

Case study**Sari city hall square design with an emphasis on creating a pedestrian area in the commercial - administrative part of the city****Authors:****Roja Nikpey¹ and Shaghayegh Nikpey²****Institution:**

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Corresponding author:**Roja Nikpey****ABSTRACT:**

This study was designed to provide suggestions to improve the central part of Sari city condition. This research consists of four sections. In the first part, the views of urban planners and experts on urban spaces, especially urban areas, and how to deal with them were discussed and the results have been used in the design section. In the second part, several examples of cases that have been implemented in Iran and other countries have been investigated and their principles and objectives have been studied and results used in design. After reviewing the ideas of urban planners and case studies, cognition of the present status the issues, problems, limitations, opportunities and potential existing have been analyzed and used within the design scope. Reviewing the strengths and weaknesses, the design principles and objectives, strategies, rules and policies of the project were presented, different options were designed based on the goals and strategies mentioned, and finally, after comparing the options in terms of matrices Evaluation, the final option was selected and presented.

Keywords:

Urban design, Square, Pedestrian, Social interaction

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Sari city hall square design with an emphasis on creating a pedestrian area in the commercial - administrative part of the city

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INTRODUCTION

The central part of the cities are the most important centers of traffic and citizens gathering places. Considering special arrangements, it can be used to feature and create a vibrant urban environment in which citizens get together and, in addition to doing their daily routines better experience, interactions and social relationships. In case of proper design and obtain suitable conditions, then this part of the city can be turned into a suitable and desirable urban space. A space for passers-by to sit and rest, space for seniors to gather, children's playgrounds, permanent and temporary exhibitions, seasonal and local markets, and commercial spaces like tea houses, restaurants, etc. These are the uses that can bring this areas closer to the target. Paying attention to pedestrians and provide the right conditions for pedestrians will have a significant impact on turning this part of the city into a vibrant and dynamic urban environment.

Pedestrian centers can guarantee a lasting liveliness as a result of civilian life and the sustainability of urban centers. Citizens like the walkways because of their safety and comfort of spaces, and the lack of cars and pollution. The walkways are known as a place to meet and trade so creating walkways in business centers will boost the economy (Pakzad, 2005). Such a space is referred to as "Urban Square" in some sources. The kind of activity occurs in this space, the type of use of the square, the general role of the space, the type of physical arrangement of it, is very effective in the way of the presence and behaviour of citizens. In fact, the relationship between citizens and urban squares are such a balanced and reciprocal relationship, and both (space and citizen) are trying to evolve for the survival of social life (Pakzad, 2005).

Sari municipality hall square is located in the central part of the city and among its ancient texture, and the most important commercial and administrative streets of the city are around this square. The crowds

and the high traffic volume in the municipality square and the surrounding streets, especially in the office hours of the day, cause traffic problems and disorder in the city.

In this study, firstly, the opinions of urban planners and experts about urban spaces and squares were discussed and the importance of creating a special area for pedestrians was being considered. After that, several examples of such spaces in Iran and also in other countries that had been successful were studied, and then the positive points of each of the plans were implemented in the design of the currently studied space.

After the brief introduction of the city and the region, the square and the important spaces around it, the analysis of issues, problems and potentials, in general, the strengths and weaknesses of this part of the city were discussed (Table 2). Using the results of the cognition and analysis, objectives, strategies and policies of the proposed plan would be obtained. Then several layouts were presented and compared with each other, the design of the optimal selection and details of urban design parts of the plan were provided and presented.

Theoretical basics and methods

The theoretical principles of the design including urban design and civil life, and social fundamentals of space are the most important component of this research, in which several factors are influential such as the safety and comfort of the citizens, the pleasant environment, the cultural location appropriate to the social behaviour and public norms of the people, the provision of safety and access to the facility, the use of regular and permanent facilities, the creation of sense of pride and belonging to citizens, the organization of urban spaces considering community needs, creating sense of navigation, visual communication, speaking, listening, smell, etc., with the surrounding environment (Leonard and Leonard, 1998).

The square is one of the first human arrangements of urban space, the place of social demonstra-

tions, the place of the crystallization of civil life and the realm of planning (Krier, 1979).

The overall features of the Square, in terms of function, shape and space, include individual and common functions, with social and cultural life, and in accordance with the climate; free and planned activities, urban space for all strata and tastes, in accordance with the modern needs, a busy or a quiet place, functional or symbolic, may have a square, rectangle, circle or triangle geometry (Moughtin, 1992).

As a concept of physical space, any land wide, flat, and flat within the city is called "square". In other words, open and vast spaces, having confined or defined range, along roads or intersection, and have communicational, social, commercial, sporting, military, or a combination of two or more applications, is referred to

as "square".(Zucker, 1959) In fact, gathering around a space forms the square. The public and usable space for people to view the city's space, the place of performance, suitable for movement and stop, remembering memories, seeing and being seen, celebrating ceremonies, buying and selling, holding political events like demonstrations and gatherings. Briefly, the city square refers to an area in which everything can happen simultaneously (Qarib, 1997).

Technically, the perception of the square as an urban open space, due to the spatial expansion and its placement in the urban spatial hierarchy, is always associated with two inseparable elements of space and time. The square has also the same characteristics as street, the difference is that the buildings induce continuity around the central space (Bacon, 1997).

Table 1. Sari's structural features in different historical periods (Eslami, 1994)

Anatomical characteristics	Qajarieyh city	The second decade of the present century	1950's	Current status
Pattern type	Stellate	Stellate	Stellar and circular combination	Stellar and double circular combination
Focal point	Downtown (bazaar and religious sites)	Clock square - adjacent to the previous focal point	Clock square	Clock square and other focal points
Rays	Communication paths of the city center to the gates	Connection between city center and clock square	The streets branching from the clock square	Two paths eastern - western and north - south
Urban outdoor	Limited, around focal points and rays	Square space and main streets	Square space and main streets	Main paths of square
Social interaction	On the scale of the neighborhood and the city center is very convenient	Suitable social context	Good inside the ring , it's weak outside	Good inside the first ring , it's weak outside
Environment	Proper combination with natural-geographical location	The environmental weakness in the formation of a new spatial organization	Weak environmental considerations of the spatial organization	Noise pollution and high air pollution, high energy consumption
Sustainable development	Flexible and evolving texture	The weakness of using existing conditions and destroying elements	Use of weak fixed capital and new construction	Inappropriate with climate and history
Visual quality	Proportional masses and elements of the building and space; materials and color were coordinated	Heterogeneity with texture structure and relative alignment with texture elements, height, materials and coloring	The heterogeneity between the historical context and the new development	The heterogeneity between the historical context, the natural environment and the new development

The design evolution of the squares from the primary integrated places in the city centers to the locations of activities and the pedestrian routes, and finally the use of squares to create urban green spaces, and the localization of urban activities (Jazayeri, 1998).

In terms of shape and configuration, the squares can be classified as closed, open and semi-open squares, divided square, central or stellate squares, longitudinal and Modern Square. The squares were also categorized as central squares, cultural squares, squares in the residential area, squares in the commercial-residential areas, railway stations and passenger terminals, memorial squares, recreational squares, park squares, traffic squares or roundabout (Qarib, 2005).

From the viewpoint of urban planning, the most important criteria to design squares in order to achieve social principles of space including providing safety and ease of access to urban spaces for all people; facilitating the regular and permanent use of residents from urban spaces; creating a sense of pride and belonging to community and location in citizens of, strengthen the curiosity and exploration; guide the crowd and activity in vari-

ous dimensions and fields; to create the sense of ownership of the place; Strengthening spoken-visual-audio-lingual communication with surrounding environment (Leonard and Leonard, 1998).

Since one of the first human arrangements to use urban space is the square, (Krier, 1979) for human being as a social being, square is the place of cultural or economic activities forms in the elements and spaces associated with each other. On the other hand, the square is one of the main manifestations of common life, the place of forming civil life which serves as a place for displaying common and human values, it is also a part of the city's spatial construction. The square provides a great opportunity for many gatherings, numerous meetings and competitions between different groups of people, along with a kind of vitality, with the improvement of the artistic quality of space in relation to life (Tavasoli and Bonyadi, 1992).

