

RELATIONSHIP BETWEEN ABANDONED OPEN SPACES AND PEDESTRIAN FLOW: IN A CASE STUDY OF ANTALYA

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ABSTRACT

As Jacobs (1961) mentioned, a vital urban life relies on the active street life that results from high levels of pedestrian flow. That flow can help prevent adverse effects and ensure the sociability of abandoned open spaces that emerged in the cities due to rapid urbanization and lack of planning. Different terms have been used to define these spaces. For example, Trancik (1986) defined them as lost spaces that no longer serve their design purposes and therefore need to be redesigned and built. He mentioned that they do not contribute positively to their environment and users; they are not well-defined and have no measurable boundaries. Because of these spaces, pedestrians do not prefer to use the surrounding urban area, so the sociability and the usage of that area and commercial areas are negatively affected. Using the pedestrian flow to solve the problems that abandoned open spaces create can be beneficial. The goal of this research is to contribute to the literature by suggesting alternative design approaches to activate abandoned open spaces through pedestrian flow. To achieve this goal, we investigated the relations between syntactical features of abandoned open spaces and the pedestrian flow around them. The hypothesis is that improving pedestrian flow around these spaces can activate them, and to improve it abandoned open spaces should be more visible and integrated with the urban texture. To evaluate the hypothesis, we selected an urban area with abandoned open spaces near the historic city center of Antalya as the research site. The target city contains various scales of multiple open spaces and pedestrian interaction; it is ideal for studying their relations.

With this goal, the following tasks have been conducted. First, determine the locations of abandoned open spaces in the research site. Second, analyze the syntactical features of selected abandoned open spaces. Third, analyze the pedestrian flow around these spaces. Lastly, investigate the relations between the syntactical features and the pedestrian flow. With these tasks, the following methodologies have been adopted. First, we selected a route in the research site and determined the abandoned open spaces on it by observations. We also determined the functions, users, and physical conditions, like being in-between buildings or corners, having empty or occupied neighboring parcels, and having greenery. Second, we

analyzed the syntactical features like connectivity, integration, choice, and visibility of abandoned open spaces using Depthmap. Third, we tracked pedestrian flow on every selected site with systematic observations, one week and one weekend day in three different periods. We counted the pedestrians that passed, used the space with the gate count method, and created maps that show usage and the flow for every site. We also consider the flow of vehicles because it affects the usage of these spaces as parking lots. For the last, we compared the values of syntactical features and the pedestrian flow by correlations and tried to discover a pattern between them.

Finally, we suggest alternative design approaches that help to activate the abandoned open spaces, not as unused spaces but as sociable environments. Activating these spaces can benefit the urban area economically by attracting more pedestrians. These spaces can be converted into usable open areas that offer pedestrians a convenient place to gather and socialize. The expected benefit of this research is that it suggests alternatives to activate the abandoned open spaces by reorganizing the pedestrian flow around them. The limitation of this research is that it was conducted in one urban part of the city. For future research, conducting it in multiple and different textured parts of the city that contain different types of abandoned open spaces will be beneficial to discover a more consistent design approach to help us to understand the relations between abandoned open spaces and pedestrian flow.

KEYWORDS: Abandoned spaces, public open spaces, syntactical analysis, pedestrian flow

1.Introduction

The lack of open spaces in the cities is a common problem, especially in the city centers. The increasing population forced us to make more buildings, and we started to lose the open spaces that are beneficial for social life, according to Whyte (1980). In his book, he mentioned the importance of small urban spaces in improving social life in the cities. In this sense, abandoned open spaces in the city centers have great potential, but they also create problems in the usage of their surrounding urban areas. To unlock their potential, they can be transformed into places where people gather and socialize by improving pedestrian flow.

Research Aim And Objectives

This research aims to contribute to the literature by suggesting alternative design approaches to activate abandoned open spaces through pedestrian flow. The research questions are as follows;

How do the syntactical features of abandoned open spaces affect pedestrian flow?

How can we activate abandoned open spaces through pedestrian flow? What approaches can we suggest to improve the flow around these spaces?

To answer these questions, first, we determined the locations of abandoned open spaces in the selected research site. Second, we analyzed the syntactical features of selected abandoned open spaces and the pedestrian flow around these spaces. Lastly, we investigate the relations between the syntactical features and the pedestrian flow.

