

ANALYSIS OF PUBLIC MOVEMENT ATTRACTION IN BANDUNG CITY

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***Abstract:** Bandung is one of the metropolitan cities in Indonesia and it experiences rapid area development. The development appears to affect public activities. Some areas have very busy public activities, i.e. the centers of public activities, and some others are not too busy. This is due to the differences in land uses. This study aims to find out the amount of public movement attraction of the centers of activities in Bandung City, to find the socio-economic condition of the people visiting the centers of activities in Bandung City, and to find out the traffic condition in Bandung City, according to the people who visit public activities centers. The method used in this study is the descriptive survey method, employing percentage statistical analysis. The findings of the study indicate that the area that attracts most public movements is the Cibeunying area, consisted of Coblong, Bandung Wetan, and Sumur Bandung Sub-Districts. It is because the area is mostly used for service, trading, and education purposes.*

***Keywords:** Public Mobility Attraction, Centers of Public Activities, Trading, Service, Industry, Education.*

1. INTRODUCTION

Bandung is one of the metropolitan cities in Indonesia with a rapid area development. One of the indicators of area development is the increase in population, both due to natural causes and the migration from the rural areas or other cities. The rate of population increase in Bandung is around 1.18%, or around 28,000 people per year.

In addition to population increase, area development is also indicated by the increase in the development of structures and infrastructures; such as residences, shopping centers, and road networks. Land uses will change, from agricultural uses (rice fields or plantations) into housing uses (residences); as happened in the North, East, and South areas of Bandung. The development of housing areas and residences is always followed by the development of supporting facilities, including shopping centers, sport and recreational facilities, and means of transportation.

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Area development will surely affect public activities in the area. Some areas are very busy that they become the centers of public activities. The rate of public activities in an area depends on the land uses of the area. When a land is used for trading, industry, or services, it will attract high level of public movement (activities).

Bandung city is a central business district in Bandung Raya area. Bandung Raya is the combination of regencies/cities in West Java, which is located in *Cekungan Bandung* (Bandung Basin) area. Bandung Raya includes Bandung City, Cimahi City, Bandung Regency, West Bandung Regency, and part of Sumedang Regency. *Cekungan Bandung* is a topographic area resembling a basin, surrounded by hills.

As a center of public activities, Bandung City is visited by people with high mobility from around Bandung Raya and other areas. The visitors' movements might be commuter mobility or circular mobility. Commuter mobility is usually undertaken by workers and students who work or study in Bandung City. Commuter mobility is routinely performed every day, without any intention to stay in the destination. Meanwhile, circular mobility is usually performed by the tourists who visit Bandung City with recreational purposes. The tourists usually come during the weekends or holidays. Most of the tourists come from outside Bandung City, mainly from Jakarta.

As a center of public activities, the people of Bandung City frequently experience traffic jam in the roads and streets to Bandung City, from all directions. The traffic jam constantly happens every day, from Monday to Sunday, due to commuter mobility (workers and students) and circular mobility (tourists) in the city.

Commuters causes traffic jam during the weekdays (Monday to Friday); particularly during the morning (06.00-08.00 West Indonesia Time) and the afternoon (17.00-19.00 West Indonesia Time) rush hours. The traffic jam is usually concentrated in Mohammad Toha St., Terusan Buah Batu St., and Wahid Hasyim St., as the main access to Bandung city from the south area (Bandung Regency, including Soreang, Banjaran, Majalaya, Ciparay, and Baleendah). Traffic jam is also concentrated in Cibereum St. and Gunungbatu-Pasteur St., as the main access to Bandung City from the west area (Cimahi and West Bandung). In East Bandung area, the traffic jam usually happens in A. H. Nasution St. (Ujungberung) as the main access from Bandung Regency and Sumedang Regency. In North Bandung area, it is concentrated along Setiabudhi St., near Ledeng Bus Station and UPI campus.

The traffic jam due to circular mobility (tourists) happens on the weekends and holidays. All access to Bandung City through intercity highways is usually congested around the toll gates; including Pasteur Toll Gate, Mohammad Toha Toll Gate, Buahbatu Toll Gate, Kopo Toll Gate, and Cileunyi Toll Gate. The worst congestion usually occurs at Pasteur Toll Gate. It is because Pasteur Toll Gate provides strategic access to tourism sites in the center of Bandung City and the North Bandung area (Parongpong, Lembang, and Dago).

Based on this background, it is interesting to conduct a study on the movement attraction (pull) of the people who visit the centers of public activities in Bandung City, both concerning the amount of attraction of the areas and the socio-economic condition of the visitors. The result of this study will contribute to, among others, the efforts to reduce traffic congestion in Bandung City.

The aims of this study are to find out the amount of public movement attraction of the centers of activities in Bandung City, to find the socio-economic condition of the people visiting the centers of activities in Bandung City, and to find out the traffic condition in Bandung City, according to the people who visit public activities centers.

2. LITERATURE REVIEW

2.1. Movement Attraction of the People of the City

Movement attraction refers to people's mobility to certain sites, including the centers of public activities. The destination of people's movement in a city is highly influenced by the use of lands in the city. People who live in residences move to visit their destinations of public activities centers; including the centers of trading, offices, industry, and education. The distribution of land use in a city causes spatial interaction of the people in the city; spatial interaction is people's movement from their residences to their destinations.