- Large public buildings around the squares, the function of these buildings, business or cultural activities alongside the residential areas provides day-to-day activities. The square can be used as a space in which

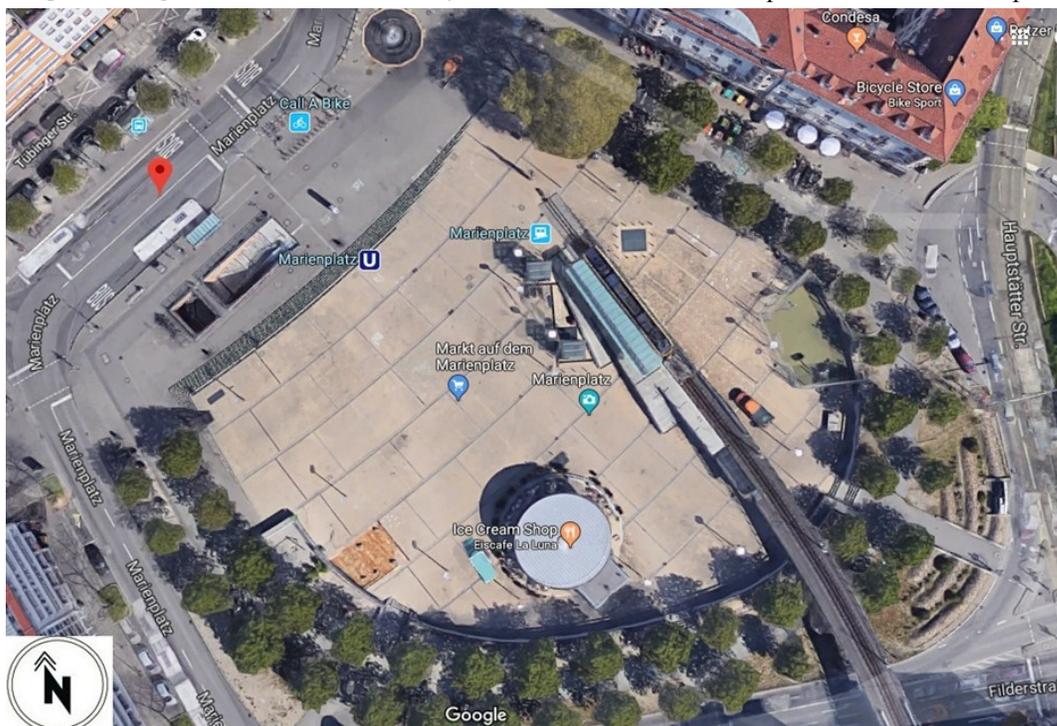


Figure 1. Marienplatz, 70178 Stuttgart, Germany (Google maps, 2017b)

Table 2. SWOT (Strength, Weaknesses, Opportunity, Threats) of case study (Pakzad, 2005)

Items	Issues and problems	Threats	Potentials	Opportunities
Physical	Discontinuous and uncoordinated skyline in the square	Loss of enclosure of square bodies	-	-
	Inappropriate urban furniture in different parts of the square	Creating physical inconsistency and visual problems	Possibility to use appropriate urban furniture in the right place	-
	Use of inappropriate urban elements and furniture to form the main Square space	The main Square space were not properly defined	-	-
	The lack of coordination in the view of the square caused by the inconsistency between the old and the new textures	Creating irregularities and visual contamination	The existence of a coherent pattern in the view of the main street of the city.	Possibility to use the model of commercial buildings in this region to enhance physical-visual coordination
	The presence of inappropriate traffic signs to guide the traffic	The spatial disorder of the square and create visual contamination	-	-
Environmental	An increase in the number of cars in this part of city, and a decrease in the amount of green space	Rising air pollution	There is a fairly large park and green space on the northern side of the square	The possibility of turning the square into an appropriate urban space for citizens
Movement	Incorrect taxi terminal location	Disturbing movement in the square	There are spaces to create passenger terminals	Increasing the order of movement in the square by setting taxi and bus stations; encouraging people to use public transportation system
	Absence of passenger terminals, taxi and bus stations	Interference in motion		
	The lack of a culture of using public transport system among people	Increasing motion disturbances and the density of cars	-	Encouraging people to use public transportation system
	Insufficient attention to pedestrians	Decrease pedestrian tendency to enter this space	Improve the movement of pedestrians by creating facilities for pedestrians	Encouraging pedestrians to be in this space
	High traffic and non-standard volumes of passing cars from this area and the streets around	Movement interference around the square	Possibility of modifications to movement patterns in streets around the square	Ease in pedestrians and riders movement in case of traffic modifications and decrease traffic flow
Use of inappropriate traffic signs to guide the movement of cars	Confusion in cars and pedestrians, spatial disorder of the square	Possibility to use proper traffic signs	Better guidance for cars and pedestrians	
The western body of the Square became a parking lot for cars and motorcycles	Movement distribution in the Square	There are spaces for generating public parking	Increasing the movement order in the square by creating a parking	

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	Lack of suitable parking space for cars and motorcycles around the Square	Western body of the square became parking lot for cars and motorcycles Generation of movements and visual problems on this side of the square	Existence of open space on the western side of the square	Possibility of proper use of the western side of the square in case of assigning a proper function to this space
	Gathering of petitioners on the northwest side of the Square	The creation of false occupations and trouble for pedestrians	There are undefined spaces around the square	Setting a place for petitioners
	Extensive and low-density spaces next to high traffic areas	Creating imbalances and inconsistencies in the square	Existence of spacious spaces around the square	The use of these spaces to meet needs of the area
Functional	Existence of commercial and office buildings in the square and surrounding streets it, and existence of the most commercial and administrative places of the city on two streets of Farhang and Enqelab	A large gathering of people in this part of the city	The possibility of attracting people to this space due to the commercial and administrative places	Transforming the square into a better urban environment in case of better organized places
	Existence of important administrative buildings, such as the municipality, the governorate, the central bank and the central bank in this area	Increasing people's traffic to this part of the city	Increasing population attraction in this space	Use of high population density to create an important urban and active urban space
	Existence of a military garrison on the southern side of the Square along with other activities in the Square including commercial and administrative	Disrupting functional coordination	The existence of a military garrison on the south side of the square	The military garrison must be legally transferred out of the city and its space can be used by the municipality.

free and planned performances, such as celebrations, plays, memorials, and rituals can be held (Bahreini, 1998).

The square design is a thoughtful response to contemporary social needs combined with geometric forms of harmony. Therefore, the square shape plays an important role in the square definition and the enclosure is the most important feature in the shape of the square (Zendehtel, 2000).

Other spatial characteristics of the square are the scale of the buildings, the difference between their heights, and their relationship with the breadth of the square and the location of the main buildings. The balance and equality of vertical and horizontal shapes in space should also be emphasized. Color, texture, floor

ing, lighting details, slope and skyline are also features of the square that affect its perceptual and emotional aspects. Using the above mentioned, the square can be transformed into a vibrant and dynamic urban space.

Examining areas and urban spaces, the principles and rules that are generally observed in all of them can be used as criteria for new designs as follows:

- **Creating places for public life:** All of the squares that have emerged as an important urban space in the cities are predominantly in the city's township with a specific role and function, and were created in accordance with practical purposes, and were places of displaying public life in the city.
- **Meaning of the square:** All squares are important in



Figure 2. Moltkestraße, 53173 Bonn, Germany (Google maps, 2017b)

terms of spatial position in the urban hierarchy system, in addition, in the spatial structure of the city, they are linked with the elements around them, and their collections represent a whole.

- **Relationships between buildings and monuments (memorial) Square:** In order to shape the organization and structure of the square, important elements and places played a significant role. The existence of valuable monuments around the squares, in combination and conjunction with neighboring monuments, has been used as a method everywhere.
- **Creating different events in square spaces:** The placement of buildings and memorial elements, the use of conditions in the space of square has significant effects. When choosing the place for sculptures, fountains and water, instead of being placed in the middle of the square, they can be located in the courtyards of the square where the space is being used by pedestrian; in many cases, practical needs and artistic demands come

together.

- **Square as a closed space:** Square space has a harmonious effect due to the closed space. With such a quality, a piece of land in the middle of the city takes the name of the square. Different methods have been used to fulfill this requirement due to the different circumstances.

