



## Analysis of physical development and activity pattern along the main entrances in Rasht

N. Azimi<sup>1,\*</sup>, M. R. Faroughi<sup>2</sup>, M. Tajbakhsh<sup>3</sup>

Received: June 2014, Accepted: October 2014

### Abstract

As a common space, urban entrance is the first place that introduces a city to its visitors and it is imprinted in the memory of people. This study aims to provide a detailed analysis of physical development and activity patterns along the main entrance of Rasht, Iran. Utilized data in this research comes from a questionnaire survey through which 707 land lots along the main entrances were studied. A number of statistical methods including nonparametric test of Kruskal-Wallis and cross-correlation analysis were used to analyze the collected data. Findings indicated that entrance axes in Rasht present a low density pattern, in the form of single row shops with sporadic low rise buildings and uneven distribution of activities mainly by auto-related shops and services. Data analysis revealed a significant difference in the development of physical elements such as density of land lots, lot size, building age, quality of structure and land use/activity pattern among the main entrances. Data results also showed that density of development along the entrances is associated with land use type and ownership. Moreover, the data showed that the age of a building is correlated with quality of structure, land use type and ownership and quality of structure is related with land use type and ownership. Adopting a number of urban planning approaches such as density increase, encouraging mixed land uses, and employing local architectural styles in building design could enhance the exterior outlook, increase the land value, expedite investments and eventually improve the economy along the entrance axes.

**Keywords:** Entrance axis, Physical development, Activity pattern, Rasht.

### 1. Introduction

After the 1960s, political and socioeconomic changes accelerated urban growth in Iran which transformed it from a predominantly rural society to an urbanized nation by mid-1980s. The land reform policy of the early 1960s and the following socioeconomic changes [1], are considered as one of the most influencing events that triggered first wave of rural urban exodus in the country. The outcome was the emergence of informal settlements especially around the large cities [1]. Revolution of 1979 and its ensuing socio-political changes exacerbated rural-urban migrations which led to more urban growth and expansion of informal settlements around most cities [2]. Over the 1970s and 1980s period, the share of urban population reached to 54% which changed Iran to an urbanized nation [3, 4].

Due to the government's effective population control measures, the growth rate declined sharply in the following years; however, because of the continuation of rural-urban migrations, urban growth rate is still relatively high. In the past 25 years, urban population was doubled in the country and exceeded 53 million and for the first time, rural population experienced a negative growth after the 1990s.

Rapid urban population growth in Iran over the past decades resulted in uncontrolled physical expansion in many cities. Generally informal settlements around the cities are incongruent with the main body of cities. Urban entrances are among the most visible places where one could observe these differences. The overall conditions in the entrances can be exemplified in different activity patterns, congestion, less public facilities and little attention to the needs of arriving passengers. This article attempts to examine the main entrances of Rasht and compare their development patterns with each other and suggests recommendations to improve the quality of urban environment.

### 2. Research Background

Lynch [5] identified five key elements that make up people's perception of their city. These elements are paths, edges, districts, nodes, and landmarks. Inspired by Kevin

\* Corresponding author: Azimi@guilan.ac.ir

<sup>1</sup> Assistant professor, Department of Urban Planning, Faculty of Architecture and Arts, University of Guilan, Km 5 Tehran Road, Rasht

<sup>2</sup> Mohammadreza Faroughi, Lecturer, Department of Urban Planning, Faculty of Architecture and Arts, University of Guilan,

<sup>3</sup> PhD. Student, Department of Urban Design, Faculty of Architecture and Urban Planning, Shahid Beheshti University, Tehran, Iran

Lynch, Norberg-Schulz, in his *Mellom himmel og jord - Between Heaven and Earth-* has also argued that cities should have defined edges or borders [6]. City edge is usually felt by people while passing through urban entrance axes which relate outer parts of cities to their inner parts. Having a visible or tangible city edge or not, urban entrance axes act like thresholds of the city. According to Bridges and Charitos [7], a threshold is an intermediate space which functions as interface or intersection between the other spatial elements. The nature of this interface may range from a state where one space flows into the other to a case where one space clearly ends and the other begins. They designate a gate from a space and an exit to another space. They are the intersections of the possible routes of an operator within the environment. Thresholds afford views to more than one space and involve decision-making (where to go next); the combination of the actual or potential navigation choices and the greater complexity of the scene, coupled with the decision-making process [8].

From a philosophical point of view and according to Küpers [9], transitional places and moves in space refer to spheres of an in-between as very basic constituents of liminality. The limen of liminality refers to a threshold or passageway, a state of being between two different existential planes. Crossing this threshold is a transient moment, but requires to actually 'take place'. Like the bottom part of a doorway that must be crossed when entering a building, traversing the liminal refers to a practical move through transitional times and spaces. As thresholds are situated at an edge calling for a movement, they carry with them a sense of opening up towards and closing away from.

Andresen and Milani [10], have emphasised on interaction between the natural world and human construction at the 'City Threshold' where the expanding sub-tropical city meets adjacent open landscapes; this forms a threshold or an in-between-place at times called the 'peri-urban'. This often-contested threshold, while neither city nor landscape, comprises overlapping and contrasting elements of both. The result is a condition of complexity and ambiguity that enriches opportunities for creative invention- a condition common to threshold places at all scales".

A recent model for planning built environment as part of the natural environment can help us in resiliently theorizing corridor and axis development concepts as the most important and tangible sections of a city, defining its characteristics and urban qualities. Over the last few decades, the new urbanists have mounted a remarkably successful public relations campaign against traditional zoning practices and the suburban land-use patterns resulting from them [11].

