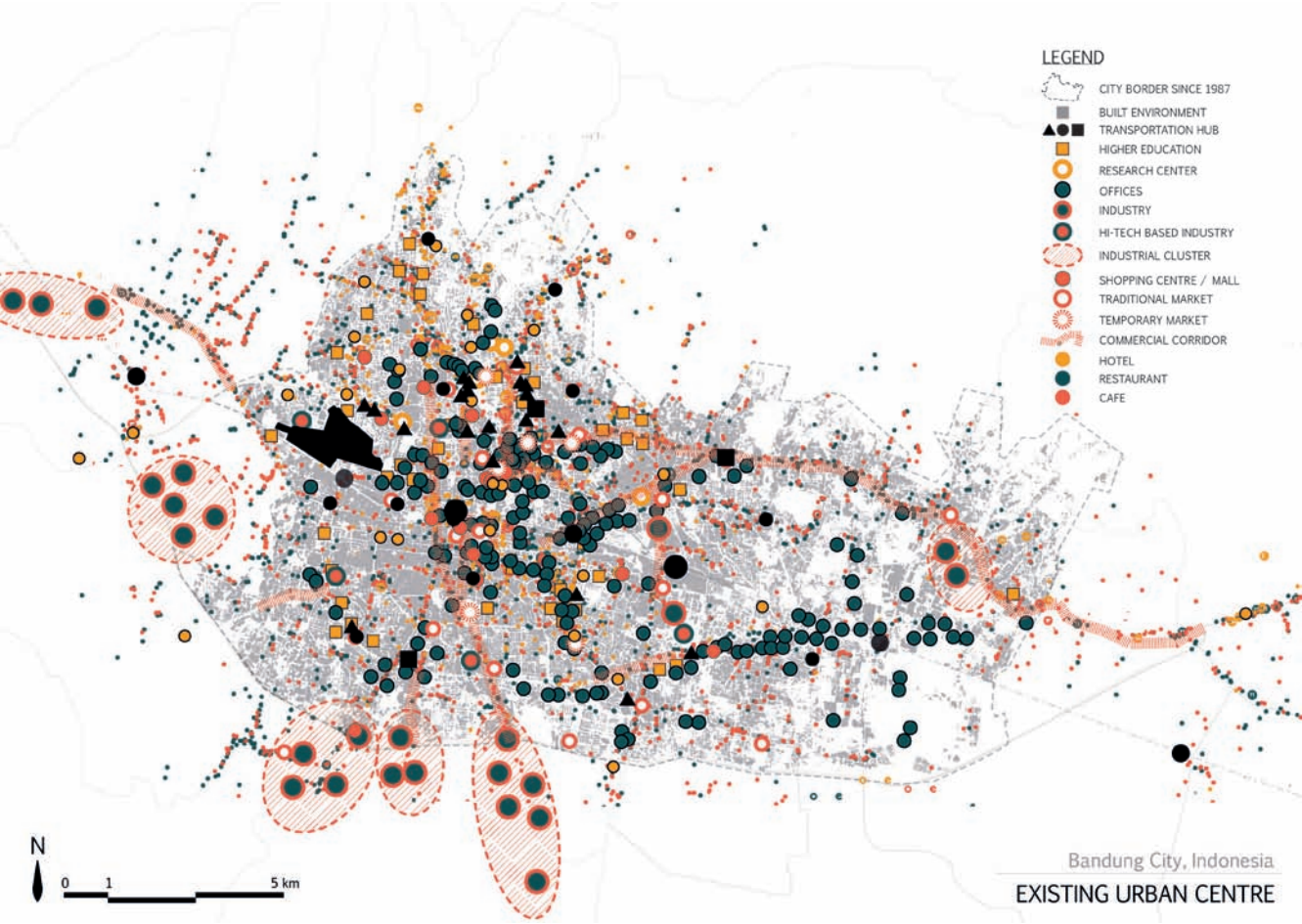


Governance

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).

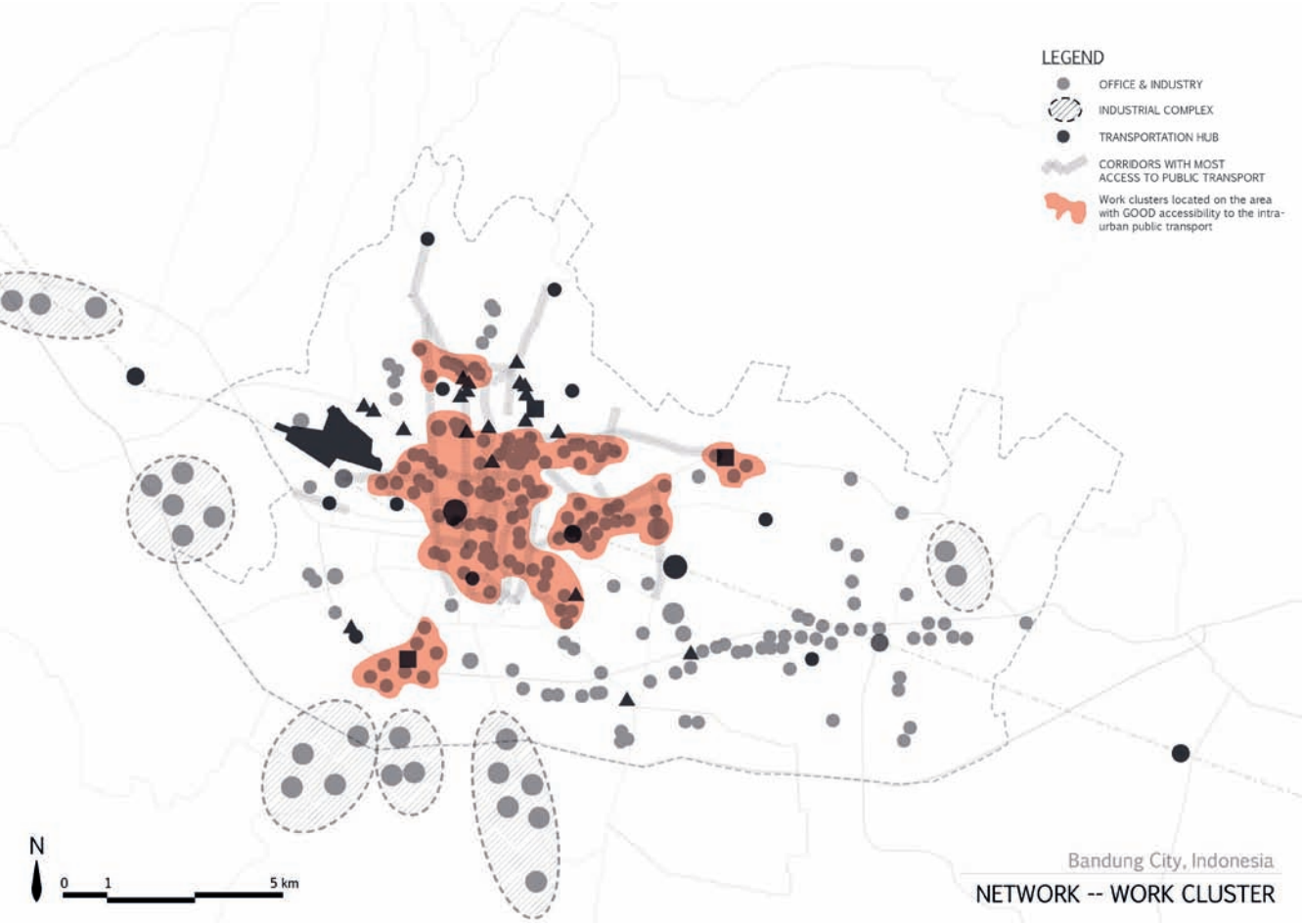
Although the division was meant to decentralise the power and decision making processes (as well as the fact that the smaller unit should act as a supporting entity to a larger unit), the role and function of each units are often overlapping and unsynchronized.



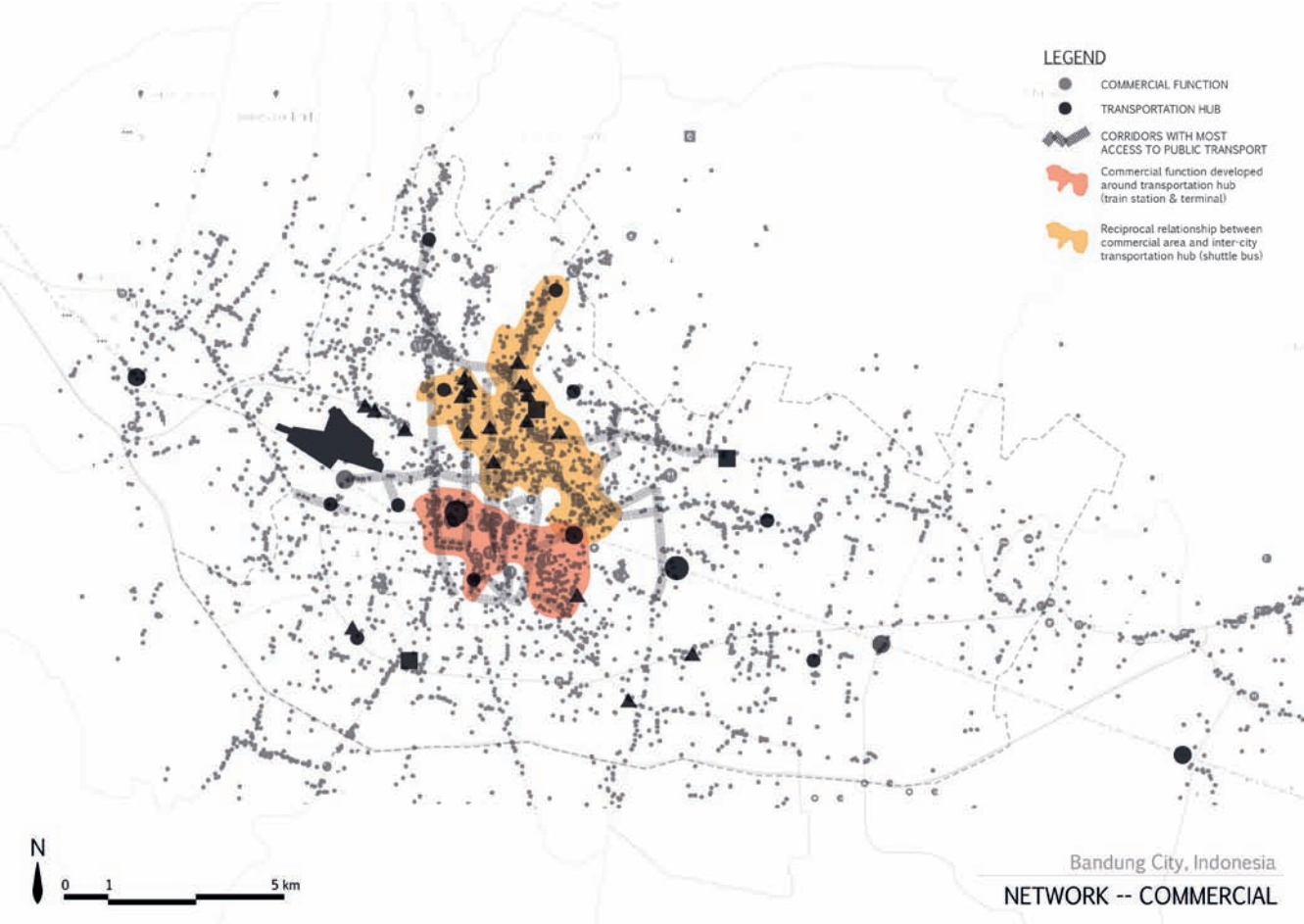
CONCLUSION ON ANALYSES

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.