Scope And Limitations

In the scope of this research, we selected an urban area with abandoned open spaces near the historic city center of Antalya as the research site. The target city contains various scales of multiple open spaces and pedestrian interaction; it is ideal for studying their relations. The expected benefit of this research is that it suggests alternatives to activate the abandoned open spaces by reorganizing the pedestrian flow around them. The limitation of this research is that it was conducted in one urban part of the city.

Methodology

First, we selected a route in the research site parallel to the main streets and determined the abandoned open spaces on it. Then we determined the functions, users, and physical conditions, like being in-between buildings or corners, having empty or occupied neighboring parcels, and having greenery by observations. Second, we analyzed the syntactical features like connectivity, integration, choice, and visibility of abandoned open spaces using the Depthmap program. Third, we tracked pedestrian flow on every selected site with systematic observations. We made the observations in two days, one weekday and one weekend, and in three different periods, 10:00 am, 3:00 pm, and 8:00 pm, for 10 minutes. Thus, we reached a more general opinion about the selected sites. We counted the pedestrians that passed, used the space with the

gate count method, and created maps showing usage and flow for every site. We also consider the flow of vehicles because it affects the usage of these spaces as parking lots. For the last, we compared the values of syntactical features and the pedestrian flow by correlations.

2. PEDESTRIAN FLOW AND ABANDONED OPEN SPACES

As Jacobs (1961) mentioned, a vital urban life relies on the active street life that results from high levels of pedestrian flow. It is vital to explore the factors most likely to create valuable public spaces to turn the underused urban voids into lively and utilized spaces for urban core activities (Velazco, 2010). Pedestrian flow can help prevent adverse effects and ensure the sociability of abandoned open spaces that emerged in the cities due to rapid urbanization and lack of planning.

Different terms have been used to define these spaces. For example, Trancik (1986) defined them as lost spaces that no longer serve their design purposes and therefore need to be redesigned and built. He mentioned that they do not contribute positively to their environment and users; they are not well-defined and have no measurable boundaries. According to Sung (2009), abandoned open spaces are more than just vacant lots; they can be unoccupied. They can be unused spaces between two apartments, an incomplete sidewalk, or an undefined green area that people do not use. They are usually unsafe spaces that are no longer in use. Some of the definitions Carmona (2010) made for urban spaces match the features of abandoned open spaces. For example, he defines leftover spaces as those left over after development, often designed without function. Carmona defines undefined spaces as undeveloped spaces that are either abandoned or awaiting redevelopment. He collected both defined spaces under the title of negative spaces.

Gehl (1987) mentioned that the quality of the physical environment could influence the types of activities that could happen in open spaces. That spaces should be designed at a human scale and well connected to their environment. He also mentioned that pedestrian, rather than vehicular flow, should be prioritized. He emphasized the importance of connectivity as a principle that needs to be considered to develop abandoned open spaces. Connectivity is one of the spatial configurations, and we can use space syntax, a set of techniques for describing and analyzing spatial configurations developed by Hillier and Hanson (1984). This study focused on spatial configurations such as connectivity, integration, choice, and visibility.

3. CASE STUDY

To investigate the relations between syntactical features of abandoned open spaces and the pedestrian flow around them, we selected an urban area with abandoned open spaces as the research site (Figure 1). Antalya contains various scales of multiple open spaces and pedestrian interaction; it is ideal for studying their relations.



Figure 1. The location of the selected urban area

The urban area we selected contains many abandoned open spaces with much potential. It is located near the historic center of Antalya. Işıklar and Atatürk Street continue at the periphery of the historic city center and separate the center from the research site. These streets and the pedestrian route near them are heavily used, but the roads in the research site are not used intensively. The site has a similar urban texture to the historic city center, but people do not use it as much. This contrast also makes this urban area interesting.

In Figure 2, we can see the crowded pedestrian route near the main streets with red. It separates the Historical Center, Karaalioğlu Park, and the research site. We did not focus on every abandoned open space on this site; instead of that, we determined a route, with blue, that is parallel to the main Streets. That is the only continuous route that connects the same roads with the main Streets in this site. We selected this route because it contains the potential as an alternative to main streets but is comparatively less preferred.



