Ethiopian Journal of Environmental Studies & Management 19(2): 213 – 229, 2026
ISSN:1998-0507 doi: https://ejesm.org/doi/v19i2.7
Submitted: February 6, 2026 Accepted: April 2, 2026

FOSTERING URBAN PUBLIC SPACE EXPERIENCE THROUGH DEPENDENCE ON CAR-FREE ZONE IN KIGALI CITY, RWANDA

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Abstract
Car-free zones as pedestrianized public spaces as a result of non-motorized streets are being embraced as vital urban realms in many cities. Their functions through landscape values lead to special connections through place dependence (PD). Currently there are few studies that illuminate place-people relationships of these spaces in African context. Kigali City's car-free zone within the central business district (CBD) forms the case study. The aim of the study was first to analyze the perception of the users based on landscape functions, second to analyze the users perception based on aspects that contribute to PD. The authors postulate that PD among the users develops as a result of the various functions, activities that are provided by the car-free zone. The study adopted a mixed approach in terms survey with 183 respondents and field investigation through photography and mapping. Findings revealed that the relationship between frequency of visit and duration of visit was significant for PD despite weak association. Through Regression analysis air quality, recreational and therapeutic values were identified as significant predictors of PD while economic and learning values were insignificant. Correlation analysis revealed that PD and the landscape values revealed moderate spatial associations. Majority of the respondents through a high Eigenvalue implied that they enjoyed recreating within the car-free zone than any other place. The study recommends that to increase usability and acceptance of public spaces, PD variables should be considered in place making and keeping. The findings are important for urban spatial planning and policy making in creating public spaces that foster dependence and attachments.

Keywords: *Public space, Car-free zone, Landscape values, Place dependence, Place attachment*

Introduction

Place dependence (PD) as a form of functional attachment to a place is represented by core factors that are irreplaceable. This is in terms of attachment to a place in terms of material and emotional attachments. It's a component of place attachment and acts to influence the sense of a given place (Prayitno *et al*., 2021). K'oyoo (2025) found out that many scholars (Mousazadeh 2022; Westerholt *et al*.,

2022; Dameria *et al*., 2020; Anton and Lawrence, 2014; Qian *et al*., 2011; Shamsuddin and Ujang, 2008; Brown and Raymond, 2007; Kyle *et al*., 2004; Williams *et al*., 1992) consider PD as one of the components of place attachment and of sense of place. Qian *et al.* (2011) showed that place dependence contributed strongly to both place identity and place attachment.

PD is the peoples' functional reliance (attachment) on the various amenities and resources that places can provide (Zhang and Lei, 2013; Raymond *et al*., 2010; Brown and Raymond, 2007; Williams and Vaske, 2003; Jorgensen and Stedaman, 2001). Anton and Lawrence (2016) concur by stating its evaluation of the ability of a place to meet individual's needs and allow for achieving of their goals. This supports earlier studies by Proshansky *et al*. (1983) that posited that PD is usually associated with self-realization or self-fulfillment of people through experiences in various places, Williams *et al*. (1992) that dependence occurs when a given place satisfies certain behavioral goals better than other places and by Stokols and Shumaker (1981) that it occurs when a place has a functional PD that is not transferable to another place. PD according to Anton and Lawrence (2016) supported by Li *et al.* (2023 tends to precede the formation of place identity even though both of them are subsets of place attachment.

Several studies have pointed out the importance of considering the aspects of place dependence in place making and keeping within the urban realms (Sanga and Mbisso (2020); Liu *et al*. 2018; Ujang and Zakariya, 2015; Karami *et al.,* 2014; Shamsuddin and Ujang, 2008). Budruk *et al.* (2009) showed that pro-environmental attitudes are associated with strong attachment to place that includes place dependence and identity. Studies have also pointed out the importance of place attachments through emotional and functional aspects in the case of redevelopments, urban renewals and new developments in order to maintain identity and resultant attachments through meanings people attach to such places. These include K'oyoo (2023); K'oyoo and Breed, (2024); Oktay and Bala, (2015); Shamsuddin and Ujang, (2008).

Landscape values/ functions according to Gerber and Hess, (2017); Brown and Raymond, (2007) consist of several space functions that include therapeutic, wilderness, heritage, intrinsic, spiritual, biological, learning, life sustaining, recreation, economic and aesthetic values. All these are values that can lead to formation of place dependence and attachment to a place. Gerber and Hess (2017) propose a 'circular landscape evaluation" using three concepts of landscape use value (aesthetic), existence and intrinsic value. Li *et al.* (2023) posit that several studies have confirmed the benefits of interaction with the natural or green spaces despite the fact that their restorative potentials have been under explored. According to Ujang (2017), Williams and Vaske (2003) place dependence as a functional attachment is embodied in the physical characteristics of a given place. Ujang (2017) posited that the physical characteristics and the functional qualities act to influence the degree of dependency to a given place and thus attachments based on the various activities and social interactions. Williams and Vaske (2003) opine that this may increase due to factors such as proximity in terms of whether the place is close enough for frequent visitation.