Transect approach which is formulated by Andrés Duany, who previously put forward the *Lexicon of the New Urbanism* for designing neighborhoods and towns, is also a planning strategy that might help while seeking for different concepts to organize the elements of the urban environment in city thresholds [12]. As nearly every town has some rural-to-urban distinctions, the transect defines a

categorization system that organizes all elements of the urban environment on a scale from rural to urban. Arrangement of these elements enhances the visual experience of travelers passing through urban entrance axes and provides urban edge dwellers and passengers with their needs [13].

The transect defines a series of zones that transition from sparse rural lands to the dense urban core. Each zone is fractal in that it contains a similar transition from the edge to the centre of the neighbourhood. The design laden code is heavily influenced by architects and requires their participation in its implementation [14]. Planners facilitate this system by learning how to allocate spatially, finding the appropriate location and juxtaposition of urban elements along a continuum of human habitats, from urban to rural. This serves to integrate natural and man-made systems in a way that is, in our modern world, conspicuously missing [12].

Connecting people is what corridors and axes are built for, but for too long we have been just using roads to cross distances, and we even lost the meanings that entrance corridors bring to the city. We connect from home to work, or from our neighboring town to our town passing through entrance corridors without feeling being welcomed and delighted by an appropriate and visually beautiful transect of the city, but as our knowledge of urban issues is expanding, that logic is also clearly shifting and these days it is understood that roads and corridors must be designed in a way to satisfy a wide range of human needs.

According to Pakzad [15] the entrance functions as a transition which extends from the outside to the inside and from the public into the private domain. Organization of a space and its elements is made according to their physical and functional characteristics which create a hierarchy in terms of the placement, use and observation of elements. One of the functions of an entrance is connecting the external space to the internal space. Other entrance space functions include changing the direction, stop, expectation, entry, division and determining the directions and paths. Having a hierarchy among these activities, leads to a better function of entrance spaces [16].

In general, entrance spaces could be categorized into perceptual and functional characteristics which reflect the formation of the elements of entrance spaces and their physical and functional characteristics [17]. The perceptual characteristic deals with factors such as inviting, identity, the sense of arrival, ready to view a new space and perceptual communication between the two spaces. The functional characteristics of a space include cases such as establishing the physical connection between the two spaces, providing needed security and monitoring related connections, guidance and control, introducing the city and defining several of its characteristics and its presence among the daily activities of the city [18].

Because of the change in transportation systems, today the nature of urban entrance has changed from the past as no longer a specific point separates inside and outside of a city. Since the speed of vehicles and the volume of traffic among the cities have dramatically increased, the old

entering points have changed to a kind of buffer zone which allows the incoming travelers to adjust the road speed to the city speed. Entrances stimulate a sense of arrival for the travelers and prepare them to enter the city. It is from this perspective that, we think addressing the case of city entrances in Rasht would help us to understand their functions and problems and seek for the ways to improve the quality of urban environment in a fast growing third world city.

### 3. Historical Development and Present Status of Rasht

Historically, Rasht was a major transport and business centre which connected Iran to Russia and Europe, and was therefore entitled the "Gate of Europe" [19]. The origin of Rasht has been referred to a village between Lahijan and Fouman regions in the 10th century where it functioned as a rest area for passing caravans [20, 21]. However, its modern history dates back to the Safavid era in the 17th century when Rasht became the provincial capital of Guilan under Shah Abbas and grew as a major centre for silk trade with numerous textile workshops [22].

Because of its long time relation to the west, Rasht exposed to international diplomacy and trade which contributed to the early development of 'European-style' cultural activities, in advance of other Iranian cities [19]. To mention a few, the first national library of Iran was established in Rasht under the Qajar dynasty (1785 to 1925), a theater was founded in the early years of the twentieth century and Nasim Shomal was the first modern newspaper of Iran that was published after the constitutional revolution (1906-1911) in this city [23]. Another sign of Europeanization and uniqueness of Rasht was the very early development of women's associations in this city. During the constitutional revolution, female circles (anjomans) were created in the province [24] and later in the 1930s, an association of literary women was established which worked for the advancement of women through various project initiatives and the publication of a bimonthly magazine [25].

Existence of religious minorities from the past and presence of foreign representatives and businesses because of the commercial linkage to Russia and Europe, characterized Rasht as a multicultural city [26]. Rabino, the early twentieth-century English vice-consul in Rasht, reports that in the late 18th century there was a large group of Armenians in Rasht, a considerable number of Russians, as well as many Hindus and Jews were living in the city [27].

For the most part of its history, the physical expansion of Rasht was confined between Zarjub and Gowhar-roud rivers and its appearance was distinct from cities of the Iranian plateau. The old city was not surrounded by gated walls and its bazaar was not covered [20]. Rabino described the bazaar in these words: "Instead of a vaulted roof or dome stretching from one end of the street to the other, there are canopies on both sides to protect from the sun and rain" [27]. Rasht remained only lightly populated and its population did not exceed 60,000 until World War I [19].

Under Reza Shah's rule (1920-1940), large thoroughfares were built from north to south and from east to west. Additionally, buildings post office, City Hall and Hotel Iran were constructed in the main square called Maydan-e-Shahrdari [28]. By mid 1950s, Rasht had a steady growth, however after the land reform policy of 1960s and the establishment of Islamic Republic (1979), rural-urban migrations caused a substantial population increase and physical expansion in the city of Rasht. New neighborhoods were shaped; producing a markedly different social geography. Since that time, the upper class have been residing in rich and fashionable neighborhoods like Golsar in north and Manzariya in the south, while the middle class residents have been residing in Motahari, Lakani, Sabze-e-Maydan and Saadi districts. The eastern, southern, and western districts of Kord Mahalla, Taza-abad, Jamaran, and Hafezabad became predominantly home to poor migrants, who settled on the outskirts of the town close to the roads leading to their regions of origin [19].