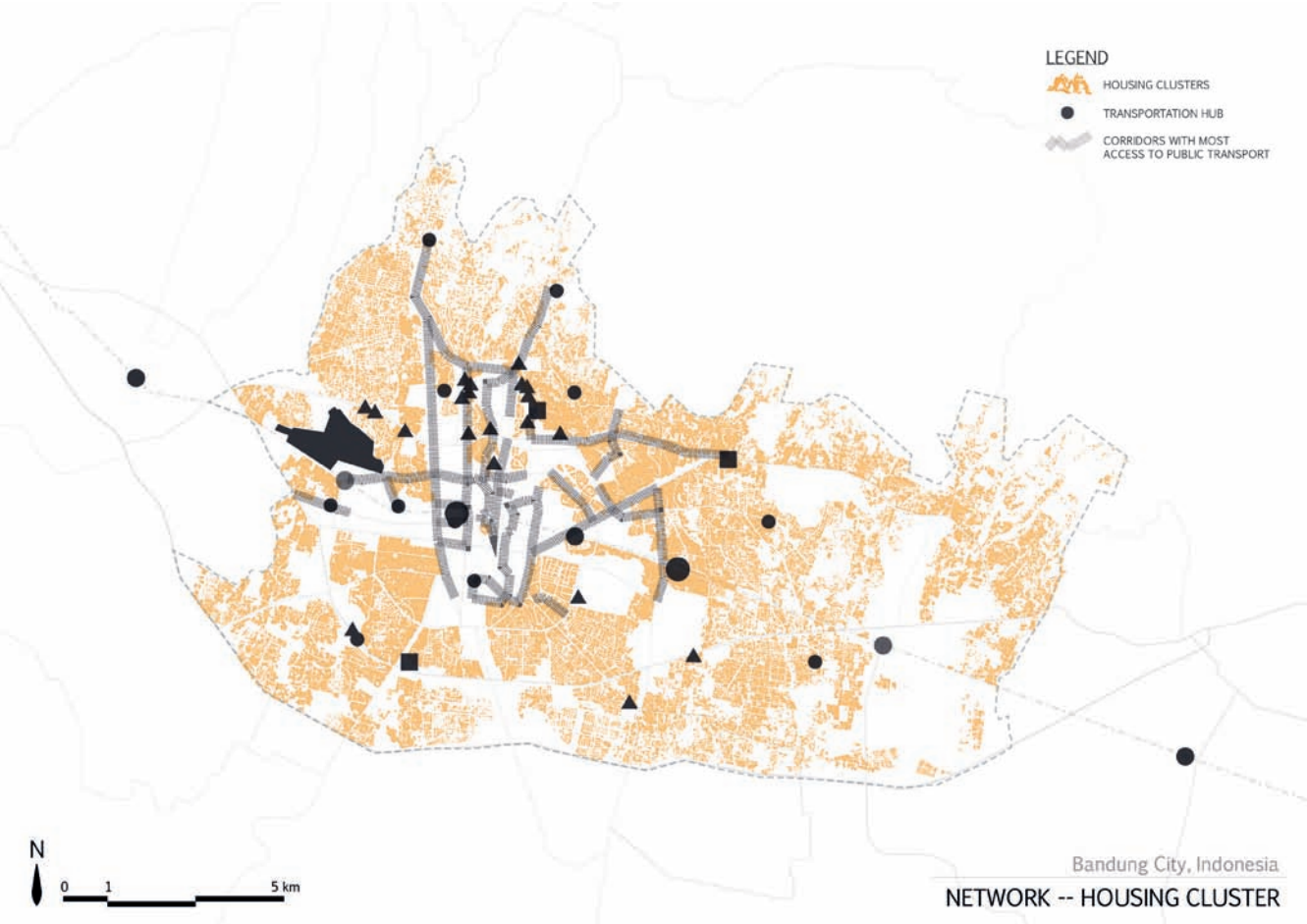
1. The fact that most of the urban facilities and services are located in the city centre confirms the monocentricity nature of Bandung City.



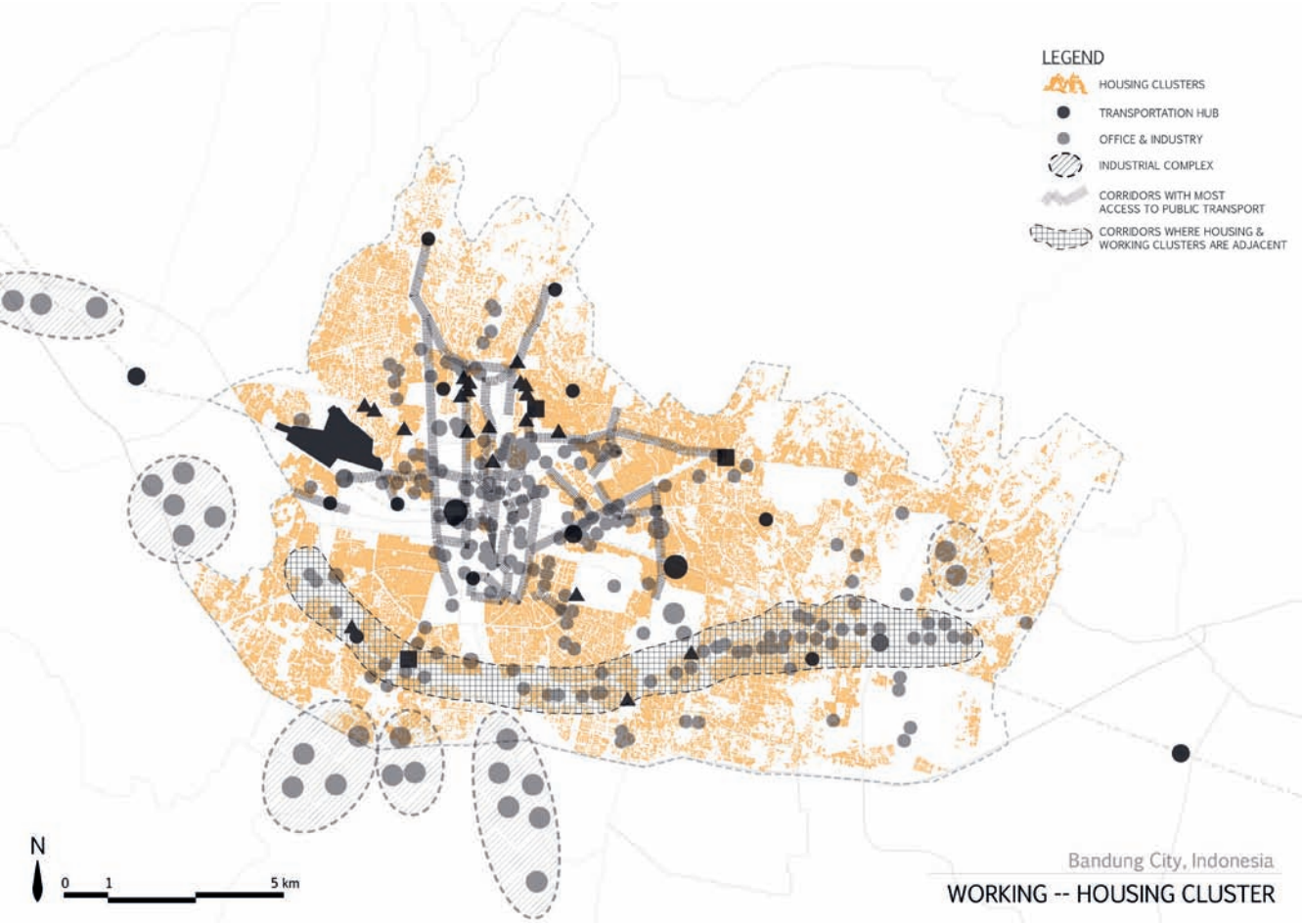
2. Although most of the working-clusters are located in the city centre and around the area which is well-served by public transport, most of the industrial areas are located 'off-grid'. Furthermore, there is also an indication on linear development of offices along Soekarno-Hatta corridor. Most probably,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



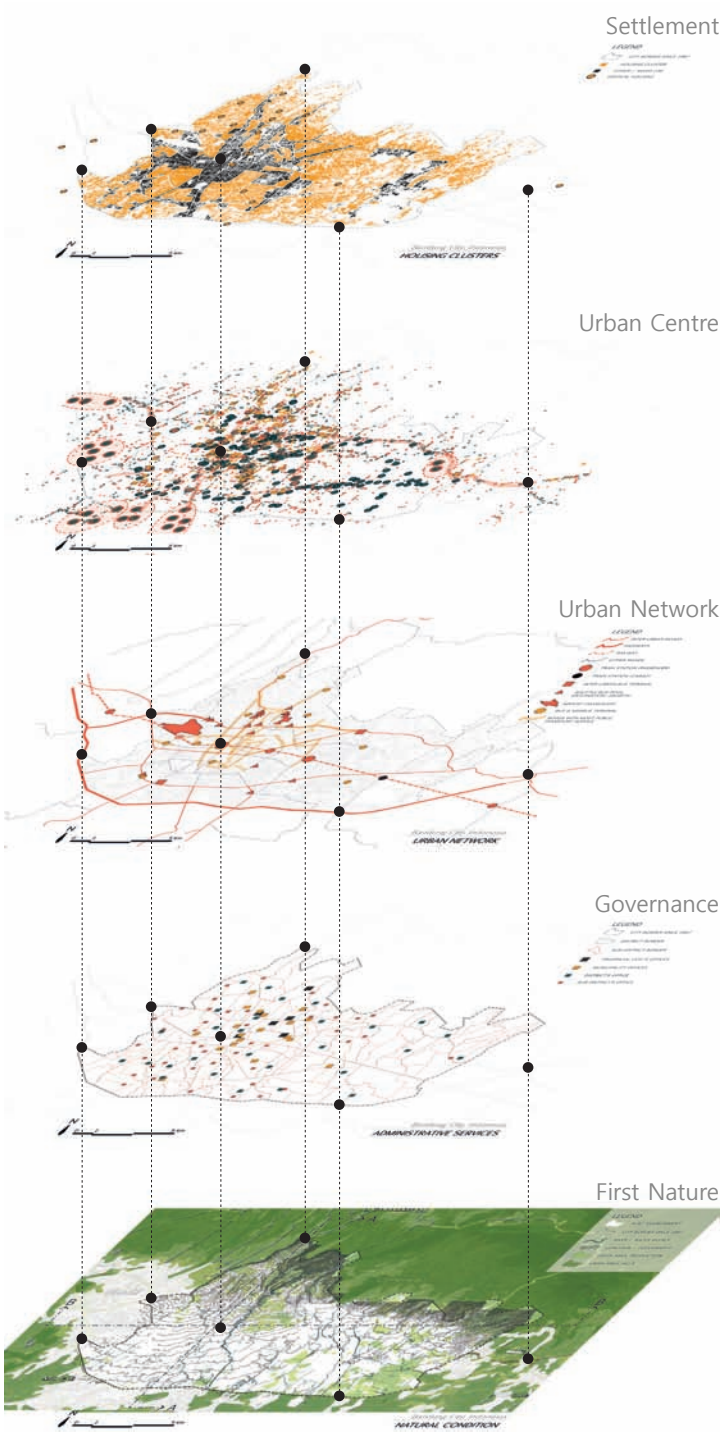
3. In its relation to mobility infrastructure, the commercial facilities are divided into two groups. The first one is located around Central Station, with high accessibility by public transport. The second cluster is situated along and around Dago Street and Cihampelas Street. Although this cluster 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.



4. 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.



5. 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.



