

Persian translation of this paper entitled:

سنجش میزان سرزندگی در چهارراه ولیعصر شهر تهران  
بر مبنای تحلیل الگوهای فعالیتی موجود در آن  
is also published in this issue of journal.

## Urban Vitality Evaluation in Vali Asr Crossroad on the Basis of Activity Patterns\*

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Received 2018/01/27

revised 2018/08/14

accepted 2018/09/01

available online 2019/04/22

### Abstract

Nowadays, the sociology of urban space has been the focus of researchers in urban planning and design fields. This has caused the cities and urban spaces within these cities to be considered more than the bodies in them and the relatively large structures in which they were built. In comparison with other sociological factors, vitality in urban spaces is a factor that has been given special attention. This kind of expectations would arise immediately after the introduction of the urban space in the minds of citizens. In fact, one of the most promising expectations of people from urban spaces is the dynamism and liveliness of that space, which is understood as the concept of urban vitality. It seems that the factor that plays a vital role in creating this vitality is the existence of activities in the context of urban spaces. The research tries to investigate the effect of existing activity patterns on the vitality of urban spaces. The Vali Asr Crossroad in Tehran have been identified as a key point in the heart of Tehran and in the structure of Tehran, and It is a totally urban space full of activity patterns, but studies show that vitality in this space is not at the optimal level. For this reason, the study of vitality based on activity patterns in this important urban space is investigated. In the analytical section, a questionnaire based on a conceptual model was designed and then a regression model was used to analyze the results. The results show that the factor of performance as a vital variable in promoting social interactions and as a result of creating vitality at the Vali Asr crossroad plays an important role. Meanwhile, the two factors of static / dynamic activity and diversity at Vali Asr crossroad are factors weakening social interactions and urban vitality.

**Keywords:** *Urban vitality, activity pattern, social interaction, urban space, Vali Asr Crossroad.*

### Introduction

The vitality of the city and how to achieve its desired level in urban spaces is a matter that has attracted

the attention of many researchers in urban issues. Lang in the book of "Creating Architectural Theory" has suggested that the environment induce certain behaviors for the inhabitants (Lang, 1987). The interpretation of Lang's words in urban spaces can mean that lively spaces have a meaningful relationship with the spatial and physical characteristics of urban spaces (Lopes & Camanho, 2013).

\*. This article is an excerpt from Ms. Mehrnoosh Maghsoud's Master's dissertation entitled "Analysis of the pattern of activities for promoting vitality of urban space (case study: Vali Asr intersection in Tehran) under the guidance of Dr. Kianoosh Zakerhaghighi in 2016 at the Islamic Azad University, Hamadan Branch.

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Hanrick states: "Today, Urban sprawl in developing countries has caused many abandoned space due to the rapid growth of these cities (Rogers, 2003, 29). According to researchers, urban open spaces as spaces where urban life is faced are elements that give the city a specialty of quality and personality. They talk about urban furniture, such as symbolic signs, paintings, and all microstructure components such as telephone kiosks and bus stations, which are essential elements for keeping street streets intact. They also believe that by eliminating some of these simple elements, it is possible to improve the quality of the city and give it a special personality (Pakzad, 2007). However, in today's cities less attention is paid to these qualities. In fact, the pattern of growth and development of activities in the urban environment is not capable of boosting the vitality and urban mobility in these spaces as expected. This phenomenon has also been shown in various urban spatial areas of Iran. One of these spaces is Vali Asr Crossroad in the heart of Tehran. It seems that the spatial location and activities around this crossroad play an important role in its spatial significance. This crossroad is located at the intersection of Enghelab Street (the most important socio-cultural axis in the central part of Tehran and the northern border of Tehran, Nasserli Age) and Vali Asr Street (one of Tehran's most powerful cultural and business axes and the longest urban axis in Tehran). This intersection acts as a fountain that every morning a variety of urban activities come out and during the early hours of the night, these energies collapsed and lose themselves from the Enghelab Street and Vali Asr in the tired body of the city (Khashtoo & Saeedi Rezvani, 2010). In terms of type of activities and functions located at a certain radius of this crossroad, it is of particular importance that it is: 1. located in the central part of Tehran; 2. the establishment of the first Iranian computer market near this crossroad (called Reza Market); 3. The existence of the Faculty of Arts and Architecture of the Islamic Azad University of Central Tehran Branch (along the Revolutionary Street); 4. The existence of the Arts and Amir Kabir universities (along Vali asr St.); 5. The existence of Alborz School as educational index points

near this area; 6. The presence of the two buildings of the Vahdat Music Hall and the City Theater (the largest collection of theater plays of Iran); and 7. The Institute of Art in the streets of Hafez and Vali Asr. One of the access routes to the University of Tehran and Enghelab Bookstores also is the impact of its Economic activities, albeit with a relatively short distance. Thus, in a general summary, one can mention the following: the existence of different land uses in and around the area (recreational, cultural, commercial, educational, administrative, etc.); observation of activity diversity in the area (combined pedestrian activity and passing vehicles); different users' expectations from space (circulation, shopping, conversation, social interaction, etc.); the location of the city center in Tehran; the existence of various types of motorways in the range (pedestrians, private rides, Bus and metro).

With this introduction, the present study is an attempt to measure the vitality level in Vali Asr crossroad, taking into account the quality of activities and the existing activity patterns. In addition, this research seeks to answer the following questions: How can vitality be promoted using the high potential of the existing activity patterns in the urban space of Vali Asr St.? And then, what is the process for improving the quality of vitality based on the existing pattern of urban spaces in Vali Asr Crossroad?