Within the city, each old district includes at least one religious building. To the east of the bazaar and the current Motahari avenue, there is a large concentration of religious buildings, including boq'a-ye kahar-e-emam", and mosques of Badi-allah and Safi, built during the Safavids. In addition to the Friday Mosque of bazaar, the bazaar itself includes mosques for each profession (e.g. mosque of zargaran, the goldsmiths; mosque of Kasa-forushan, the vessel merchants, edged by a theological school; etc.). To the west of the city lies the shrine of Dana-ye Ali and Baqerabad Mosque of Haj Shamad Khan to the north of Bazaar.

An evidence to the city's multicultural past, Rasht comprises a few Christian churches and a section of the bazaar called Posht-e kelisa "Behind the church" indicates the remembered presence of an old church. While there is no synagogue in Rasht, the place name Tappa-ye Yahudi, still in use, gives evidence of Jewish settlement. The most outstanding architecture, however, are not religious monuments. Rather, they are found in public and date back to the end of Qajar (19th century) and early Pahlavi period. The town hall and the post office are imposing and elegant buildings of early twentieth-century European style, standing in the main city square, while the pavilion (Emarat-e Kolah-farangi) adorns the southern city park (Park-e shahr). Rasht also contains many upper-class houses with brick walls, verandas and wooden doors, wooden mullion and multicolored glass windows, and roofs covered with semi-cylindrical roof tiles [19]. Among these remarkable houses are the Abrishami house in the Sayqalan neighborhood and the Qadiri house in the Sabze-e-Maydan [28].

Under the general socioeconomic conditions of the country, Rasht has experienced a rapid population growth and physical development particularly during the last three decades which transformed it from a medium sized city to a regional metropolitan in the recent years. After the 1980s, Rasht turned to one of the fastest growing large cities in Iran [20].

The rapid population growth of Rasht in recent decades has been accompanied by significant physical expansion.

While in 1979 Rasht occupied only 1,579 hectares (ha) of land, the city expanded to 8,118 ha in 2006 [20]. Like many third world cities, such a rapid growth relinquished a balanced urban development and led to the emergence of various urban problems, such as inadequate infrastructure, lack of basic services, congestion, housing shortage and informal development particularly in the fringe areas [29]. Because of the rapid growth, large amount of agricultural lands around the city especially along entrance roads were consumed. In this study, four main entrances in the city of Rasht with 9.8 km in length are examined in detail.

#### 4. Data and Methods

The main data utilized in this study comes from a field survey conducted in the summer of 2012. A questionnaire was designed to obtain the physical characteristics and activity patterns along the four main entrances in Rasht. A total of 707 questionnaires were completed for this study

which covered all land lots along the margin of four entrances. The main variables studied in this research included density of lots, lot size, building age, height, façade and land use or activity pattern. Main entrances include: 1) Tehran Road (Rd) entrance in the south, 2) Lahijan Rd entrance in the east, Anzali Rd entrance in the northeast and the Fouman Rd entrance in the west. Their lengths are 2.4 Kilometers (km), 2.1 km, 2.3 km and 3.0 km respectively. Fig. 1 shows the location of study area in the city of Rasht.

We used both quantitative and qualitative methods to describe and explain the characteristics of urban entrances in terms of their physical developments and activity patterns. At first, data findings were described for selected variables in all entrances. Then, a nonparametric test of kruskal-Wallis was conducted to find any significant differences among the entrances. The analysis was followed by a cross correlation test to find possible associations among the selected variables.

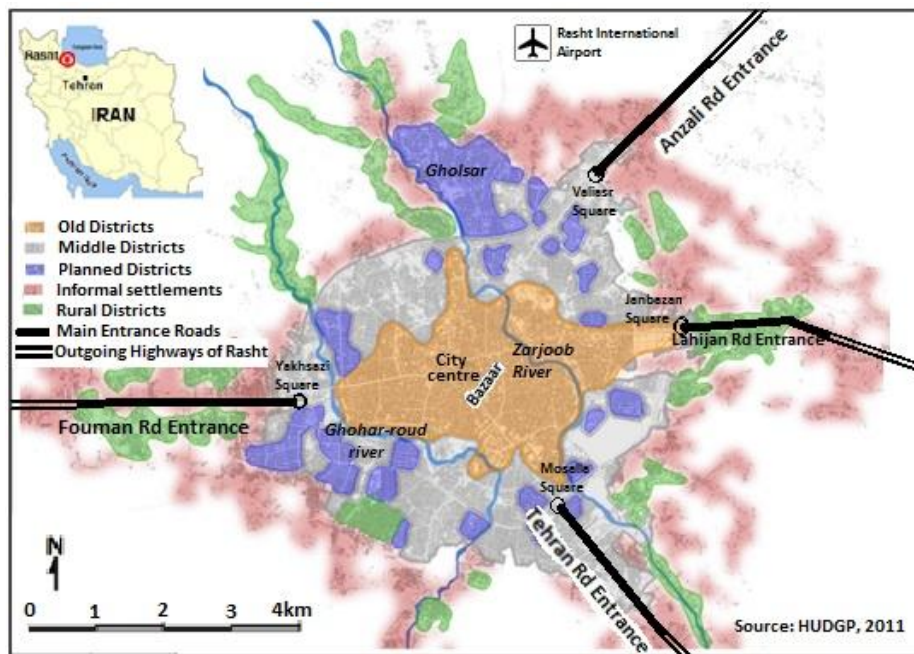


Fig. 1 location of study area in Rash

#### 5. Findings

##### 5.1. Description of physical development along the main entrance axes

###### 5.1.1. Density of land lots

A total of 707 land lots were counted along the four main entrances in Rasht from which 616 (87%) were built lots and 91 (13%) unbuilt lots. In terms of density, on average, there are 35 lots per kilometer along the entrances which varies between 28 in Anzali and Fouman Rds to 57 in Lahijan Rd (Table 1). The difference in the density of land lots shows that Lahijan Rd has the smallest size of

lots among the others and Anzali and Fouman Rds have the largest lots.