Actually, in spatial interaction, people are not the only one who moves; ideas and goods also move from one place to another. As Ulman (in Daldjoeni, 1998: 245) states, spatial interaction includes the movements of goods, passengers, migrants, money, and information. People's movement from one place to another is always based on certain purposes, including working, studying, shopping, and having a vacation. These movements take the forms of commuter mobility and circular mobility. Commuters are those who routinely move to their destinations every day, without any intention to stay in the destination; for example, students and workers. Circular mobility is characterized by irregular movements; for example, the mobility of tourists who do not routinely visit a city.

Public movement will be concentrated on the central business district or the center of the city. The primary destinations of public movement include the centers of public activities in the center of the city; such as the center of government offices, trading, industry, services, and tourism. Daldjoeni (1998: 213) notes that most of the lands in a city are used for industry, service providing, and residences. It is because the economic activities in a city are dominated by industry and services, which do not require wide areas of land. In addition, the lands in a city are also used for service, trading, and education.

A city also serves as the center of activities that can attract people from the suburbs (urban fringe areas) and villages (rural areas). This is because the city promises many advantages over the villages, including the diversity of jobs and learning

opportunities. This is in line with Colby's statement (in Yunus, 2001) that the high rate of public mobility from rural to urban areas is because urban areas have their attractions, such as employment opportunities across a wide range of sectors, ability to provide higher income, conveniences in accessing public facilities (healthcare, education, entertainment), greater opportunities in career development, and ease in developing new businesses.

People's movement or mobility from the villages and suburbs to the city, and vice versa, is a form of spatial interaction. Spatial interaction occurs because of differences in potentials of the area; both the natural and the human resources. Daldjoeni (1998: 247) states that spatial interaction consists of three elements; complementarities, transferability, and intervening opportunity.

Complementarities in a city can be seen from its land use, in which the centers of public activities are concentrated in its central business district, while the residences are distributed outside the center of the city into the fringe areas. Such distribution is influenced by the high price of land and the accessibility in the center of the city due to the improvements in transportation structures and infrastructures. As Tamin (2000: 3) proposes, the higher price of land in the center of a city pushes the residences to move to the fringe areas, while places of work become more concentrated in the center of the city.

Transferability in a city can be seen from the movement or mobility of people and goods. People or public mobility is based on the purpose or interest of the movement. LPM-ITB (1996, 1997; in Tamin, 2000: 16), public mobility in a city is categorized into economic, social, educational, recreational, and cultural activities.

- Economic activities are related with earning income and obtaining goods or services. Earning income is conducted through mobility to workplaces, while obtaining goods or services is conducted through mobility to trading or business areas.
- Social activities concern with developing and maintaining personal relationship; including visiting friends or mobility to gathering places.
- Educational activities involve mobility to schools and universities. These activities are mostly conducted by people of 5 to 22 years old. In developing countries, these activities involve up to 85% of the total population.
- Recreational activities involve mobility to recreational areas, including restaurants, attraction sites, and resorts.
- Cultural activities involve mobility to religious places; for instance, to Mecca, Medina, and Jerusalem.

Concerning public mobility in a city, Tamin (2000: 114-5) argues that the mobility or public movement can be categorized based on the purpose (destination), time, and type of people.

- Based on purpose or destination, mobility from home or residences moves to workplaces, education places (school or university), trading places (shopping area), and social and recreational places. Mobility to workplaces and education places occurs daily, so that it is called routine mobility.
- Based on time, mobility is categorized into rush (peak) hour and non-rush hour. The proportion of movement (mobility) in every destination fluctuates greatly. Most of the mobility in the morning rush hour (07.00-09.00) is a primary mobility that has to be taken every day.
- Based on the people, individual mobility is greatly influenced by socio-economic conditions; including level of income (high, medium, and low) and ownership of vehicles (not possessing, possess 1 vehicle, possess 2 or more vehicles per family).

The intervening opportunity in mobility is the factors hindering the mobility of people or goods, including traffic congestion and the closing of roads due to maintenance project. Traffic congestion is caused by the condition of the road, type of vehicles on the road, and the drivers (Sukarto, 2006).

- The condition of the road and surrounding environment; the bad condition of the road, for example, will decrease the speed of the trip, which results in the increase in time needed.
- Types of vehicles on the road will affect the road they pass and the traffic. For example, when there are too many big vehicles (buses and trucks) on the road, the traffic may get congested.
- The drivers of the vehicles. Generally, people will choose the shortest, cheapest, and quickest route. When all drivers choose the same route, traffic congestion will occur.

2.2. Centers of Public Activities

Centers of public activities are the use of land that can attract people's mobility, according to their purpose and destination. Land use in a city is very complex, compared to the land use in villages, due to the complex nature of jobs of the residents. Land use in cities is dominated by non-agricultural use; including for trading, service, education, and residences.

2.2.1. Trading

Trading is the main economic activity of a city, in which people sell and purchase goods to satisfy their needs. Trading is comprised of traditional markets, main markets, shopping areas, and malls. The classification is based on the size of the buildings for trading. Market is the place of trading that serves to satisfy the daily needs of people; including the needs of food, vegetables, and household tools and equipments. Main market is the market that supplies goods to traditional markets.

Shopping area is a series of stores that sells various objects, including clothes (factory outlet), snacks, and foods (restaurant). Mall is a big-scale shopping center; usually consists of stores that sell various kinds of branded clothes, big restaurants, supermarket, cinema, karaoke shop, and children's play area. Mall can only be built on main road and collective road, not on small or local road. Mall is usually built in an economically strategic location, for example in the center of the city.