## Literature Review

In the last two decades, various researchers have been actively pursuing the issue of activity and related issues in urban spaces (Alexander, 1964; Michelson, 1975; Thiel, 1961; Jacobs & Appleyard, 1987; Whyte, 1980). In fact, the founder of behavioral studies is Professor Donald Elliard, who, in collaboration with Kevin Lynch and John Mayer, made the first visual visualization study on a city scale. William Mickelson also conducted a study about ten years after this, which, unlike the previous study, emphasized the behavioral aspects of space users (Bahrainy, 2008: 10-13). Another specialist in the field of pedestrian activity is Ian Gehl, an architect and urban planner in Denmark. Ian Gehl's studies began with the study of outside activities in

the central part of the city of Copenhagen, Denmark. The flagship study of the city of Copenhagen in Denmark dates back to 1967. He and his students at the Architectural School of the Royal Danish Academy of Fine Arts have found a number of findings in terms of the time, type, duration, quality of these activities and, finally, their relationship with the physical features of the public spaces. Following many changes in urban spaces of the city of Copenhagen, Gehl also studied the impact of external activities on people in the years 1968 to 1986, and he emphasized the importance of the planning and design of public spaces more and more on the magnitude and manner of occurrence externally emphasized activities (Gehl, 2005).

William White studied the urban vitality and behavior of citizens in a 1980 study titled "Social Life in Urban Spaces." White's project was initially launched in 1971

under the title "Street Life Project", with a very limited goal. It was a basic research and White's focus was on pedestrian behavior, and whether or not a particular discipline is in place for behaviors. A part of White's work, which is most applicable, shows what spaces work, what spaces do not work and why! (Bahrainy, 2008: 22).

Vitality means a state of dynamism and interacting between people and environment. The term was first introduced in the urban design literature by Donald E. Appleyard in his book "Lively Streets". Robert Cowan (2005: 22) defines "livability" as a suitable lifestyle and an optimal quality of life. William White uses livability for spaces which used by people in the book of "Social life of small urban spaces". Kevin Lynch uses this term in his book to express the quality of urban spaces, which reflects the healthy biological



Fig. 1. A Survey on the Behavior of People on the Street Source: Whyte, 1980.

function of the community and guarantees their survival in the city. (Lynch, 1981: 155-166) In his book, Robert Cowan defines it as valuable assets and capabilities, including social and material resources and life interactions, which was used by Racody and Lewis Jones in 2002 (Cowan, 2005) in the debates on poverty reduction approaches. Many thinkers and scholars have suggested urban vitality as a major factor in promoting environmental quality in the city (Jin, Long, Sun, Lu, Yang & Tang, 2017; Fanea-Ivanovici, 2013; Marquet & Miralles-Guasch, 2015). Also, many thinkers (along with Lynch) have introduced vitality as one of the main elements of urban design. Among them, Coleman in his article, "Opportunities for innovation in urban design education" recognized the vitality and diversity as one of the six key qualities of any urban design. Alan Jacobs and Donald E. Appleyard considered required qualities for urban design: 1. vitality, 2. identity and control, 3. access to opportunities, imagination and happiness, 4. originality and meaning, 5. social and public life, 6. urban self-esteem, and 7. environment for all.

In general, it can be said that the creation of lively urban spaces which has attracted the attention of designers, architects and urban planners in recent decades is connected with the physical features and community. It is necessary to have a vibrant environment for selective, recreational and social activities, and on the other hand, to bring such activities into an environment with certain qualities, such as utilization of environment, providing physical comfort for people in space, as

well as attention to the features of activities in urban spaces. Consequently, it should be acknowledged that the concepts discussed by the thinkers are on the nature of vitality in the multifaceted and diverse urban spaces. Table 2 brings together a combination of these concepts. It should be noted from the viewpoint of information theory, urban space is a field of events including various three-dimensional information (Pakzad, 2007: 58). By considering the effective role of perceptual factors, the above diagram can be considered with four components of urban design.

In this part of the study, we will study the issues that are specifically affecting the vitality and urban spaces, taking into account the existing activities. The physical features that create vitality in public places include those that provide the conditions for the presence of individuals in space, and, make spaces comfortable and more attractive for individuals. Throughout history, there has been a close connection between social life of cities and urban spaces. Wherever the quality of the art and architecture has been higher, people's interest for being present in urban spaces has been greater. The designer of urban space should look for the answer to the question of how they can create a sense of comfort in their environment and increase communication? Donald Appleyard calls such places a pleasing environment (Tibbalds, 1993).

Therefore, there are three major categories of physical characteristics that contribute to vitality. The first category is in the area of climatic comfort. The second

Table 1. The views of the thinkers of urban planning and vitality on the quality of urban design. Source: authors.

Thinkers	Factors Affecting the Quality of Urban Space
Lynch (1981)	Vitality, meaning, compatibility, access, control and supervision
Coleman (1987)	Historical preservation and urban restoration, Focus on special design for pedestrians
Jacobs & Appleyard (1987)	Vitality, identity, control, access to opportunities, imagination and happiness, originality and meaning, social and universal life, self-reliance, urban environment for all
Southworth (1989)	Structure, readability, form, comfort and convenience, accessibility, health and safety, historical preservation, vitality, natural environment protection, diversity, adaptability, openness, social intercourse, equality, maintenance, meaning, supervision and discretion
Lopes & Camanho (2013)	Function (communication, security, climatic comfort, diversity), order, identity, vitality, scale, visual and functional alternation
Carmona (2012)	Vitality, existing harmony with diversity, human scale, permeability, readability, flexibility, developmental, measured and controlled variability

category includes physical issues that provide safety and security in space. These factors are the result of some elements of the body that result in the safety and physical protection of people on the one hand, and the creation of peace and mental security on the other. The third category refer to the environmental features that create vitality in one place include those stimulating the aesthetic sense of humans (Tibbalds, 1993). Table .2 describes this activity category.

