Residential Activity System and Noise Level

Case study:Residential zone in Erbil City – New Rasty Zone.

نظام الفعالية السكنية ومستوى الضوضاء

الحالة الدراسية:– منطقة سكنية في مدينة اربيل/ منطقة راستي الجديدة

M.Sc. Hadeel Salim Eshaq (هـديل سالم اسحق المدرس المساعد :)
UniversityofSalahaddin/ College of Engineering/ Department of Architecture/ Erbil / Iraq
hadeel_ salim@yahoo.com

Dr.MufeedIhsanShouk (د. مفيد احسان شوك)
University of Technology/ College of Engineering/ Department of Architecture/ Baghdad / Iraq
mufeedshouk@yahoo.com

خلاصة البحث:

يحاول البحث دراسة الفعالية الحضرية في المنطقة السكنية على مستويين أساسيين:الأول هو دراسة الفعالية الحضرية من ناحية التوزيع المكاني ، ومستوى الضوضاء المرتبط بالفعالية في البيئة السكنية، أما المستوى الثاني فيتضمن دراسة التحليل التركيبيللفعاليات باستخدام نظرية تركيب الفضاء وعلاقتها بالشبكة الحضرية بصيغة الخطوط المحورية ودراسة معالم تركيب الفضاء لمنطقة الدراسة، ومن ثم إيجاد العلاقة مابين خصائص التنظيم الفضائي ومستوى الضوضاء. الهدف الرئيسي للبحث هو التوصل الى نظام فعاليات فعال ضمن البيئة السكنيةوذلك من خلال الموقع والعلاقة المثالية بالشبكة الحضرية، فالنظام الكفوء يحقق درجة وصولية عالية للفعاليات ضمن أقصى مسافة سير تعتمد على نوع الفعالية وكذلك تحقيق مستوى ضوضاء ضمن المقاييس التخطيطية للفعاليات الحضرية (المستشفيات والمدارس وغيرها) . أما المشكلة الأساسية هو أن معظم الفعاليات الحضرية في المناطق السكنية لا تأخذ بنظر الاعتبار التوقيع المكاني الامثل وعلاقته بالشبكة الحضرية ومستوى الضوضاء. فرضية البحث تشير الى إن خصائص التنظيم الفضائي بصيغة التكامل والانعزالية ، ومستوى الضوضاء لا يراعى في توقيع الفعاليات ضمن البيئة السكنية . منهجية البحث تتكون من جزئيين أساسيين : يتضمن الجزءالأولدراسة نظرية لأهمأدبيات الموضوع ، دراسة الفعاليات الحضرية ومعاييرها حسب ما جاء بدراسة (Polservice–Iraqi Code). أما الجزء الثاني فيتضمن دراسة عملية لمنطقة راستي الجديدة في اربيل ، دراسة الفعاليات الحضرية ، ومواقعها، خصائص التنظيم الفضائي للمنطقة باستخدام (Depth Map 10)،واختبار مستوى الضوضاء لمقارنتها بمدونة الصوتيات العراقية .

الكلمات المرشدة: الفعالية السكنية، شبكة الشوارع، التنظيم الفضائي، معيار مستوى الضوضاء.

Abstract:

The research tries to study residential activity system at two levels; firstly to study the spatial distribution of urban activities within neighbourhoodcommunity, andanalyze noise level to be compared with planning standards. Secondly to studyneighbourhood activities through the relationship between urban networks in term of axial lines and the location of the activities in the zone, from other hand to find the relationship between spatial organization and noise level criterion. The main goal is to achieve efficient urban activities systemthrough spatial location, and the capacity of each activity. The successful urban system achieves high degree of accessibility in term of walking distance to the facility. The research'sproblemrepresented

that most activities in the residential areas didn't take into account spatial location in the relation with urban network and noise level criterion. The hypothesis is; the spatial organization and noise level doesn't take into account in the residential zones. The methodology consists of two parts: firstly; theoretical study of the most important literaturesincluding:residential activity system, planning standards according to (Polservice-Iraqi Code,), noise level criterion to be compare with Iraqi code, Secondly , case study includes residential zone in Erbil city.

Keywords:Residential activity, Streets Network,Spatial organization, Noise level Criterion.