2.2.2. Industry

Industry is a series of factory buildings, where the production or processing of raw material into finish product is conducted. In addition of factories, warehouses are also part of industry area.

2.2.3. Service

Service is a sector of public activities focusing on public services; provided by the government or private institutions. Service area is categorized into offices, hotels, and hospitals.

Hotels are a building where tourists stay during their visit. Offices consist of government and private institutions buildings. Government institutions include the offices of governor, regent, head of sub-district, state-owned enterprises, and government bank. Private institutions include private bank, consultant office, and the offices of other services. Hospitals are social facilities that provide healthcare services.

2.2.4. Education

Education is a place where teaching and learning activities occur to improve the knowledge and skills of students. Education places are categorized into schools and universities. Schools consist of primary school, junior high school, and senior high school or vocational school.

3. METHODOLOGY

3.1. Research Method

This study is conducted using the descriptive survey method. Leedy (1980; in Yunus, 2010: 314) states that descriptive survey method is the collection of verbal data through interviews.

3.2. Research Site

This study is conducted in Bandung City, because the city is the center of Bandung area as well as a tourism destination. These two facts indicate that there are many visitors moving to the city, both from the city itself, from outside the city, and from outside the West Java Province.

3.3. Population and Sample

The populations in this study include area population and human population. The area population covers all land usage in Bandung city which can attract public movement; while the human population consists of all visitors coming to the areas. The sample of human population is taken using accidental sampling from the visitors that visit the centers of activities. The detail of population and sample in this study is as follow:

Table 1
Population and Sample of the Study

No	Center of Public Activities	Population	Area Sample	Human Sample
1	Trading/Commerce	131	70	
	Traditional Markets	13	2	20
	Shopping Areas	89	2	30
	Malls	27	2	20
2	Education	133		80
	Schools	108	6	60
	Universities	25	2	20
3	Services	195	5	
	Offices	151	2	20
	Hotels	31	2	19
	Hospitals	13	1	20
4	Industry	125	2	20
	Total			209

Source: Interpretation of QuickbirdImage of Bandung City, 2013.

3.4. Data Collection Techniques

The data in this study is collected through several techniques, including:

3.4.1. Quickbird Satellite Image Analysis

Satellite image analysis is conducted to obtain information concerning the distribution of public activities centers in Bandung City; particularly the locations of trading, service, education, and industry centers.

3.4.2. Field Observation

Field observation is conducted to obtain data on the number of movement attraction to the centers of public activities. The movement attraction is calculated for each of the public activities centers; the trading center, service center, education center, and industry center. The time for observation is adjusted to the characteristics of the activity. In trading centers of malls and shops, the observation is conducted during the peak hours of 16.00-20.00 WIB; while in traditional markets, the observation is conducted at 06.00-09.00. In service centers, the observation is conducted at 06.00-09.00 (for offices), 12.00-15.00 (for hotels), and 13.00-15.00 (for hospitals). In education centers, the observation is conducted at 06.00-08.00, 12.00-15.00, and 16.00-18.00. The object of

these field observations includes the number of vehicles (personal cars, public transport, and motorcycles) and people visiting the areas. The data is calculated per 15 minutes.

3.4.3. Interview

Interview with the people is conducted to obtain data concerning the socio-economic condition and mobility of visitors in public activities centers. The socio-economic condition includes age, sex, levels of education, jobs, income, origin, ownership of vehicles, means of transportation used to visit the areas, and the condition of traffic.

3.5. Data Analysis

For the distribution of public activities centers, a spatial analysis is conducted; while for the public movement attraction and socio-economic status, percentage statistical analysis is used.

4. FINDINGS AND DISCUSSION

4.1. Distribution of Public Activity Centers in Bandung

4.1.1. Trading

The trading area in Bandung is mainly distributed around the west side of Bandung City. Other trading areas in Bandung are Cibeunying Kidul and Kiaracondong. The main location of trading centers is distributed in the Sub-Districts of Andir, BojongloaKaler, Astanaanyar, Sumur Bandung, Bandung Wetan, Coblong, and Sukajadi.

4.1.2. Service

The use of lands for services is centered in the Center of Bandung City, including the Sub-Districts of Bandung Wetan, Sumur Bandung, and Batununggal. The service areas outside the center of the city include Kiaracondong, Buahbatu, Lengkong, and Regol Sub-Districts.

Hotels are mainly distributed in the center of Bandung City and in the west side of the city; the old part of the city before development. These areas include the Sub-Districts of Sumur Bandung, Bandung Wetan, Coblong, Lengkong, Cicendo, Sukasari, and Cidadap. Hotels are also concentrated in the North side of Bandung City, because this is a rest area for tourists going to Lembang, TangkubanParahu, Parongpong, and Dago.