Car-free zones are pedestrianized areas where no automobiles are allowed to enter and pass through (Salleh *et al*., 2020). Studies have shown that car-free zones within urban realms are beneficial in many ways in terms health benefits, reduction of traffic related problems such as accidents, noise, air pollution, congestion. These areas add to the open green spaces for public use within the cities (Nieuwenhuijsen and Khreis, 2016; Marcheschi *et al*. 2022; Njeru and Kinoshita, 2019; Gundlach *et al*. 2018). Many cities are striving to implement car-free initiatives such as car-free zones, streets, car-free days all in a bid to reduce greenhouse emissions and benefit the residents in terms of health in addition to space for recreation and social interactions. According to Gubic and Baloi (2020) the city of Kigali is promoting car-free activities within the city and neighborhoods by trying to encourage the residents to spend time outside for events such as sports, exhibitions and performances. Kigali City conducts monthly car free days to promote walking and other activities that encourage physical exercise such as jogging when selected roads are closed temporarily for these activities (Gubic and Baloi, 2020). The Global Green Growth Initiative GGGI (2018) state that access to public open spaces is an important in increasing recreational walking.

Kigali City, Rwanda has few public open spaces and the car-free zone within the CBD was one of the initiatives to increase public spaces. Rwanda is faced with high urbanization rates and high population. There is need for more public open spaces especially within Kigali City (Gubic and Baloi, 2020). UN (2015) Sustainable Goal 11 targets to make cities and human settlements inclusive, safe, resilient and sustainable. Target 11.7 of this goal seeks to provide universal access to safe, inclusive and accessible green and public spaces in particular for women and children, older persons and persons with disabilities (UN, 2015). According to Sanga and Mbisso (2020) urban open spaces offer recreational activities that are both active and passive within them thus offering relaxation and solace to the city residents.

Few studies especially in Africa as part of the Global South have studies on PD and associated attachments to place within car-free zones as part of the urban environments. This study seeks to fill a knowledge gap and add to the body of knowledge in terms of urban space functions/values and place dependence as one of the dimensions that form place attachment and resultant sense of place. The rest of the paper is organized into sections: materials and methods followed by the results and discussions and lastly conclusions and recommendations.

Materials and Methods

Study Area

Kigali City's CBDs car-free zone (1.9478° S, 30.0597° E) also known as Imbuga City Walk is a public open space located on the KN 4 Avenue in the heart of Kigali City, Rwanda. It's centrally located and is a popular destination for locals and tourists. It is Kigali's largest car-free zone that was developed by the city government. It was completed in 2021 by the city's urban planning department and is managed by a private entity. The aim of its creation was to reduce automobile traffic and their associated emissions from the city centre in order to provide greener public space. The study respondents were sampled within the University of Rwanda's College of Science and

Technology campus (-1.9586, 30.0642) that is the largest educational facility within the CBD. Figure 1 below shows the location and proximity of the car free zone to the campus. The study area was purposively selected due to its proximity to the respondents as the largest public open space within the CBD.