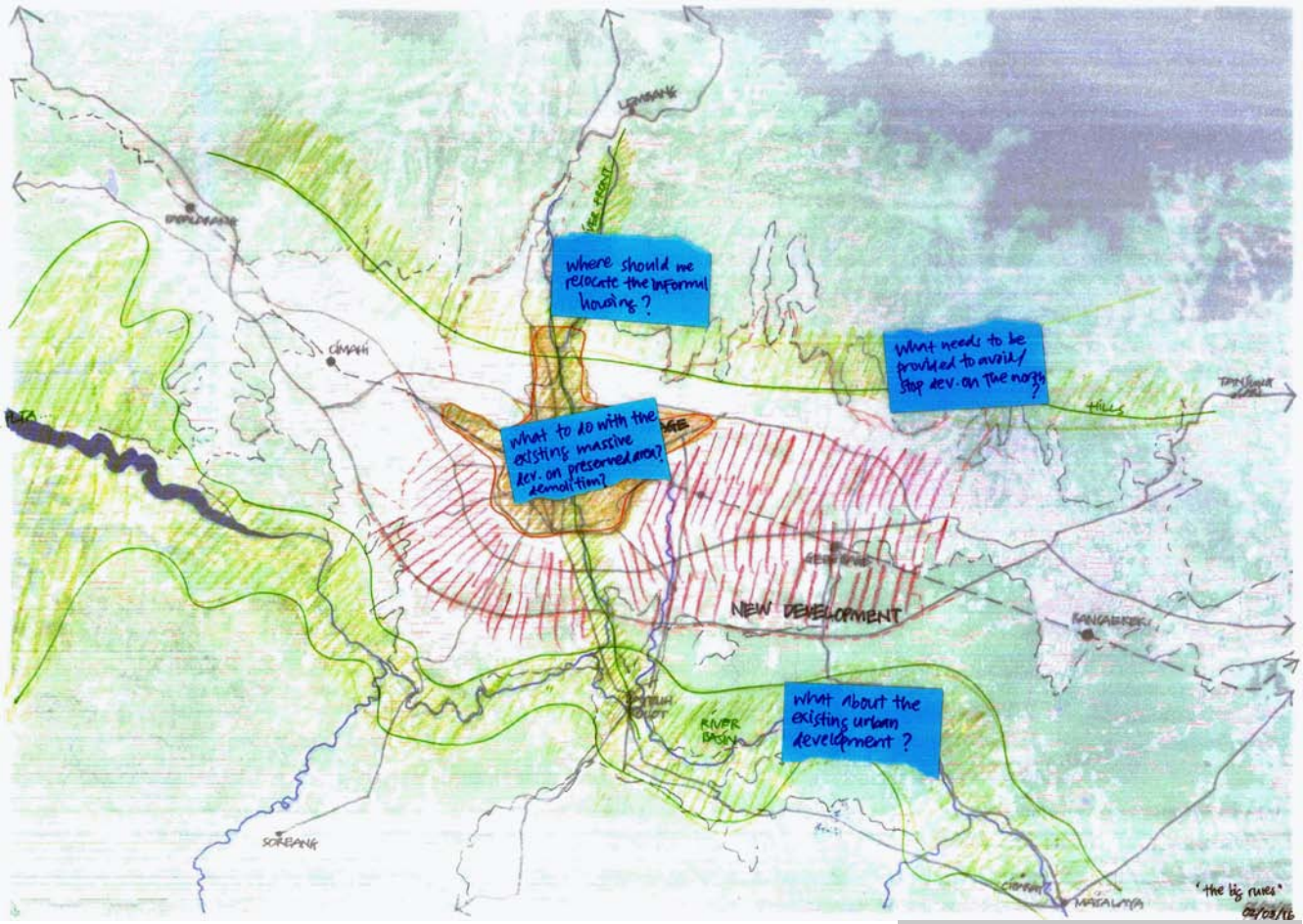
Conclusions of the layered analysis

strategies

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 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.

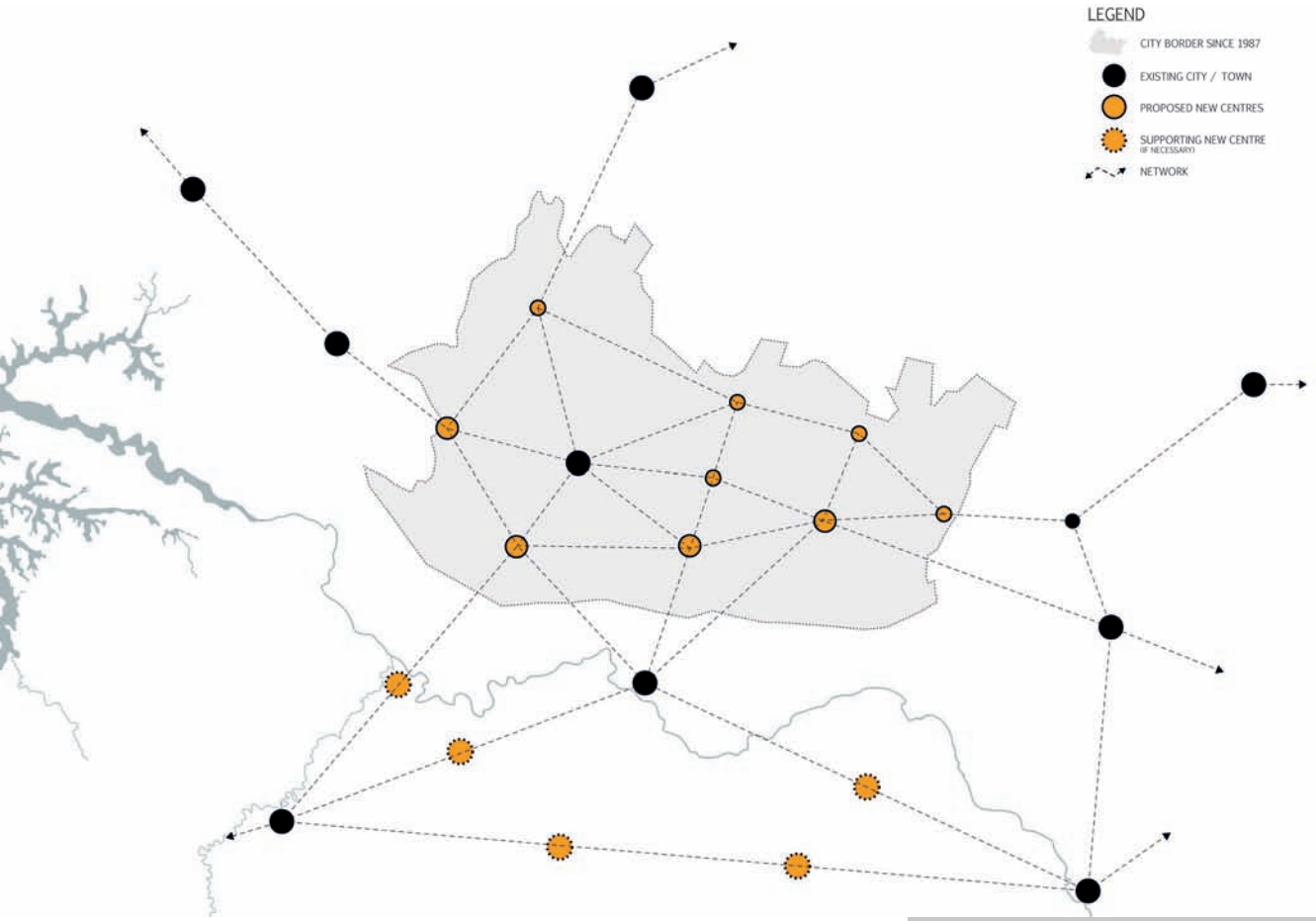
Sustainable urban development has been a renowned jargon in spatial planning in Indonesia. Nevertheless, the implementation of the jargon is another thing. Most of the spatial plans have been done more in a non-participatory manner. Often, if not always, stakeholders are not involved (or informed) in the decision making process. 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, 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.



Illustrated Development Framework

In terms of spatial planning, the municipality has provided detailed spatial plans in city scale, supported with 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 development framework, structure vision, development guidelines, and implementation strategies.



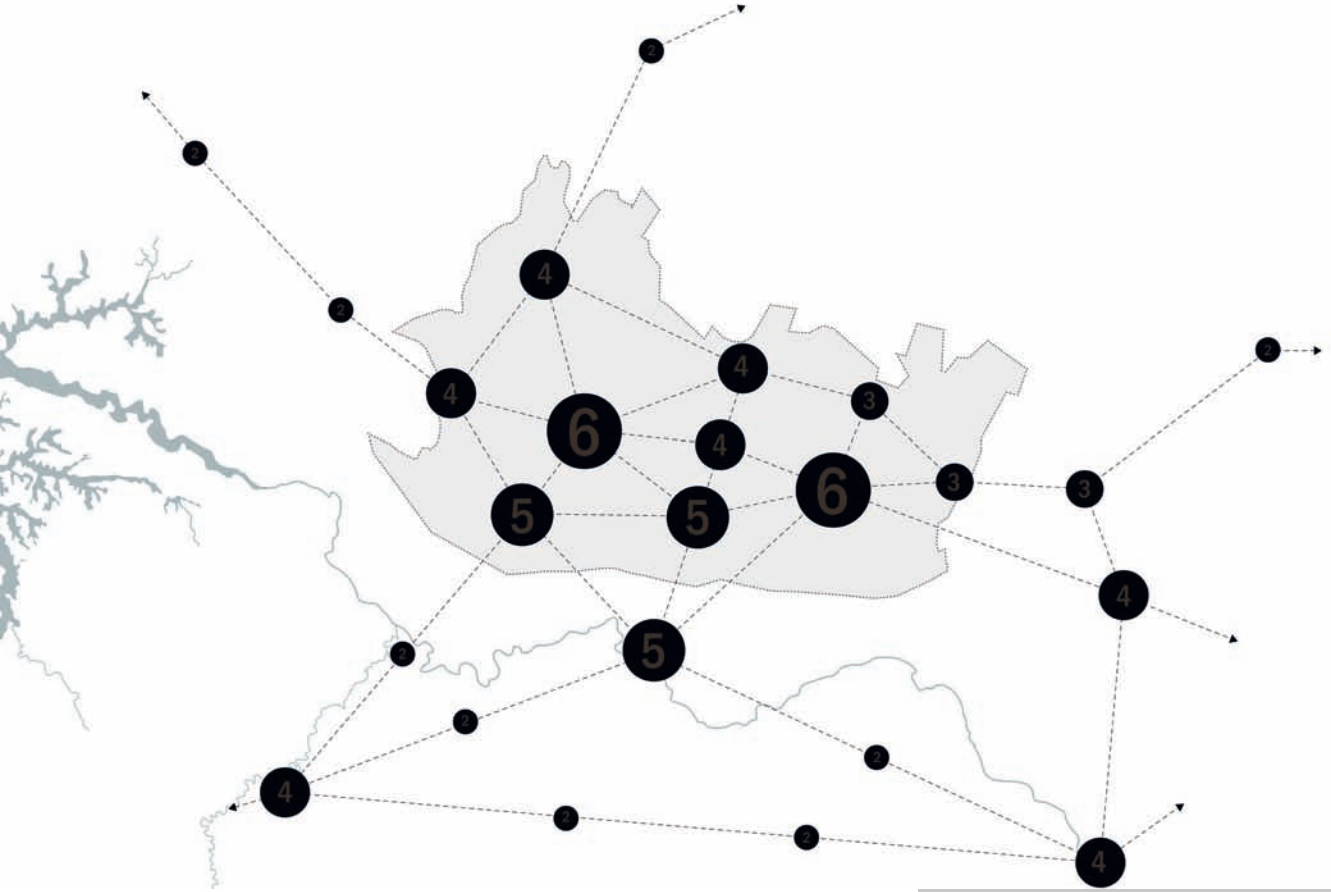
Proposed location for new centralities in Bandung City

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



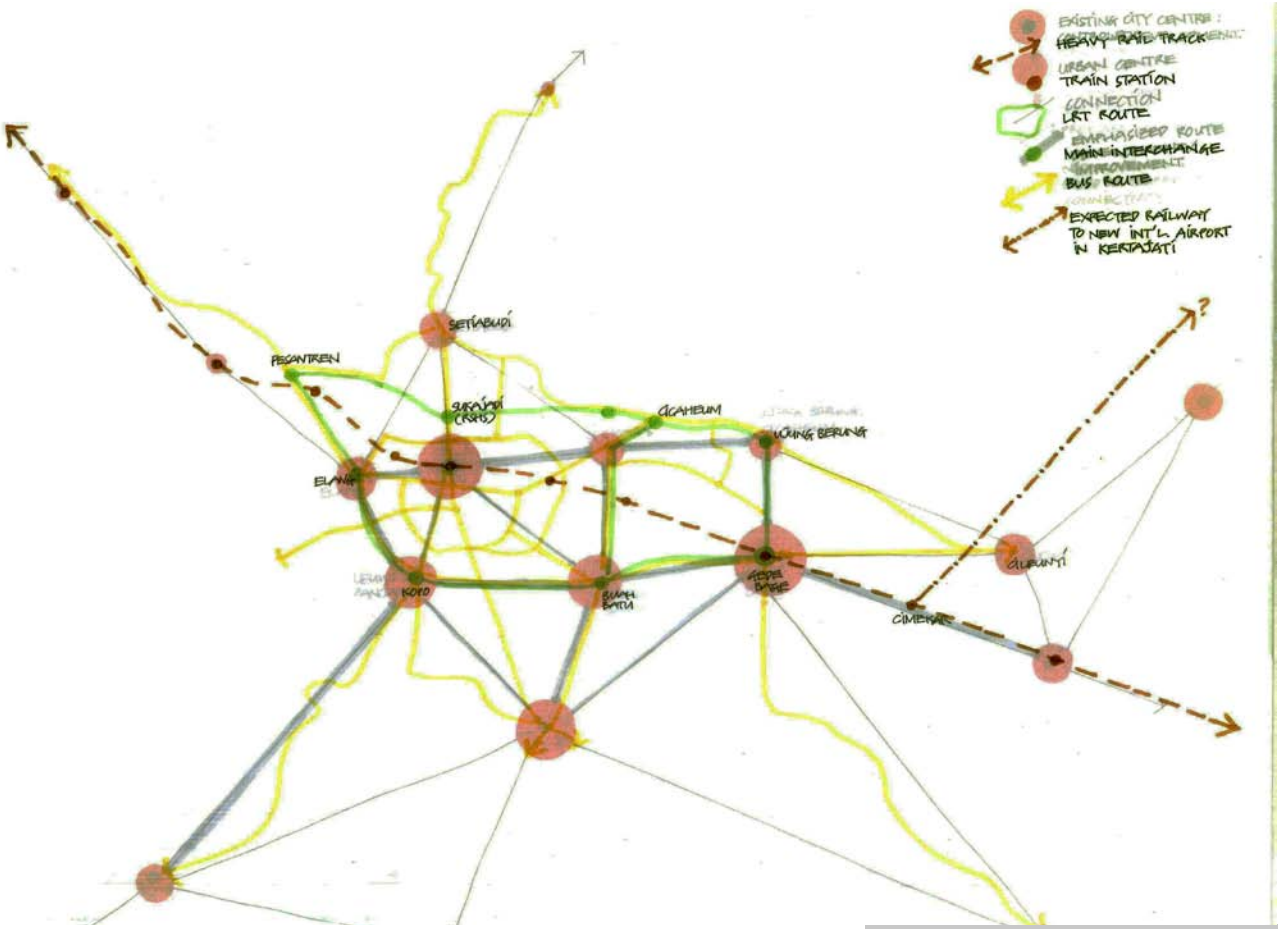
Size of centrality based on degree of connectivity