4.1.3. Industry

Industry is distributed in the West, Central, and East Bandung. In the west area, it is mainly centered in Bandung Kulon Sub-District (Kelurahan Caringin, Cibuntu, Gempolsari, and Cijerah) and in Babakan Ciparay Sub-District (Kelurahan Babakan Ciparay and Margasuka), near the border of Bandung Regency and Soreang. In

Central Bandung, industry is distributed around the Sub-Districts of Batununggal (KelurahanKebonWaru), Kiaracondong (KelurahanBabakansari and Cicaheum), and CibeunyingKidul (KelurahanPadasuka, Sukapada, and Pasirlayung). In East Bandung, it is mainly distributed in Cinambo Sub-District (KelurahanPakemitan and Babakan Penghulu) and Panyileukan Sub-District (KelurahanMekarmulya and Cipadung). In smaller scale, industry is also distributed in Cibiru, Andir, and Cicendo Sub-Districts.

4.1.4. Education

Higher education institutions (colleges and universities) are concentrated in Coblong Sub-District, covering Kelurahan Dago, Lebak Gede and SadangSerang; Bandung Wetan Sub-District (Kelurahan Taman Sari and Citarum); Cibeunying Kaler Sub-District (KelurahanSukaluyu and Neglasari), Sukajadi Sub-District (KelurahanSukawarna), Sukasari Sub-District (Kelurahan Isola), Kiaracondong Sub-District (Kelurahan KebonKangkung), Buahbatu Sub-District (Sekejati), Lengkong Sub-District (KelurahanTurangga and Cikawao), and Panyileukan Sub-District (KelurahanMekarmulya and CipadungKidul). In a smaller scale, education in Bandung is also distributed in Sumur Bandung and Cicendo Sub-Districts. The higher concentration of education institutions in Coblong Sub-District is because that area is located in higher grounds with cool climate that makes it very comfortable for learning.

Primary education institutions are distributed in every sub-district and *kelurahan* in Bandung City. Secondary education institutions (Junior High Schools, Senior High Schools, and Vocational Schools) are mainly concentrated in west and north areas of Bandung (Coblong, Cicendo, Bandung Wetan, Andir, Sumur Bandung, and Lengkong Sub-Districts). In smaller scale, they are also distributed in all sub-districts in Bandung City, particularly in the east and south areas of the city, including Buahbatu, Kiaracondong, Ujungberung, and Cibiru Sub-Districts.

4.2. Movement Attraction to the Centers of Public Activities

4.2.1. Trading

Bandung is a city famous for its trading (shopping) tourism. Therefore, trading is one of the main activities of the city. The malls that are selected as the samples in this study include Istana Plaza Mall in Pasirkaliki Street and Bandung Indah Plaza Mall in Merdeka Street. Bandung Indah Plaza is one of the main shopping tourism sites in Bandung City. It is located in the center of the city so that it is accessible to people from every areas of Bandung. It is the first mall in Bandung City.

Based on the field observation conducted on December 14, 2013, the average number of vehicles entering Bandung Indah Plaza is 230 units per hour for cars and 233 units per hour for motorcycles. The average number of visitors is 1271 people per hour. The peak hours in Bandung Indah Plaza last for six hours, which means that the

total daily visitors in the mall are 7626 people. The area of Bandung Indah Plaza is 75,868 square meter, so that its total movement attraction is 0.10 people per square meter.

Istana Plaza mall is located in Pasir Kaliki Street, Cicendo Sub-District. It is accessible to people from West and North areas of Bandung, Cimahi City, and West Bandung Regency (Lembang Sub-District and surrounding areas).

The observation on 10 December 2013 indicates that the average numbers of vehicles entering Istana Plaza is 222 units of car and 50 units of motorcycles per hour. The average number of visitors is 625 people per hour. It makes the number of daily visitors is 3,750 people. The total area of Istana Plaza is 55.765 square meters, which means that its total movement attraction is 0.10 people per square meter. The average of movement attraction of the two malls is 5688 people per day.

Traditional markets also have high attraction for people because they are related with the fulfillment of daily life need. The markets selected as samples in this study are Sederhana Market and Andir Market. Sederhana Market is located in Sederhana Street, Sukajadi Sub-District. As a public activities zone, Sederhana Market attracts movement of vehicle; motorcycle and public transportations.

Based on the field observation on 15 December 2013, it is found that the average number of vehicles entering Pasar Sederhana Bandung is 11 units of car and 75 units of motorcycles per hour, and the average number of visitors is 494 people per hour. The peak hours of Pasar Sederhana last for four hours, which means that its total daily visitor is 1,976 people. Since the area of Pasar Sederhana is 14,706 m², its movement attraction is 0.13 people per square meter.

The average number of cars entering Pasar Andir Bandung is 7 units per hour, while the average number of motorcycles is 85 units. The average number of visitors is 193 people per hour. In the peak hours, that last for four hours, the total daily visitors of Pasar Andir is 772 people. The area of Pasar Andir is 68,360 m², which means that its movement attraction is 0.01 people per square meter. The average attraction of the two markets is 1,374 people.

The shopping site selected for this study is Cihampelas Shopping area in Cihampelas Street, Bandung. Cihampelas Shopping area is located along the Cihampelas Street. It is the most popular shopping area in Bandung City, focusing on clothes (jeans) shops. Currently, Cihampelas Shopping area is the main shopping tourism site in Bandung City. However, the parking areas in this site are greatly insufficient. This causes traffic jam along the street because many vehicles are parked in the sidewalk, forcing the pedestrians to walk on the street. The shops selected as samples in this study are Scaters, Jongko, and Provider Shops.

The field observation on 15 December 2013 reveals that the average numbers of vehicles entering Scaters Shop is 1 unit of car and 1 unit of motorcycle per hour. There are 24 visitors per hour in this shop. In Jongko shop, 1 car, 1 motorcycle, and 22 visitors

per hour are the average. The average visitors in Provider Shop are 1 unit of car, 2 units of motorcycles, and 28 people per hour.

