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## Public Perspective Toward Car-Free Day Program as A Public Open Space: A Case Study in Klaten, Central Java

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### *Abstract*

Public open spaces are the core component of sustainable urban development which can provide multiple advantages. There has been growing interest from policy-makers to implement car-free day (CFD) either in big cities or small cities to promote economic activity, public mental health, and wellbeing. Here, we conducted an exploratory study to describe the characteristic of CFD as an open space allocation and its characteristic as well as explores the perspective of urban residences regarding the utilization of road space as open space viewed from physical, social, and economical functions. Results indicate that circulation lines, public facilities as well as street furniture are well organized although there is a small issue regarding pedestrian space that was minimum. Respondents believe that public open spaces should consider prioritizing the comfort and active engagement support while they do not aware of the discovery aspect. The vast majority of respondents (32%) purposes are to have an exercise at CFD.

**Keywords:** car-free day; people wellbeing; open space; transport congestion.

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## I. Introduction

Public space allocation is more popular for urban society since the demands are increasing, particularly nowadays when land scarcity emerges. As a need for improving social well-being has been part of development priority, the local government in Indonesia has modified some infrastructures to become available as public open space either permanently or partially in response to population growth and urbanization (Ling *et al.*, 2021; Nurhandoko *et al.*, 2021). There are diverse types of public open space in terms of features, physical forms, or functionalities such as city parks, sports areas, historical places, green spaces, etc. It has been recognized that public open space plays an essential role in fostering public mental health because it has functioned as a venue for recreation, conservation, and relaxation. In addition, public open space also provides a huge opportunity to enhance social interaction and creates a sense of community attachment (Yung, Conejos and Chan, 2016a). There are some other positive impacts gained from these activities, primarily at improving physical, increasing economic opportunity for both permanent and side traders, and reducing traffic problem as well as pollution (Nasution and Zahrah, 2015a; Farda and Balijepalli, 2018a).

Modification of public streets as a public open space called "car-free day" (CFD) is common in cities in Indonesia. The scheme of CFD implementation is growing rapidly because it has been recognized by the government as a cost-effective strategy to deal with traffic jams and pollution (Arwini, Negara and Suthanaya, 2015). CFD is also effective to improve traffic conditions in many aspects, such as less congestion, less pollution, less energy consumption, and improvement to well-being (Leo, Morillón and Silva, 2017). It is particularly correct since Indonesia is known as one of the highest societies with car or motorcycle ownership (Belgiawan *et al.*, 2014). In the big city of Indonesia, there was approximately 75% of people have a private vehicle and this situation is expected to increase in near future (Dharmowijoyo *et al.*, 2015). If there is no regulatory control of transportation use, higher traffic volumes and pollutants will be more problematic for social well-being. Thus, CFD has been taken into account by local authorities to ameliorate the traffic congestion.

The CFD itself has been globally implemented though on a limited scale in cities around the world including China, India, Indonesia, the Philippines, and Central or Latin America. In Indonesia, it was initially introduced in several big cities such as Jakarta, Surabaya, and Bandung due to an increase in living density. However, because it offers many advantages for urban life, the implementation of CFD has been rapidly increasing in many small cities and towns in Indonesia (Farda and Balijepalli, 2018b) including Klaten regency, Central Java. Apart from its advantages, there is a dilemmatic for a certain group of society where the concept of CFD as a public open space is no longer as ideal as its concept. In particular, there is observed that CFD has shifted toward private space rather than public space because most of the space is used by street traders as the center of economic activity instead of as relaxation activity (Priyono, Rohidi and Soesilowati, 2017). Consequently, portions of public facilities are not fully accessible for public activities. It is not completely wrong as the presence of street vendors is the most factor motivating people to come to CFD (Prabowo *et al.*, 2018). There are different characteristics of CFD among cities in Indonesia concerning how people use CFD.