###### 5.1.2. Lot size

To evaluate the scale of development along the entrances, lot sizes were classified into five groups including very small lots up to 99 square meter ( $m^2$ ), small lots (100-249  $m^2$ ), medium size lots (250-499  $m^2$ ), large lots ((500-1999  $m^2$ ) and very large lots (2000  $m^2$  and more). In general among the four entrances, 27.3% of the lots are very small with only 1.1% of area share and 7.4% of them are very large with 68.9% of area share (Table 4).

**Table 1** Status of land lots in the main entrance of Rasht, 2012

Status of land lots	Main entrances				Total	
	Tehran Rd	Lahijan Rd	Anzali Rd	Fouman Rd	No	(%)
Total number of land lots	191	212	133	171	707	100
Built land lots	168	194	116	138	616	87.1
(%)	88.0	91.5	87.2	80.7	87.1	
Undeveloped (vacant) land lots	23	18	17	33	91	
(%)	12.0	8.5	12.8	19.3	12.9	12.9
Length of the entrance (km)	2.4	2.1	2.3	3.0	9.8	
Density of land lots (Ave/per km)	39.8	50.5	28.9	28.5	36.1	

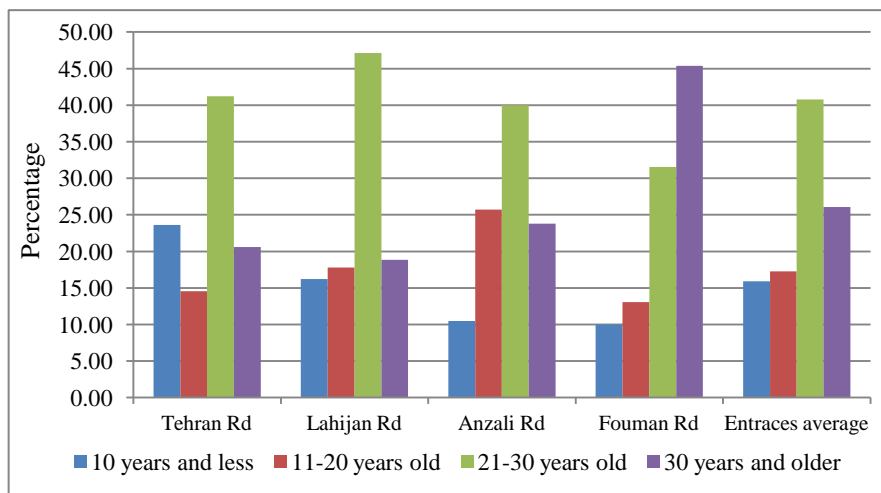
**Table 2** Classification of lot size among the main entrances of Rasht, 2012

Land lot classes	Tehran Rd		Lahijan Rd		Anzali Rd		Fouman Rd		All entrances	
	Lots (%)	Area (%)	Lots (%)	Area (%)	Lots (%)	Area (%)	Lots (%)	Area (%)	Lots (%)	Area (%)
Very small lots ( $\leq 99 m^2$ )	11.1	0.3	34	2.7	31.5	0.7	28.1	1.4	27.3	1.1
Small lots (100-249 $m^2$ )	27.8	3	21.6	7.7	23.3	2.2	26.3	5.3	24.4	4.2
Medium size lots (250-499 $m^2$ )	31.7	6.8	15.6	10.9	6.8	1.4	21	8.2	18.8	6.3
Large lots (500-1999 $m^2$ )	21.7	11.3	24.5	44.4	20.6	11.2	20.1	21.9	22.1	19.6
Very large lots ( $\geq 2000 m^2$ )	7.7	78.6	4.5	34.2	17.8	84.4	4.4	63.1	7.4	68.9
Total (%)	100	100	100	100	100	100	100	100	100	100
Total no. of lots	191		212		133		171		707	
Total area of lots (ha)		30.06		17.1		26.37		19.68		93.2
Average lot size ( $m^2$ )		1574		806		1806		1151		1318

### 5.1.3. Building age

Among 616 buildings surveyed along the main entrances, 15.9% are 10 years old or less, 17.3% between 11 and 20 years old, 40.8% between 20 and 30 years old,

and finally 26.1% are over 30 years old. Among the entrances, Tehran Rd has a relatively higher percentage of newly constructed buildings compared to the other three. On the other hand, the Fouman Rd has the biggest share of older buildings among the others roads (Fig. 2).

**Fig. 2** Building age in the main entrance axes, Rasht, 2012

### 5.1.4. Building height

Our survey indicated that in terms of building height, most buildings along the main entrance roads are relatively lower than that of the city average. In total, among the 616

surveyed buildings, 70% are single-storey, 19% two-storey, 6.1% three-storey, 4.5% four-and only 0.4% five-storey buildings. The average for four entrances is 1.46 storeys (Fig. 3). Based on 2006 census, the average building height in the whole city was 1.75 storeys [30, 31]. Since the last decade, because of the shortage of land

within the city, the majority of residential buildings are constructed in multi-storey form. Based on 2011 census,

about 45% of the total residential units in Rasht are considered apartment houses [32].