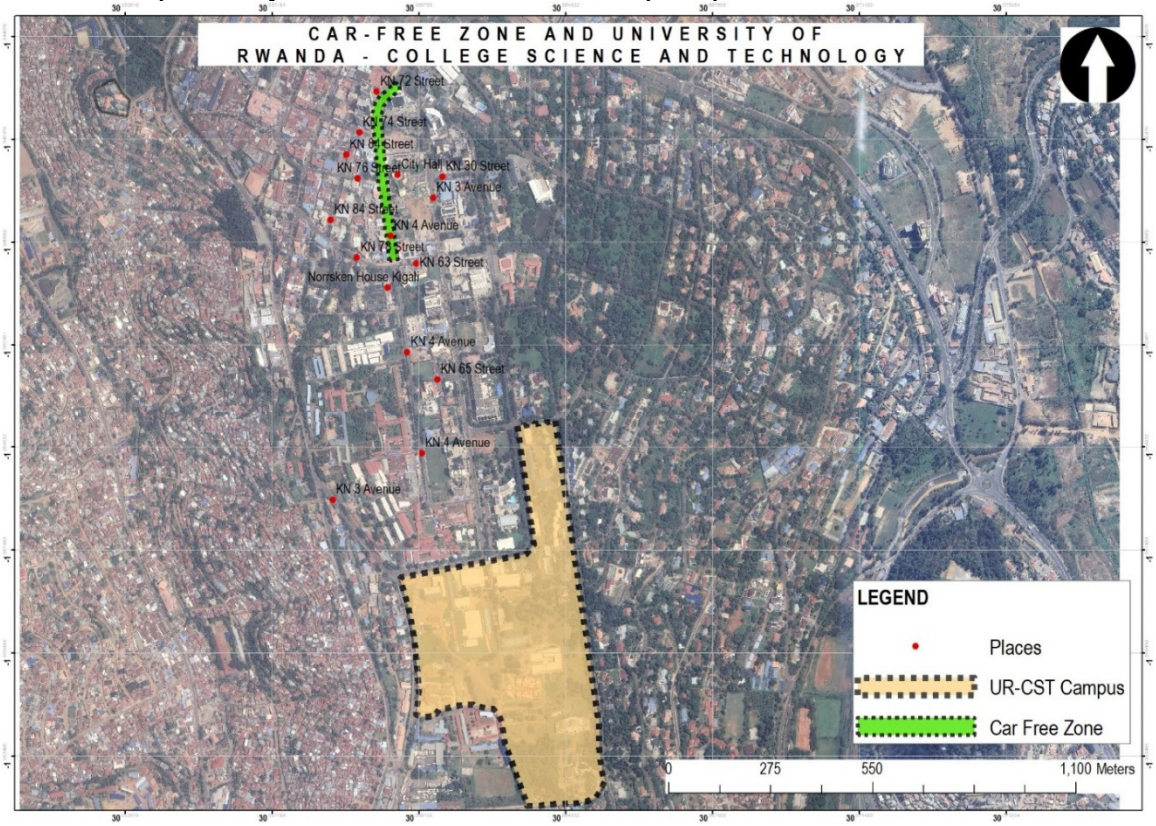

Fig. 1: Kigali CBD Car Free Zone and the College of Science and Technology

Sampling Design

Through quantitative research design the study employed a combination of random and convenience sampling for data collection. University students were the main respondents to investigate their perception of the car-free zone as the largest public open space nearest to their campus within the CBD. The University of Rwanda's College of Science and Technology, through its five schools, provided study respondents through different departments through convenience and random sampling. A sample size of 183 respondents was used to achieve statistically significant results. The respondents' were verbally requested to consent before issuing the survey questionnaire for filling. The purpose of the study was clarified to them and they were not required to provide any personal information. Inclusion criteria were based on availability at the campus at the time of data collection and willingness to participate in the study. The sample per school distributed amongst the departments was based on the proportionate number allocated based on the school's student population.

Data Collection

Field Investigation

The authors investigated the various types of activities that users of the car-free zone engaged in. This was through the

spaces and amenities. The site visits were held on selected days and times between 8am and 7 pm through observations and photography. These constituted the qualitative material of the study.

Survey

The survey instrument was structured into parts, incorporating the key concepts that were under investigation: Part 1 of the instrument consisted of demographic characteristics namely; School /department/year of study of the respondents, gender and age. To explore the predictive validity of place dependence. Scale based questions that assess related behaviors or outcomes were incorporated. For example: "How often do you visit the car-free zone?", Length of time spent in Kigali CBD, last time the respondent visited the car free zone, knowledge duration for car free zone by the respondents. Part 2 of the instrument was on urban public space values/functions. This section assessed the level of agreement or disagreement with various values/functions within the car-free zone and used a 5 -point Likert scale (e.g., 1 = strongly disagree, 5 = strongly agree) to measure the importance of each value. Examples include: Economic value, aesthetic value, recreation value, learning value, Therapeutic value and air quality Part 3 of the instrument was on place dependence questions. This section assessed the level of agreement or disagreement with various place dependence questions using Psychometric scale to measure place dependence within the car-free zone and used a 5 -point Likert scale (e.g., 1 = strongly disagree, 5 = strongly agree) to measure the importance of each.

Results and Discussion

Field Investigation

Landscape Spatial Attributes

Field investigation through photography yielded the selected photos (Figure 2 and 3 a to c) below for the various landscape spatial attributes. The study area consists of new high-rise building over 10 floors of mixed use on the northern end embarking the road access near it, closed end near new construction of high-rise building and bank building, Kigali city metallic landmark monument near City Hall building, commercial buildings on the eastern boundary mostly 2-4 floors high, concrete planters with seating areas on the northern end, metallic and timber pergolas and seats within the southern end, city hall building from rear end, curio shops and fast food kiosks, soft and hard landscaping with seats under palm trees, bank building on western end, and closed end from the southern end.

Fig. 2: Commercial buildings, curio shops, concrete seats, planters, litter bins, timber seats and metallic pergolas along northern end

Fig. 3: Kigali metallic landmark, landscaped pedestrian walkways, commercial buildings.

Li *et al*. (2023) state the perception for a given landscape depends on factors that include aesthetics, historical, uniqueness, naturalness, and safety. The authors in this article posit that the various activities within the car-free zone add to its vitality in terms liveliness especially during the day and late evenings. The activities that are entertaining among other street activities within it that encourage passersby to stop and watch add interest and thus can lead to longer period of stay within it and lead to dependence and attachments from time to time.

Activities

Table 1 below summarizes the findings from the car-free zone based on identification of activity/function and the attributes and elements of the space that facilitate it. Ujang (2017) investigated users' activities in similar studies through analysis of attributes related to vitality, diversity/choice, and transactions. They considered several elements within these three main attributes.