Figure 2. Selected route in the research site

We determined the abandoned open spaces on this route by making observations at the research site, and we eliminated the ones that belong to hotels. So we focused on six sites with different physical conditions and syntactical features. In Figure 3, we can see the locations of these sites.



Figure 3. Abandoned open spaces in the selected route

Evaluation of Selected Abandoned Open Spaces

In this part we evaluated the abandoned open spaces we selected. In Table 1, we can see the photos of each site. Site 1 is a parking lot and in-between buildings from three sides. There are no empty parcels around it, and it has no greenery. Site 2 is a parking lot and a place for homeless people to stay. It is on the corner, and there are roads on two sides of it. There are no empty parcels around it but one of the buildings near is damaged. It has trees in some parts. Site 3 is not used at the moment. It is in-between buildings from two sides, there is a road on one side of it, but it is close to a corner point. There is an empty parcel on the back side but no connection with the back road. It has greenery.

Site 4 is used as a parking lot. It is in-between buildings from two sides, and there is a road on one side of it. There are empty parcels on the back side, connected to the back road. It has greenery. Site 5 is used as a parking lot. It is on the corner, and there are roads on two sides of it. There are no empty parcels around it, and it has no greenery. Site 6 is used as a parking lot. It is in-between buildings from two sides. There is a road on one side of it, but there is a wall that weakens the connection with the road. There is an empty parcel on the back side but no connection with the back road. There are trees in some parts.

According to that observation, Sites 1, 3, and 6 are similar to having only one connected side, and Sites 2, 4, and 5 have two connected sides with the environment.


















Abandoned Open Spaces			
	Map	Photo 1	Photo 2
Site 1			
Site 2			
Site 3			
Site 4			
Site 5			
Site 6			

Table 1. Maps and the photos of selected sites

Analysis of Syntactical Features and Flow

Syntactical Analysis

After evaluating selected sites, we made syntactical analysis in the selected urban area. Table 2 shows the maps of the connectivity, integration, choice, and visibility. In the maps, the red parts of the network show the highest values, and the blue parts show the lowest ones. The gray dots show the selected sites, and we

determined the values of each variable on each site. According to these values, Site 2 and 4 have the highest connectivity and choice values, Site 2 has the highest integration value, and Site 4 has the highest visibility.