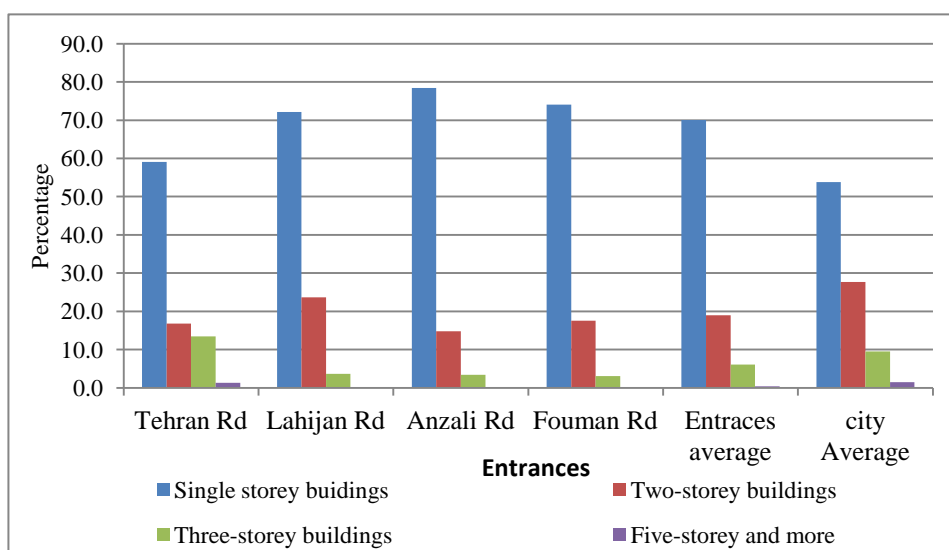


Fig. 3 Composition of building height along the main entrance in Rasht 2012

### 5.1.5. Building façade

Building façade features the environment image of city [33] and plays an important role in urban and environmental design [34]. It also represents the value of building structure and it is considered as a representative device for inner and outer side of the building [35].

We classified existing building façades in the entrance into seven groups including: stone, cement, brick, store

shutter, glass/composite and other materials. Even though the store shutter is not a usual façade type, we considered it a category in itself for our purposes, because most ground level buildings along the entrances are row shops with store shutters. 47.2% of the buildings' facade are shutter, 17% stone, 12.6% cement, 6.6% glass or composite, 3.5% brick and 2.6% other materials. Approximately 10.6% of the buildings lacked any kind of façade (Table 5).

Table 3 Status of building façade in the main entrances of Rasht, 2012

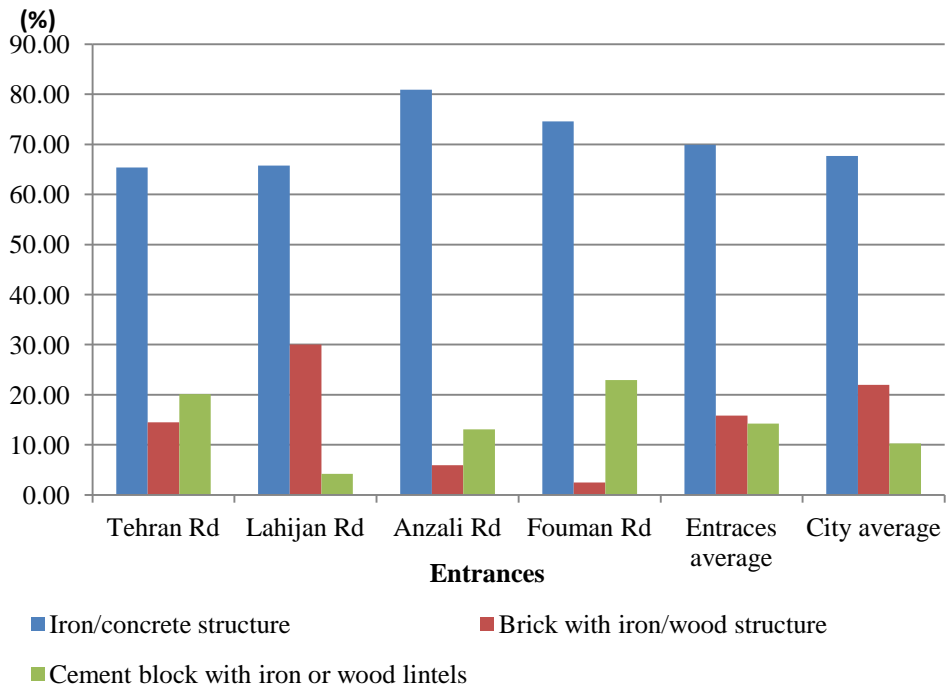
Type of façade	Tehran Rd (%)	Lahijan Rd (%)	Anzali Rd (%)	Fouman Rd (%)	All entrances (%)
Store-shutter	38.5	51.6	42.2	55.7	47.2
Stone	26.1	14.6	12.2	13.4	17
Brick	9.4	0.5	0.8	2.7	3.5
Glass/composite	4.6	13.9	3.4	1.4	6.6
Cement	14.7	7.4	23.2	8.6	12.6
Other materials	2.4	3.3	2.4	1.8	2.6
Facade-less	4.3	12.5	10	16.2	10.6
Total	100	104	94	100	100

### 5.1.6. Building structure

In this study, building structures were classified into three main categories including 1) iron and concrete structure, 2) brick and iron structure, and 3) cement block. Iron or concrete frame structure is the most durable structure and usually most multi-storey buildings are built with this material. In brick and iron structure, walls are typically built with brick and the spanning is made with iron lintels covered with a brick arch which is relatively

stable. The cement block structure has been defined as a less stable structure because its main material is comprised of cement blocks covered most frequently with wooden or iron lintels.