Table 1: Activity attributes and elements of car-free zone

Activity	**Attributes**	**Landscape/space elements**
Banking transactions	-The buildings embarking the car-free zone on either ends offer four major banks with many visiting for various transactions.	- Adjoining buildings
Photography and videography	-Done by an organized group of professional photographers situated mostly next to the metallic land mark	-Done within the entire zone and especially next to the metallic landmark near city hall building
Hotel and restaurants	-Within the adjoining buildings on western side	-Done indoors and outdoors for some buildings adjoining the zone
Fast foods within curio shops	- Metallic shops 5no preparing various fast foods at the southern end. The shops sited in the middle part leaving walking paths on either ends.	-Provision of seats and shades next to the curio shops
Bicycle riding	-Hired bikes at 300 Rwanda Francs by mostly the youth	-Done within the walking paths, open area and allowed within the adjoining streets
Skating	-Mostly done by the youth	-Done within the walking paths and especially within the

		large open area that is entirely paved
Walking through	-Locals and tourists walking through the entire length of the zone just to access other parts of the CBD	-Done within the wide walking areas that are entirely well paved
Relaxation(sitting)	-Done by people of all races mostly by sitting within the various areas while carrying out various activities from phone calling, resting, storytelling etc.	-Done within the pergola seats, open to sky seats, seats under palm trees, concrete planter seats
Exhibitions	-Done for selected events during selected days of some months	-Done under tents placed within the large open area and other adjoining walking areas
Street vending	-Not allowed but occasional street vendors on foot access the area	-Within the entire space for those within the zone
Other businesses	Include forex bureaus, supermarkets, boutiques, various office services etc.	-Done within the adjoining buildings and curio shops

Figure 4 a to d below shows selected photos of some of the activities that add to the vitality of this public space through liveliness and diversity thus leading to dependence and attachment of the place.

Fig. 4: a) Advertisement board for sales exhibition in December, 2025, b) tents for exhibiting vaious goods within the large open area, c) bikes for hire and d) the curio shops, resaturats and businesses within the adjoining buildings

Karami *et al*. (2014) indicated that people's activities in urban spaces increased the opportunity for social contacts which then provided people with the chance to establish social bonds. These authors support earlier studies that confirmed the importance of place settings and activities in enhancing place attachments through meanings. A large variety of activities for people within a given space was more effective than the architectural attributes in generating place attachments. Shamsuddin and Ujang (2008) posit that streets are very important in sustaining the economic activities and enhancing cultural diversity besides self and group identities. The car-free zone as a closed street to automobiles remains a realm for various users to interact and exchange in various ways from socially, culturally and economically. The diversity of people within it from various races locals and tourists alike in addition to the wide range of products and services offered within it adds to its importance as an urban open space hence lead to place dependence and attachments.

Socio-demographic Characteristics

In order to comprehend the respondents of the study in view of urban public space values and place dependence the respondents' demographic profile was imperative. The respondents were requested to provide their demographic characteristics; the results are presented in Table 2 below.

Table 2: Demographic characteristics of respondent's

Characteristics	**Percentages**	**X^2**	**P-value**
Gender		18.765	0.001
Male	64.5%		
Female	35.5%		
Age		16.370	0.037
18-20 years	13.7%		
21-25 years	76.5%		
Over 25 years	9.8%		
Frequency of visit		29.794	0.02
Daily	9.3%		
Once a week	29%		
2-5 times per week	22.4%		
2-3 times per month	11.5%		
Once a month	27.9%		
Duration of visit		29.007	0.004
< 1 hour	64.5%		
1-2 hours	21.9%		
2-4 hours	9.8%		
>4 hours	3.8%		
Last visit		27.338	0.04
Within this week	26.2%		
Last week	26.8%		
Few weeks ago	22.4%		
Last month	10.4%		
A few months	14.2%		
Knowledge of car free zone		1.934	0.748
Since joining UR CST	47.5%		
Since 2021	52.5%		
In session visit to car free zone		30.450	0.000
Must	6.6%		
Always	23%		
Some times	70.5%		

The demographic breakdown (Table 2) above shows a gender distribution of 64.5% (n=118) for males and 35.5% (n=65) for females respectively depicting gender disparity among the study participants. Majority of respondents (86.3%) were at least 21 years of age and was considered to be mature enough to respond to the various questions sought in the study. The cross tabulation between

gender and respondent from respective school shows a significant association (χ^2=18.765; P-value=0.001<0.05**).** The majority of residents (90.8%) indicated they frequently visited car free zone either once a week or 2-5 times per week or 2-3 times per month or once a month implying that they feel a strong connection to this car-free zone. The study found a statistical significance difference in the frequency of visit to the car free zone by the respondents from different schools (χ^2=29.79; P-value=0.02<0.05**).** The majority of residents (86.4%) indicated they spend at most 2 hours during their visit to car free implying that car-free zone is important to them and would therefore spare some time involving themselves in activities within it. The study found a statistical significance difference in the duration of visit to the car free zone by the respondents from different schools (χ^2=29.001; P-value=0.004<0.05**).** The majority of residents (75.4%) indicated they have known car free zone since they joined the campus as opposed to since the car free zone was opened to the public in 2021.

Relative Importance Ranking of Urban Public Space Values/Functions

We sought to examine the relative mean importance of the six urban Public Space values/functions using mean, standard deviation and ranges in order to do the rankings. The results are presented in Table 3 below.