Total number of visitors during peak hours in these shops is 296 people. Since the peak time last for 6 hours, the total daily visit to these shops is 1,776 people. The area of these shops is 750 square meters, which means that their movement attraction is 2.37 people per square meter.

4.2.2. Service

The office site selected as sample in this study is the City Hall of Bandung, located in Merdeka Street. City Hall is the main government office in Bandung City. It is a historical building, a heritage from the Dutch colonial time, which is used as the offices for Bandung Regent and Bandung Public Representatives.

The observation on 20 December 2013 reveals that the average numbers of vehicles during the morning peak hours are 47 units, 65 units of motorcycles, and 98 people per hour. During the afternoon peak hours, 59 units of car and 71 units of motorcycles exit the Bandung City Hall, while the number of visitors is 100 people per hour. This means that the total movement attraction of Bandung City Hall is 198 people per hour.

The peak hours of these offices last for four hours. It means that the total movement attraction is 792 people per day. The area of Bandung City Hall is 81.260 square meter; indicating that its attraction is 0.009 people per square meter. The difference in the numbers of movement attraction and repulsion movement during the day is because the city differentiates the office hours. The employees go to work at different times, but all leave work at the same time.

Hotel services selected as sample in this study are the Grand Royal Panghegar in Merdeka Street and Grand Preanger in Asia Afrika Street, Bandung. Panghegar Hotel is located in the same area with other activity centers, such as malls and government offices, because Merdeka Street is one of the main roads in Bandung. Preanger Hotel, meanwhile, is a historical building, a heritage from the Dutch colonial time. It was the meeting place of tea plantation owners in Bandung.

The average number of visitors entering Grand Royal Panghegar is 29 units of car, 4 units of motorcycle, and 92 people per hour. The peak hours of the hotel are six hours; which means that its movement attraction is 552 people per day. Since the area of Panghegar Hotel is 9554 square meter, its average attraction is 0.06 people per square meter. Its potential attraction is 177 people.

For Grand Preanger Hotel, the average number of visitors is 26 units of car, 14 units of motorcycle, and 89 people per hour. The peak hours of the hotel are 6 hours; which means that its daily attraction is 534 people. The area of Grand Preanger Hotel is 10,507 square meter, the average attraction is 0.05 people per square meter.

The average number of visitors in the two hotels is 91 people per hour. During the six peak hours, the total daily visitors for the two hotels are 546 people.

Another service institution that attracts people movement is hospital. In this study, the Hasan Sadikin Hospital (RSHS), the biggest hospital in West Java, is the sample. Observation in this hospital indicates that the average number of visitors is 112 units of car, 152 units of motorcycles, and 643 people per hour. During the 10 hours of peak hour, the total daily visitors of this hospital are 6430 people. RSHS's area is 92,185 square meter, resulting in movement attraction of 0.07 people per square meter.

4.2.3. Education

The education sample for this study consists of primary schools, Junior High Schools, Senior High Schools, and Universities/Colleges. The primary schools selected to be sample in this study are SDN Cihampelas, located in Cihampelas Street, and SDN Sejahtera, located in Sejahtera Street, Bandung. The field observation on 7 January 2014 shows that the average numbers of visitors per hour are 132 people for SDN Cihampelas and 282 people for SDN Sejahtera. The average number of visitors per hour to the two schools is 348 people per hour. The effective movement hour in the primary schools is 4 hours; the attraction is 1,392 people per day.

The Junior High Schools selected to be the sample in this study are SMPN 15 Bandung and SMPN 12 Bandung; both are located in Setiabudhi Street, Bandung. The average movement to SMPN 15 is 191 people per hour. The area of this school is 3,051 square meter. The average movement out of SMPN 12 Bandung is 177 people per hour. The average repulsion and attraction movement of both Junior High Schools is 368 people per hour. Since the effective hour of movement in both schools is 6 hours, the total number of attraction is 2,208 people per day.

The sample of Senior High School in this study consists of SMAN 2 Bandung and SMA Pasundan 2 Bandung; both are located in Cihampelas Street Bandung. The average movement out of SMAN 2 Bandung is 263 people per hour, and the total daily visitors are 1,578 people. The area of SMAN 2 Bandung is 35,229 square meters; which means that the attraction is 0.04 per square meter. The average movement out of SMA Pasundan 2 Bandung is 134 people per hour. The average movement of the two schools is 199 people per hour. Since the effective hour of the Senior High Schools is 6 hours, the total daily movement is 1,194 people per day.

The Higher Education institutions selected as sample in this study are Indonesia University of Education (UPI), in Setiabudhi Street, and Bandung Institute of Technology (ITB), in Ganesha Street, Bandung. The field observation on 6 January 2014 indicates that the average movement attraction to UPI is 97 units of cars, 523 units of motorcycles, and 532 people per hour. The peak hour of the campus lasts for 6 hours, which means that the total attraction is 3,192 people per day. The area of UPI is 356,378 square meter. The average movement in ITB is 308 people per hour. The average visitors of the two universities are 420 people per hour. Since the effective hour is 6 hours, the total number of movement is 2,520 people per day.