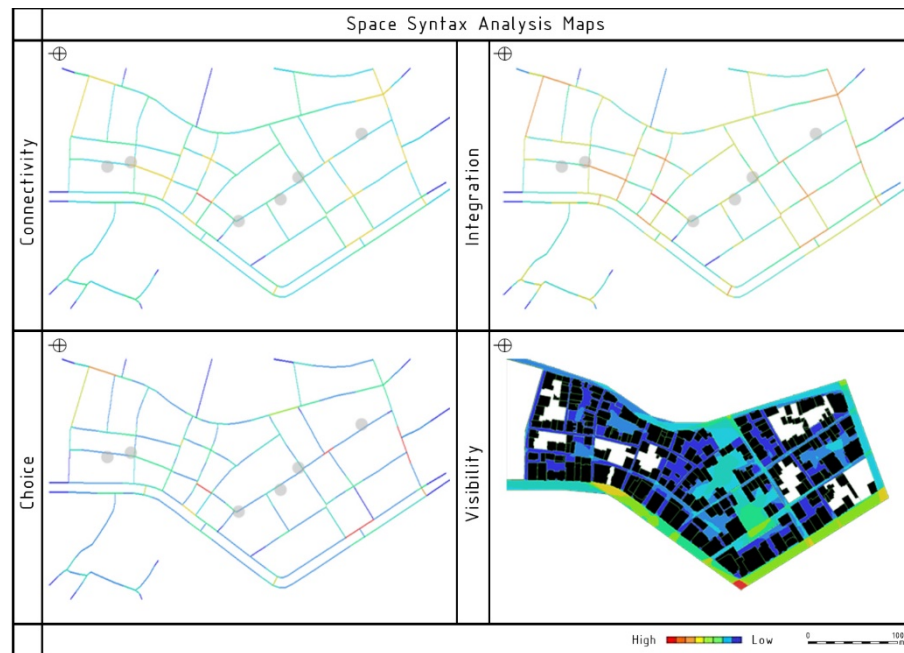


Table 2. Maps of Syntactical Analysis

Flow Analysis

In addition to syntactical analysis, we analyzed the flow around the selected sites. We started with a focus on pedestrian flow, but the flow of vehicles was also relatively high and essential because the sites are used as parking lots. So we also add the vehicle data we collect, such as bicycles, motorcycles, scooters, and cars. Table 3 shows the flow maps of each site during every observation time, on a weekday and a weekend. According to the table, Sites 5 and 3 have the highest flow, and Site 2 follows them. Being in the corner can be effective for Sites 5 and 2. For Site 3, being close to a corner point can be effective.

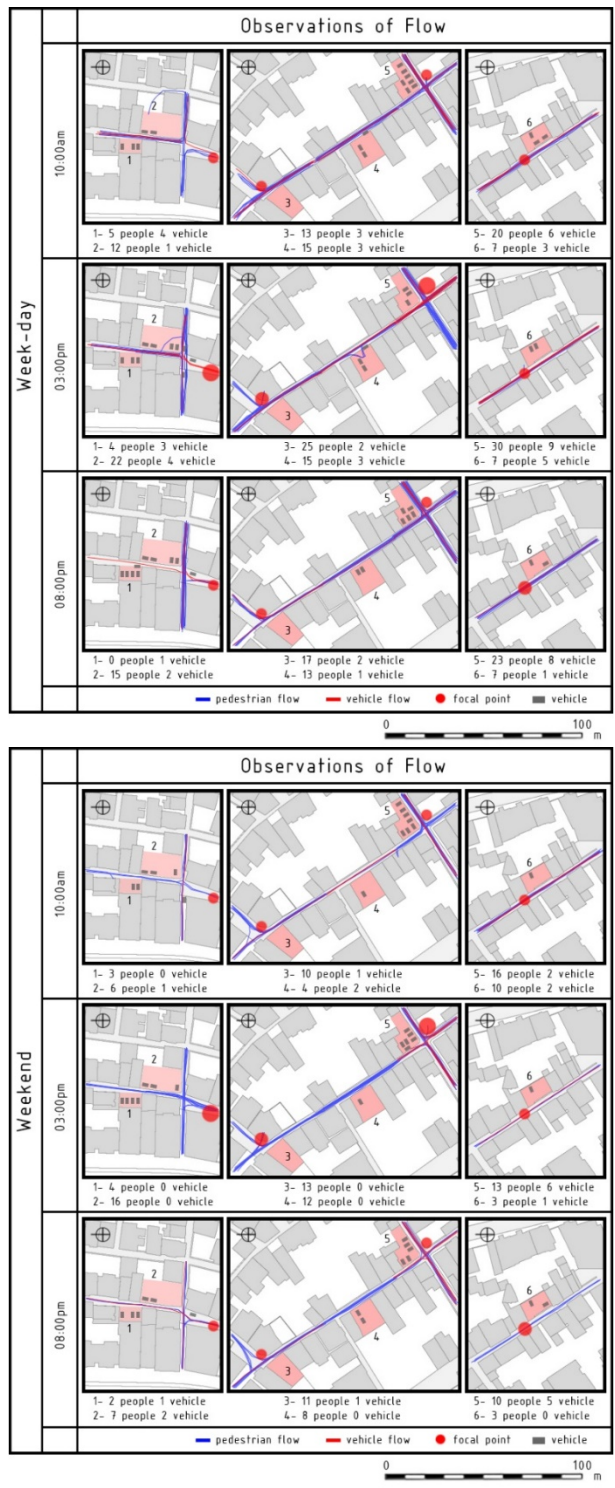


Table 3. Observation of flow in week-day and weekend

Figure 4 shows the number of pedestrians and vehicles according to the observation times on each site. Changes in the number of pedestrians and vehicles are similar on weekdays and weekends, so we evaluated them as total. In most sites, pedestrian flow is low in the morning; it increases in the afternoon and decreases in the evening again. The usage is high in the corner sites. Vehicle flow is almost constant in most sites, but in Site 5, it increases during the day. It is related to the high capacity of this site as a parking lot compared to other sites.