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 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 the facing page illustrates the location of new centralities, which are mainly



Development guideline for connectivity network

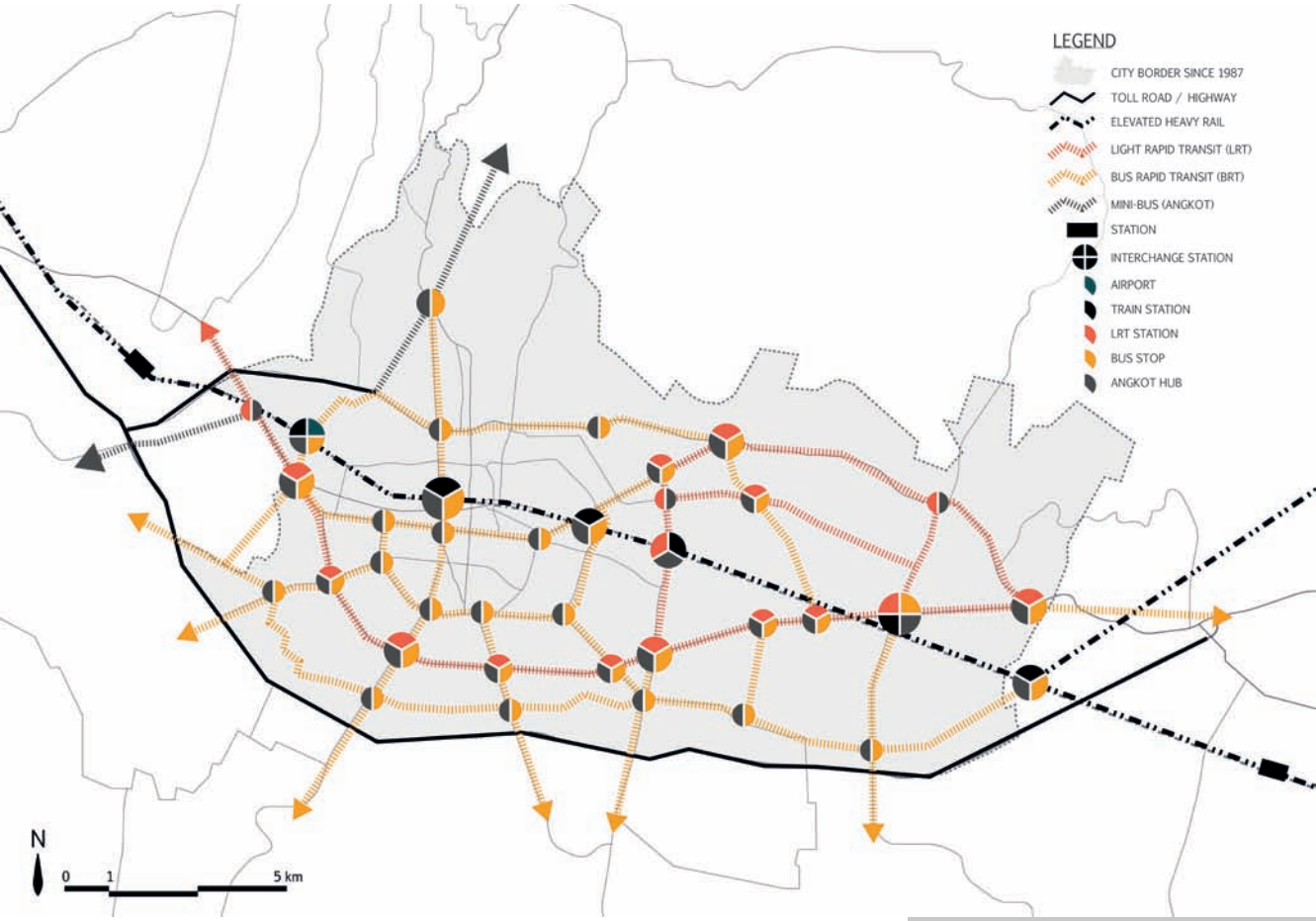
located between two existing centralities. The new centres are proposed to perform as an intermediary centre to minimize travel distance (both in kilometres and in time).

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 through 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

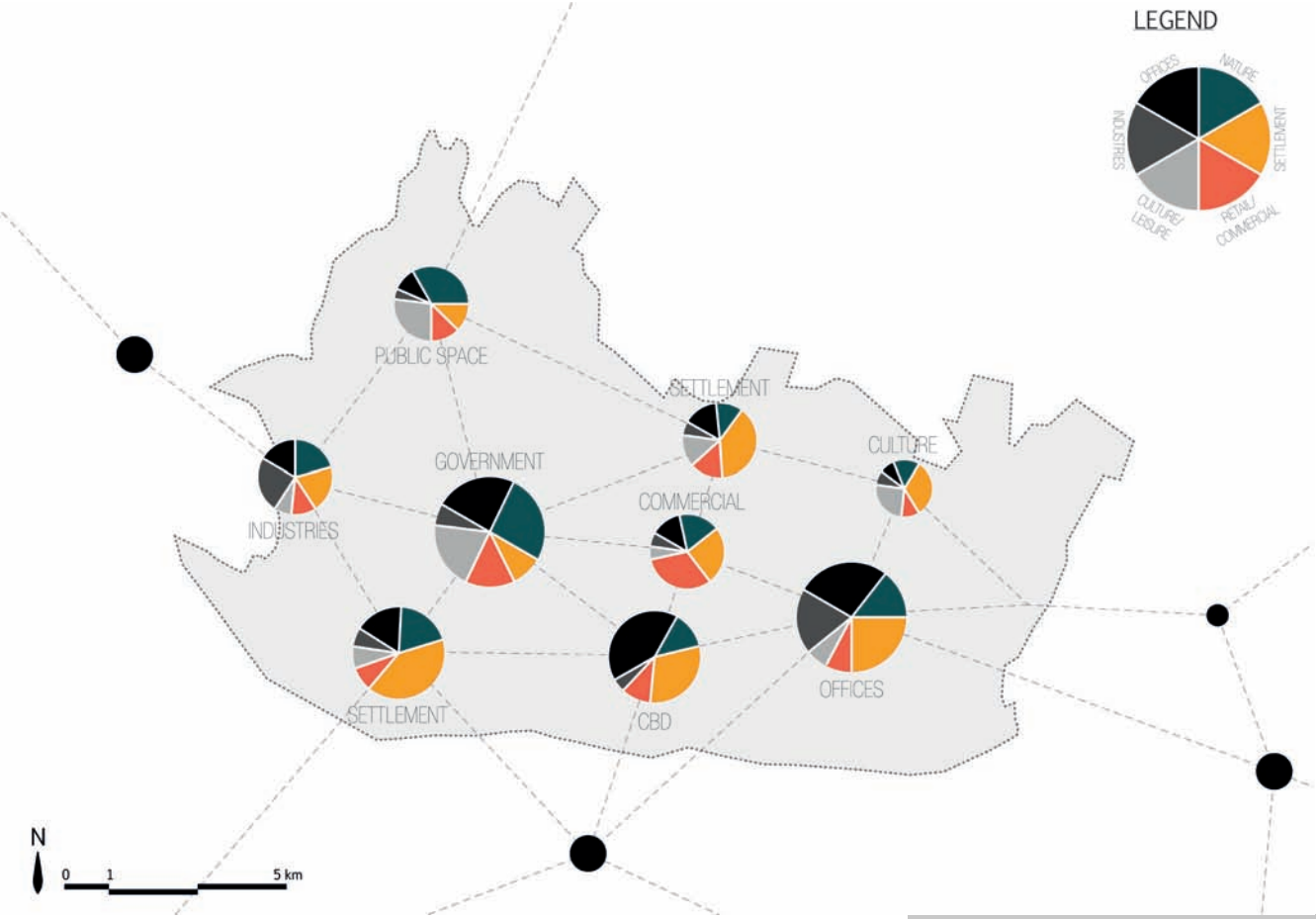


Development guideline for transportation links

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. Numbers of

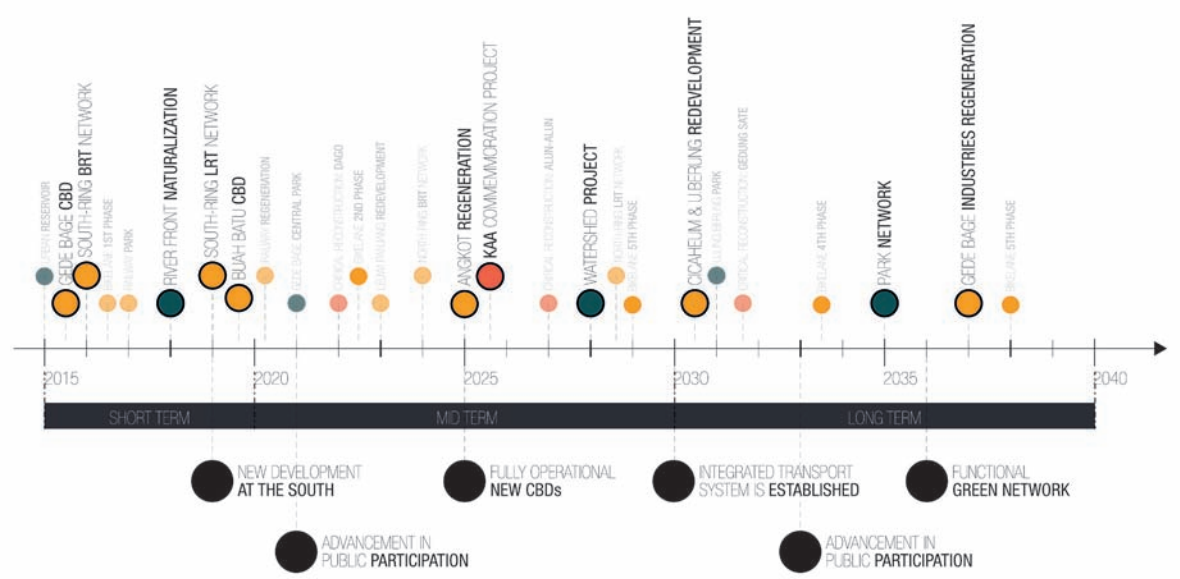


Development guideline for new centralities: programming

interchange stations are located along the routes and will be used as the main hubs of the TOD.

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 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



Implementation strategies
2015 - 2040

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.

(see illustration on previous page.)

IMPLEMENTATION STRATEGY

In addition to the development framework, this project is also intended to pose an implementation strategy comprises sets of projects and urban interventions. These urban interventions are structured in a timeline of 25 years, with "ease of access", "better environment quality", and "active citizen participation" as the ultimate goals. The 25-years timeline is divided into three terms, the short term interventions will take place in the first five years (2015 – 2020), followed by the mid-term interventions in the next ten years (2020 – 2030), and completed by the long-term interventions from 2030 – 2040 on.