Considering renovation and rearrangement of some squares in order to make them more effective and useful in cities for social interactions some cases were introduced as below:

- Marienplatz, 70178 Stuttgart, Germany (Figure 1), was founded during the period of urban development, in 1876. This square is surrounded by the deep valleys of Stuttgart area. This square was initially a terminal for trams, a circus place and a local traffic distribution region. But nowadays the square has changed. Marienplatz, in the urban regeneration, is an important area of internal part of the city and is known as a traffic

junction, a local square and children's playground. (Knirsch, 2004)

- Moltkestraße, 53173 Bonn, Germany (Figure 2), Characteristic of the Bad Godesberg urbanization due to dispersed and spaced constructions appears in large parts of the city. Around the Moltkestraße square, and in the western part of the city, the urban space is noticeably dense, this density is related to the height of constructions, residential density in the adjacent neighborhood, as well as different uses such as markets, stores and cinema (Knirsch, 2004).
- Union Square, San Francisco (Figure 3), which is located in downtown San Francisco, has been forgotten over time due to inattention, with a redesign and redevelopment of space which took place in 1997, has gained new flourishing. The square was previously separated from its adjacent spaces, but now it has found some vitality by placing stairs around the square and have communication with adjacent spaces. Due to its unique location and characteristics, it has affected, hotels, supermarkets and surrounding theaters as one of San Francisco's active centers (Knirsch, 2004).

To design appropriate large urban squares some principles shall be considered as below (Pakzad, 2005):

- **Relating inner and outer part of square:** The streets and sidewalks around a square have a great impact on access and application of it, as well as the buildings around the square. The activity and vitality of the inner space of a square is associated with intimacy and vibrancy of the outer atmosphere of it.
- **Creating attraction and motivation for people to attend:** Each large metropolitan area has a variety of places within itself that causes motivation and attraction. This attraction can be of any type; open-air bars, waterfalls, statues or even an event occurring on the square.
- **Passage traffic:** One of the success factors of the squares is the ease of access to them. The best squares

in the world are always those that can be easily walkable and have narrow streets and traffic passing slowly. Pedestrian crossings are quite distinct and the lights are set for pedestrians and not vehicles. In fact, squares that surrounded by high-speed traffic lines, are separated from the pedestrian routes and are deprived of the essential feature of the permanent presence of human beings.

- **Flexible design:** As any good public space, the use of square space varies over the time. However, very few types of squares are designed to be flexible at different times.
- **Management:** Fluidity and change in the space of the square are factors that cause people to visit the site frequently. One of the ways to achieve such goals is to benefit from a management whose most important approach is to increase the vitality and presence of people in the square.

Sari is the capital of Mazandaran Province, one of the northern provinces of Iran near the Caspian Sea. According to multiple narratives, its construction dates back to before Christ ages. Sari grew after Qajar dynasty, and the new Sari urban system has remained since then. Sari was the first Iranian city that construction of Iran's national railroad had been commenced on there. After Reza Shah, during world war II it was captured by Soviet forces. After world war II, the Naz Dasht Airport was built there and development projects were set up eastward; after the revolution, the roads around the city were developed. In recent years, passing the railway along the city and the construction of streets and public buildings, Sari has been rebuilt and today it's become one of the beautiful cities of Mazandaran province and the north of the country (Eslami, 1994). Table 1 represents historical periods of Sari city.

The municipality hall square is located in the central part of the city of Sari (Figure 4 and 5) and surrounded by the old texture. This area is known as an

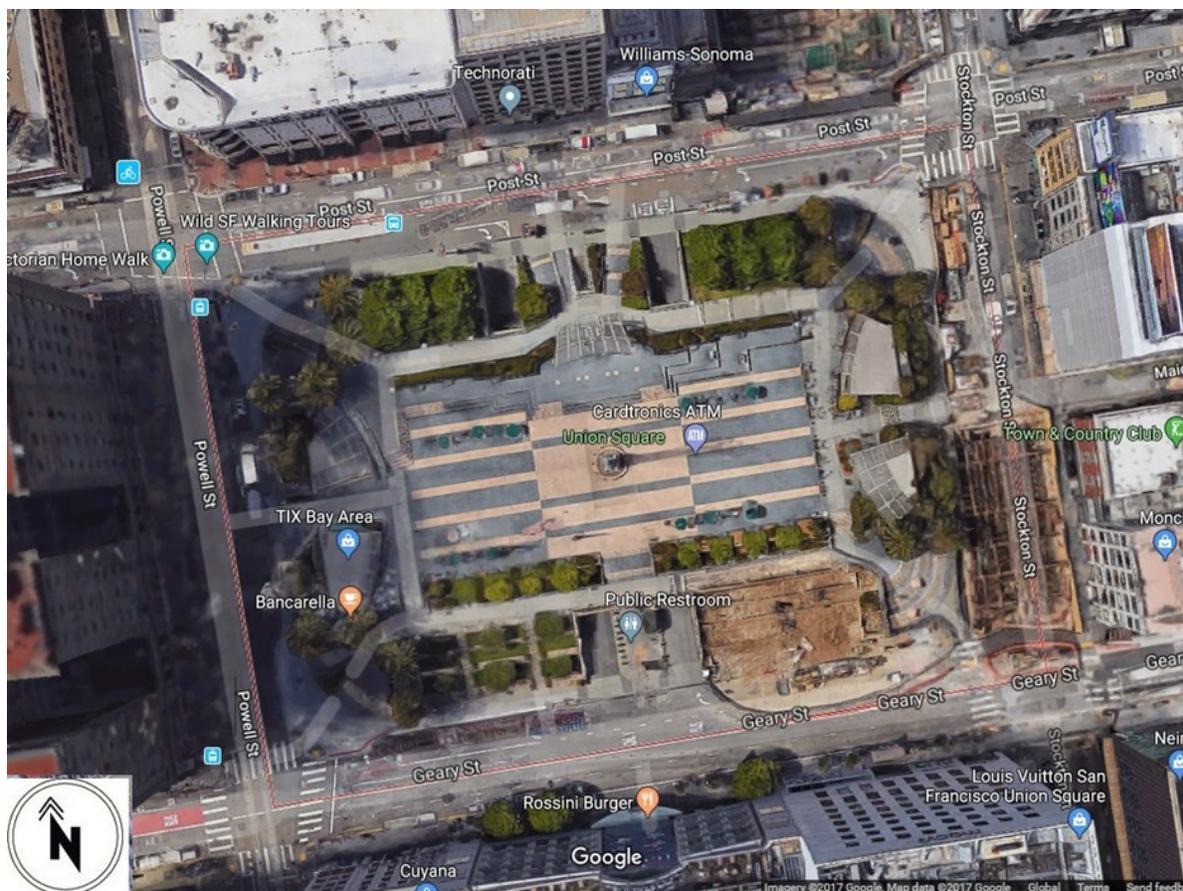


Figure 3. Union Square, San Francisco (Google maps, 2017b)