On the other hand, amenities should be the priority and focus of authorities to create a positive and supportive environment for the society. Studies on the car-free day have been reported for several capital cities in Indonesia such as Bandung (Farda and Balijepalli, 2018b), Denpasar (Arwini, Negara and Suthanaya, 2015), and Surabaya (Indria and Munawar, 2015; Prabowo *et al.*, 2018) while there are no studies specifically on the small town such as Klaten. Thus, this exploratory study aims to describe the characteristic of CFD as a concept of public

open space and explores the perspective of urban residences regarding the utilization of road space as open space as viewed from physical, social, and economical functions.

## II. Methodology

### 2.1. Participants and data collection

This study utilized direct observation and a survey using a questionnaire to collect the data. The population of this study was visitors of the car-free day (CFD). The CFD is regularly conducted every Sunday on Jalan Pemuda that is located in central Klaten regency, Central Java Province which was stretched about 3 km in length in the center town of Klaten (Figure 1). The Town area of Klaten is represented by three Kecamatan (so-called a sub-district) that has a total area of approximately 33 km squares and is resided by approximately 13 thousand people. Because this study focused on the urban resident perspective, thus the sample was determined using the convenience sampling method which only allowed people who live in the center of Klaten was chosen as targeted-respondent.

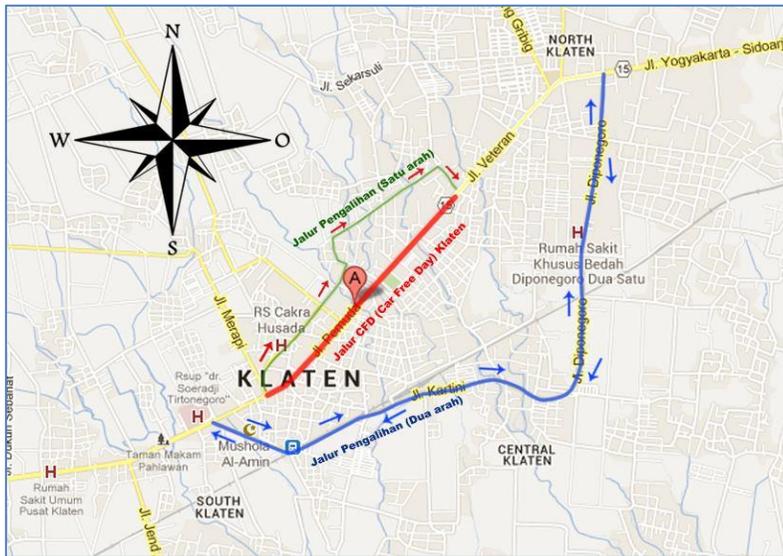


Figure 1. Study site and street line for a car-free day program in Klaten, Central Java

In searching respondents, we initially asked person by person about his/her willingness to answer our questions. The sampling strategy was selected since there is too diverse of people background in the field and also to avoid perfunctorily might happen. This was conducted also to increase the response rate and also to increase the reliability and validity of the data. Another reason was that general population surveys with random sampling tend to generate quite low response rates, making their value for capturing a representative sample questionable (Veske, 2008).

Regarding the observation process, we documented the field data by directly portrait the object for four consecutive weeks. Observations were conducted several times to assess whether there were changes. At a similar time, in-person surveys were conducted to visitors irrespective of their age, gender, and occupation. Before the survey process, we conducted a pilot interview which asked he/her about his/her point of view on the car-free day concept and supporting infrastructure to gauge participants' familiarity with car-free day function as a public open space. We then briefly explained the research purpose and context to avoid misunderstanding.