4.2.4. Industry

Bandung city has many industries; big, medium, and small industries. One of the industries in Bandung city is pharmaceutical. The pharmaceutical industries selected as the sample in this study are PT. Kimia Farma, Tbk, located in Padjajaran Street, and PT. Bio Farma, Tbk, located in Pasteur Street, Bandung. The field observation on 10 December 2013 shows that the average number of vehicles entering PT. Kimia Farma is 14 units of cars, 97 units of motorcycle, and 310 people per hour. The peak hour of Kimia Farma, both in and out, lasts for 4 hours. This means that the attraction is 1,240 people per day. The area of Kimia Farma is 59,398 m², which means that the attraction is 0.02 people per square meter.

The average movement attraction in Bio Farma is 64 units of car, 81 units of motorcycle, and 127 people per hour. Considering the 4 hours of peak time, the total attraction of the industry is 508 people per day. The average attraction of both industries is 219 people per hour; with four hours of peak time, the daily average is 876 people.

4.2.5. The Socio-Economic Condition of People who Move

More than half of the respondents in the trading areas (65% in the malls, and 67% in the shops) are 20 to 30 years old. In the traditional markets, 50% of the respondents are 20-30 years old, and 30% of the respondents are 30-40 years old. In the service areas, 35% of respondents in offices are 20-30 years old, and 30% are 40-50 years old. In hotel sector, 47% of respondents are 20-30 years old and 37% are 40-50 years old. 40% of respondents in hospital are 30-40 years old. In the industry area, 25% of respondents are 30-40 years old, and another 25% is more than 50 years old. In education area, 35% of Primary School respondents are 20-30 years old; 70% of Junior High School respondents and 90% of Senior High School respondents are less than 20 years old; while 50% of respondents in universities are 20-30 years old. It can be concluded that the centers of activities are visited by a varied range of visitors, in terms of age.

4.2.6. Trading

The characteristics of respondents visiting trading areas are as follows: 45% of mall visitors are of Senior High School and College educations; 50% of market visitors are Senior High School graduates and 30% of visitors have college education; and 67% of shopping areas visitors has college education.

Regarding respondents' vocational status, 25% of mall visitors are private employees and students; 40% of the markets visitors are self-employed; while the visitors of shopping areas consist of private employees (33%) and university students (30%). It can be concluded that the visitors entering the trading areas are dominated by students, university students, private employees, and self-employed people with at least Senior High School Education.

More than half of the respondents (55%) state that the objective of their movement to the malls is recreational; 80% respondents who come to the markets and 70% of

respondents who visit the shopping areas share the same objective; i.e. to shop. The visitors have different reasons to visit the trading areas. 35% respondents go to the malls to have recreation, and 25% go there because the mall is close to their homes. 45% of respondents state that the reason of their going to the market is because it is close to their homes, while another 40% claim that it is because the price in the market is cheap and the goods are varied. The visitors visit shopping areas for the following reasons: because the goods are cheap and varied (23%) and because they go in group with their family and friends (17%).

25% of respondents visit the malls once a week; and 15% of respondents state that they visit the malls without certain regularity. 30% of the respondents who visit the market do so once a week and 25% of respondents visit the market in less than once a week. The most frequency of visitation to shopping areas is once in three months (20%); some respondents do not visit the shopping areas regularly (17%).

Concerning income, respondents from malls earn 1 – 2 million rupiah (25%) and 2 – 3 million rupiah (20%) per month. The respondents in the markets earn 3 – 4 million rupiah (25%), 2 – 3 million rupiah (20%), and 5 – 7 million rupiah (20%). Of those who visit the shops, more than half (63%) has no fixed income.

In terms of transportation used to visit the trading areas; the respondents in malls use motorcycles (50%) and public transportation (35%), while most of the visitors of the markets (85%) and shops (77%) use motorcycles. Regarding the respondents' ownership of vehicles, 55% of the respondents in malls only possess motorcycles and 35% own both cars and motorcycles; 90% of respondents in the markets possess motorcycles; and in the shops, 57% of respondents only own motorcycles and 40% of the respondents possess both cars and motorcycles. It can be concluded that most respondents use motorcycles and public transportation to visit the trading areas.

Concerning the ownership of vehicles, mall visitors possess one unit of motorcycle (55%) or two units of motorcycles (35%); traditional market visitors own one unit (45%) or two units of motorcycles (45%); and more than half (63%) of the respondents in shopping area own one unit of motorcycle. Furthermore, more than half of the respondents do not own personal car (65% in malls, 60% in traditional market, and 57% in shopping area).

In regard to respondents' spending for transportation, 35% of respondents in mall spend more than IDR 100.000 per week and 20% of mall respondents spend IDR 20,000-30,000 per week. In the traditional market, 35% of respondents spend IDR 40,000-50,000. In the shopping area, 50% of respondents spend IDR 40,000- 50,000, while 23% of respondents spend IDR 20,000-30,000.

Regarding the distance to access the trading area, the respondents in malls travel 1-5 km distance (35%), 5-10 km distance (25%), and more than 15 km distance (25%); the respondents in markets travel 1-5 km (40%) and 5-10 km (25%) to access the markets; and most of the respondents in shopping area travel more than 15 km (80%).

Meanwhile, concerning the time needed to travel to the trading area, 30% of respondents in malls spend more than 1 hour on the road, 50% of respondents in markets take less than 15 minutes to access the area, and 80% of respondents in shopping area need more than 1 hour to get to the area. It can be concluded that the differences in distance and travel time indicate that most of the respondents are from outside Bandung City.