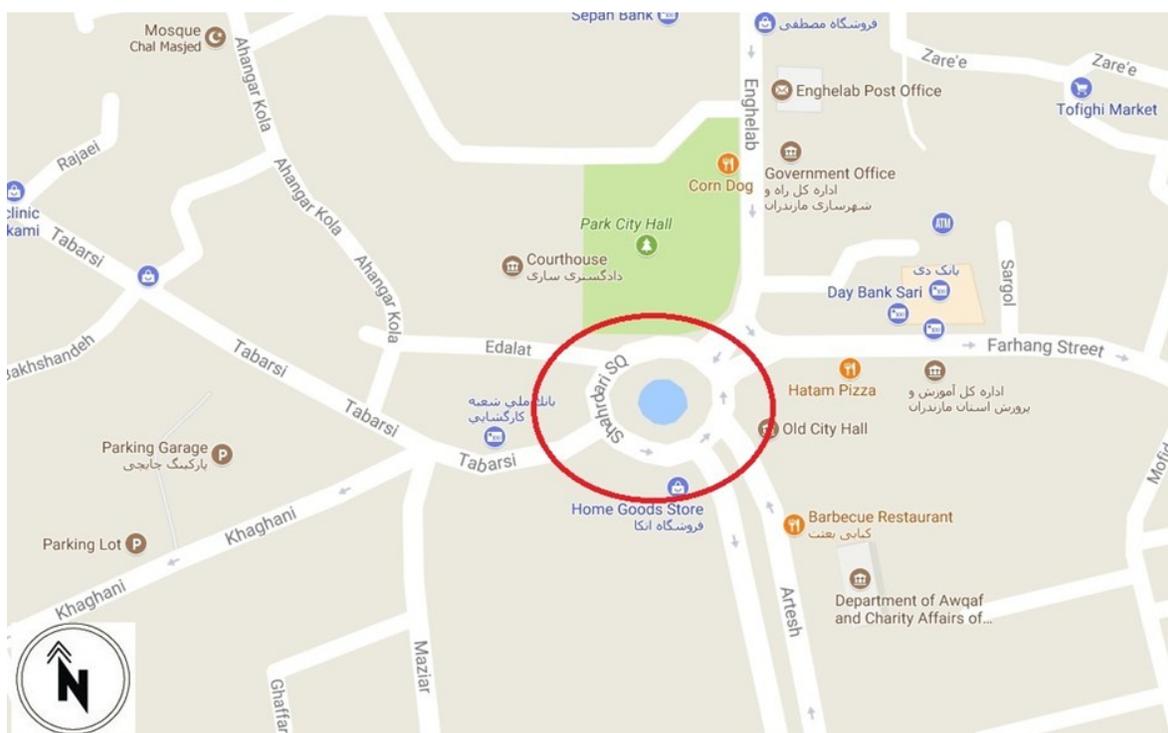


Figure 4. The municipality hall square (Google maps, 2017 a)



Figure 5. The municipality hall Square located in the central part of Sari city (Google maps, 2017b)

important commercial-administrative center. One of the most important features of this urban space is the high traffic of cars as well as the large amount of pedestrian traffic in this space.

In this study, the following cases were considered: Position of municipality hall square in Sari city; roads and streets, visual organization, network of infrastructure and urban facilities, square communication network, traffic volume and arches connected to the square. Considering above mentioned items, the issues and problems encountered in the study included physical-visual problems, functional problems, traffic problems, environmental problems and social problems, which were summarized in the Table 2.

The central part of the cities are one of the most important centers of traffic and citizens gathering. Considering special arrangements, it can be used to create a vibrant urban environment. Sari municipality hall square has such a potential. The most significant cases included in the plan is:

- Vitality:** Spreading diverse applications, considering user-friendly services for the population, deploying leisure-time use, avoiding the uniform arrangement of urban furniture along the way; enabling badgers to work, creating spaces for pause, sitting and watching, anticipating areas for ceremonies, and Special events, maintaining and enhancing physical indicators, the use of diverse materials, the use of diverse forms with various rhythms in the walls, coordinating the path lighting with the illumination of the bodies.
- Flexibility:** Avoiding the use of rigid furniture, fitting and unmovable, considering arrangements for easy installation of shades and other extension elements where necessary, avoiding levelness of space by trees and vegetation, avoiding unnecessary levels of floors and breaking and crushing the floor, avoiding large gardens and waterfalls on the floor, creating different usability of space during the week and on holidays, creating different usability of space throughout the day.



Figure 6. First option: adding a small roundabout to the west of the current square (Google Maps, 2017a)

- **Safety:** Preventing the entry of cars and motorcycles, minimizing the intersection of the pedestrians and the riders, safe access to the rider, the ability to see the regions in the pedestrian area, remove obstacles in

space, the lighting for walking, avoiding dark and hollow cores, avoiding the deployment of office time use in the region.

Based on the research objectives of this study, a

special part of the city is selected for creating a pedestrian area in the commercial - administrative zone and both quantitative and qualitative data analysis are conducted to develop the research solutions. Different stages are as follows:

- Studying and discussing different views and ideas of urban planners about city center, pedestrian zones, citizens' social life and communications, urban and architectural standards.
- Investigating different case studies of national and international samples with similar functions and problems.
- Testing different variables and the conceptual framework such as traffic studies, city old buildings and monuments and residents' sense of fixation and belonging to the city center
- Finalizing the framework and identifying key variables.
- Developing an operational framework by reviewing the strengths and weaknesses, the design principles and objectives, strategies, rules and policies of the project done by the authors
- Applying the result on the case study in special site conditions, then comparing and validating the findings and different design alternatives by authors.
- Explain knowledge and practical contributions.
- Explain limitations and give recommendations for future researches.
- Comparing different concepts and alternatives based on each research objective.

Principles and objectives of the proposed plot are creating a pedestrian environment; improving the traffic situation of the square and the surrounding streets; setting up a residential traffic situation; encouraging the use of public transport; linking the city with nature; attracting private sector investment and improving economic conditions (Pakzad, 2005) which have been considered in proposals. A pedestrian network

creates a dynamic urban environment including parking outside the riding level, access to public transportation services by constructing taxi and bus stations, not causing additional traffic in other parts, no interfering with pedestrians and rides, creating places along the path for sitting and resting, installing suitable lightings (Pakzad, 2005).

Area applications including the integration of applications with the transportation system; the integration of applications with a natural platform, the compatibility of applications with each other and with the city, the population in the day (administrative-commercial), social-economic development projects including creation of new business and cultural centers in the plan, allocation of facilities to the stakeholders, attention to valuable points within the scope of the plan and finally environmental improvement considerations including urban design, outdoor and green spaces, furniture, lighting, landscaping were main options in proposal (Pakzad, 2005). Existing views include the skyline, proportions, structure and composition of windows, the ratio of full and empty surfaces, gradients was considered in all plots.

Among all of above mentioned criteria four of them were selected to be scored, first of all visual and physical coordination within the area, in this category two options were considered: promoting the attractiveness of urban spaces and improving the quality of urban environments. Second selected criteria was economic and functional development of the region, in this criteria three options were distinctly noticed: creating revenue sources in the region, public usage development in region, reducing personalized ride with convenient distribution, third selected criteria was linking city to the nature, in order to obtain this purpose improvement of the natural and artificial landscape were investigated. Last of all, development of social security and more attention to pedestrians by means of increasing the region for pedestrians were inspected.