The first and second items of the questionnaire asked about the frequency and main purpose of the respondent, respectively. We provided five choices for the question regarding the purpose of the respondent visiting CFD: exercise, trading, shopping, recreation, and on duty. After these initial questions, the third to ninth items elicited the respondent's agreement level. Responses were given on a five-point scale (5 = "strongly agree" to 1 = strongly disagree). Following this, there were another five questions that evaluated the respondent's perspective on factors influencing a good public open space using a similar response scale. In the last part of the questionnaire, the respondent was asked about his/her general background and such as age, gender, domicile, and last of educational background. Of the total 75 questionnaires, 68 were qualified for further analysis. There were 3 with not fully answered and the remaining 4 did not receive back.

**2.2. Data analysis**

The validity and reliability of the questionnaire were examined to know whether the instrument is valid and reliable. The validity and reliability of this questionnaire scores are satisfactory (0.3 and 0.68), with an internal consistency  $\alpha = 0.5$ , and Pearson correlation coefficient relating preferences of 0.2 or less. Therefore, the current version of this instrument may be considered reliable, valid, and suitable. Data obtained from the questionnaire were subjected to descriptive analysis to compare the trend of respondent's agreement level regarding the items asked.

**III. Results and discussion**

**3.1. Respondents' profile**

Public open space availability is crucial for both people's well-being and sustainability. The car-free day is a promising concept for providing the POS; hence, it is indispensable especially for urban life. In-person surveys with equal gender representative (of which 52.3% male and 47.7% female) (Table 1) reveals that exercise is the most reason for people attending CFD. Of the total 65 people, more than half indicated a regular attendance or can be categorized as frequent visitors. Respondents who answer occasional and infrequently visit were 36.9% and 7.8%, respectively. This result indicates that CFD is being part of urban resident habit as their necessity.

**Table 1.** Respondent profile and intensity

Respondent	Sample size	Percentage (%)
Gender		
Male	34	52.3
Female	31	47.7
Intensity		
Often	36	55.3
Sometimes	24	36.9
Seldom	5	7.80

Within the "active recreation" domain, public open spaces are considered to be an important location (i.e. physical environment) where people can accumulate physical

activities (Koohsari *et al.*, 2015). POS is defined as any public space, accessible to all people, independent of age, ethnicity, physical disabilities, or other characteristics. The functions of POS such as convenient accessibility, design and pleasantness, safety, cleanliness and tidiness, facilities, service charges, and the benefits that people received from these spaces are the major consideration of the utilization factors of the public (Panya, 2012). Accordingly, it makes sense that the vast majority of people visiting CFD are to have physical activities. In addition to facilities, people especially adolescents often perceived that age-appropriate facilities were lacking in POS which discouraged their visitation (Victoria Derr, Halice Ruppi and Deryn Wagner, 2016). However, as there are few options for recreational purposes, CDF is the most favorite and assessable one for urban society in a small town to spend the weekend (Table 2).

**Table 2.** Activity and purpose of respondent visiting CFD

Activity	N respondent	%
Exercise	21	32.3%
Selling	11	16.9%
Shopping	20	30.7%
Recreation	10	15.3%
On duty	1	1.6 %
Others	2	3.3%

Interestingly, nearly two to third participants attend the CFD because of shopping. This is in line with Prabowo *et al.* (2018) who recently reports that CFD has shifted from its original purpose. Nowadays, CFD becomes a new culinary destination for people living around the area. This is mainly due to a gradual increase of street vendors who take an advantage of the CFD for promotion purposes and selling various foods both traditional and modern. Furthermore, people who utilize the CFD agenda as the recreational place is relatively low represents of 15.3% of the respondents, similar to those with selling or promotion purpose (16.9%). In this exploratory study, we also observed a low percentage of participants who indicate that they are on duty purpose (1.6%) while the remaining 3.3% of respondents did not have an exact purpose.