Table 3. Relative importance ranking of Urban Public Space Functions/ Values

Value/Functions	**n**	**Mean**	**Standard deviation**	**Overall rank**	**Min.**	**Max.**
Economic	183	3.53	1.20	5	1	5
Aesthetic	183	3.68	1.07	4	1	5
Recreation	183	3.74	1.06	2	1	5
Learning	183	3.45	1.14	6	1	5
Therapeutic	183	3.70	1.16	3	1	5
Air quality	183	3.96	1.05	1	1	5

Based on the rank values in Table 3 above, the mean importance scores for the six public space values/landscape functions in the study indicated that the respondents perceived air quality value, recreation value and therapeutic values to be most important. The implication of the findings is that good air quality, recreational and therapeutic and values may lead to high place dependence because people rely on it for exercise and leisure. All these three values /functions scored above the midpoint of the scale, indicating generally positive importance ratings and how much the students do rely on the urban public space to meet their varied needs or achieve their goals. Learning value as well as economic value were considered to be least important.

Ozkan and Yilmaz (2019) demonstrated that the social attributes in a particular environment had a higher impact on the functional attachment (place dependence) of the users as compared to the physical attributes. The choice of highest-ranking functions to be recreational in addition to air quality by the car-free zone users confirms their preference for social activities and leisure oriented thus supporting the position by Ozkan and Yilmaz (2019).

Relationship between Place Dependence and Respondent's Variable

The bivariate correlation to determine the strength of the relationship between selected respondent's variable namely frequency of visit to car free zone, length of visit to car free zone and knowledge of car free zone, age and respondent's gender and summative scales with place dependence was undertaken. The results are presented in Table 4 below.

Table 4: Relationship between place dependence and respondent's variable

Variable	**Place dependence**		
	Correlation(r)	**P-value**	**n**
Visit Frequency to car free zone	Pearson correlation r=-0.193**	0.01	183
Duration of visit to Car free zone	Pearson correlation r=-0.219**	0.03	183
Knowledge of car free zone	Spearman rank (r= -0.033**)	0.658	183
Gender	Spearman rank (r= 0.017**)	0.591	183
Age	Spearman rank (r= 0.039**)	0.602	183

Note: ** P<0:001; 2-tailed sig.
Items are coded on 5-point scales ranging from strongly disagree (1) to strongly agree (5).

The results in Table 4 above indicate that the respondents who expressed knowledge of car free zone since they joined the university had insignificant higher place dependence (r= -0.033; p-value= 0.658>0.05). Age of respondents were found to have significant relationship with summative scale for place dependence (r= 0.04; p-value =0.602>0.05). Gender of respondents was found to have significant relationship with summative scale for place dependence (r= 0.02; p-value =0.591>0.05). These relationships demonstrate weak negative correlation for place dependence. However, the relationship between frequency of visit was found to be significant for place dependence despite weak negative correlation (r=-0.193; p- value =0.01<0.05). The relationship between duration of visit was found to be significant for place dependence despite weak positive correlation (r=0.219; p-value =0.03<0.05).

Karsono *et al*. (2021) showed that continuous and frequent engagement with various places contributed to familiarity. This led to long term engagement with such places hence creating a sense of belonging. The respondents for the car-free zone linked their awareness and familiarity to the urban open space to the frequency of visits and the durations of engagements. Sanga and Mbisso (2020) found out that urban open spaces that did not fulfill the desires of the target population due to unintended uses attracted low frequency visits and as such no sense of place. These authors recommended the provision of urban spaces that considered the socio-cultural expectations of the populations in order to achieve sense of place. Field investigation through observations and photography showed that no unintended functions were

ongoing and were not allowed within the car free zone. This ensured the city residents and visitors alike enjoyed the purpose of their visits to this central public space.

Association between scale measures of place dependence and Urban Public space values/Functions

The relationship between scale-based measures of place dependence and urban public space values using multiple regression analysis was undertaken. The results for linear regression results for urban public space functions values regressed against place dependence are presented in Table 5 below.

Table 5: Urban public space functions values regressed against place dependence

	Place dependence (Dependent variable)			
	R	**R^2**	**F**	**P-value**
Independent variables	0.492	0.242	9.39	0.000
(car-free zone values/functions)	**β**	**T**	**Tolerance**	**VIF**
Economic	-0.102	-1.793	0.755	1.325
Aesthetic	0.093	1.379	0.692	1.446
Recreation	0.348	5.793	0.776	1.288
Learning	-0.006	-0.890	0.717	1.395
Therapeutic	-0.006	-0.099	0.747	1.338
Air quality	0.152	2.297	0.747	1.338

Regression models were used to help identify the urban public space values that best predict the scale based measures of place dependence as determined by the magnitude of the standardized beta coefficients. The results of both regression models were statistically significant ($P<0.05$). Urban space values explain 24.2% of the variance in place dependence. Four urban public space values/functions were significant predictors of place dependence: air quality value (β= 0.152, P-value=0.01<0.05); recreation value (β= 0.348, P-value=0.000<0.05); therapeutic value (β= -0.006, P-value=0.03<0.05) and aesthetic value (β= 0.093, P-value=0.04<0.05). However two urban public space values/functions were insignificant predictors of place dependence: economic value (β= -0.102, P-value=0.809>0.05); and learning value (β= -0.006, P-value=0.809>0.05). The collinearity diagnostics on the regression models suggest a tolerable level of multicollinearity in the independent variables.