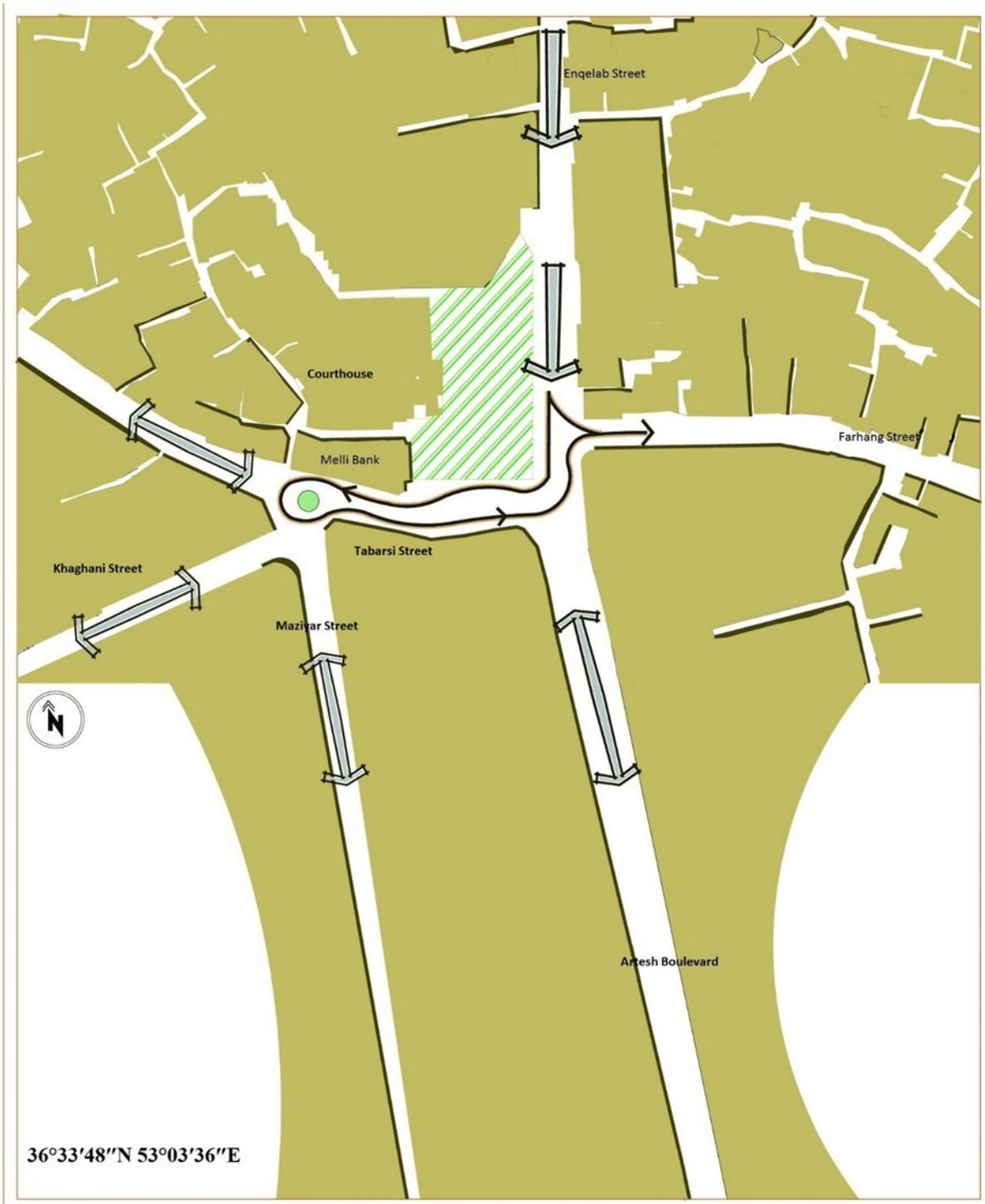


Figure 7. Second option: moving the square to a point in the west of the current square (Google Maps, 2017a)

Considering above mentioned items, some plots has been designed using AutoCAD 2013, Photoshop cs9 and Autodesk 3D Max 2013, afterwards designed plots have been compared in different aspects of design and finally one has been chosen as proposed plot. Compar-

ing the options was performed by matrices evaluation method. A basic evaluation matrix consists of forming a set of criteria which can be scored and summed to gain a total score and then to be ranked. To evaluate selected criteria, a fraction of one was considered.

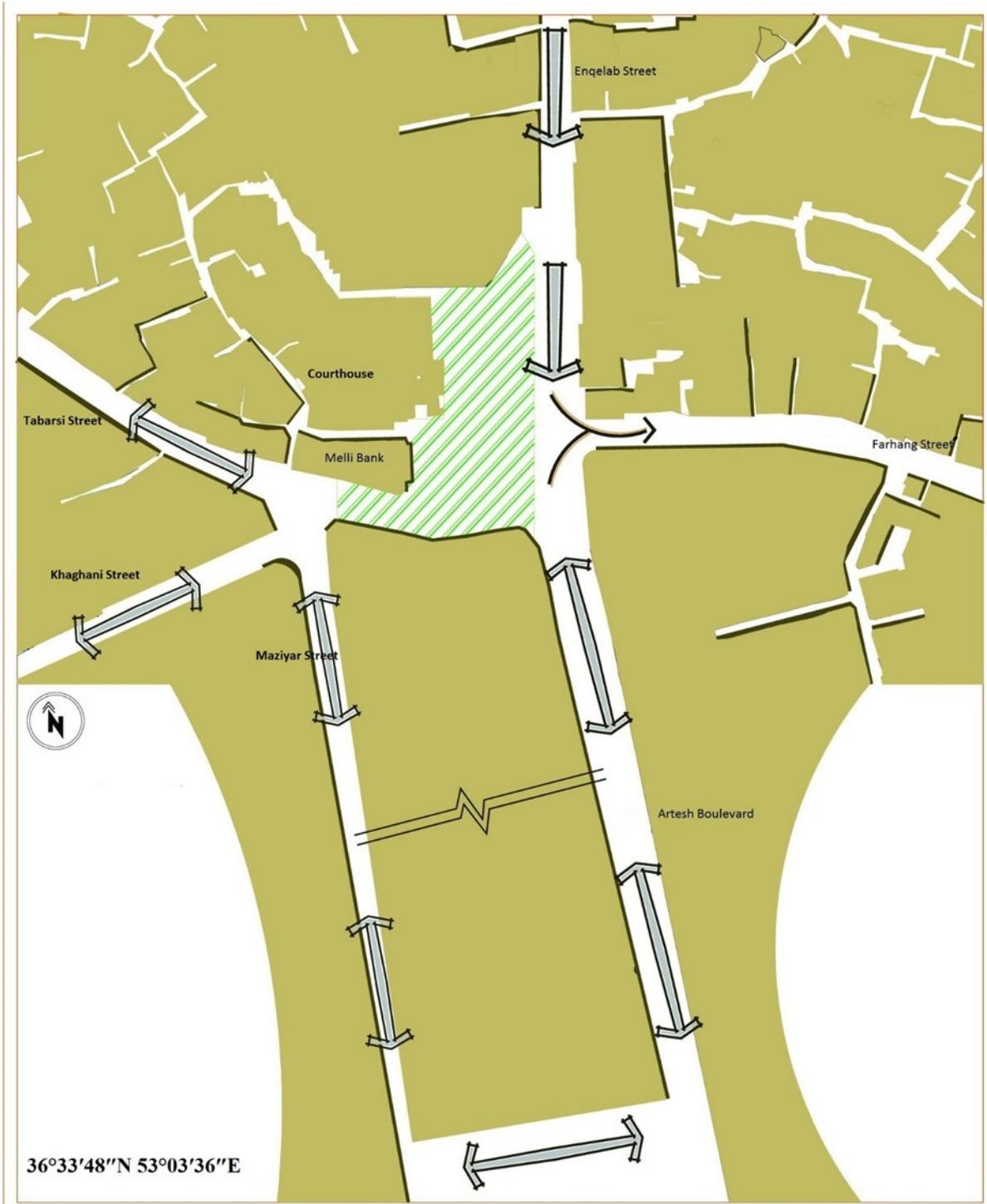


Figure 8. Third option: converting the entire square space, and the park in the northern part, to the pedestrian area (Google Maps, 2017a)

RESULTS AND DISCUSSION

Design principles including objectives, policies and strategies to increase the efficiency of the pedestrian range, anticipate some design rules; proposals were presented.

- **First option:** Adding a small roundabout to the west of the current square (Figure 6).
- **Second option:** Moving the square to a point in the west of the current square (Figure 7).

Table 3. Goals, strategies, policies considered in the plot (Pakzad, 2005)

Items	Macro goals	General goals	Strategies	Policies
Physical	Creating visual and physical coordination within the range	Promoting the attractiveness of urban spaces	Detecting valuable historical buildings and utilizing them in accordance with their quality	Preservation of the views and historical sights
		Improving the quality of urban environments	Creation and promotion of physical qualities and activities Creating vitality in the central part of the Sari city and the municipality hall Square	Maintaining the natural landscape of the region (trees and other plants) Locating and developing open spaces and urban green spaces Maintaining and creating safety and security in urban environments Infrastructure correction (flooring, green spaces, night lighting, etc.)
Functional	Economic and functional development of the region	Creating revenue sources in the region	Establishment and development of appropriate uses in the region as part of the city center	Preserve historic monuments Commercial space design Considering a place to hold permanent or temporary exhibitions Preservation and development of open spaces and urban green areas Development and distribution of applications commensurate with the identity of the main city center Use of free and public land for public uses and needs
		Public facility development in region	Development of services in the center of activities and main paths	Creation and development of urban services (cultural, educational, leisure and recreation) Improvement of urban environments and enhancement of the attractiveness of urban open spaces for gathering citizens and holding ceremonies
		Decreasing personal cars by help of proper distribution of the public transportation	Distribution of public transportation system to reduce need for motor vehicles and air pollution	Developing public transportation policies related to the distribution of uses with the aim of restricting the use of private vehicles
Environmental	Link the city with nature	Promoting natural and artificial landscape	-	Increasing the role of natural elements (water and green space) in the design Use the green wall to separate the pedestrian and street Suggesting a sample view for business and office buildings to coordinate and enhance visual order
Movement	Developing social security and giving more attention to pedestrians	Increasing the area of side walks	Augmentation the public access system	Distribution of utilities and urban services near major paths Creating a taxi and bus terminal between the pedestrian and riding area Use of appropriate urban furniture
			Development of pedestrian life in order to pave the way for social life Creation and development of public parking lots	Solving the ride and foot traffic system appropriate to the passageways and squares Improvement of passages and urban areas (flooring, planting trees, lighting) related to pedestrian life Reducing the traffic of personal vehicles in the region Turning the square into a pedestrian space Adding the park space near the square to the pedestrian area Considering a place for public parking in the plot