### 3.2. Physical, social, and economic activities

Observations were directly conducted within four consecutive weeks to assess the physical, social, and economical characteristics of car-free days in Klaten. For physical aspects, we assessed circulation lines, public facilities as well as street furniture (Figure 2). The CFD implemented a linear circulation line along the Jalan Pemuda as the main city street where it connected one place to another as shown in Figure 1, while road alleys were used as parking spaces. Commuters were not allowed to drive through this street line and as consequence, there was an alternative road to facilitate vehicle users. This form of CFD is identical to many other cities in Indonesia (Belgiawan *et al.*, 2014). However, as there is a difference between small and big cities, particularly in car volume, it is noted that despite some positive impacts, there is also a negative impact as CFD is implemented. For instance, in Surabaya, (Anwar *et al.*, 2009) suggested that changing the traffic flows where surrounding roads witness a traffic flow increase. Nevertheless, this was not observed in Klaten indicating that there are no significant commuters on the weekend.

In addition, authorities have referred to aspects of smoothness, safety, and comfort indicators. Although there are few problems regarding on safety aspect because of no specific allocation for pedestrians and bicycles which potentially allow accidents to occur. In regard to smoothness and comfort, we observed sufficient regulation and public facilities supporting people activities such as the availability of public officers to arrange circulation along with the areas and provide public facilities such as trash, toilet, parking space, signage, and green space area.



**Figure 2.** Support facility and street furniture at car-free day event in Klaten, Central Java

On the other hand, a car-free day program creates various social interactions such as sports activities, art performances, cultural parades, and promotions for community service activities (Figure 3). Car-free day implementation on Sunday received high enthusiasm from the community to fill his day off on Sunday morning by following the variety of agenda. These activities indicate that the CFD is an effective model in providing public open space since it supports recreation, relaxation, and public engagements. Such activity is illustrated in Figure 3. Generally speaking, public open space is closely related to street sellers. Similar to other cities, car-free day in Klaten has also presented massive street vendors as this is an effective way to meet between seller and buyer and this program has been recognized as contributing to the economy of the society. This economy is perfectly appropriate because the main purpose of visitors attending a CFD is for a culinary tour (Prabowo *et al.*, 2018) and/or to have family time during the weekend. Thus, it is commonplace for street vendors to sell various items. Prabowo *et al.* (2018) mention the 7 best-selling items sold on CFDs: drinks, snacks, sports accessories, used goods, women's knickknacks, children's toys, and kitchen utensils as this is following our observations. Accordingly, Figure 4 provides a few illustrations for such economic activities.

### 3.3. Public perception toward car-free day as public open space

In this study, public perception regarding the functionality of CFD as a public open space is examined by asking respondents five questions regarding their perspective of public open space with the aspects of comfort, relaxation, active engagement, passive engagement, and discovery. The result of the public perspective on these options is presented in Table 3. In this exploratory study, we find that people strongly agree that open space must be comfortable (40%) and provide an opportunity to have active engagement (53.8%). These two factors are the most important they considered that CFD must be prioritized. Furthermore, more than half of people also considered that aspect of relaxation (52.3%) and passive engagement (52.3%) to be important factors influencing their interest though the degree is lower than comfort and active engagement. There is a lower percentage of people on the discovery aspect (44.6%) than those of the four aspects.

**Table 3.** Public perspectives on aspects of public open space

Respondent's Agreement	Aspects in Public Open Space				
	Comfort	Relaxation	Active Engagement	Passive Engagement	Discovery
Strongly disagree	0.0	0.0	0.0	0.0	3.1
Disagree	3.1	0.0	1.5	10.8	1.5
Neutral	18.5	20.0	9.2	16.9	29.2
Agree	38.5	52.3	35.4	52.3	44.6
Strongly agree	40.0	27.7	53.8	20.0	21.5

Carmona (2019) summarizes that comfort is one of the absolute requirements for the success of public spaces. The duration or the length of time someone is in the public space can be used as a reference or benchmark for whether or not a public space is comfortable. In this case, the comfort of public spaces is influenced by environmental comfort in the form of protection from the influence of natural factors such as protection from sunlight, wind, rain, and physical comfort in the form of the availability of various supporting facilities. In addition, several physical settings are important to enhance social interaction as part of active engagement. Outdoor seating, urban furniture, and spatial setting are a few examples required to provide a pleasant and comfortable environment to interact and rest (Turel, Yigit and Altug, 2007).