According to Fig. 4, from 616 buildings along the main entrances, about 69.9% have been built with iron or concrete frame, 15.9% with brick and iron and 14.2% with cement block. Estimated figures for the whole city are about 67.7%, 22 % and 10.3% respectively which relatively are the same as those of entrances [3, 36].

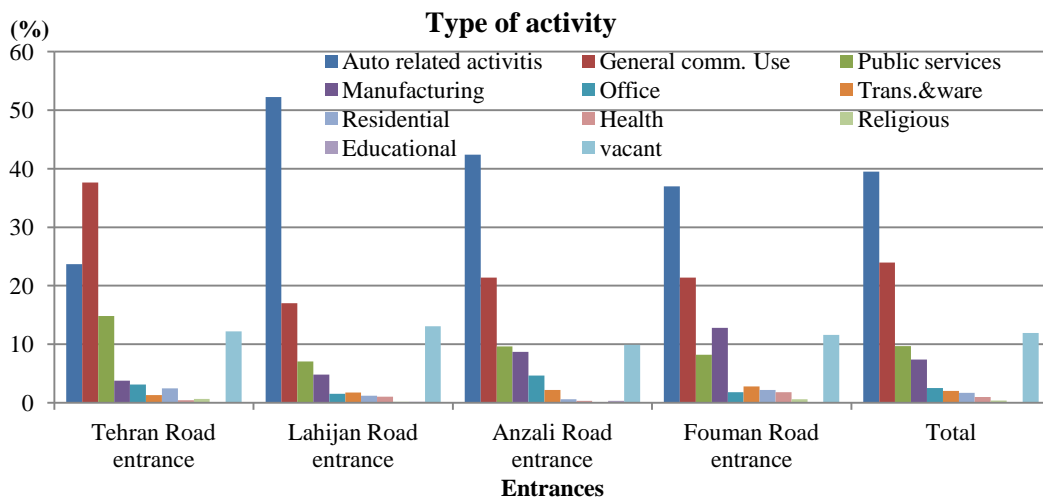


**Fig. 4** Main building materials along the urban entrances in Rasht, 2012

### 5.1.7 Land use type (activity pattern)

Our study showed that most of the land lots along entrance axes have more than one activity. We enumerated a total of 1857 activities at ground level along the four main entrances (on average of about three activities per lot). However, in multi-storey buildings, on the upper levels, number of activities per lot declines sharply; 162 in

level 2, 60 in level 3 and 42 in level 4 and up. The reason for this sharp decrease is that the majority of built lots are single-storey buildings. On the upper levels, activities are mainly residential and in some cases, office use. Existing activities at ground level were classified in 11 groups. Type and distributions of activities within each entrance is depicted in Fig. 5.



**Fig. 5** Distribution of activities at ground level along the entrance axes in Rasht, 2012

As Fig. 5 illustrates, auto-related activities which constitute 39.5% of total activities are the most dominant along the entrance, followed by general commercial activities constituting 24%, public services 9.7% and manufacturing 7.4% of total activities. Other activities (e.g. education, health, transportation) and vacant comprise 7.5% and 11.9 % respectively.

### 5.2. Data Analysis

Having described the characteristics of physical development along the main entrance axes in Rasht, we attempt to compare these characteristics and see if any significant differences exist among the entrances. To do this, a nonparametric test of Kruksal-Wallis was conducted

to evaluate differences in mean ranks to assess the null hypothesis that the medians are equal across the four entrances. Table 4 presents the results of these tests.

Selected variables for this test include density of lots, lot size, building height, age, structure, façade and land use type or activity pattern.

**Table 4** Results of Kruskal-Wallis tests for comparison of development patterns across the main entrances in Rasht

Elements of physical development	Chi-Square ( $\chi^2$ )	df	Asymp. Sig.
Density of lots	12.244	3	.007
Lot size	8.759	3	.033
Building age	15.679	3	.001
Building height	3.327	3	.344
Quality of structure	20.300	3	.000
Type of façade	5.968	3	.113
Land use/activity pattern	26.269	3	.000

Results of Kruskal-Wallis test for density of lots among the main entrances with  $\chi^2= 12.244$  and  $p= 0.007$  was significant. Number of lots along the entrances and their averages per *km* which correspond to the density of activities are significantly different across the entrances. In conjunction with the density of lots, results of the test for lot size with  $\chi^2= 8.759$  and  $p= 0.003$  indicated a significant difference among the main entrances too. As described above, a range of lot size from very small to very large exists along the entrances which have been distributed differently among the entrances.

Building age is another physical element which was tested here. Result of test with  $\chi^2= 15.679$  and  $P= 0.001$  also indicated that building age across the entrances is significantly different from each other. In terms of building height, however, the test results with  $\chi^2= 3.327$  and  $p= 0.344$  depicted that no significant difference was observed across entrances. This means that patterns of building height among the entrances do not much different from each other. Quality of structure is another element which was tested here. Since the development along the entrances has occurred over the time, it has resulted in different structural pattern. Result of Kruskal-Wallis test with  $\chi^2= 20.300$  and  $p= 0.000$  showed a significant difference in the quality of building structure across the entrances.