The simplest element of human common life is social action. Social action is a series of significant movements that human beings accomplish to achieve a goal in relation to another human being. Individuals have intrinsic need to establish a social relationship, and therefore, they create situations that can experience social relationships (Talebi, 2004: 162). One of the reasons for going to parks, as one of the urban spaces, is social networking, for example. According to Jane Jacobs, a sociologist, researcher and critic of American cities, what makes a city work is a combination of social and urban physical texture. One of the effects of this social mix is that people are on the street at different times: workers and children leave home in the mornings and return later, retailers are always there and others use

the space at sunset and night for leisure. This changing social scene is interpreted by Jacobs as an unorganized ballet of walking. It brings social vitalities to the street and links it to the larger orbit of the city's life (Jacobs, 1961). The presence of various people in the street at different hours of the day also has a significant impact on the street. Very simple, it's always around. In Jacobs's terms, this means an informal and bilateral patrolling of the urban space that individuals carry out for their daily work each other. It can surprisingly be felt in the streets of big cities (Ibid: 142).

From the summing up of the various views and the studied experiences, the following diagram illustrates how to study the pattern of activities and their impact on the vitality of urban spaces. The conceptual model represents a mutual and reciprocal relationship between the activity pattern and the amount of vitality in urban spaces. In other words, the pattern of activities in each area directly affects the understanding of vitality in urban spaces, and vice versa, vitality in urban spaces changes and improves the status of the pattern of activities in the range; other indicators of static / dynamic, functional dimensions and the diversity in the component of the existing activity pattern indirectly affects the dimensions

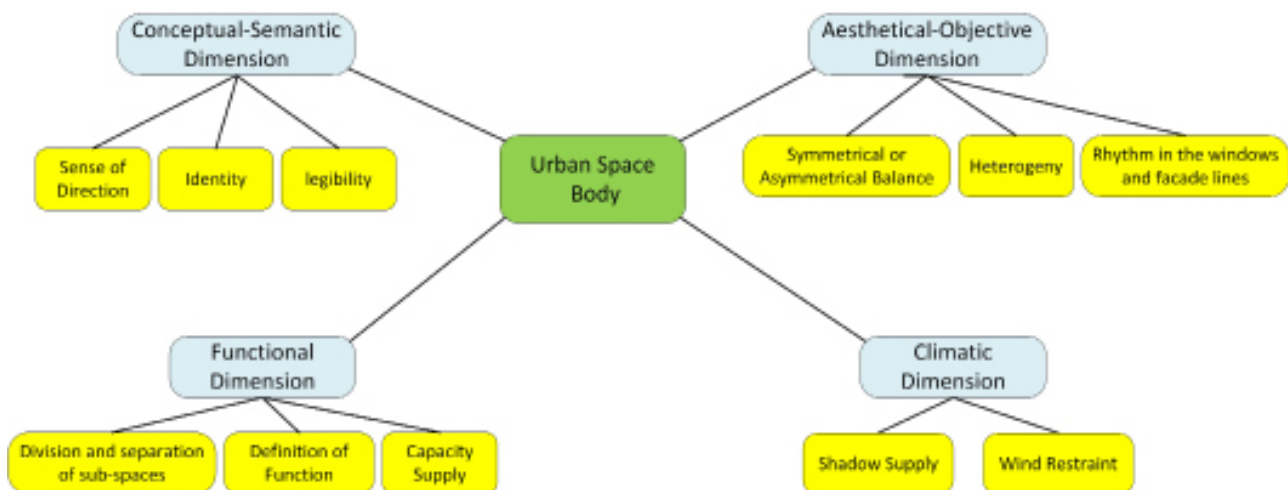


Fig. 2. Dimensions of Urban space. Source: authors.

Table 2. Activity vitality and human needs in the physical location. Source: Tibbalds, 1993.

Factors contributing to activity vitality	Human needs
First category: Creating climatic comfort	Providing light and shadow, protection against wind, proper temperature
Second Category: Creating Safety and Security	Physical security and social security
Third category: Providing aesthetic sense	Being a provider in a desirable environment with aesthetic criteria

of local vitality through increasing social interactions. Therefore, the proposed model and its hypotheses are tested in this study using the questionnaire and statistical methods.

**Research Methodology**

Research method is mixed method by using qualitative-quantitative method. These two qualitative and quantitative methods were used simultaneously. Both methods were used for field and descriptive studies of the study area including qualitative characteristics, behavioral status study in a quantitative manner and using a questionnaire. The results of this study were qualitatively tested.