Table 4. Matrix of comparing options considering selected criteria –proposed plots to increase the efficiency of the pedestrian range

Goals of the proposed options	Visual and physical coordination within the area				Economic and functional development of the region			Link city with nature	Development of social security and more attention to pedestrians	Evaluation of the options
	Promoting the attractiveness of urban spaces	Improving the quality of urban environments	Creating revenue sources in the region	Public usage development in region	Reducing personalized ride with convenient distribution	Improvement of the natural and artificial landscape	Increase the region for pedestrians			
1 st option	1.4	1.4	1.2	1.2	0	1.2	0	29%		
2 nd option	1.2	1.2	3.4	3.4	1.4	3.4	3.4	60%		
3 rd option	3.4	3.4	3.4	1	1	3.4	1	85%		

Table 5. Matrix of comparing options considering selected criteria - for building a passenger terminal, commercial section and pedestrian paths

Goals of the proposed options	Visual and physical coordination within the area			Economic and functional development of the region			Link city with nature	Development of social security and more attention to pedestrians	Evaluation of the options
	Promoting the attractiveness of urban spaces	Improving the quality of urban environments	Creating revenue sources in the region	Public usage development in region	Reducing personalized ride with convenient distribution	Improvement of the natural and artificial landscape	Increase the region for pedestrians		
1 st option	1.4	3.4	3.4	1	0	1.2	1	75%	
2 nd option	1.2	1.2	1.2	1	3.4	3.4	3.4	68%	
3 rd option	1.4	1.2	1.2	1	1	1.4	1.2	57%	
4 th option	3.4	3.4	3.4	1	1	3.4	0	86%	

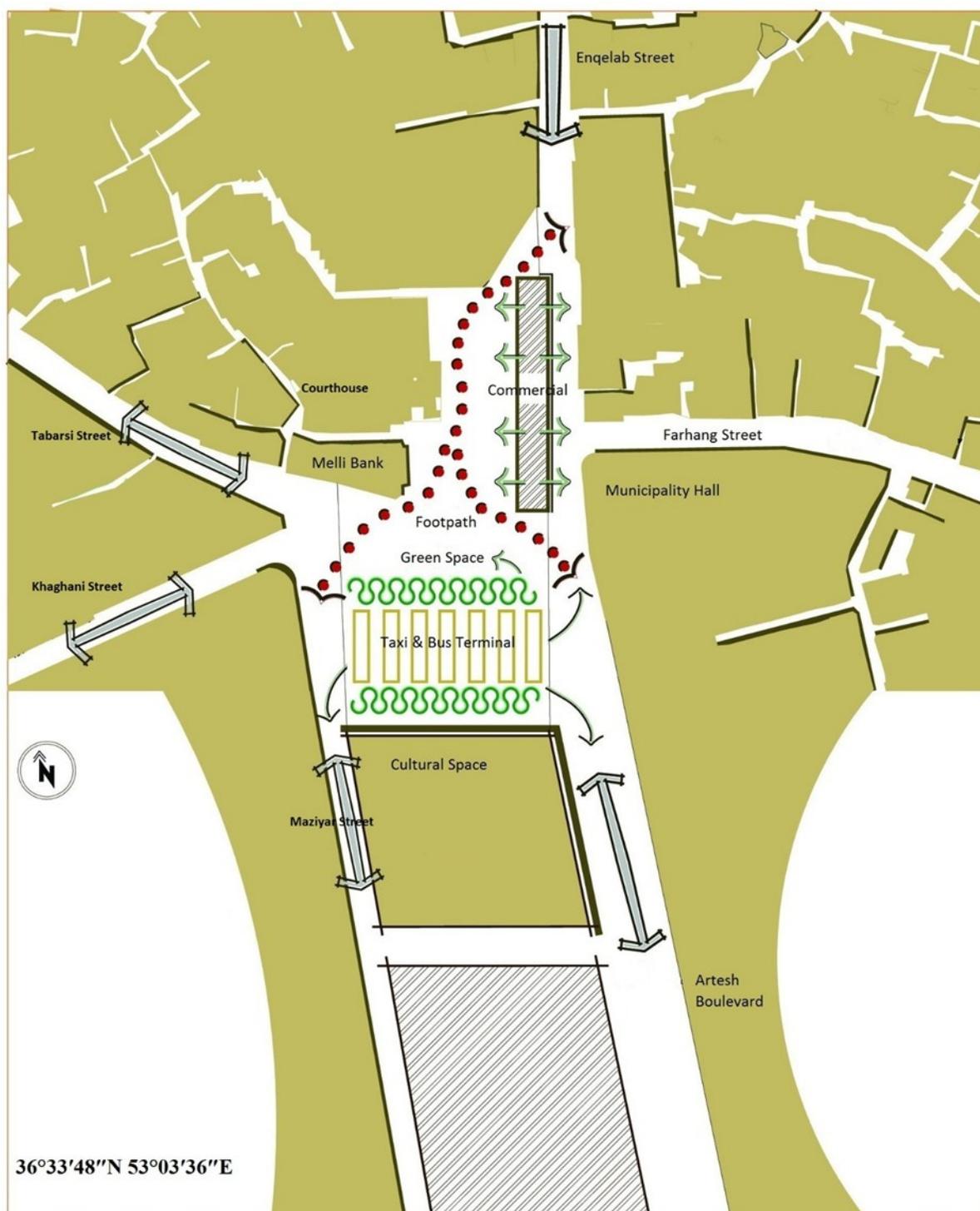


Figure 9. First option: dedicating parts of the garrison's space to the taxi and bus terminus and surrounding it with the green space (Google Maps, 2017a)

- **Third option:** Converting the entire Square space, and the park in the northern part, to the pedestrian area (Figure 8).

In first option, the route from Enqelab Street to the Artesh Blvd is more distant. But some interferences

are avoided around the square. In this regard, some of the square traffic can be moved with more regularity, and causes reduced traffic. The problem with the plot is the low distance between the two squares which can cause disturbances and principally not correct. Also,