Introduction:

The residential zones in the city consist of many activities with different levels, articulated with physical elements visually and functionally. The zone of influence of each activity connects with the functional significance in terms of the land use intensity, land value and activity level. The study tries to analyze urban activities in the residential area in terms of spatial location , planning and design standards or criteria to reach efficient urban activities system,from other hand the study of urban activity in the residential zones connect directly to urban mobility, where traffic represents the movement of vehicles, and land use represents the urban activities in the system.

The spatial model that has adopted in the study is (Depth Map 10); which gives an advanced spatial analysis depending on streets network in term of axial lines, and to distinguish two types of spaces; integrated and isolated spaces to connect with urban activities.

The study depends on the standards which submitted by polservice (Housing Technical standard /Iraq and Urban planning and design criteria) at the level of design feature or general location for urban activities.

Generally, the study of residential activity system requires four issues:

- Standards or Criteria of urban activity system in the residential zones.
- Location /or disposition of urban activity .
- Urban transportation/urban form& activity system.
- Technical tools (Analytical Models) to support planning process.

Effecient urban activity system requires recognition of the limitations of the land and the need for a balance of social, cultural and economic uses within these natural limitations. Land use planning is fundamentally related to five dimensions: social, cultural, environmental, economic, and governance. Practical aspects of planning include (among others) growth management, housing choice and affordability, and inter- jurisdictional coordination. In a city, the land use contains mixed of functions called (social infrastructure/ or community facilities); Social Infrastructure is a subset of the infrastructure sector and typically includes assets that accommodate social services. Social Infrastructure includes

housing,educational, health, commercial, industrial, religious, governmental use and other facilities which support the life of dwellers in the neighbourhood.

UrbanActivity System in the City:

The arrangement of urban activities is a basic element in the neighbourhood community. The key to the design of patterns is intelligent disposition of major activities in relation to routes of movement, while trying to achieve maximum diversity in each area itself. The city is basically a place of exchange, and its capacity to affect exchange depends on the proximity of complementary elements, the separation of mutually harmful elements and, above all, the location of major functional groups in the most advantageous places from the point of view of transportation access (Spreiregen, 1965, p.78). Our early cities were good examples of this. The religion activity was in the center of the city and around it grew the commercial and financial zones. The sociologistErnest Burgess-1925 proposed a model to explain urban activities in the city. This concentric ring model depicts urban land use in concentric rings: the Central Business District (or CBD) was in the middle of the model, the second ring was the transitional zone, third ring was working class zone, fourth ring was residential zone and the last ring was Commuters zone (Suburbs) (Al-hety, 2002, p53). In small towns this was relatively easy to accomplish. In our time this principle remains the same, but the complexity of our own problems of arranging city from is vastly greater. Still we can and must practice the art of arranging urban activities on a small, as well as an extensive, urban scale. The activity patterns of large cities exist as a series of hubs, many of them determined in their geographical extent by our ability to walk from one part to another. Some of these hubs are of ancient origin and have individual characteristics of change. The different areas of a city, whether new or old, require varying degrees of intermixture with complementary facilities in order to function well. Because there have been severe abuses in the juxtaposition of incompatible elements in the city, the term " mixed-use" developed, a term used to describe these abuses but which has led in some cases to the opposite extreme of wholesale functional segregation. Mixed-use, or better still, diversity and intensity of use, does not mean overcrowding of facilities, but their complementary proximity (Spreiregen, 1965, p.80). On the scale of the city the design of urban functions is a matter of allocating the major hubs of activity to the most desirable places functionally, intermixing them with other facilities that complete them, and finally linking all of these to each other to create coherent system of urban activity in the city.

UrbanActivity System &Transport:

The terms "urban activity system" or "urban land use" refers to the spatial distribution of activities within urban area (Meyer, 2001, p.334). The spatial distributions of population and employment constitute primary inputs into transportation demand models. The way that people and goods travel and hence the

energy consumption and carbon emissions of each travel must be taken into account, more trips means more carbon emissions in the built environment (Rydin, 2010, p107). The interrelation between traffic as vehicles movement and land use as activity spots is determined by gravity between each other, where some activities are more attractive than others, so urban activities represent the source of trips generating in the city (origin – destination), bad land use planning means more problem with traffic, the interrelation between traffic and land use reflects the efficiency of urban form. The structure of urban land use has an important impact over transport demand and over the capacity of transportation systems to answer such needs.