In the first phase of the study, which was descriptive (qualitative) in order to know the scope of the research, the method of research was carried out in qualitative way. it can be argued that each of the methods used to measure activities, which so far has been used by different researcher, takes into account certain aspects that have affected their research results. Obviously, the methods for assessing activities have gradually evolved and developed, and have been developed and reconstructed in the methods of the current study. However, there

are still some points to note in the current methods of studying activities in urban spaces. In the table below, the positive and negative characteristics of each of the common measurement methods are grouped and presented in the field of how data of the activities are gathered and how they are presented in the study documents. Table 3, lists the following methods with respect to their respective experts:

Also, in the quantitative phase of the study, the data collected through the questionnaires distributed among citizens at Vali Asr Street in Tehran and was statistically analyzed. The data was coded and entered into the computer and analyzed by SPSS software version 19. The questionnaire of the research was designed based on the three categories of indicators in the research model, namely vitality, social interactions and activity patterns. The sample consisted of 320. The reliability of the questionnaire was calculated using Cronbach's alpha and the value of it was more than 0.7, confirms the reliability of the questionnaire. (Habibpour Gattabi & Safari, 2009: 358). Further, according to the research model, multiple regression was used. Using multiple regression, the researcher can study the linear relationship between a set of independent variables with

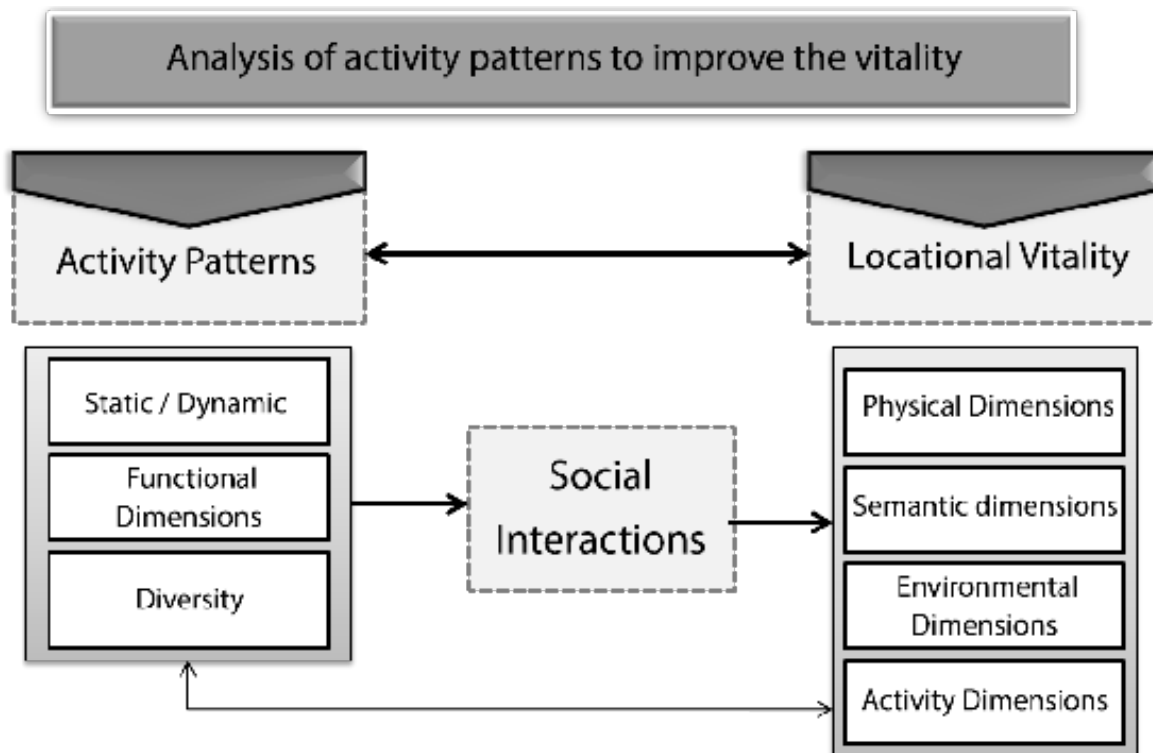


Fig. 3. The conceptual model of vitality of urban spaces and activity patterns based on social interactions. Source: authors.

a dependent variable in a manner in which the existing relationships between independent variables are also case to be considered. Multiple regression attempts to explain the variance in the dependent variable, and by estimating the contribution of each variable (two or more independent variables) in this variance. This analysis is quite suitable for studying the effects of independent variables (including test variables) on the dependent variable (Carmines & Zeller, 1979). Here, the multivariate regression relationships between independent variables in the subset of the active model with the level of social interactions are developed and in the next stage, the level of social interactions as independent variables and vitality rate as dependent variable were investigated. In parallel, qualitative data

including observations were collected by the author of this study to identify some behavioral patterns in order to investigate these behavioral patterns and the level of vitality in the site.

**Case Study**

The study area is one of the seven main centers of Tehran, which has been introduced as the cultural center and new economic activities of Tehran. This area extends from the north to Keshavarz Boulevard and from the south to Jomhori Street and University of Tehran, Amirkabir University of Technology, and from the East to the University of Tarbiat-e-Moalem and the House of Artists of Iran. This area includes major city cinemas and theaters, Vahdat Hall, Culture Hall and the

Table 3. Study of the methods and history of measurements of activities in urban spaces. Source: authors.