Composition of building facades with  $\chi^2= 5.968$  and  $p= 0.113$  was another element which did not prove any significant difference among the entrances. In terms of land use, despite the dominance of

commercial activities along the four entrances, patterns of activities with  $\chi^2= 26.269$  and  $p= 0.000$  revealed a significant difference across the entrances.

Even though the characteristics of physical development along the main entrances vary with those of the main body of city, results of kruskal-Wallis analysis indicated that these characteristic are mostly different

across the entrances too. This implies that each entrance has its own development pattern. Accordingly, we used a cross-correlation analysis to find possible relationship among the development elements within the entrances. Results of the test are presented in Table 5. Important association among the selected variables are as following:

Density of land lots along the main entrances at 0.01 confidence level is significantly correlated with the type of activity and ownership with ( $Sig.=0.228$  and  $0.187$ ). This implies that lots occupied with auto related shops/services and commercial activities are denser than those occupied with government offices or public services. Also the higher the density of land lots the more privately owned and the lower the density of lots the more government and publicly owned. Age of buildings at 0.01 level is correlated with quality of structure, type of activity and ownership with ( $Sig.= 0.746, 0.192, -0.140$ ), meaning that recently constructed buildings have higher quality structures (with concrete and iron frame) and older buildings have lower quality structures with more brick and cement material. Also buildings occupied with auto related services/shops and commercial activities are older than buildings occupied with government offices or public services. The inverse correlation of building age with ownership implies that the more privately owned buildings, the older they are; and the more government and publicly owned buildings, the newer they are. Correlation analysis showed that the quality of structure is correlated with the type of activity and ownership. Buildings occupied with auto related services/shops and commercial activities are usually older than government and office uses and therefore have lower structural quality and are more privately owned. In contrast, buildings occupied with government, office or public services are newer and therefore have better structural quality with mainly government or public ownership.



**Table 5** results of correlation analysis for selected variables

Variables		(1)	(2)	(3)	(4)	(5)
Density of land lots (1)	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	707				
Age of building (2)	Pearson Correlation	-.080	1			
	Sig. (2-tailed)	0.15				
	N	597	597			
Quality of structure (3)	Pearson Correlation	0.015	.746**	1		
	Sig. (2-tailed)	0.717	0.000			
	N	598	597	598		
Land use/activity type (4)	Pearson Correlation	.228**	.192**	.191**	1	
	Sig. (2-tailed)	0.000	0.000	0.000		
	N	602	597	598	602	
Ownership (5)	Pearson Correlation	.187**	-.140**	-.140**	0.001	1
	Sig. (2-tailed)	0.000	0.001	0.001	0.98	
	N	588	579	579	580	588

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## 6. Summary and Conclusion

This article analyzed characteristics of physical development along the main entrances axes in the city of Rasht. General findings for all entrances could be summarized in lower density development, larger land lots, lower building height and different activity pattern and exterior outlook. Comparison of physical development elements among the entrances revealed a significant difference in most selected variables. Results of Kruskal-Wallis analysis showed that characteristics of physical elements including density of land lots, lot size, building age, quality of structure and land use/activity pattern varies significantly among the four entrances, however no significant difference was found among variables of building height and façade type. For explanation of variation among the entrances, a cross-correlation analysis was used. Results showed that density of land lots along the main entrances is correlated with land use type and ownership; age of buildings is correlated with quality of structure, land use type and ownership and finally quality of structure is correlated with land use type and ownership.

Like other large cities in Iran, since 1990s shortage of urban land in Rasht persuaded local authorities for the adoption of densification policy in the previously built areas. As a result, a wave of redevelopment has begun in many interior districts. Because of the continuation of rapid population growth in the city, redevelopment is advancing outward. Since the majority of existing buildings along the entrances are single storey with over 20 years old of age, they are starting to become prone to redevelopment as some of them have already begun.

Adopting a number of new urbanism approaches such as supporting the density increase, encouraging mixed land uses, and employing local architectural style in building

design could enhance the land value, expedite investments and eventually improve the economy along the entrance axes. Increasing the land value and further redevelopment could push the car services out of entrance axes and replace them with more clean and tourist attracting activities like restaurants, souvenir shops, banks and social and cultural activities. These measures and placing some cultural figurative symbols in appropriate open spaces along the entrances could help to revive the identity of the city in these sections facilitate; the integration of entrance axes to the main body and improve the quality of urban environment in the whole city.

**Acknowledgements:** This research was conducted with the financial support of Research Centre of Rasht City Council Fund. Thanks to the anonymous referees for their feedback. Special thanks to research assistants from the Department of Urban Planning, University of Guilan for their great help in field survey.

## References

- [1] Majd MG. Land Reform policies in Iran, American Journal of Agricultural Economics, 1987, No. 4, Vol. 69, pp. 198
- [2] Maghsoudi Tilaki M, Mostafa R, Marzbali MH, Abdullah A, Arrifin J. Challenges of the informal settlements in developing countries' cities, a case study of Iran, World Applied Sciences Journal, 2011, No. 2, Vol. 12, pp. 160-169.
- [3] SOGP, 2011. Statistical Year book of Guilan Province, 2010, Management and Plan Organization of Guilan Province, Rasht.
- [4] MPPG, 2007. Statistical Yearbook of Guilan Province, 2006, Management and Plan Organization of Guilan Province, Rasht.