Interestingly, there are more than a quarter of people do not aware (neutral) of the discovery factor. Discovery terminology in this aspect can be defined as a process of managing public space so that in it occurs an activity that is not monotonous. Activities can be in the form of events that are scheduled (routinely) or incidentally, such as musical performances, art exhibitions, regional cultural arts performances, festivals, and cultural parades.

Access to public open spaces is an important environmental factor contributing to neighborhood 'liveability' (Badland *et al.*, 2014a; Villanueva *et al.*, 2015a; Alakshendra, Kumar and Mehta, 2020)(Badland *et al.*, 2014b; Villanueva *et al.*, 2015b). Therefore, it must be safe, attractive, socially cohesive and inclusive, and environmentally sustainable as well as provide people with comfortable facilities for walking and cycling. Public open spaces could improve the environmental quality of the city (Shuib, Hashim and Nasir, 2015a) and also bring a positive contribution to the quality of life of people (Nasution and Zahrah, 2015b). When a city is approaching sustainable urban development, POS plays a prominent role in environmental sustainability and they can perform various functions for cultural expression to a wide diversity of people, social interaction, economic exchange and these spaces should design and manage to ensure human development by building peaceful, promoting cultural diversity and democratic societies.

The multiple benefits of POS mean the services provided by the POS that promote human or societal wellbeing, either directly or indirectly (Konijnendijk *et al.*, 2013). In general, the multiple benefits of POS contain health, social, economic, environmental, and tourism benefits. People can get relaxation and can escape from their daily routine by visiting public spaces such as urban parks and other recreational places. When the place has contributed to the social interaction and improved psychological comfort and safety, it could be determined as the success of POS (Shuib, Hashim and Nasir, 2015b). Psychological and physical health can be affected by the activities in the POSs and the presence of natural

elements (Nasution and Zahrah, 2015b). Public parks can reduce stress, enhancing contemplativeness, provide a sense of peacefulness and tranquility and rejuvenate the city dweller (Chiesura, 2004).

In addition, POS can provide economic benefits for not only citizens but also municipalities. For example, air purification by trees and plants can reduce the pollution cost and prevention measures. Urban POS and green spaces are also the factors that influence urban heat island effects (Kurniati and Nitivattananon, 2016) and this is the effective way of reducing cost and amount of energy used in city (Lau, 2014). The attractiveness of the city is increased by the aesthetic, recreational, and historical values of urban parks and this can promote tourist destinations and generating revenues and employment (Chiesura, 2004). Due to the creation of POS, the quality of the local environment and maintenance standard will improve to a significant level and regard as satisfactory by the vast majority of people.

#### 3.4. Public perception toward car-free day as public open space

Nowadays, population is becoming urban. The increasing density of cities has progressively occurred in the last few decades in response to massive urbanization. This phenomenon triggers many consequences, including socio-economic impacts, environmental problems, quality of life of the people living in an urban setting environment, and the need for the urban layout. Given the fact that a larger population now resides in cities, not only are people's behavior affected by land use conditions but also their daily living spaces are squeezed. In some big cities in Indonesia, increasing urban density and the exploding population provides less space for public recreational activities (Matthew McConnachie and Shackleton, 2010). This situation has led to research on how modern society in the urban environment using "naturally" available space or open space setting to fulfill their need to keep healthy both physically and mentally. Public open space (POS) can be defined as a managed public space, available, accessible, and open to all public (Carmona, 2019b). Although there are many definitions regarding POS, there is no universal consensus that can be postulated. Thus, this terminology is made to represent the most common idea on the function of POS, especially for modern society. Exploration of POS as part of modern society is relevant to the 11th pillar of Sustainable Development Goal on the development of sustainable cities and communities and the New Urban Agenda. In the big city, it is crucial to address problems related to overexploitation and mismanagement of state-owned public open spaces (Ling *et al.*, 2021). In a small city, however, this concept has a different purpose.