Researchers	Methods of surveying activities	Method of presenting results
<b>Lynch &amp; Appleyard (1961)</b>	<ul style="list-style-type: none"> <li>-Surveying with the eye and by human force and involves human errors.</li> <li>-In surveys, It does not interfere in the perceptions of time. In the event of mistakes, errors are not subjected to revision.</li> <li>-The difference in the types of dynamic and static activities has not been considered.</li> </ul>	<ul style="list-style-type: none"> <li>-Separation of activities into static and dynamic categories</li> <li>-The lines and points taken are not measurable and do not have a quantitative scale.</li> <li>-The stopping time for pedestrians in maps is unknown.</li> <li>-The amount of movement, in each of the tracks at different times cannot be considered.</li> <li>-The density of the lines in the maps does not provide accurate information on the quantity of activities.</li> <li>- Different types of static or movable activities with signs such as line and point cannot be distinguished.</li> </ul>
<b>Gehl (2005)</b>	<ul style="list-style-type: none"> <li>-In crowded times, the ability to survey activities decreases</li> <li>-Perceptions are not subject to revision.</li> <li>- The impressions are incomplete and do not include much of the underlying spaces.</li> </ul>	<ul style="list-style-type: none"> <li>- Use signs such as triangle and circle to distinguish static activities.</li> <li>-In the activity maps only static activities are compared.</li> <li>-The dispersion of the individual use at a time cannot be investigated.</li> </ul>
<b>Whyte (1980)</b>	<ul style="list-style-type: none"> <li>-The video recording and full scan of the activities with the ability to revise and correct the findings using a video recording technique has been used.</li> <li>- surveying need a high level of equipment and staff</li> <li>- time is required for coordination and filming, and more time is needed for studying movies and picking up activities from captured movies.</li> </ul>	<ul style="list-style-type: none"> <li>-The surveying of activities has been done continuously throughout the day, with the involvement of the time factor.</li> <li>-The use of spaces (with emphasis on activities and acceptance of a variety of behavior in space) has been examined without observer interference.- Only a fraction of space has been investigated, and the relationship between sub spaces of a public space cannot be investigated.</li> <li>- The only activity of sitting people as a static activity is taken quantitatively and other activities are evaluated qualitatively.</li> </ul>

most important publishing and distribution center for books and computers around the country.

The complete area of this study is from the north to Taleghani Street, from the east, shortly after Kharak street, from the south to Jomhori Street and from the west to Vesal Street. The approximate area is 1,370 meters in 1100 meters. The study area is located in the intersection of the main and most important north-south street of Tehran, (Vali Asr Street) and the west-east (Engheleb Street). These two streets continue to be the mainstays of the structure of Tehran. Based on field observations of the researchers, the set of activities and functions has led to the identification of the middle range of these two streets as the artistic center of Tehran. City Theater and Daeshjou Park is the most important part of this crossroads and one of the key cultural places of Tehran. Daneshjou Park is one of the most famous parks in the city of Tehran, but a large part of it, apart from the western part of the park, is influenced by the presence of the city's theater (Shahr Theater). In addition, the park has some social negative features and specific problems about LGBT issues but in many cases do not create inconvenience in the activities around this crossroads or disturbance to users of this space. The implementation of live street theater in the northern area of the city's theater area has also made this space more socially important. Except for the above-mentioned features, the crossroads are considered as a traffic junction for the traffic network. Various land uses within and around this area (recreational, cultural, commercial, educational, administrative, etc.) cause a large volume of traffic, especially in this part of the city . The presence of indicators and activities in the vicinity or intersection of this crossroads has also led to an increase in traffic volumes at this crossroads. As it has been said, this crossroads has an important role in increasing the traffic intersection of the two main streets of Enghelab and Vali Asr, and also has added to the traffic congestion of vehicles and pedestrians who come to this crossroads for various reasons. On the other hand, the characteristics of this space in terms of functional scale can be categorized as follows: On a large scale, this space is part of the city center of Tehran, located in

the central part of the city. This space in the central zone of Tehran has a multi-functional role it include: cultural and artistic activities (city theater complex) with urban scale, educational activities (Islamic Azad University) with urban scale, leisure activities (Danrshjo Park) with regional and local scale, activities of regional retail trade, and the most important computer market of Tehran.

With regard to the above-mentioned roles and based on the available evidence, the pattern of activities within the urban space of Vali Asr Crossroad can be classified as follows:

Local scale activities: Due to the presence of the play area located in Daneshjou Park, the main users of this area are residents of adjacent neighborhoods.



Fig.4. Vali Asr Crossroads and its surroundings . Source: <http://maps.google.com>

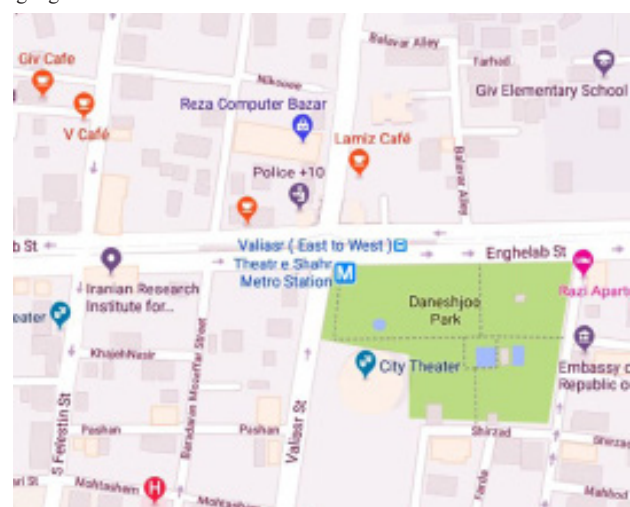


Fig. 5. Map of intervention, immediate and inclusive areas. Source: [http:// earth.google.com/web](http://earth.google.com/web)



Regional scale activities: Residents located in the vicinity of this crossroads and many residents in the fair distance of this crossroads, namely, 6th, 11th and 12th district of Tehran municipality, come there for daily, weekly and monthly shopping. In addition, the presence of official departments, banks and institutions in this area also have a regional role and have such a function.