- [5] Lynch K. *The Image of the City*, Cambridge, MIT Press, Massachusetts, 1960.
- [6] Van Nes A. Between heaven & earth christian norberg-schulz's contribution to the phenomenology of place & architecture, in *Environmental & Architectural Phenomenology Newsletter*, 2012, Vol. 24.
- [7] Bridges AH, Charitos D. On architectural design of virtual environments, *Design Studies*, 1997, No. 2, Vol. 18, pp. 143-154.
- [8] Gale N, Golledge R, Pellegrino JW, Doherty S. The acquisition and integration of route knowledge in an unfamiliar neighbourhood, *Journal of Environmental Psychology*, 1990, No. 1, Vol. 10, pp. 3-25.
- [9] Küpers W. Dancing on the limen—embodied and creative inter-place as thresholds of becoming: phenomenological perspectives on liminality and transitional spaces in organisation, *Tamara, Journal for Critical Organization Inquiry, Special Issue on Liminality*, 2011, Nos. 3-4, Vol. 9, pp. 45-59.
- [10] Andresen B, Milani L. Place and occasion at the city threshold. In: R. Kenny (ed), *Subtropical Cities Conference Proceedings: Achieving Ecologically Sustainable Urbanism in a Subtropical Built Environment*, 27-29 September 2006, Brisbane, Australia, pp. 1-12.
- [11] Garnett NS. Redeeming Transect Zoning. *Brooklyn Law Review, Notre Dame Legal Studies Research*, 2012, Paper No. 12-83, pp. 571-588.
- [12] Talen E. Help for urban planning: the transect strategy, *Journal of Urban Design*, 2002, No. 3, Vol. 7, pp. 293-312.
- [13] Steuteville R (2000). *Transect applied to regional plans, Better! Cities & Towns*, September Issue, p. 1 Accessed in Jan. 2012: <http://bettercities.net/article/transect-applied-regional-plans>.
- [14] Van Hemert J. *Sustainable Zoning: A New Imperative, the Sustainable Community Development Code*, Rocky Mountain Land Use Institute, February 2007, Draft, accessed at: <http://www.law.du.edu/images/uploads/rmlui/rmlui-sustainable-SustainableZoningFramework%206>.
- [15] Pakzad J. *Theoretical Principles of Urban Design Process*, Ministry of Housing and Urban Development, Shahidi Publications, Tehran, 2009.
- [16] Soltanzadeh H. *Entrance Spaces in Traditional Iranian Architecture*, Daftar Pajoheshhaye Farhanghi, Tehran, 2005.
- [17] Bahraini H, et al. Environmental design principles and standards of urban entrance, *Journal of Environmental Studies*, 2003, No. 31, Vol. 29, pp. 13-36.
- [18] Soltanzadeh H. *Urban Spaces in Historical Contexts of Iran*, Daftar Pajoheshhaye Farhanghi, Tehran, 2006.
- [19] *Iranica Encyclopedia. RASHT i. The City*, Accessed at: <http://www.iranicaonline.org/>, 2011.
- [20] HUDGP, *Master plan of Rasht, Housing and Urban Development Organization of Guilan Province, Rasht, 2007a, Vol. 1.*
- [21] Sutudah M. *Hododol Allam Menal Mashreg val Maghreb*, University of Tehran, 1962.
- [22] Sardar-Afkhami- *Engineering Consultants. First Master Plan of Rasht*, Ministry of Housing and Development, Tehran, 1966.
- [23] Nowzād F. *Tāriḳ-e jarā'ed o majallāt-e Gilān az āgāz tā enqelāb-e eslāmi*, Tehran, 2000.
- [24] Afary J. On the Origins of Feminism in Early Twentieth Century Iran, *Journal of Women's Studies* 1/2, 1989, pp. 65-87.
- [25] Faḳhrā' i E. *Gilān dar gozargāh-e zamān*, Tehran, 1976.
- [26] Bromberger C. Comment peut-on être Rashti? *Contenus, perceptions et implications du fait ethnique dans le nord de l'Iran*, in J.-P. Digard, ed., *Le fait ethnique en Iran et en Afghanistan*, Paris, 1988, pp. 89-108.
- [27] Rabino HL, W. V el ayāt-e dār-al-marz-e Irān: Gilān, tr. J. Ḵhommāmizāda, Taati Publication, Rasht, 1995.
- [28] Azimi N. *Restructuring urban morphology, a case study of Rasht, Iran*, *Quarterly Researches in Geography, University of Tehran*, 2006, No. 53, pp. 13-25.
- [29] Azimi N. *Recent urban housing change in Iran, a case study of Rasht, Guilan Province*, in: *Proceedings of the International Conference on Adequate & Affordable Housing for All*, June 24-27, University of Toronto, Toronto, Canada, 2004.
- [30] *Statistical Office of Guilan Province (SOGP). Detailed Result of 2006 Census, Shahrestan-e-Rash, Tehran, 2009.*
- [31] HUDGP. *Master plan of Rasht, Housing and Urban Development Organization of Guilan Province, Rasht, 2007b, Vol. 2.*
- [32] *Statistical Centre of Iran (SCI), (2012) Statistics Yearbook of Country for 2011.*
- [33] Moughtin C, Oc T, Tiesdell S, *Urban Design: Ornament and Decoration*, Great Britain: Butterworth Architecture Press, 1995.
- [34] Utaberta N, Jalali A, Johar S, Surat M, Che-Ani AI. *Building Facade Study in Lahijan City, Iran: The Impact of Facade's Visual Elements on Historical Image*, *World Academy of Science, Engineering and Technology*, 2012, Vol. 67, pp. 701-706,
- [35] Askari A, *Public Evaluation of Historical Building Facades in the Vicinity of Dataran Merdaka, Kuala Lumpur*. *Journal of design and built environment*, 2009, Vol. 5, pp. 49-59.
- [36] *SCI. Detailed Results of the General Census of Iran, Guilan Province, Statistical Centre of Iran, Tehran, 2007.*