Prayitno *et al*. (2021) in a study of place dependence and land usage change found out that environmental quality was the most important factor that influenced the population under study. This they attributed to the good conditions that provided a sense of comfort to the population. The findings by Prayitno *et al.* (2021) concur with the results for air quality by majority of the respondents in the case OF Kigali City's car free zone. This confirms the relative importance that city residents attach to air quality of the public spaces they spend their time within.

According to Khaidzir and Kamal (2023) students developed a sense of place based on place dependence and other place based relationships of place identity and attachments. A strong sense of place suggested that the students had a strong emotional attachment or connection to a specific location for instance the university. The results of the car-free zone

variables on place dependence indicate that the students have a strong connection and attachment to this public space.

Exploratory factor analysis for place dependence items for the respondents

Principal factoring analysis with Varimax rotation to determine the number of latent components that give a good fit for the latent constructs of place dependence items was done. The results are presented in Table 6 below.

Table 6: Exploratory factor analysis for place dependence items

Constructs	**Component**	**Factor Loading**	**Communalities**	**Eigen values**	**Cumulative % variance explained**
Place dependence items (5 items)					
I enjoy recreating within the car free zone more than any other public space?	1	0.678	0.623	51.916	51.976
No other public space can compare to the car free zone in the CBD	2	0.459	0.741	16.214	68.190
I get more satisfaction out of visiting the car free zone than from any other public space	3	0.696	0.782	7.738	75.928
Recreating within the car free zone is more important than in any other place	4	0.484	0.694	5.381	81.309
I would not substitute any other public space for the type of recreation I do at the car free zone	5	0.454	0.605	5.042	86.351
Cronbach's alpha(0.867)					

The Bartlett's test of Sphericity indicated a p-value of 0.000<0.05 suggesting that the correlation matrix is not identity matrix and that there is sufficient relationship between variables for factor analysis. The correlation between each variable (survey question) and each factor indicated moderate positive correlation for all the items under the place dependence as variables. The exploratory factor analysis extracted five components. The first component, with an eigenvalue of 51.916, accounts for a substantial 52% of the variance in the data. This indicates a dominant factor strongly influencing the measured variables. The range of factor loadings indicate that some variables have stronger associations with their respective factors than others. The communalities ranges indicate that the extracted five factors explain a substantial portion of the variance in each variable. The variance in each variable is accounted for by the extracted factors, this suggest that the factors are effectively capturing the underlying structure of the data set.

These high communalities suggest that the selected factors are a good fit for the variables.

Alrobaee and Al-Kinani (2019) opine that place dependence can be determined by two factors: place qualities and place expectations. Place quality is the ability of a given place to achieve the objectives of the people. This can be in terms of availability of amenities, availability of open spaces, entertainment, accessibility, diversity and how diverse a place is. Place expectations is in terms of the future experiences that are cognitive that are likely to occur in a given place. These are based on long term expectations by the individuals. Majority of the car-free zone respondents through a high Eigenvalue implied that they enjoyed recreating within the car-free zone than any other place. This indicates a strong influencing factor for place dependence and its other influencing variables. This results could be attributed to good place qualities and place expectations of the car-free zone as the centrally and largest public open space. Field investigation of the car-free zone shows that it offers several amenities for relaxation, recreation. There are a variety of landscape elements that enhance the various activities of the users. Several economic activities are offered by the buildings that embark this open urban space that includes banks, restaurants, forex bureaus, curio shops, fast food joints among other recreation activities offered like hired bike riding all in a bid to make the experience within it enjoyable. These attributes in terms of functions and activities could be a clear pointer to the public dependence for this space.

Dameria *et al*. (2020) analyzed place dependence in terms of three principles: evaluation, preference and unwillingness to move. Evaluation according these authors comes from a person's consideration of the qualities of a place, is the place the best and able to meet the needs. Preference is in terms of the qualities of other places that are being compared to the current place. Ujang and Zakariya (2015) associate preference to a place to the physical elements and the activities that make a place to be distinct from other places. Unwillingeness to move is based on proximity that affects the behavior in terms of the ability to return again to a given place. This fosters the long term relationship with the place (Dameria *et al*., 2020). The various physical elements and activities offered by the car free zone are major determinants that influence visitation and foster place dependence within this central public space.

Conclusion

The study concludes that the relationship between frequency of visit and duration of visit was significant for place dependence despite weak association. Regression analysis revealed that the air quality, recreational, aesthetic and therapeutic values were identified as significant predictors of place dependence while economic and learning values were insignificant. Correlation analysis revealed that place dependence and the landscape values revealed moderate spatial associations. Majority of the respondents through a high Eigenvalue implied that they enjoyed recreating within the car-free zone than any other place. This indicates a strong influencing factor for place dependence and its other influencing variables. It's important to consider place dependence as a functional component of attachment to place when place making and keeping the various urban environments. This leads to higher

acceptance and fosters good usability as the needs of the people are met. Better urban planning and design outcomes can be achieved through consideration of place dependence aspects of given places.