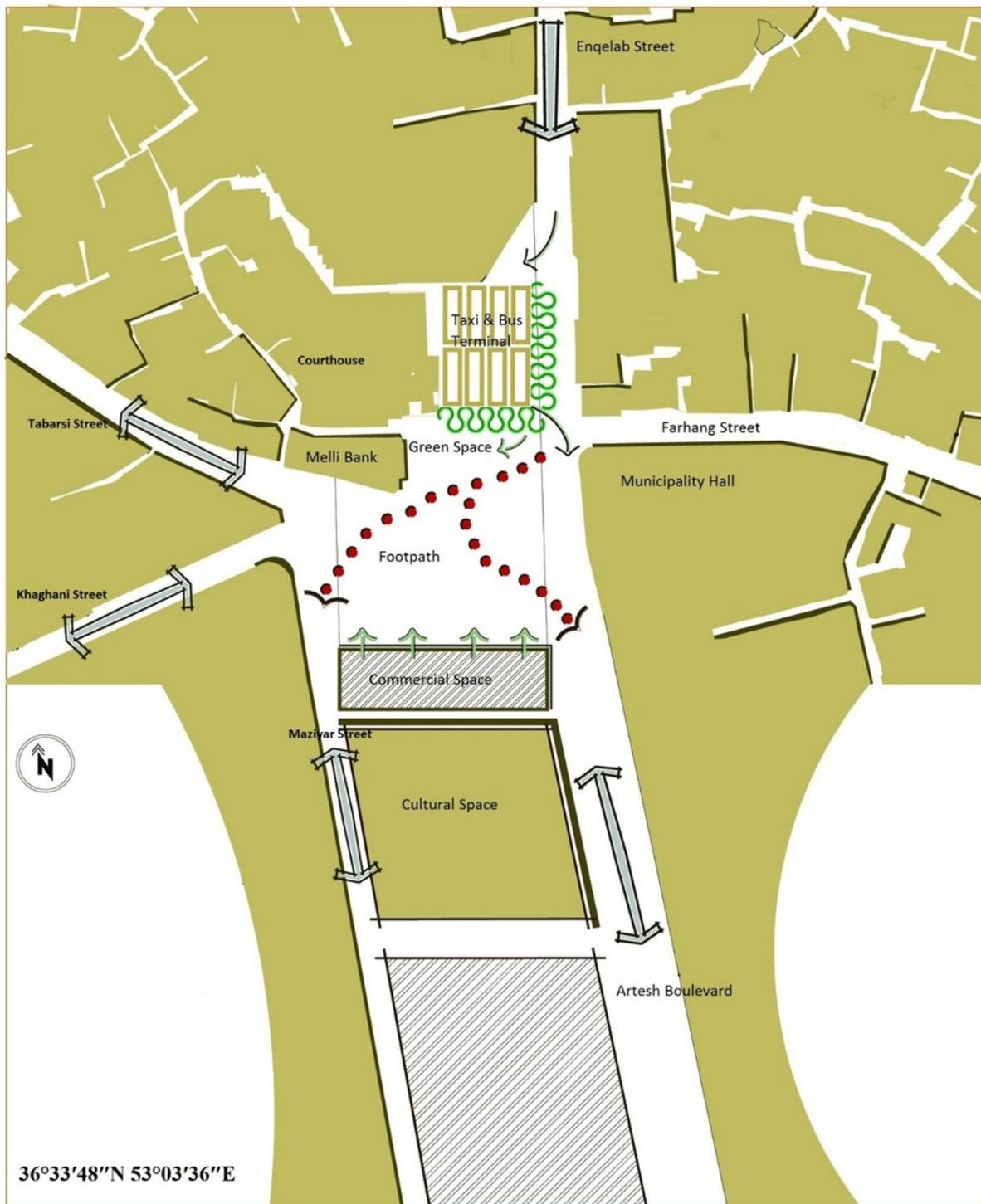


Figure 10. Second option: assign the northern part of the garrison in the vicinity of the square to commercial units and dedicate the northern part of the square to create a taxi and bus terminal and consider the southern section to the commercial units for cult (Google Maps, 2017a)

attention to pedestrians, which was one of the most important design goals, is not taken into account in this plot, and pedestrian space is reserved for the same green space and park in the northern part of the municipality

(Table 3).

Second option, in which the two nodes were created in the form of a trilogy; at these two points, it would be confronted with the traffic problems. In this

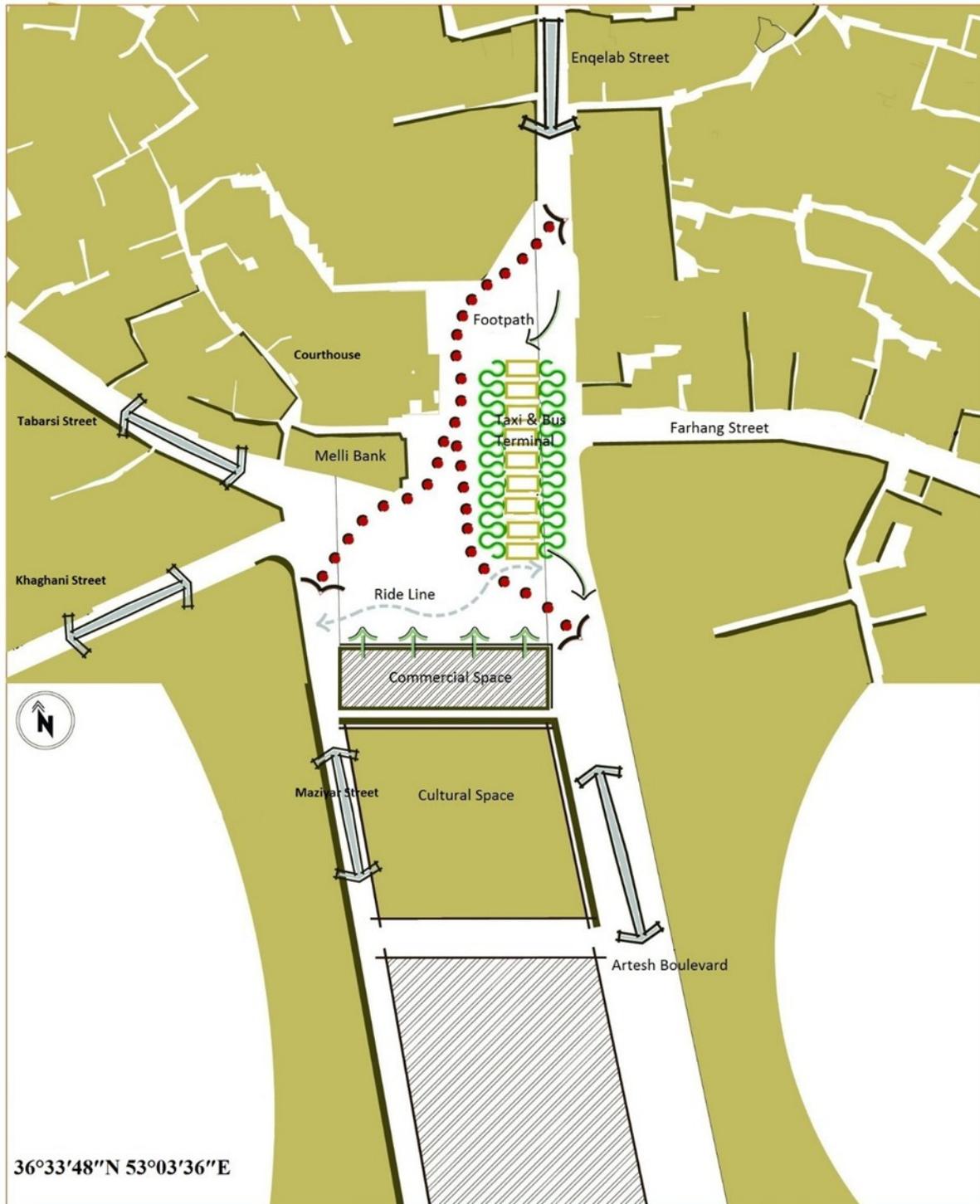


Figure 11. Third option: dedication of the northern part of the garrison adjacent to the square to the commercial units and the eastern part of the Square to create a taxi and bus terminals and the southern sections to cultural spaces. (Google Maps, 2017a)

plot, the space and surrounding areas can be combined with the greenery of the park located north of the square and create a good urban space, this is one of the main goals of the proposal, which is one of the positive as-

pects of the plot. In case of increase in pedestrian area, in addition to creating urban space and increasing social interactions among citizens, it can provide a good opportunity for economic exploitation and also a place