Residential Activity System &NeighbourhoodCommunity:

The facilities should, if possible, be grouped together in the direction of the major traffic flow from the development area to the outside, accessible by direct pedestrian and automobile routs. Such grouping will encourage the use of all facilities (DeChiara, 1975, p.343). The existence of a physical center of the neighborhood stimulates the growth of community relationships and the acceptance of community responsibilities by the residents. As most community facilities require comparatively flat land, topography will, to some extent, govern their grouping and location. Special situations may occur in which such grouping will not be advisable, especially where existing facilities must be taken into account (Al-Moswy, 2015, p74).Within the group, the various community facilities should be physically separated from each other to prevent conflict of circulation. It is especially important that pedestrian access to the school be separate from all vehicular access to other facilities.

Residential zones Requirements:

For many neighborhoods planning purpose, it is desirable to know community facilities land requirements as a whole. Therefore, is a summation of these requirements. It should be noted that the table (1) below combines recommended and assumed areas; the values given area therefore not to be considered mandatory standards (DeChiara, 1975, p.343). Before final decisions are made in regard to the provision of neighborhood community facilities. The area should be examined for availableexisting facilities. Special care must be taken to check the**capacity** as well as the **location** of such facility.

Standards on Residential Areas:

A dwelling is a basic unit in the spatial organization of housing development. It is function is to accommodate a household being the society's basic unit. A dwelling should give a shelter and create suitable conditions for living activities of its dwellers, i.e. resting and sleeping, family co-existence care and training of children,entertaining, andreception of relatives and guests (Polservice, 1983, p.143).

Every household should be provided with a separate and independent dwelling of size and functional organization adequate to the number of persons. According to (Housing Technical Standards and Codes of Practice) submitted by Polservice 1983 to study housing sector in Iraq, the main standards represented by following:

A. One- family houses:

1) In cases when the access distance between the residential area and the nearest shopping center exceeds 200m a " corner shop" having floor area of $(70-100m^2)$ is recommended.

2) Open spaces including some resting places for adults and playgrounds for children are also recommended, particularly in residential area consisting of row and / or courtyard houses. The coefficient of at least $2m^2$/ inhabitant should be applied.

3) The traffic way of the access street should be (6m) wide and within the right-of-way lines 12m respectively. The length of cul-de-sac Access Street should not exceed 150m.

B. Multi- family buildings:

1) Multi-family (low rise and high-rise buildings)should not exceed 5000 person in the neighbourhood level.

2) Open spaces including resting places for adults, playgrounds for children and green areas. Open spaces should be constituted not less than 25% of the total residential area. Open spaces should be characterized by coefficient greater than $6-8\ m^2$/inhabitant. The area of playgrounds for small children should not be less than $(0.75\ m^2$/ inhabitant and the playground not smaller than $(75m^2)$.

3) Access ways for vehicles and pedestrians and car parks.

From other hand; residential areas need to be considered in relation to land for other uses, such as work and leisure.Commercial and industrial uses generally command higher land prices than housing, and land used for highincomehousing commands higher prices than land used for low-income housing. Given these disparities wherethe value of land, particularly in urban areas, is largely determined by its use, there are considerable prospectsfor generating internal cross-subsidies within development schemes that include different land uses. Professionalexpertise can maximize the surplus from high-yield uses to reduce unit costs for less commercially viable ones,such as housing for lower income groups, while remaining within the discipline of market-based prices.

Residential activity system and Urban form

Residential activity system is usually related to the urban form characteristics. The main patterns

Table (1) Land Area of all Neighborhood Facilities

Source:DeChiara, Joseph, Koppelman, Lee, "Urban Planning and Design Criteria", second edition, published by Van Nostrand Reinhold Company Ltd, New York, 1975.

form requireshigh). For example, A neighbourhood of about 7500 people could be housed at densities of about 70 dwellings per hectare on

a piece of land where the furthest distance from the centre is just over 500m, a reasonable walking distance (Moughtin, 2003, p193).