The short-term strategy consists of development projects on the southern part of the city as well as the new public transport infrastructure establishment. These projects are crucial to shift the development trend from the city centre.

By halfway through the mid-term period, new CBDs are expected to be operational, supported by BRT and LRT network. In addition to that, regeneration on "angkot" network is also expected to start by this time. This particular intervention might take a lot of resources. Since the drivers are more likely to be opposing any plans which are not beneficial for them, dialogues need to be initiated as soon as possible. Had the effort to integrate "angkot" to the new transportation network and system succeeded, an integrated transport system can be established by the end of the mid-term period.

The long-term interventions are mainly concerning urban water system issues. Not only this issue will take longer time to be resolved, but also it involves more multidisciplinary experts and multi-level stakeholders. Smaller efforts towards better environment quality, especially in lowering the flood risk, may be started within the short-term period. However, a functional green-blue network may take more time to be established.

key project

KEY PROJECT

The key project is located in Gede Bage area, on the southeastern 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.

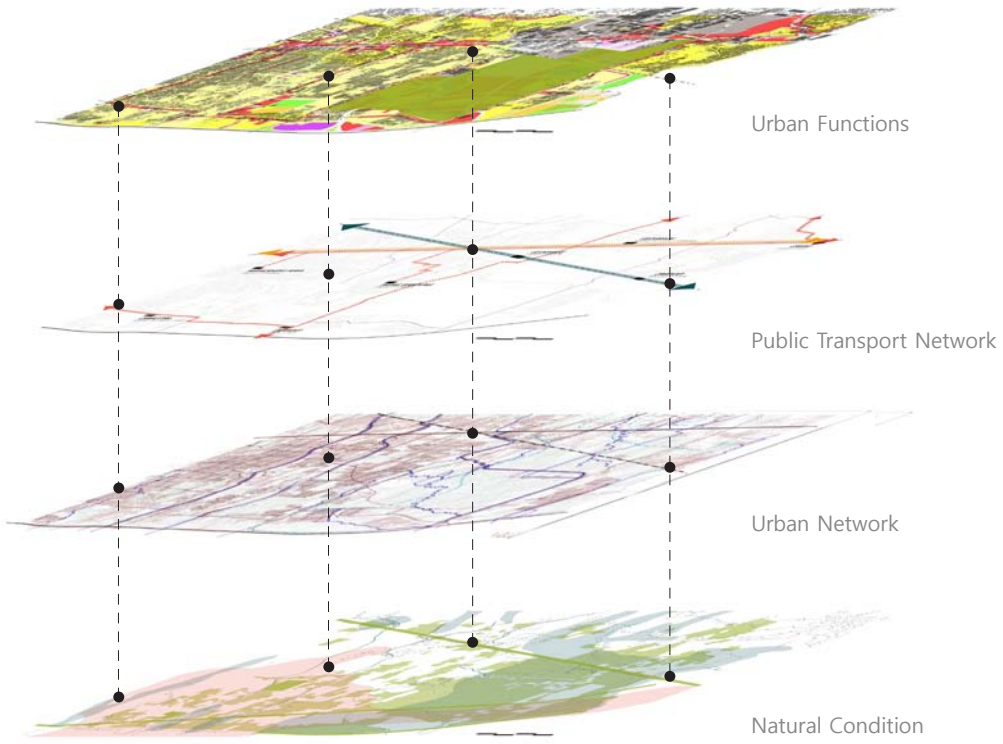
In order to achieve a thorough understanding about the project area as well as the impact area, analyses were done in both scales using DLA as an analytical tool. The site visit findings are also taken into account in this analysis.

GEDE BAGE DISTRICT

Gede Bage district is projected to be the new centre of development by the municipality of Bandung City. The development theme for this district is "Technopolis", which was set by the government but will be interpreted differently in this particular project. This area has been promoted as the new centre for nearly 10 years, but the development has never taken place.

Natural Condition

Located on 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 is also caused by ground water harvesting for industries, which later sagged the soils in this area.



Layered analyses on Gede Bage District

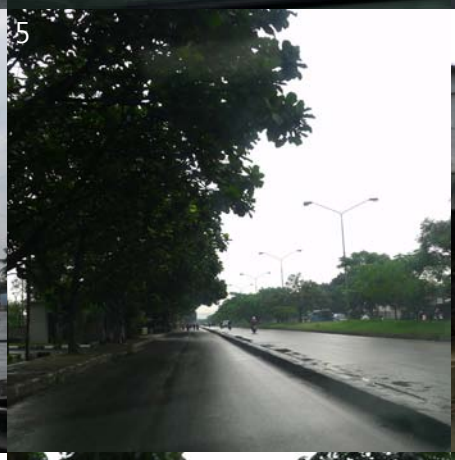
Gede Bage used to be an area with a vast agricultural land in the form of rice fields. Most of the rice fields are located on the lowest area and suffered from flood risk. The flood risks remained unnoticed until numbers of settlements were built in Gede Bage.

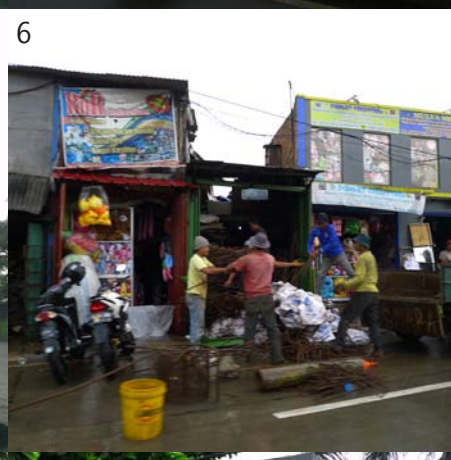
Urban Network

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

Urban Functions

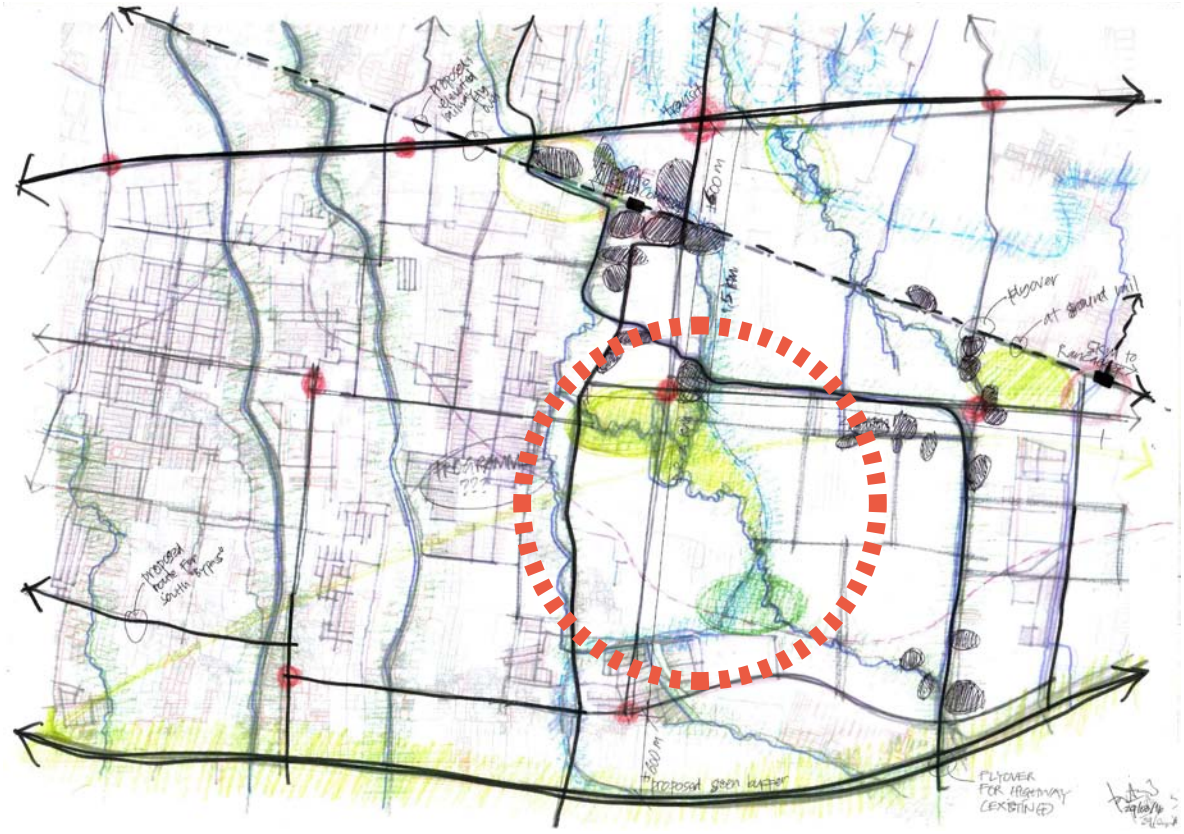
Most of the land-use along Soekarno Hatta Avenue is occupied by offices, small retail spaces, showrooms, and other services





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 street's profile
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)

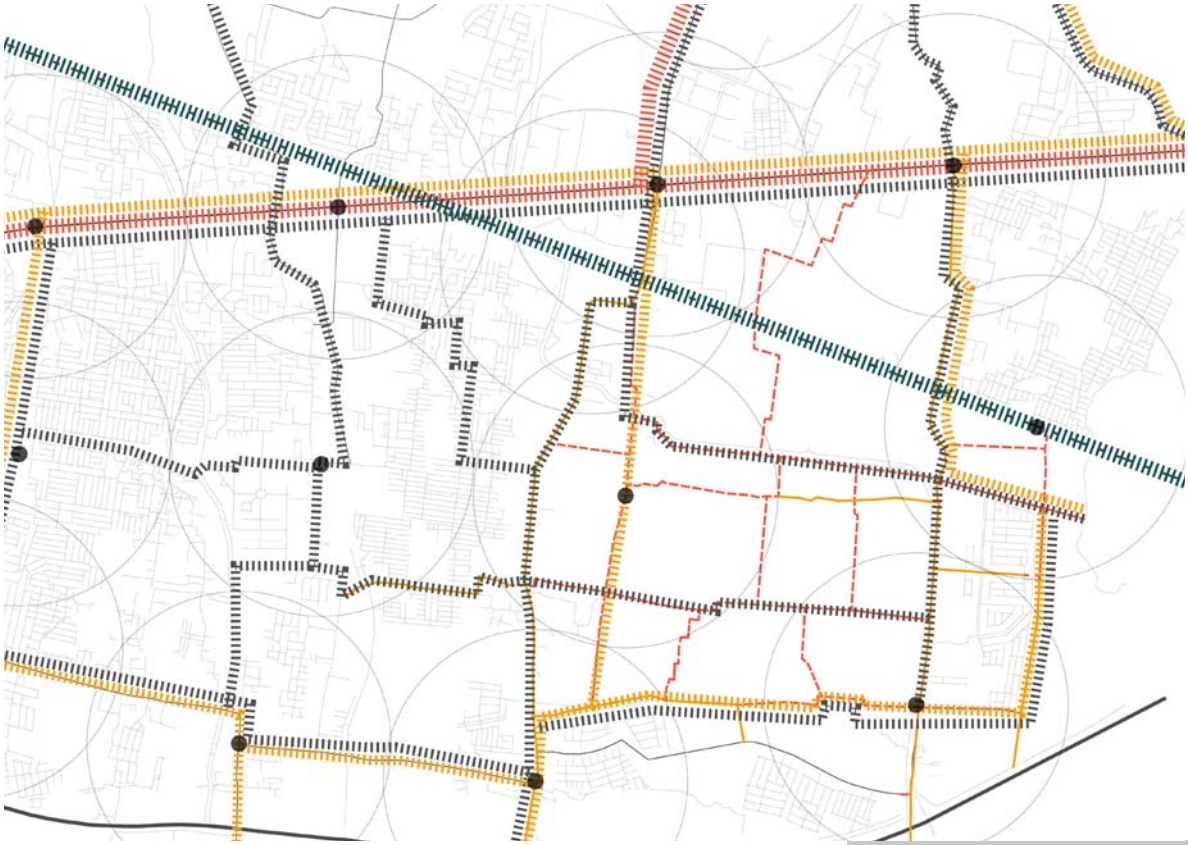


Proposed development framework for Gede Bage area

(insurance, bank, etc.) and settlements are found on the "pockets" behind these buildings. Informal retails 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 4 storeys.