Urban scale activities: Urban actors in this area mainly have social and cultural objectives. Also educational needs, artistic tendencies, and space required for leisure have caused formation of urban spaces for such activities and networks, include the City Theater Complex, Daneshjou Park and some other hangouts such as cafes and restaurants located in this area.

These activities are evaluated and analyzed based on questionnaire with many questions about the issues like the spatial structure, the analysis of communal spaces and social dimension, the urban area characteristics, the status of the area, access network, functional structure, perceptual structure, physical characteristics, aesthetics, identity and readability of urban image.

Examination and analysis of spatial structure: An examination of the status of land uses in the area shows

that about one third of the area (34%) are residential area with a housing density of 175% and a population density of 108 persons per hectare and two thirds of the area assigned to all non-residential land uses (76%) which is indicative of a relatively weak region in the matter of residence.

Urban image: At present, most part of the area is confined with big and rigid rectangular buildings. In general, the degree of confinement is almost at the top of the range. Also, a combination of green space and buildings rarely can be seen in the region. The texture composition can be divided into three categories: large and important volumes, medium volumes, and mid-spots and small volumes. In terms of color, due to the lack of well-defined building codes, it can be claimed that the combination of colors are not closely matched to each other. Considering the traffic volume of pedestrians urban furniture of Enghelab Street has a better condition for the citizen. In Vali Asr Street, despite the proper physical environment, urban furniture has caused disturbances of urban landscapes in different sections.

Enghelab Street is located between Old and New Tehran, as a border between old irregular texture and

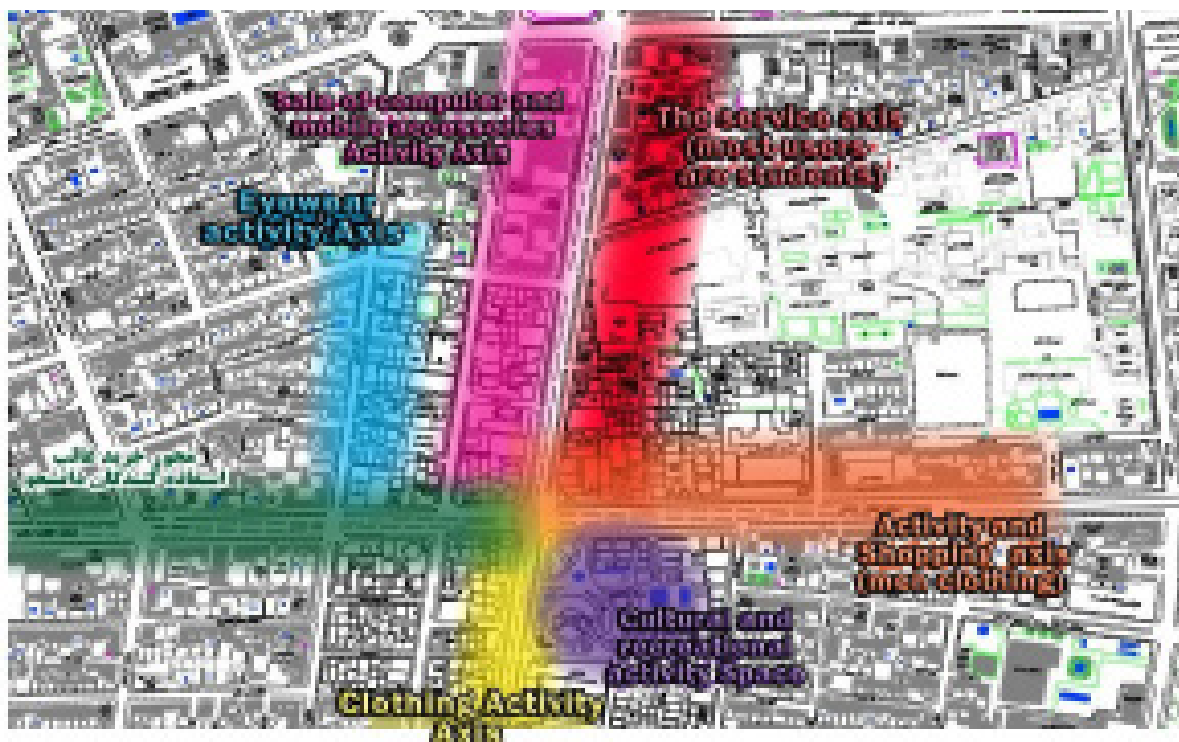


Fig. 6. Activity map in the Inclusive Area. Source: authors.

a new regular, planned fabric. What can be easily seen in this area is the hierarchical diversity of the access network in the range from the first arterial to the local streets and regular urban grid throughout the region. The presence of two main streets of Tehran, including Vali Asr and Enghelab Streets, and two subway lines and their stations cause easy transfer in this region by multiple mode of transportation vehicles. There is also the potential for organizing walking options, especially on Valiasr Street. At the same time, it should be kept in mind that the daily vehicle traffic and its negative consequences such as pollution resulting from fossil fuels and traffic has caused many problems in the health of citizens of the region. As a fact, this area is one of the most polluted areas in Tehran.

construction of fences along the street will result in less interference between vehicles and pedestrians, and this will result in more fluid vehicle traffic and more security for the pedestrians. But based on what the field evidence suggests, Vali Asr's underpass was not designed for pedestrian and has only been a positive answer to the traffic problem of Vali Asr Traffic Road. It can be said that this pedestrian underpass has no plans to improve the quality of urban space in terms of Physical-visual dimensions and obviously, social aspects are not considered. One of the underlying weaknesses of this underpass is separating Vali Asr crossroad to four separate parts. This separation is especially important in the case of Daneshjou Park. If there is an easy connection between the four sides of the crossroads, people will be present in space to use it and this presence will cause that citizens meet their needs, and spend their leisure time in this space.