The aim of planners is to plan urban areas so as to encourage a modal shift in travel behavior from high carbons forms of transport –principally individual car use on roads – to lower carbon forms such as public transport, cycling and walking, maximum distance consider an essential factor to create efficienturban system to achieve good walking distance from dwelling units to the facilities figure (1). By this way carbon emissions reduce because dwellers will not mainly depend on car to travel from origin to destination, so the successful spatial planning reduce car dependency (Rydin, 2010, p25). From other hand many advantages will be done at the level of transportation system and energy consumption, therefore the essential element is promoting sustainable land use planning and management(Williamson, 2003, p5) to achieve sustainability in city planning and to create healthy environment for the residents.

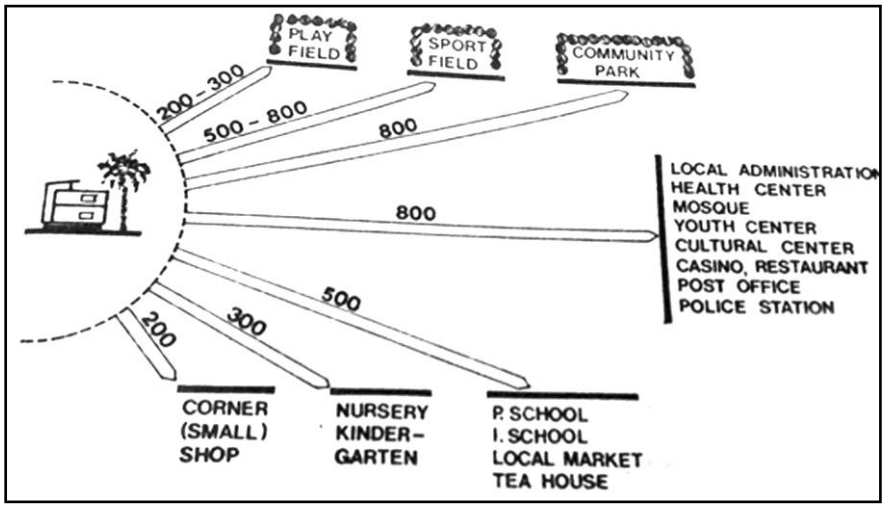


Fig (1) Maximum access distance in (m) from dwellings to community facilities.

Source: Polservice, 1983, p141.

Planning & Design Standards for Social Infrastructure

Social infrastructure should meet planning and design standards; the following represents the main standards which must be taken into account in the neighbourhood design:

Facility	Design feature	General Location
Kindergarten	- Gross Ventilation. - Adequate internal installation. - In-door spaces for playing, rest and gymnastic, health care room. - Shaded spaces for games and rest in open air. - Covered circulation (corridors). -Recommended: one-storey pavilion-type building.	- Close to dwelling-places and main pedestrian access-linking residential areas and places of work. - Safe access on foot. - Calm zone. - Should be accessible by foot path from dwelling units without crossing any street, if street must be crossed it should be a minor street.
Primary school	- Gross Ventilation. - Adequate equipment of class-rooms and work-shops. - Adequate internal installation. - Direct entrance to class rooms. -Recommended: 2-storey pavilion-type building, courtyard for meeting and recreation purposes.	- Isolate from other facilities. - Far from circulation network. - Close to residential buildings and recreation areas. - Close to main pedestrian accesses. - Should be accessible by foot path from dwelling units without crossing any street, if street must be crossed it should be a minor street.
Intermediate	- Gross Ventilation.	- Isolate from other facilities.

school & Secondary school	– Adequate equipment of class–rooms, work–shops and laboratories. – Adequate internal installation. – Direct entrance to class rooms. –Recommended: 2–storey pavilion–type building, courtyard for meeting and recreation purposes.	– Far from circulation network. – Close to residential buildings and recreation areas. – Close to main pedestrian accesses. – Jointly with secondary school (recommended educational complex).
Health Care Center	– Two separate dispensaries for adults and children. – Children dispensary situated on the ground floor. – Joint registry. – Adequate micro–climate conditions. – Access to day–light to all. – Adequate internal. – Installations. –Maximum 2–storey building. – Orientation according to zone location.	– In the center of served area. – Close to common green areas. – Isolation from noise and air pollution. – Convenient traffic activity. – Protection against sun and wind.
Mosque	– According to Muslim traditions and culture.	– Located within civic center.