DEVELOPMENT FRAMEWORK

Gede Bage District will be developed with "Technopolis" theme. In this particular project, this term is interpreted "an area which utilizes technology as a tool to achieve sustainable urban development". This theme will be more specifically related to technology in water management to cope with the site's specific challenge: floods. The circled area on the illustration above is planned to be the core of the water management research and design institution, where numbers of facilities (both built and unbuilt) is provided as the research laboratories.



Proposed network for Gede Bage area

Network and Transit

The development in Gede Bage District will be supported by an adequate transport facilities such public transport network (BRT and "angkot") and new routes. The new routes are not only dedicated for 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.

Programme

Each TOD nodes will be developed according 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 more domestic functions such as local shopping centres (or market),

Proposed new programming on each TOD point in Gede Bage

housing, and community centres. Each of the nodes are required to provide adequate (well-designed) open space that will perform socially and environmentally.

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

Key project's location: Gede Bage intersection

KEY PROJECT: GEDE BAGE INTERSECTION

Site Analysis

Gede Bage intersection is one of the main intersections along Soekarno Hatta Avenue. Several small rivers are passing through this area, some of them are utilized for rice field irrigation. Numbers of industrial estates are located within this area and make use of the water from these water bodies as well.

There are two existing main transportation hubs in this area, which are Gede Bage "angkot" terminal and Gede Bage dry-port (marked with yellow dots on the map). The terminal is located adjacent to one of the primary traditional markets while dry-port is served by railway network.

Potential areas for development (vacant & to be consolidated)

Potential Areas for Development

Although most of the areas within 800 m radius from the intersection are already built, some vacant spaces are likely to be found. Several building plots are also potential to be consolidated for urban redevelopment. The highlighted areas on the map above illustrate the potential areas, which consists of existing built-up, vacant space, and rice fields.

Existing land use and function

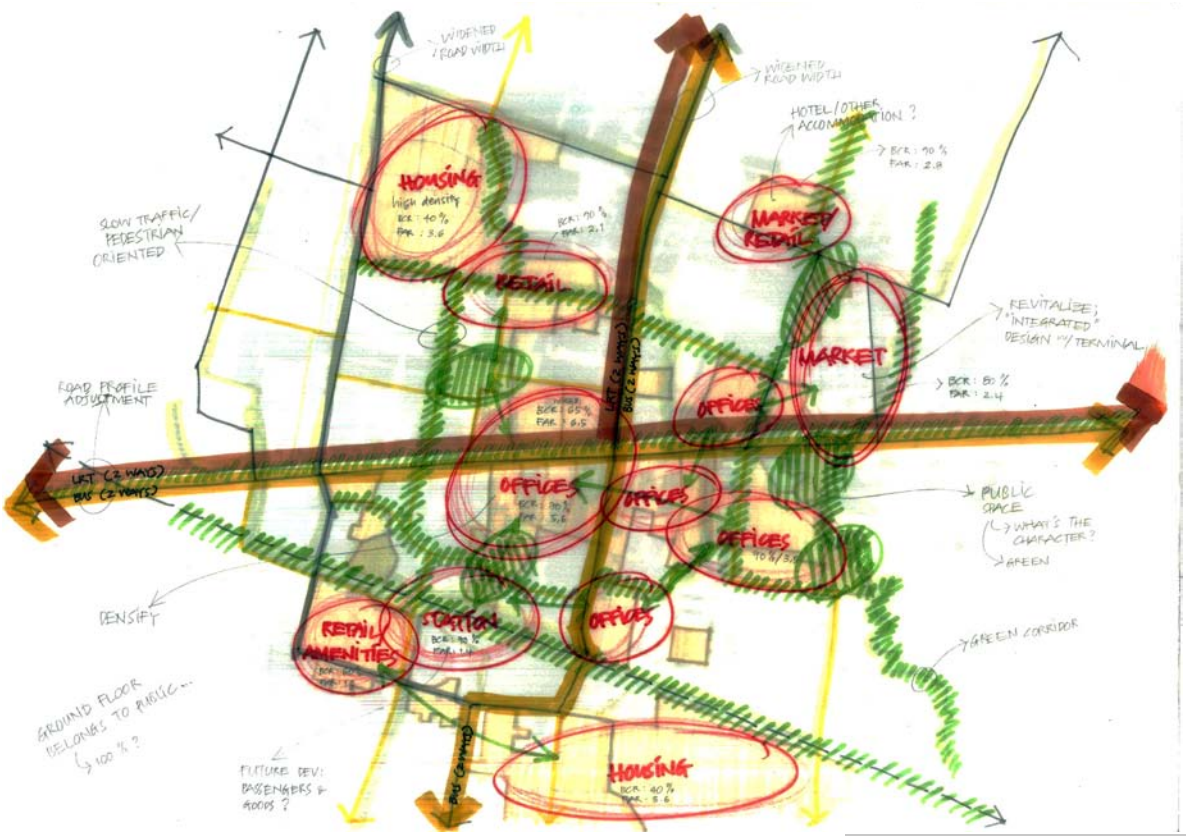
Existing Land-Use

There are five main land-use found in 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.

Stakeholder mapping based on existing land ownership

Stakeholders

The land in 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 on the illustration above is the map of estimated land ownership based on information available online.



Conceptual programming of the intervened area

Programming

The new programming in 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 offices and other business facilities around it. Land consolidation is required to allow this development to happen. The land intensification (or densification) is to be done following current GFR and FAR regulations from the municipality.

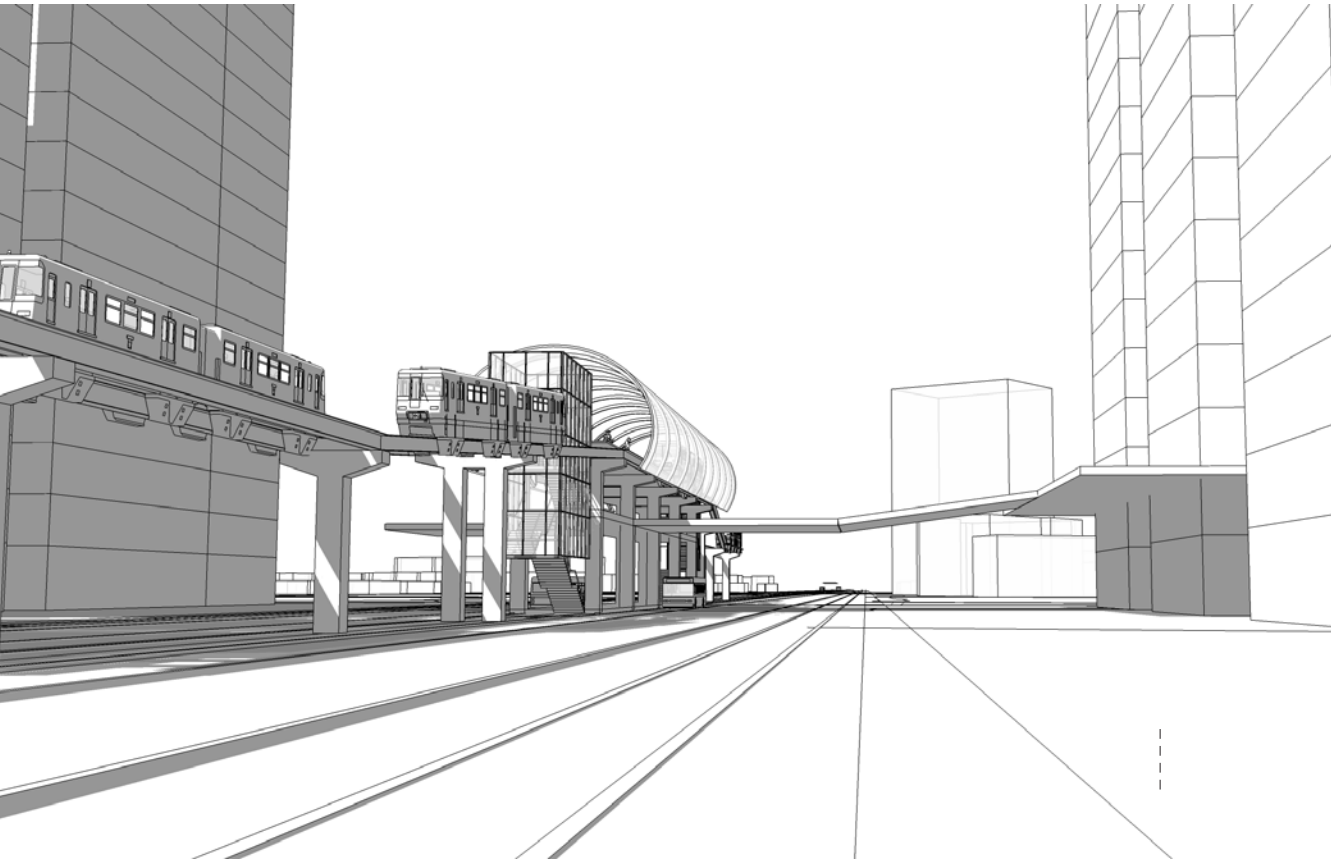
Green network in this area is established by providing green strips along the streets, parks, green pockets in the existing settlement areas, and green corridors along the water bodies.

Aerial view of the proposed intervened area

Design Proposal

As previously mentioned, the development within this area comprises offices and business facilities, settlements, and mixed use facilities around transit node. Land intensification is proposed especially in the building plots along Soekarno Hatta Avenue because this corridor will be serviced by a more integrated public transport system consists of LRT, BRT, and "angkot". The new transit hub is located within walking distance from the existing "angkot" terminal as well as the railway station. Numbers of walking routes are proposed to connect these hubs.

The development is attempted to be "neighbourhood" friendly, as the existing functions is maintained to be co-existed. Therefore, existing housing area and urban villages are kept as one of the distinct elements in this area. Although the eviction is very much prevented, urban regeneration interventions such as infrastructure improvement programs for roads and sanitation will be carried on. New housing project will be established especially on the northwest part of the area. These housings will be a mid-rise housing complex of six storeys high. Furthermore, some vacant areas, especially those adjacent to the river, are reserved to perform as an ecological buffer.