Recommendations

The following recommendations are suggested

-Use of local landscape elements that can strengthen greater attachment to the car-free zone both in terms of functional and emotional aspects.

-Increase the diversity and frequency of social activities and events within the car-free zone to strengthen the functional attachment and to popularize the area.

-Maintain the distinctiveness and uniqueness of the car-free zone through the landscape elements, activities to enhance place dependence and resultant contribution to urban landscape identity.

-Encourage a variety of day and night activities that can encourage frequency and durations of visits and thus add to its vitality through liveliness and diversity to enhance dependence and attachments.

References

Alrobaee, T.R. and Al-Kinani, A.S. (2019). IOP Conf. Series: Materials Science and Engineering, 698 (2019) 033014IOP. doi: doi:10.1088/1757-899X/698/3/033014

Anton, C.E. and Lawrence, C. (2016). The relationship between place attachment, the theory of planned behaviour and residents' response to place change. *Journal of Environmental Psychology*, 47: 145e154. http://dx.doi.org/10.1016/j.jenvp.2016.05.010

Brown, G. and Raymond, C. (2007). The relationship between place attachment and landscape values: Toward mapping place attachment. *Applied Geography*, 27(2007): 89–111. doi:10.1016/j.apgeog.2006.11.002

Budruk, M., Thomas, H. and Tyrrell, T. (2009). Urban Green Spaces: A Study of Place attachment and Environmental Attitudes in India. *Society and Natural Resources*, 22: 824–839. DOI: 10.1080/08941920802628515

Dameria, C., Akbar, R., Indradjati, P.N. and Tjokropandojo, D.S. (2020). A Conceptual Framework for Understanding Sense of Place Dimensions in the Heritage Context. *Journal of Regional and City Planning* 31(2): 139-163. DOI: 10.5614/jpwk.2020.31.2.3

Gerber, J.D. and Hess, G. (2017). From landscape resources to landscape commons: focusing on the non-utility values of landscape. *International Journal of the Commons*, 11(2): 708–732. DOI: 10.18352/ijc.745

Global Green Growth Initiative. (2018). Mapping of Public Spaces in Kigali: Towards City-Wide Public Space Strategy,

Gubic, I. and Baloi, O. (2020). Public open space initiatives for healthier cities in Rwanda. *The Journal of Public Space*, 5(2): 129-146. https://www.journalpublicspace.org

Gundlach, A., Ehrlinspiel, M., Kirsch, S., Koschker, A. and Sagebiel, J. (2018). Investigating people's preferences for car-free city centers: A discrete choice experiment, Transportation Research Part D: *Transport and*

Environment, 63: August, 677-688. https://doi.org/10.1016/j.trd.2018.07.004

Jorgensen, B.S. and Stedman, R.C. (2001). Sense of place as an attitude: Lakeshore owners' attitudes toward their properties. *Journal of Environmental Psychology*, 21: 233–248.

Karami, S., Ghafary, M. and Fakhrayee, A. (2014). Analyzing the correlation between urban spaces and place attachment Evidence from: Narmak neighborhood in Tehran, European *Online Journal of Natural and Social Sciences*, 3(4): 129-139.

Karsono, B., Saleh, B.M., Chung, C.O. and Wahid, J. (2021). Place Attachment in the Riverfront Public Space Case of Malaysia. IOP Conf. Series: Materials Science and Engineering 1101 doi:10.1088/1757-899X/1101/1/012028

Khaidzir, M. F. S., and M. A. A. Kamal. 2023. "Sense of Place: Place Identity, Place Attachment,and Place Dependence among University Students." *The International Journal of Academic Research in Business and Social Sciences,* 13(10): 938–951. https://doi.org/10.6007/IJARBSS/v13-i10/18945 .

K'oyoo, E.O. (2025). Sense of Place: Concepts, Importance and Methods of Study, Africa Habitat Review 20(1) (April 2025), pp. 3136-3146. https://uonjournals.uonbi.ac.ke/ojs/index.php/ahr/issue/view/287

K'oyoo, E. and Breed, C. (2024). Urban memory and identity weighed against economic investment in urban renewal projects: A case of Kisumu City, Kenya. *Acta Structilia*, 31(1): 84 – 119.

K'oyoo, E. (2023). Impact of urban renewal changes on urban landscape identity: Case study of Kisumu City, Kenya. *Acta Structilia*, 30(1): 156-185. DOI:https://doi.org/10.38140/as.v30i1.7036

Kyle, G., Graefe, A., Manning, R. and Bacon, J. (2004). Effects of place attachment on users' perceptions of social and environmental conditions in a natural setting. *Journal of Environmental Psychology,* 24: 213–225. doi:10.1016/j.jenvp.2003.12.006

Li J, Luo J, Deng T, Tian J and Wang H (2023) Exploring perceived restoration, landscape perception, and place attachment in historical districts: insights from diverse visitors. *Front. Psychol.* 14: 1156207. doi: 10.3389/fpsyg.2023.1156207