Cultural Center	– Gross Ventilation. – Adequate internal installations.	– Close to main pedestrian accesses or close to common green areas. – Jointly for cultural center and youth center (cultural complex).
Youth Center	– Grouping of cultural and recreation youth activities. –Adequate internal installations. – Spatial and functional connection of interior sport facilities with external recreational facilities.	– Close to recreation open spaces. – Jointly for cultural center and youth center (cultural complex).
Local Market	– Basic shops and services. – Additional services: watch market, metal workshop, electrician, haberdashery, artisan shop. – Tea–house for rest and social contact purposes. – Location along or around covered passages. –Adequate internal installations. – Limitation of day–light access and sun–glare.	– On direction from home to work places. – By main pedestrian accesses.

Shopping Center	– Grouping of shopping center with restaurants, tea–houses and refreshment shops. – Shade walkways. – Adequate internal installations. – Limitation of day–light access and sun–glare.	– By main pedestrian accesses (commercial thoroughfares), or in areas between settlement streets and housing development.
Tea or Coffee House	– One story pavilion. – Internal yard or patio. – Roofed porticos. – Protection against intensive sun–light and winds. – Cross ventilation. – Adequate internal installations.	– Center of neighbourhood activities. – Close to green areas.
Restaurants	– Not more than 2 storeys. – Adequate internal installations. – Protection against intensive sun–light and winds. – Internal yard or patio. – Roofed galleries and porticos. – Toilets accessible from	– Center of neighbourhood activities. – Close to green areas.

	entrance hall.	
Local Administration	- Should be decided by local authorities. - Adequate internal installations.	- Located within civic center.
Post Office	- Gross ventilation. - Adequate internal installations.	- Close to local administration offices and police station.
Police station	- Maximum 2-storey building. - Public access should not conflict with prisoner passageways.	- Separation from other facilities. - Close to neighbourhood exit streets.

From here urban planner must meet these criteria to create efficient residential zone at the level of design features of dwelling units and the general location of activities, and from other hand to enable dwellers to walk to the facilities with reasonable distance in the neighbourhood.

Noise Level Criterion in the Residential zone

Sound is acoustical energy released into the atmosphere by vibrating or moving bodies. Noise is undesirable sound and as such it is cloaked with a certain degree of subjectivity. Urban mobilityis major contributor to noise in the modern urban environment. Noiseis generated by the engine and exhaust system of vehicles, aerodynamic friction, and the interaction between the vehicles and its support system (e.g., tire-pavement and wheel-rail interaction). Because noise diminishes with distance from the source, the most serious transportation- related noise problems are confined to transportation corridors (e.g., highway and rail way corridors and aircraft flight paths) and at major transportation hubs (e.g., airports and transit terminals) (Papacosta, 2001, p.507). A lot of states and agencies began to establish community noise regulations, including motor-vehicles noise standards such as (FHWA NOISE STANDARDS)-19073 by Federal Highway Administration which is issued for several categories of land use in the city. Table (3) shows noise level standard in different urban area.

Table (3) Noise Level Standard in urban zones
Source: Aljwadi, 2013, p.8/4

Zone	Noise level (dB)	
	Day period	Night period
Pure Residential zone	50	35-40
Mixed Residential zone	55	40-45
Schools, hospital, clinical	57	47
Public open spaces, gardens.	55	55
Agricultural zones	60	40-50
Commercial zones	65	50-55

Case Study Application: Residential Zone in Erbil City

A. Zone's Description

The neighborhood locates in Erbil city/ Iraq which is called Rasty districtFig (2), the area of the zone approximately (46.2 hectare), the main activity of the zone is residential function with supported facilities such as mosque, schools, health centers, local market and hotels Fig (3). The area of analysis is focused on developing axial lines and finding the most integrated and segregated area in the selected zone as well as noise level of each activity.