Figure 3. Physical and recreational activity of people at car-free day event in Klaten, Central Java

Not only do the big cities set an artificial open space for their citizens, but also government does of some small cities in Indonesia started to copy the model to provide such public open space (POS) allocation by implementing a car-free day event to provide

recreational space for their residences (Arwini, Negara and Suthanaya, 2015; Farda and Balijepalli, 2018b). It is one of the important types of land use policy that can provide people to actively engage in “conservation, recreation, and interaction” in an urban context (Kabisch *et al.*, 2021). The definition of POS in this context includes a city park, museum, urban plaza, and public market festival which has been globally considered as an important contributor to improve people’s physical, social and psychological health as well as social interaction (Chen, Liu and Liu, 2016; Jennings, Larson and Yun, 2016; Yung, Conejos and Chan, 2016b; Kabisch *et al.*, 2021).

### **3.5. Car-free day: A support system for people wellbeing**

Despite a significant risk of traffic congestion on people's health due to vehicular emissions especially in big cities such as Jakarta and Bandung, interest to reduce transportation activity by implementing car-free days in small cities has been growing rapidly. The purpose is primarily to provide alternative recreational spaces for people. The car-free day is reported to effectively address many problems as a result of people's dependence on the use of a private automobile, such as problems on air pollution, safety issues, global warming, and stress (Nieuwenhuijsen and Khreis, 2016; Huboyo, 2019). It promotes much more benefits on people living in a small town as they can interact with each other and do many exercises such as walking, cycling, shopping, etc. (Rachman and Barus, 2019) stated that car-free day program visualizes the city with minimal use of private cars for the public, while also fostering and encouraging awareness of the presence of alternative transportation modes. Since a car-free day initiative will minimize car travel distance and emissions, a car-free day is a good way to encourage people to change their travel habits to achieve a low carbon society.

In addition, the car-free day is also considered as a future model of tourism spot allocation for small-town society concerning continuously increasing private car and motorcycle ownership throughout cities in Indonesia (Farda and Balijepalli, 2018b). If the city's growing urbanization is combined with private vehicle ownership, the city is likely to face gridlock in the not-too-distance future. Furthermore, as a result of high traffic rates, pollutant emissions from road traffic have reached levels far beyond reasonable limits. Car-free day and odd-even plate policy measures caught the attention of authority recently more than ever (Cai and Xie, 2011; Cantillo and De Dios Ortúzar, 2014; Arwini, Negara and Suthanaya, 2015), due to the pressure on local government to deal with the problem related to transportation especially traffic congestion but also due to the urgent need to reduce environmental damage caused by the pollutant emissions from road traffic. A car-free day scheme is a practical and cost-effective strategic control measure that restricts the usage of non-sustainable modes of transportation by prohibiting them on a specific day/time span on a specific route. Allowing only people on bikes to use the road during the car-free daytime encourages contact between people and communities. In certain cases, a car-free day offers an incentive for people to spread their message, perform musical performances, and boost sales at local businesses. By preventing non-sustainable modes of transportation from using a road, improvements in local air quality, social interaction, and people's health and well-being are expected (Farda and Balijepalli, 2018b).

## **IV. Conclusion**

It is concluded that the car-free day program has presented an open space for the urban resident to do various physical, social, and economical activities. Large percentages of respondents believe that the car-free day program provides a positive environment because the implementation has to meet major aspects required to create a public open space such as comfort, promote an active and passive engagement, relaxation, and discovery. Thus, it

encourages them to come often as indicated by 55.3% of respondents who frequently attend the CFD program to do a variety of exercises, promotions, shopping, and recreations.

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