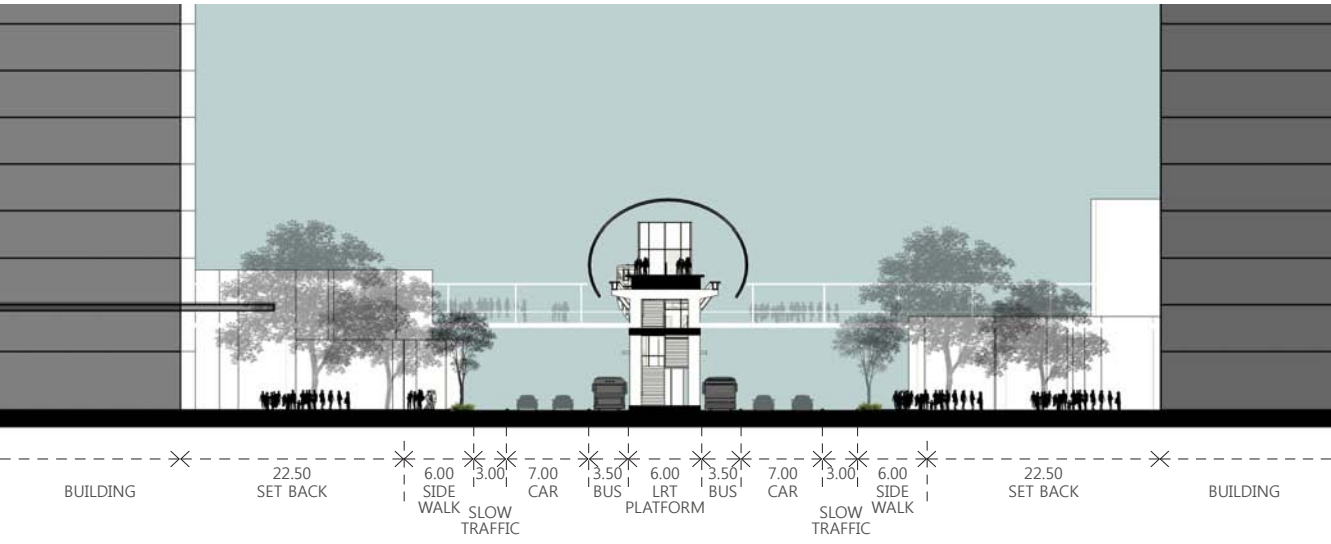
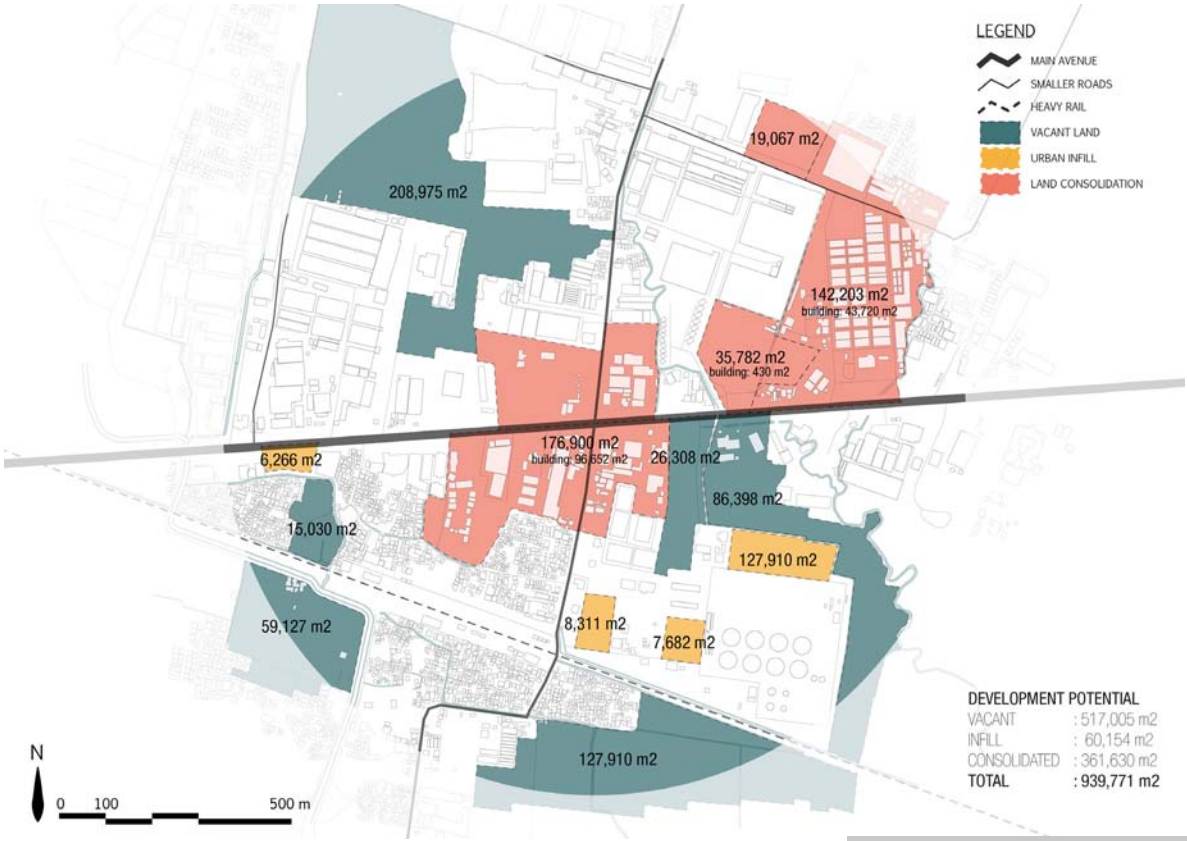


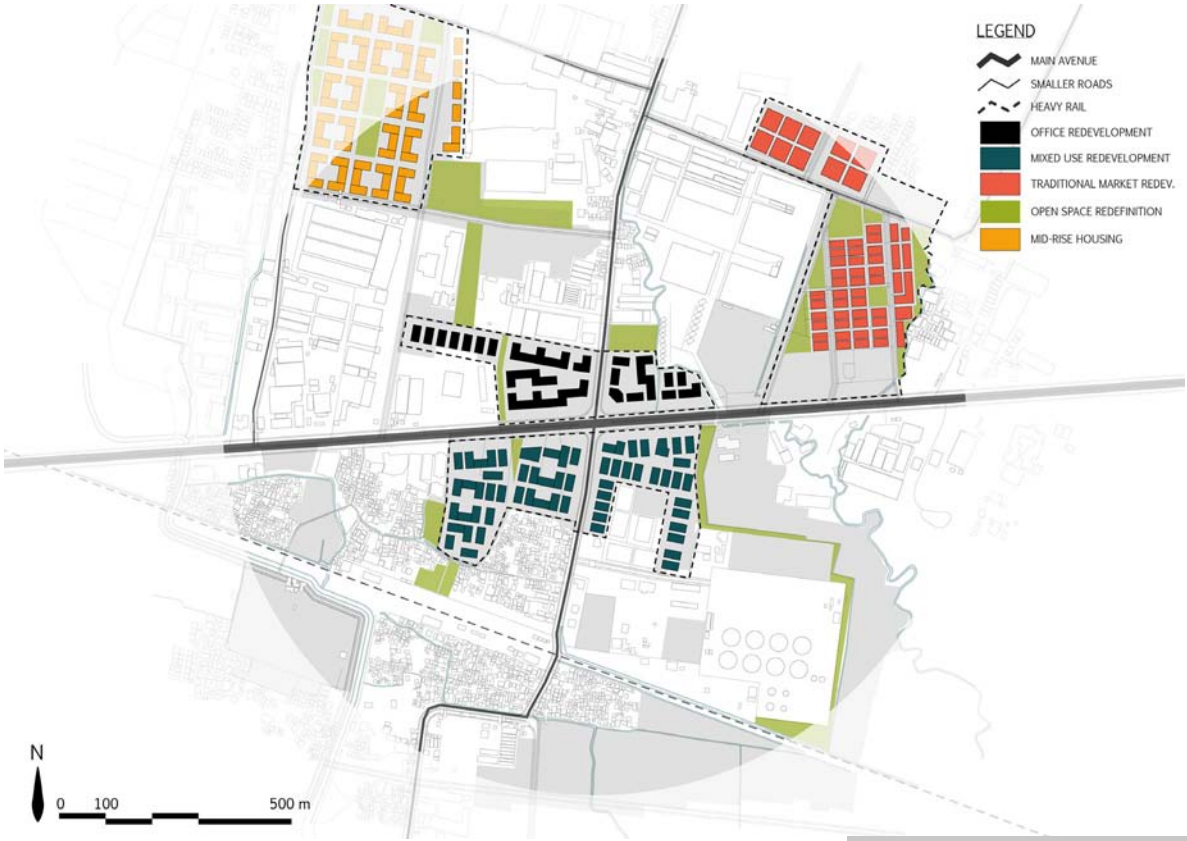
Illustration of the relation between transit node & building functions



Potential areas to be developed

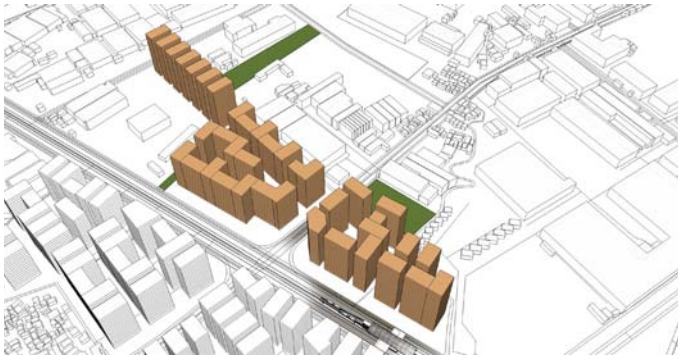
Development Volume

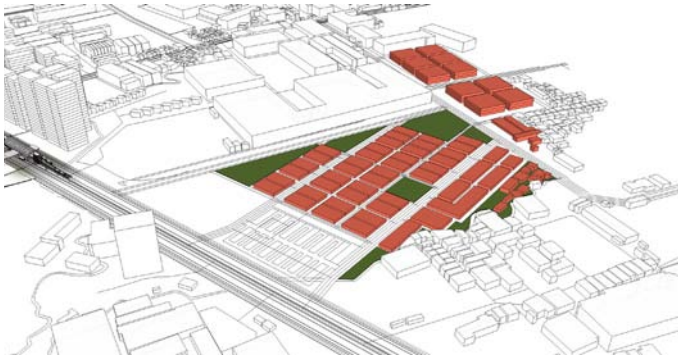
As the development is very depending on the financial, physical, and social resources, it is important to have a rough estimation on the development volume. It is not only about how much money will be spent to establish the plan, but also how many things that need to be consolidated and collaborated. The image above is showing the type of development potentials and its volume.



Possible development volume within the area of intervention

However, the development will also provide some revenues, whether it is for the municipality (in form of taxes), for the developers (in form of rent and lease income), for the companies (in square meters of office space), as well as for the communities (as measured in housing units and public space). The image above illustrates the new development that will be established in this area, while images on following page are pointing out the development volume for each types of function.





DEVELOPMENT VOLUME

OFFICE REDEVELOPMENT

GROUND FLOOR	: 23,442 m²
TOTAL	: 401,220 m²

MIXED-USE REDEVELOPMENT

GROUND FLOOR	: 39,320 m²
COMMERCIAL	: 79,702 m²
OFFICES	: 483,296 m²
HOUSING	: 77,544 m²
TOTAL	: 640,542 m²

TRADITIONAL MARKET REDEVELOPMENT

BUILDING	: 20,000 m²
ANGKOT TERMINAL	: 27,556 m²

OPEN SPACE REDEFINITION

TOTAL	: 99,108 m²

MID-RISE HOUSING DEVELOPMENT

6 STOREYS HOUSING

GROUND FLOOR	: 38,880 m²
TOTAL	: 233,280 m²
(6,480 UNITS)	

3 STOREYS RETAIL

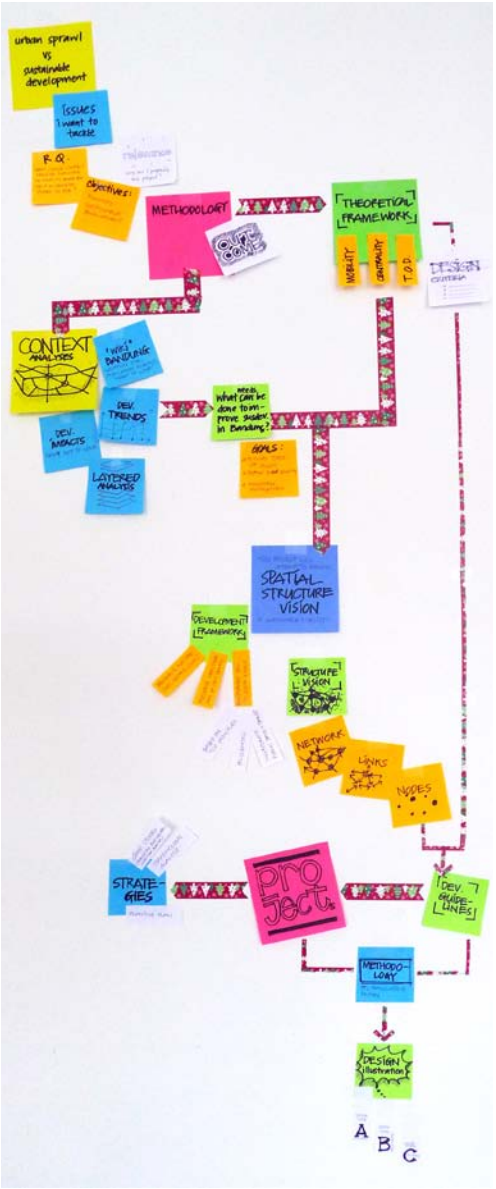
GROUND FLOOR	: 3,888 m²
TOTAL	: 11,664 m²
(36 UNITS)	

conclusion & reflection

CONCLUSION & REFLECTION

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.