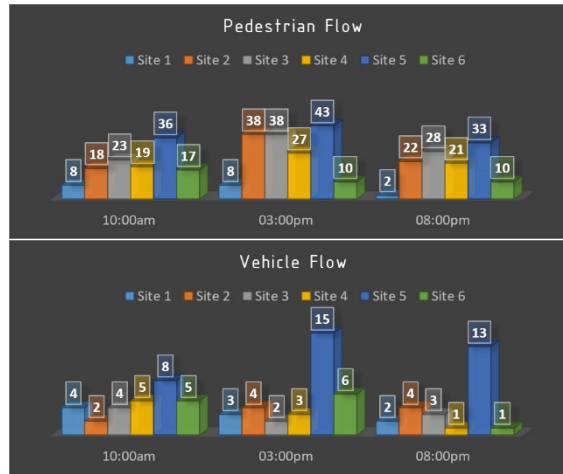


Figure 4. Pedestrian and vehicle flow according to the observation times on each site

Evaluation of the Analysis

Table 4 shows the values of each variable for each site. We highlighted the highest and the second-highest values. According to them, three variables have the highest values in Site 2 and Site 4. There are also some highest and second-highest values in Site 5, including the number of flows. These variables are directly proportional, and the corner sites, Sites 2 and 5, have the highest values. The high values of Site 4 are because the site has connections from both sides, like corners. When we evaluate the sites, we consider Sites 2, 4, and 5 similar to having two connected sides with the environment. So that condition positively affects the number of flows and the syntactical values.

	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6
Number of flow	27	88	98	76	148	49
Connectivity	2.00	3.00	2.00	3.00	2.50	2.00
Integration	1.06	1.79	1.11	1.70	1.50	1.06
Choice	2.00	4.00	2.00	4.00	3.00	2.00
Visibility	295	710	680	1570	1130	150

Table 4. Variable values for each site

4. RESULTS

To investigate the relations between the syntactical features and the flow, we compared the values by correlations. Table 5 shows the correlation values of each variable with each other. According to the correlation between the syntactical variables, connectivity, integration, and choice are highly positively correlated. Visibility is also positively correlated with them but not high as they are with each other. When we look at the correlation between syntactical variables and the flow, we can see that flow is positively correlated with all of them but mainly with visibility. After visibility, integration has the second highest correlation with the flow.

	Flow	Connectivity	Integration	Choice	Visibility
Flow	1				
Connectivity	0,34	1			
Integration	0,46	0,99	1		
Choice	0,34	1	0,99	1	
Visibility	0,58	0,74	0,73	0,74	1

Table 5. Correlation values for each variable

5. CONCLUSION

In this research, we focused on the abandoned open spaces in the selected urban area in Antalya. We aimed to contribute to the literature by suggesting alternative design approaches to activate abandoned open spaces through pedestrian flow. Thus, we investigated the relations between syntactical features of abandoned open spaces and the pedestrian flow around them. We made syntactical analyses and systematical observations on each selected site. Then, we compared the values of syntactical features and the pedestrian and vehicle flow by correlations and tried to discover a pattern between them.

The hypothesis was that improving pedestrian flow around abandoned open spaces can activate them, and to improve the flow; these spaces should be more visible and integrated with the urban texture. So the result values support the hypothesis. According to that values, we can see the importance of flow to activate the abandoned open spaces. Connectivity, integration, choice, and visibility are effective in organizing the flow around these spaces. According to correlation results, making abandoned open spaces more integrated with the urban texture around them and visible increases the flow and activates them. So we can suggest design approaches to increase the integration and visibility of these areas;

Designing new connections in the network can increase the integration of the sites and the flow. So we can create some paths in the abandoned open spaces that connect us with the existing roads.

The visibility of abandoned open spaces has an essential effect on the flow. So we can maintain these spaces open in the vistas to be seen coming from the main streets.

With increasing integration and visibility, we can convert abandoned open spaces into usable open areas that offer pedestrians a convenient place to gather and socialize. Thus they attract more pedestrians and become beneficial for the urban area.

For future research, conducting it in multiple and different textured parts of the city that contain different types of abandoned open spaces will be beneficial to discover a more consistent design approach to help us to understand the relations between abandoned open spaces and pedestrian flow.

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