## Results

As indicated in the research methodology section, the research questionnaire was designed based on three categories of indicators in the research model, namely, vitality, social interactions and activity patterns. The sample size was 320 based on the Cochran formula and then reliability of the questionnaire was tested. The objective here is to find the regression between the independent variable such as the subsets of the

activity patterns, namely, the static/dynamic, the functional dimensions and the predictive variability of the dependent variable of the social interaction in the multivariate regression analysis. In the regression analysis, the goal is to predict the variation of the dependent variable with respect to the variations of the independent variables. Therefore, here, the researchers expect that by determining the linear relationship between the set of independent variables with the dependent variable, they will be studied in a way that the relationships between the independent variables are also considered. (Carmines & Zeller, 1979). Regarding the final model of the study, regression relations were grouped into two sets of general relations and analyzed on the basis of this categorization as follows:

Investigating the Rate and Type of Effect of Activity Patterns on Social Interactions in the Vali Asr Crossroad of Tehran: One of the output tables of the multi-variable regression test is the Model Summary table, which looks at the correlation coefficient between the variables and the adjusted coefficient of determination.

The results of table. 4 indicate that the correlation coefficient (R) between the variables is 0.491, which shows that there is a strong correlation between the independent variables and the dependent variable of the research. On the other hand, the value of the adjusted coefficient (R square) is 0.203, which indicates that 24.1% of the total change in social interaction index is dependent on the pattern of activities mentioned in this equation. The next table of this test is related to the ANOVA table that examines the fitness of the model. In

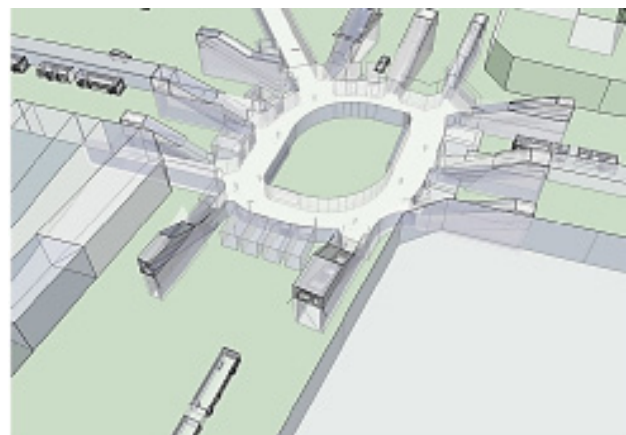


Fig. 7. Schematic map for Vali Asr underpass and its entrances. Source: <http://medn.me/daiv5>.

the table below, the dependent variable is the research of social interactions and the independent variable of the activity pattern.

Since the significance of the F value at the error level is less than 0.002, it can be concluded that the regression model of the study composing of three independent variables and a dependent variable is a good model and the independent variables set can measure the effect of the pattern of activities on social interactions within Vali Asr crossroad of Tehran. The next output is the coefficients table, which shows the effect of each variable in the model. The dependent variable in this table is social interactions.

In table 6, the significance level less than 0.05 ( $p < 0.05$ ) indicates the relationship between the variables. The beta number also specifies the type and severity of the relationship. The results of the above table indicate that based on the sig column, all the variables in the model column, i.e. the index of the proposed pattern of activities, have a significant relationship with the social interaction index. The beta number also shows the type and severity of this direct relationship. Thus, the table shows that functional dimensions with the number of beta 0.436 play the most important role in promoting

social interactions in vali Asr district.

- The study of the effect of the component of social interaction on spatial vitality: One of the output tables of the multivariate regression test is Table 8 on the output of the model. This table examines the correlation coefficient between the variables and the adjusted coefficient of determination.

The results of the above table indicate that the correlation coefficient between the variables is 0.314, which shows that there is a strong correlation between the set of independent variables and the dependent variable of the research. On the other hand, the corrected coefficient is equal to 0.664%, which indicates that 66.3% of the total variation of spatial index is dependent of the independent variable of social interactions and its indices in this equation. In the next Anova table the fitness of the model was examined. In this table, the dependent variable is spatial spatiality and the independent variable is social interactions.

Since the significance of the F value at the error level is smaller than 0.002, it can be concluded that the regression model of the research consisting of an independent variable and a dependent variable, and a set of independent variables can explain the impact



Fig. 8. Activity map. Source: author.

of the indices of social interactions on spatial vitality . The next output is the coefficients table, which shows the effect of each variable in the model. In this table, the dependent variables are spatial vitality and the independent variable is social interactions.

The independent variables of social interactions in the table above indicate a relationship between variables if the significance level is less than 0.05 ( $p < 0.05$ ). The beta number also specifies the type and severity of the relationship. The results of the above table indicate that based on the sig column, the column variable of the model, ie the index, has a significant relationship with a spatial index, the beta number also shows the type and severity of this relationship (Negative, inverse, positive relationship, direct relation). The statistical results indicate the direct relationship between the three dependent variables of the static / dynamic activities, functional dimensions, and functional variations on increasing the level of social interactions. This indicates that positive intervention in these three variables can directly affect social interactions and indirectly affect the level of vitality in the range. In practice, it seems that the three main variables in the activity model range have a key role to play in influencing the level of vitality.