Regarding the traffic condition in Bandung City, 75% of respondents in malls state that they have an uncomfortable traffic, 45% of respondents in markets agree that their travel is quite comfortable, and 63% of the respondents in shopping areas find their travel to be uncomfortable. Concerning the traffic congestion, 45% of respondents in malls agree that they go through a little traffic congestion and 40% states that they pass some significant congestion; in the markets, 50% of respondents say that the traffic is quite congested, and 35% of respondents say that it is highly congested; 87% of respondents in shopping area agree that the traffic they pass is quite congested. It can be concluded that the traffic in Bandung City is uncomfortable, mainly due to traffic congestion.

4.2.7. Service

Education characteristics of respondents in service area are as follows: respondents in offices have college degree (45%) and high school diploma (45%); respondents in hotels have college degree (79%); and the respondents in hospitals mainly have high school diploma (70%). Based on their vocation or jobs; in offices, 35% of respondents are Civil Servants and 20% of respondents are college students; in hotels, 37% of respondents are Civil Servants and 32% of respondents are self-employed; while in hospitals, 40% of the respondents are private employees.

The purpose of respondents in offices is mainly for working (75%); the purpose of respondents in hotels is mainly recreational (63%); and the purpose of respondents in hospitals is to visit a sick family member (75%). The frequency of respondents' visits in offices is five day a week (60%); the respondents admit that they visit hotels in irregular frequency (42%) and not too frequently (37%); 80% of respondents visit hospital in irregular frequency.

The means of transportation used by the respondents in offices include public transport (45%) and motorcycles (40%). The respondents in hotels mainly use personal car (47%) and public transports (26%); while most of the respondents in hospitals (80%) use motorcycles. It can be concluded that the visitors of hotels prefer personal cars, while the visitors of hospitals and offices prefer motorcycles and public transport.

Regarding the ownership of vehicles, half of the respondents in offices only own motorcycles, 79% of respondents in hotels own cars and motorcycles, and 80% respondents in hospitals own motorcycles. 65% of respondents in offices and 70% of respondents in hospitals only own one motorcycle. In hotels, 53% of respondents own one unit of motorcycle and 37% own two units. 75% of respondents in offices do not

possess cars; 68% of respondents in hotels own one unit of car; and 100% of respondents in hospitals do not possess car.

Regarding the weekly spending for transportation; in offices, 30% of respondents spend less than IDR 20,000, 25% of respondents spend IDR 20,000-30,000, and 25% of respondents spend IDR 45,000-50,000; 58% of respondents in hotels spend IDR 250,000-500,000; and 70% of respondents in hospitals spend IDR 20,000-30,000 per week.

Concerning their monthly income, 40% of respondents in offices earn IDR 1-2 million, 42% of respondents in hotels earn IDR 7-10 million, and 90% of respondents in hospitals earn IDR 1-2 million.

Regarding accessibility of the service area, the respondents in offices travel 5-15 km (45%) and 1-5 km (30%); most of the respondents in hotels (79%) and hospitals (60%) travel more than 15 km. Meanwhile, regarding the time needed to access the service areas, 40% of respondents in offices spend 30 minutes; 84% of respondents in hotels and 60% of respondents in hospitals take more than one hour to get to the areas. It can be concluded that most of the visitors to hotels and hospitals come from outside of Bandung City.

Concerning the comfort of the traffic, 65% of respondents state that the traffic in Bandung is uncomfortable; 53% of respondents in hotels find the traffic to be quite comfortable, while 47% of hotels respondents think it is uncomfortable; 60% of respondents in hospitals agree that it is uncomfortable. Regarding traffic congestion, 80% of respondents in offices agree that the traffic is quite congested; in hotels, 47% of respondents state that the traffic is congested and 42% of respondents state that it is quite congested; 90% of respondents in hospitals agree that the traffic is quite congested. 40% of offices respondents and 58% of hotels respondents state that the traffic congestion lasts for 30 minutes. It can be concluded that the respondents find the traffic to be quite congested and heavily congested, lasting for 30 minutes in average.

4.2.8. Industry

The characteristics of respondents in industry area are as follow: most of the respondents (70%) have high school diploma; 50% of the respondents are private employees and 40% of the respondents are employees in State-Owned Institutions. The purpose of mobility is to work (100%). The reasons for working in industry include the ease of public transportation access (60%) and the closeness of the area to respondents' residences (35%).

The frequency of respondents' visit to industry area is 5 days a week (90%), using motorcycles (80%). The reasons for using motorcycles are because it is cheap and effective. 80% of the respondents only own one unit of motorcycle, and most of the respondents (85%) do not own a car. The respondents' spending for transportation per week is IDR 20,000-30,000 (50%); while the monthly income of most of the respondents (70%) is between IDR 2-3 million.

Regarding the distance from home to work area, 50% of respondents travels 1-5 km, taking 30 minutes (45%) or less than 15 minutes (30%).

Concerning the traffic condition in Bandung City, 60% of respondents in industry area find it to be quite comfortable; and 50% of them admit that the traffic is congested.

4.2.9. Education

The characteristics of respondents in education area are as follow: 55% of respondents in primary schools are housewives who take their children to school; 70% of respondents in Junior High Schools and 90% respondents in Senior High Schools are students; and 85% of respondents in universities are college students.