Liu, Q., Fu, W., Cecil, C., Bosch, K.V., Xiao, Y., Zhu, Z., You, D., Zhu, N., Huang, Q. and Lan, S. (2018). Do Local Landscape Elements Enhance Individuals' Place Attachment to New Environments? A Cross-Regional Comparative Study in China. Sustainability, 10, 3100; doi: 10.3390/su10093100

Marcheschi, E., Vogel, N., Larsson, A., Perander, S. and Koglin, T. (2022). Residents' acceptance towards car-free street experiments: Focus on perceived quality of life and neighborhood attachment. *Transportation Research Interdisciplinary Perspectives*, 14:

100585. https://doi.org/10.1016/j.trip.2022.100585

Mousazadeh, H. (2022). Investigating the sense of place attitudes to quality of life of urban communities nearby the river. *Folia Geographica*, 60(2): 104–125. ISSN 1336-6157 (hard copy) • ISSN 2454-1001 (online)

Nieuwenhuijsen, M.J. and Khreis, H. (2016). Car free cities: Pathway to healthy urban living. *Environment International*, 94: 251–262. http://dx.doi.org/10.1016/j.envint.2016.05.032

Njeru, A.M. and Kinoshita, I. (2019). Mobility, space and community: A study on the importance of Tokyo's car-free local streets as social spaces for residents. *Urban and Regional Planning Review*, 6: 45-63. http://dx.doi.org/10.14398/urp.6.45

Oktay, D. and Bala, H.A. (2015). A holistic research to measuring urban identity findings from Girne (Kyrenia) area study. *International Journal of Architectural Research* (IJAR), 9(2): 201-215.

Ozkan, D.G. and Yilmaz, S. (2019). The effects of physical and social attributes of place on place attachment. A case study on Trabzon urban squares. Archnet-IJAR: *International Journal of Architectural Research*, 13(1): 133-150. DOI 10.1108/ARCH-11-2018-0010

Prayitno, G., Ashari, M.I. and Rukmi, W.I. (2021). Structural equation model with partial least square (SEM-PLS) of place dependence with land used change. *Journal of International Studies,* 14(1): 153-171. doi:10.14254/2071-8330.2021/14-1/11

Proshansky, H.M., Fabian, A.K. and Kaminoff, R. (1983**).** Place-identity: Physical world socialization of the self. *Journal of Environmental Psychology*, 3(1): 57-83. https://doi.org/10.1016/S0272-4944(83)80021-8

Qian, j., Zhu, H. and Liu, Y. (2011). Investigating urban migrants' sense of place through a multi-scalar perspective. *Journal of Environmental Psychology*, 31(2): 170-183. https://doi.org/10.1016/j.jenvp.2011.01.002

Raymond, C.M., Brown, G. and Weber, D. (2010). The measurement of place attachment: Personal, community, and environmental connections. *Journal of Environmental Psychology*, 30: 422-434. doi:10.1016/j.jenvp.2010.08.002

Salleh, A.H., Ahamad, M.S.S. and William, G.W.W. (2020). "Feasibility Study on Walkable City Through Implementation of Car-Free Zones in Georgetown, Penang Using GIS Network Analysis." *IOP Conference Series Earth and Environmental Science* 540: 012032, 1–8. https://doi.org/10.1088/1755-1315/540/1/012032 .

Sanga, E.E. and Mbisso, D.A. (2020**).** Sense of Place and Placelessness of Urban Open Spaces in Dar es Salaam. *Journal of Sustainable Development*, 13(4): doi:10.5539/jsd.v13n4p191

Shamsuddin, S. and Ujang, N. (2008). Making places: The role of attachment in creating the sense of

place for traditional streets in Malaysia. *Habitat International*, 32: 399–409. doi:10.1016/j.habitatint.2008.01.004

Stokols, D. and Shumaker, S.A. (1981). People and places: A transactional view of settings. In Cognition, social behavior and the environment, ed. J. Harvey, 441–488. Hillsdale, NJ: Lawrence Erlbaum Associates.

Ujang, N. (2017). Place Attachment and Continuity of Urban Place Identity, Asian *Journal of Environment - Behaviour Studies,* 2(2): 117-132. https://doi.org/10.21834/aje-bs.v2i2.182

Ujang, N. and Zakariya, K. (2015). Place Attachment and the Value of Place in the Life of the users. *Procedia - Social and Behavioral Sciences,* 168: 373 – 380. doi: 10.1016/j.sbspro.2014.10.243.

United Nations (2015). *Transforming Our World: The 2030 Agenda for Sustainable Development*. New York: UN Publishing.

Williams, D.R. and Vaske, J.J. (2003). The measurement of place attachment: Validity and generalizability of a psychometric approach. *Forest Science*, 49(6): 830–840.

Williams, D.R., Patterson, M.E., Roggenbuck, J.R. and Watson, A.E. (1992). The variability of user-based social impact standards for wilderness management. *For. Sci*., 14: 29–46.

Zhang, H. and Lei, S.L. (2013). Effect of residents' place attachment on their participation intention in local tourism development. *Tourism as a Tool for Development*, 72: 23-31. doi:10.2495/978-1-84564-812-1/0