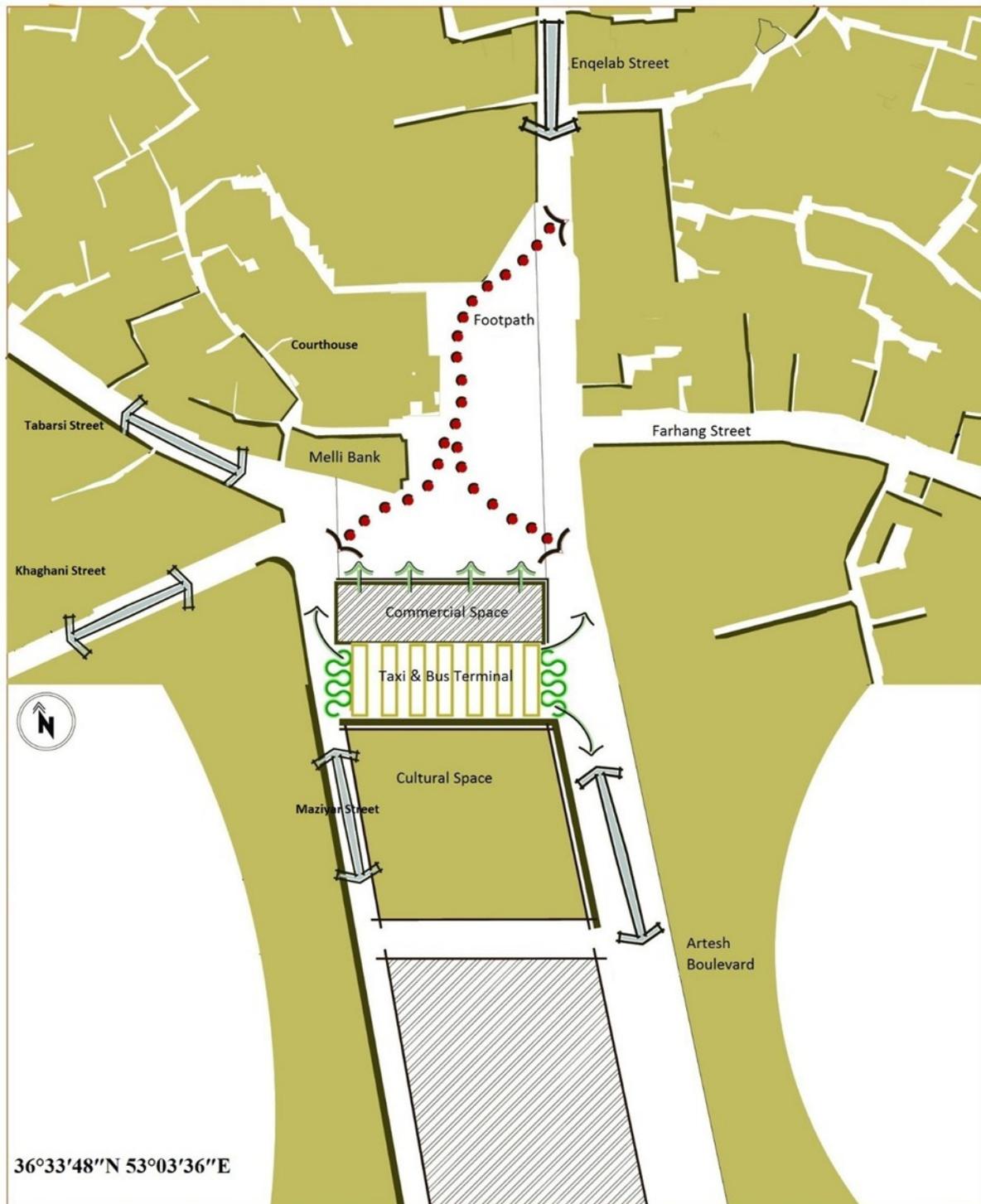


Figure 12. Forth option: assigning the northern part of the garrison adjacent to the square to the commercial units and its southern section to create a taxi and bus terminal and finally assign the southern section to cultural spaces. (Google Maps, 2017a)

for the creation of necessary applications within the region; these include terminals for public transportation, taxis and buses, new business units, cultural spaces and public parking. In this plan, traffic travels more and

more in the current region, but all traffic on the municipality square have been shifted to a smaller square where traffic of the same point is added, and in the new square would probably be faced with traffic problems.

In third option, this plan, the entire area of the square is allocated to pedestrians. This is one of the main goals of the design, which is one of the positive aspects of the plot. In the event of an increase in pedestrian level, in addition to creating urban space and increasing social interactions among citizens and it can provide a good opportunity for economic exploitation and also provide a place for the creation of necessary applications within the region, these include terminals for public transportation, taxis and buses, new business units, cultural spaces and public parking. In this case, the military garrison space can be allocated as part of the plan, part of this space can be turned into public parking, bus, etc. The southern ride can also be located closer to the square. Thus, the length of the cavalry passageway is also reduced to some extent. One of the problems with this plan is to increase the traffic on some streets around the square. As a result, Maziyar Street and Artesh Blvd will have more traffic than the current state.

Matrix of comparing options using matrices evaluation method was summarized in Table 4, consid-

ering selected criteria. Considering factors such as creating visual and physical coordination in the region, economic and functional development of the region, linking city to the nature, developing social security and paying more attention to pedestrians, third option has been chosen as the preferred option.

There were four options for building a passenger terminal, commercial section and pedestrian paths:

- First option: Dedicating parts of the garrison's space to the taxi and bus terminus and surrounding it with the green space (Figure 9).
- **Second option:** Assign the northern part of the garrison in the vicinity of the square to commercial units and dedicate the northern part of the square to create a taxi and bus terminal and consider the southern section to the commercial units for cultural spaces (Figure 10).
- **Third option:** Dedication of the northern part of the garrison adjacent to the square to the commercial units and the eastern part of the Square to create a taxi and bus terminals and the southern sections to cultural spaces (Figure 11).



Figure 13. Suggested layout 3D image considering the proposed options (Google maps, 2017c)

- **Forth option:** Assigning the northern part of the garrison adjacent to the square to the commercial units and its southern section to create a taxi and bus terminal and finally assign the southern section to cultural spaces (Figure 12).

The first option; placing the green space around the terminal reduces the air pollution and also has a roll-over effect and separates the area for pedestrians from the terminal. The southern part of the passenger terminal in this project is dedicated to cultural spaces, this can increase the population's attraction to the space. The strengths of this plot is vicinity of the terminals to the streets around. The location of taxis and buses in this plot is such that their access to the main streets around are convenient and quick and facilitate public transportation and can increase the tendency to use public transportation and have no with other paths. In this plot, the business sector is located on the eastern side of the square. In this regard, commercial units can serve the pedestrian, as well as the Enqelab street.

The second option; can increase the population's attraction to the space. Also, the vicinity of commercial units to cultural spaces and the operation of these two applications can be effective in turning the square into a vibrant and dynamic urban environment. In this plot, commercial units located adjacent to the infantry area can only be used by pedestrians. The taxi and bus terminus space is surrounded by green space. The placement of green space around the terminal reduces air pollution and also has a rollover effect and separates the pedestrian area from the terminal. The proximity of the terminal's input and output is weaknesses of this plot. Also, the location of the terminal is such that is far away from some of the main streets, which reduces the serviceability of the terminal to a certain extent.

The third option; this can also increase the population's attraction to the space. The taxi and bus terminal in this plot is located near the main and crowded streets of the Enqelab, which increases the ease of use.

In this plot, the terminal is far from the west streets of the square, this problem can be solved by creating a special route for public transport vehicles. In case of passing the special line of the rider from the pedestrian area, appropriate considerations should be taken at the intersection of these routes to ensure the safety of pedestrians. In this plan, the space around the taxi and bus terminal is surrounded by green space which reduces air pollution and also has a rollover effect and separates the pedestrian area from the terminal.

The fourth option; the strengths of this plot is vicinity of the terminals to the streets around. The location of taxis and buses in this plot is such that their access to the main streets around are convenient and quick and facilitate public transportation and can increase the tendency to use public transportation and have no with other paths. In fact, the placement of passenger terminals behind commercial units is an advantage that reduces the crossing of pedestrians and cavalry and lowers the effect of terminal pollution in the pedestrian range and the view of the terminal space from the pedestrian area. The space around the taxi and bus terminal is surrounded by green space. The placement of green space around the terminal reduces air pollution and also has a rollover effect and separates the area of pedestrians and main streets from the terminal.

Matrix of comparing options using matrices evaluation method, was summarized in Table 5, considering selected criteria. Considering factors such as creating visual and physical coordination in the area, economic and functional development of the region, linking city to the nature, developing social security and paying more attention to pedestrians, the fourth option was chosen as a desirable option according to Table 3. (Figure 13).

CONCLUSION

Considering the proposed options and comparing them with the design mentioned in the previous

section, converting the square to pedestrian space was selected. Comparing the layout of commercial units, terminals and pedestrian routes with the goals, the placement of commercial units in the southern part of the space and the taxi and bus terminals behind the commercial units was considered as optimal design option. Some of the key points in this space include:

- Place entrance
- Walk ways are consist of three parts with different flooring, two covered sideways and one middle uncovered section. When needed, the uncovered section is used as a rider's path.
- Children's playground
- Chess tables place
- Outdoor theater is a place for public celebrations, entertainment programs, outdoor concerts, ritual ceremonies, public gatherings and etc.
- Semi-open space for exhibitions and seasonal markets
- New business units in the southern part of the site. Around these units is a portico that covers around business units. Those business units that have applications such as restaurants, cafes, etc. can use the semi-open space in front of their shops for their customers.
- Taxi and bus terminals and public parking located behind commercial units to decrease disturbance for pedestrians.
- The water route in the whole space and its combination with walking paths, green spaces, semi-open spaces and sitting and resting area; some open space considered in the plot, which can be used in the performance of special ceremonies and other uses.

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