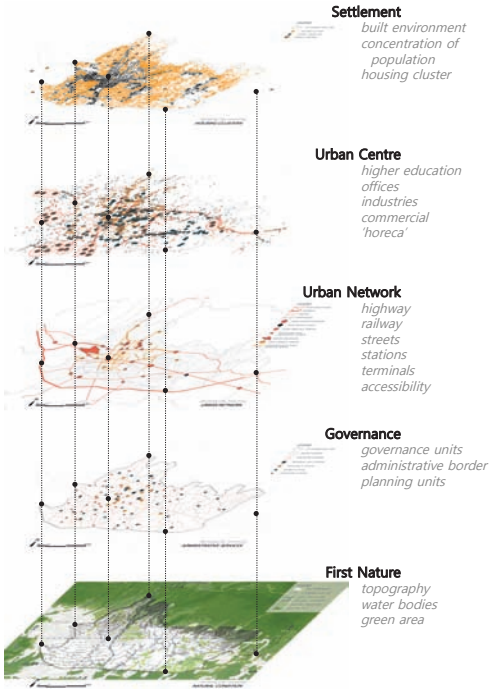
At the very beginning of the graduation year, I chose Complex Cities as the main research group. I see my project as a multidimensional project, which will affect and involve numbers of different stakeholders at different scales. Moreover, I would like to delve into the planning process and the planning 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

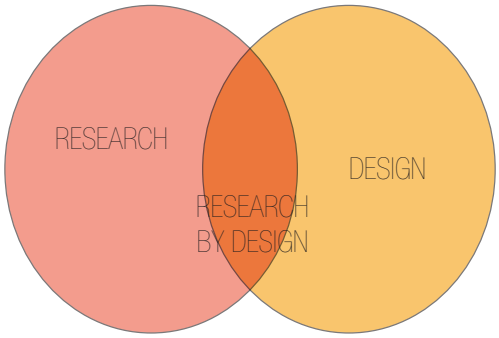


the need of green public space within the city. However, I think it is highly important to be selective when it comes to choosing relevant layers. Although there are a lot of things which might seem to be relevant, not all of them are important and at the same priority level when it comes to analysis. 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. First, I have a feeling 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. The layered approach got me far especially with the analyses on built environment and network. However, 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.

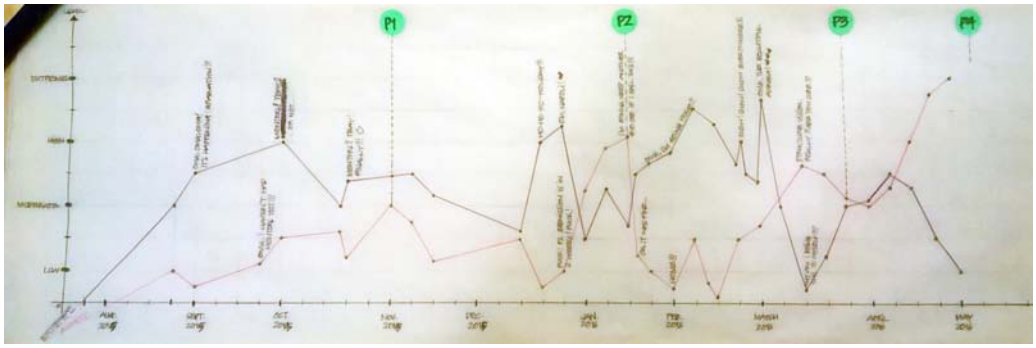
Secondly, given the fact that I am working on a site 12,000 km away from the university and especially with the limited amount of time, there are things that I cannot observe thoroughly during the site visit. The site visit, which was conducted after P2 presentation, was somewhat ineffective in terms 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 am still attempting to do so, I would like to break down the analysis into several key issues so that it is manageable to be done within the remaining time

schedule. The case study will then only focus on the success stories and for specific issues. For example, I will try 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, Hong Kong.

The research conducted thus 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 offices 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.



appendix

Dispersed Concentration

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

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Graduation Lab Urbanism Conference

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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

1 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.

2 '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).

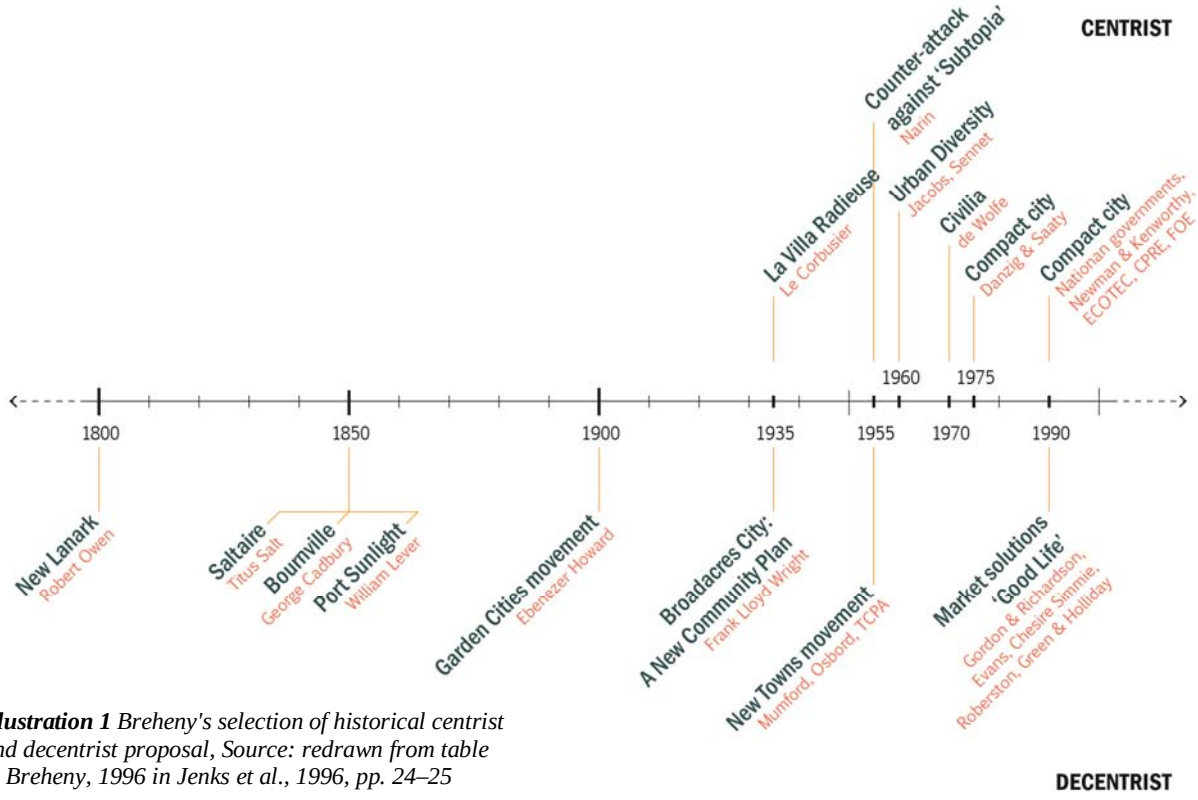

Illustration 1 *Breheny's selection of historical centrist and decentrist proposal, Source: redrawn from table in Breheny, 1996 in Jenks et al., 1996, pp. 24–25*

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 Le 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.

3 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 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,

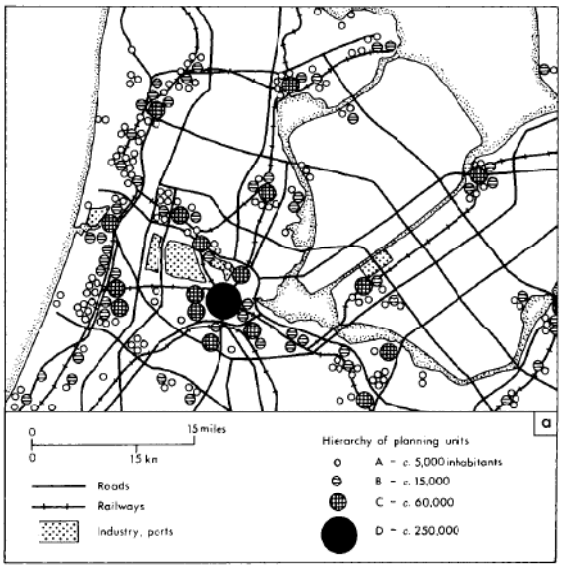

Illustration 3 *Principle of 'deconcentrated concentration' as posited in the Second Report on Physical Planning in the Netherlands, Source:Hall, 2002, p. 180*

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 Fransisco), 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 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

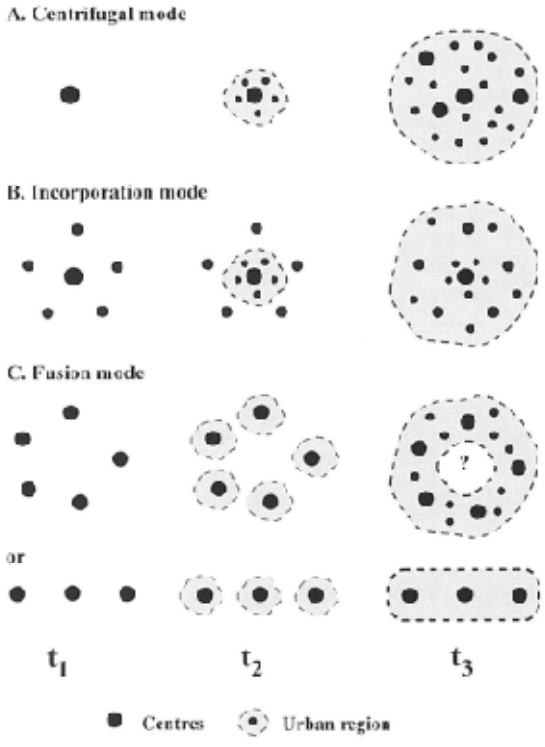

Illustration 2 *Champion's evolutionary model of polycentric urban region, Source:Champion, 2001, p. 665*

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, 20115 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).

4 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.

5 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 & 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 is the summary of both 'compact city' concept and polycentric urban model as reviewed earlier.

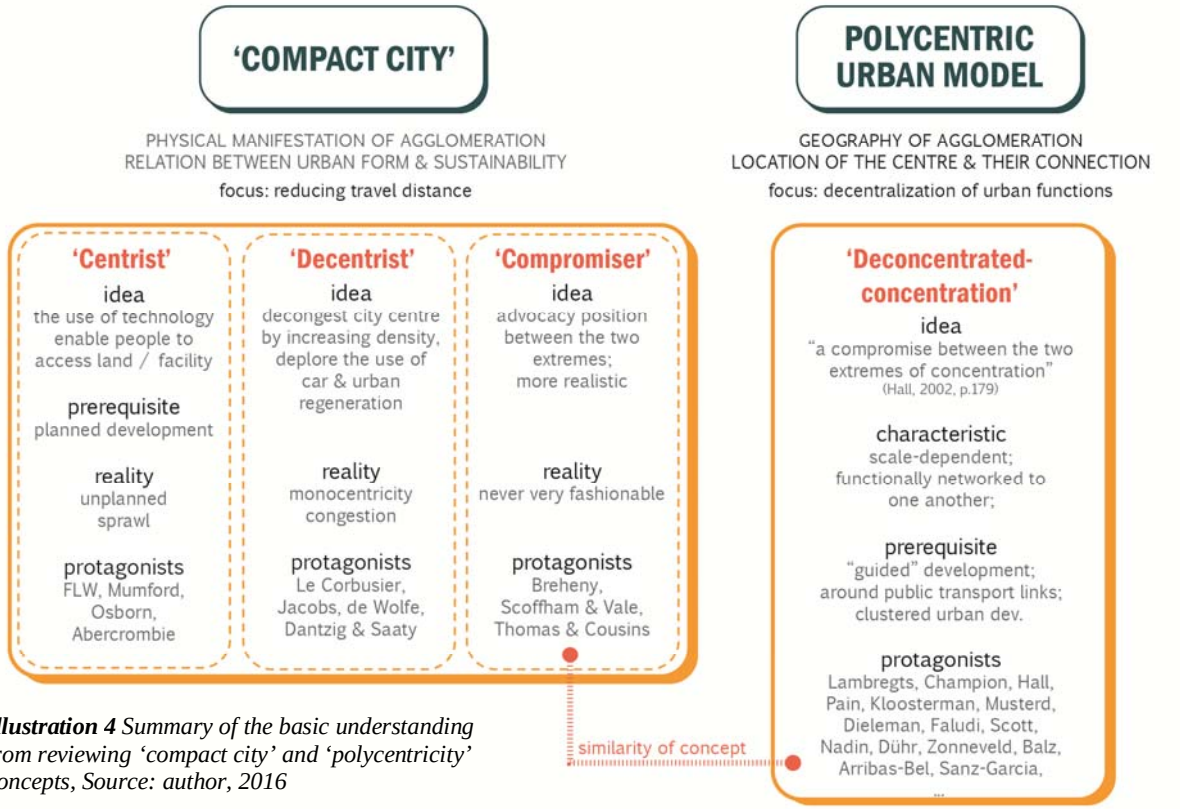

Illustration 4 *Summary of the basic understanding from reviewing 'compact city' and 'polycentricity' concepts, Source: author, 2016*

6 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).

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