The respondents' purposes to visit the areas are mainly to study (70% in Junior High Schools, 90% in Senior High Schools, and 85% in universities) and to take their children to school (75% in primary school). The reasons of their mobility include taking their children to and from schools (75% in primary schools), closeness to home (50% in Junior High Schools), unaccepted in public schools (35% in Senior High Schools), and desire to study (80% in universities). The frequency of respondents' visit to the areas is six days a week (70% in primary schools, 30% in Junior High Schools, 55% in Senior High Schools, and 40% in universities). It can be concluded that respondents' mobility to education areas is a routine mobility.

Regarding the means of transport used to access education areas; the respondents use public transport (30% in Junior High School, 40% in Senior High School, and 50% in universities), use motorcycles (65% in primary school, 35% in Junior High School, and 40% in Senior High School), and walk (50% in universities) to get to the areas. It can be concluded that motorcycles and public transports are the main mean of transportation used.

Concerning the ownership of vehicles; 70% of respondents in primary schools own motorcycles, 50% of respondents in Senior High Schools own motorcycles and cars, and 70% of respondents in universities do not own vehicles. Regarding the number of vehicles the respondents own, most of the respondents own one unit of motorcycle (55% in primary schools, 35% in Junior High Schools, and 40% in Senior High Schools); 65% of respondents in universities do not own motorcycle. Most of the respondents also do not own personal car (95% in primary schools, 70% in Junior High Schools, 50% in Senior High Schools, and 85% in universities).

Regarding the cost of transportation the respondents spend per week, they spend less than IDR 20,000 (45% in primary schools, 30% in Junior High Schools, 45% in Senior High Schools, and 20% in universities) and between IDR 20,000-30,000 (35% in primary schools); while 25% of respondents in universities do not spend any amount of money for transport. Most of the respondents (75% in Junior High Schools, 90% in Senior High Schools, and 90% in universities) do not have steady source of income.

Concerning the accessibility of education areas, 75% of respondents in primary schools, 50% of respondents in Junior High Schools, and 45% of respondents in Senior High Schools travels 1-5 km to the area. 50% of respondents in universities and 45% of respondents in Junior High School travel less than 1 km to their education area. Regarding the time needed to get to the education areas, most of the respondents need less than 15 minutes (90% in primary schools, 55% in Junior High Schools, 45% in Senior High Schools, and 70% in universities). It can be concluded that the respondents live near the education areas.

Regarding the condition of traffic in Bandung City, most of the respondents (65% in primary schools, Junior High Schools, and universities, and 70% in Senior High Schools) find the traffic in Bandung City is uncomfortable. 50% of respondents in primary schools, 60% of respondents in Junior High Schools, 40% of respondents in Senior High Schools, and 45% of respondents in universities agree that the traffic is quite congested.

5. CONCLUSION

The distribution of public activities of trading, education, and service, is concentrated in the west part of Bandung, as the central business district in the city. This area includes Andir, Sumur Bandung, Bandung Wetan, Coblong, Lengkong, and Sukasari Sub-Districts. Meanwhile, the distribution of activities of industry is concentrated in Bandung Kulon, BabakanCiparay, Cinambo, and Panyileukan Sub-Districts.

The attraction towards public movement to trading areas includes malls (5,688 people per day), markets (1,374 people per day), and shops (1,776 people per day). The attraction on public movement to service areas includes offices (792 people per day), hotels (546 people per day), and hospitals (6,430 people per day). To areas of education, the attraction of public movement includes primary schools (1,392 people per day), Junior High Schools (2,208 people per day), Senior High Schools (1,194 people per day), and universities (2,520 people per day). The attraction to areas of industry is 876 people per day.

The visitors of trading areas have, on average, education levels of Senior High School and higher. Most of them are students, university students, and private employees who want to have some recreations and to shop. These visitors use motorcycles and public transportation to access the trading areas, although the traffic is usually uncomfortable due to traffic jam. They mainly come from other cities. Visitors to service areas use different means of transportation. They mainly use personal vehicles to access hotels, and public transportation to visit the hospitals and offices. Hotel visitors mainly come from outside the City. Meanwhile, the movement to education areas is a routine or regular movement; using motorcycles and public transportation as the primary means of transportation. The visitors to education areas generally live near the areas.

It is recommended that the government issues policies to distribute the centers of public activities to the East area of Bandung City; to Gedebage and Ujungberung, for instance. This is important to evenly distribute the development of the city, and it is expected to cause the people not to be concentrated in the West area of Bandung City.

References

- Daldjoeni, N. 1998. *Geografi Kota dan Desa*. Alumni. Bandung.
- Sukarto, H. 2006. *Pemilihan Model Transportasi di DKI Jakarta dengan Analisis Kebijakan "Proses Hirarki Analitik"*. *Jurnal Teknik Sipil*, Vol. 3, No. 1 Januari 2006. Jurusan Teknik Sipil Universitas Pelita Harapan. Tangerang.
- Tamin, O.Z. 2000. *Perencanaan dan Pemodelan Transportasi*. Penerbit ITB. Bandung.
- Yunus, H.S. 2001. *Megapolitan: Konsep, Problematika dan Prospek*. Pustaka Pelajar, Yogyakarta.
- Yunus, H.S. 2010. *Metodologi Penelitian Wilayah Kontemporer*. Pustaka Pelajar, Yogyakarta.