**Conclusion**

Today, urban experts have special interest in environmental sociology and psychology. In fact, the

existing approach seeks to provide places for citizens whose mental and social aspects are also included. Among these mental aspects, the emergence of lively spaces in the context of cities is a category which strongly emphasized by urban researchers.

the present research is based on the problem of how the activity pattern affects the creation of vitality in the urban environment. The urban space of Vali Asr Crossroad in Tehran was selected as the case study. The research question was how to measure vitality of this urban space in terms of diversity and variety of activity patterns that exist at this crossroads. To achieve this goal, after reviewing the literature related to the two concepts of urban vitality and the pattern of activities, the conceptual model of the research was developed and based on the indicators of the research, the questionnaire was designed on a 5 point Likert scale and distributed among the citizens of Tehran In the research model, the factor of social interactions is variable that links the indicators of activity patterns to the factor of vitality. On this basis, it was found that the functional dimensions of the activity patterns of this urban environment produce sustainable social interactions in this space and thus create vitality in it. However, it can be argued that the patterns in the two fixed / dynamic factors of the activities and the diversity in these patterns are weak. In fact, the spaces in this crossroad are such that they are unable to

Table 4. Model Summary. Source: authors.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.491	0.241	0.203	0.836

Table 5. ANOVAb. Source: authors.

ANOVA				
Model		df	F	Sig.
1	Regression	3	6.261	0.001
	Residual	89		
	Total	92		

Table 6. Coefficients. Source: authors.

Coefficients					
Model	Non-standard coefficients		Standardized coefficients	t	.Sig
	B	Std. Error	Beta		
constant	1.226	0.530	-	2.388	0.020
Static/dynamic activities	0.052	0.132	0.50	0.397	0.03
Functional dimension	0.466	0.138	0.426	3.366	0.001
Diversity	0.031	0.024	0.249	1.295	0.020

produce static and dynamic activities. In definitions of the static and dynamic nature of activities, these two factors are defined as the intensity of the flexibility of activities in the socialization of individuals. On the other hand, these two factors act negatively in creating social interactions and consequently spatial vitality at Vali Asr Crossroad, which seems to have multiplied the vitality of this urban space if they propose suitable strategies for improvement of these patterns. Below these strategies are suggested.

Performance enhancement strategies include: Using a diverse range of activities based on time and space diversity in a way that has adequate security for the presence of children and women (includes activities in part of the night at street level); Improving the quality of applications for collective activities and the presence of users to create liveliness in the streets; Focus on cultural practices by doing diverse activities on public streets, public arts presentation in public spaces, and allocating some spaces for seasonal activities.

Environmental upgrading strategies include: Ensuring environmental comfort through the use of appropriate vegetation cover for climatic comfort and the design of porches with appropriate vegetation; Reducing pollution and environmental incoherence through integration of natural factors; and improving green and pedestrian network interconnections with tree planting in the main directions of the space.

Strategies for promoting social interactions include: Promoting attachment to the place and sense of place Through the participation of the people and business in urban events, creating a sense of place through appropriate designs according to the spirit of urban spaces; design of hangouts in suitable places for activities of the citizens at the Vali Asr crossroad, and holding various ceremonies in space, which will attract the most creative and cultural class of citizens to this space.

Strategies for upgrading space activities in order to enhance vitality include: enhancing the flexibility of activities by providing a platform for fairs, amateur sales, street exhibitions and music venues; promoting the field of static activities in urban space by creating and increasing the number of street cafes, Sitting edges for relaxation and conversation.

In general, the scrutiny of the activity pattern at Vali Asr Crossroad shows that the existing functions have resulted from the diversity of different classes of people in this urban space. This is the main factor of creating vitality in this space. It means that, making flexibility in its dynamic and static activities will be caused more vitality in the urban space. On the other hand, the study of the location and the major uses of this crossroads show that the main functions that led to the vitality of this crossroads have been influential in the immediate and comprehensive area of the crossroads.. This is partly

Table 7. Model Summary. Source: authors.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
0.597	0.314	0.663	0.644	0.597

Table 8. ANOVA. Source: authors.

ANOVA				
Model		df	F	Sig.
1	Regression	1	3.254	0.004
	Residual	89		
	Total	90		

Table 9. Coefficients. Source: authors.

Coefficients					
Model	Non-standard coefficients		Standardized coefficients	t	Sig.
	B	Std. Error	Beta		
constant	43.751	5.070			
local vitality	2.728	1.515	0.234	1.801	0.04

due to the fact that the dimensions of urban planning, urban scale use and the role of the urban area can have a significant effect on the production of social activities and lively space. In fact, this means that the study of the factors influencing the creation of vitality in urban spaces must be considered in two macroeconomic and macro dimensions otherwise, local actions cannot have a long-term and profound effect on the behavior of users.

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### HOW TO CITE THIS ARTICLE

Maghsoud, M. & Zakerhaghighi, K. (2019). *Urban Vitality Evaluation in Vali Asr Crossroad on the Basis of Activity Patterns*. *Bagh- e Nazar*, 16 (71):5-18.

DOI: 10.22034/bagh.2019.86867

URL: [http://www.bagh-sj.com/article\\_86867\\_en.html](http://www.bagh-sj.com/article_86867_en.html)