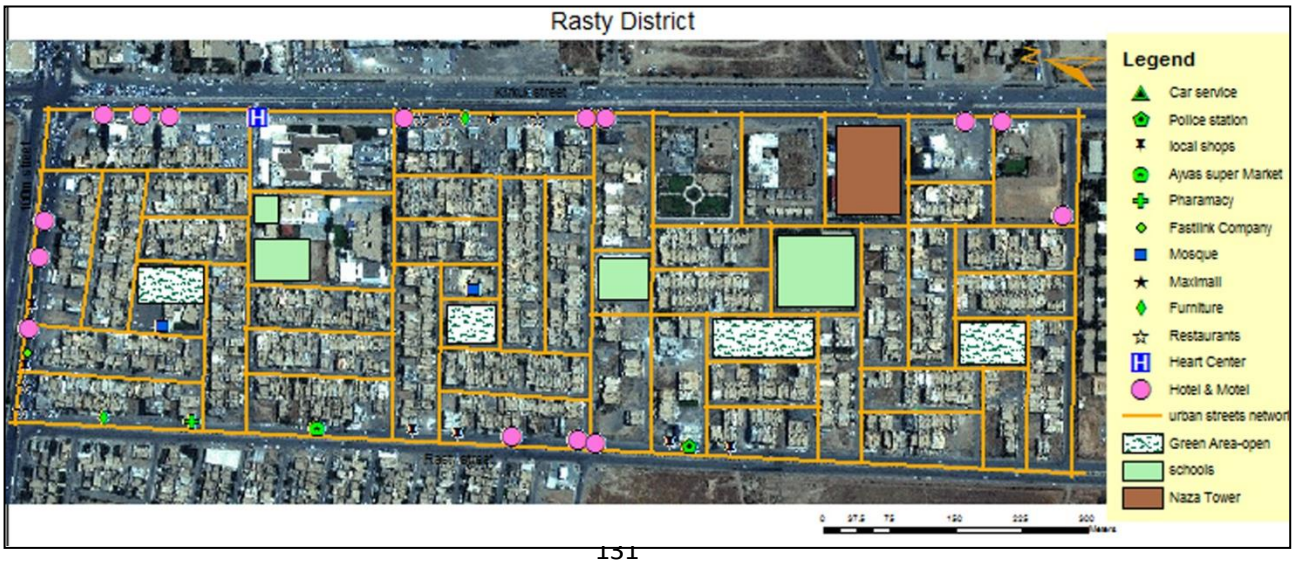
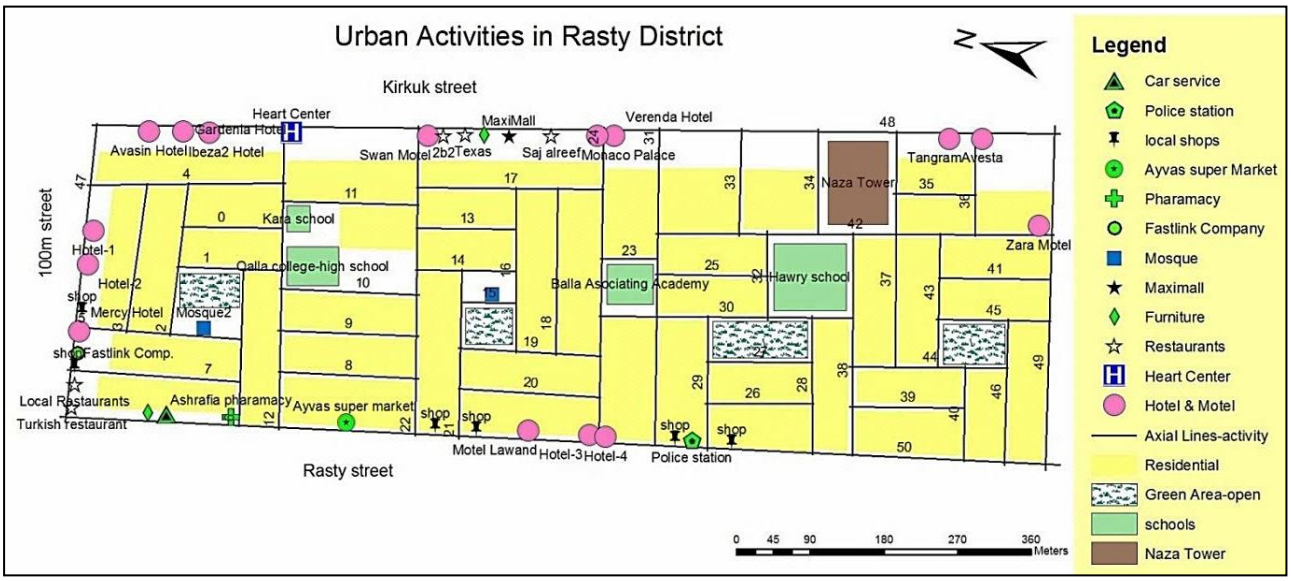


Figure (2) Satellite image of the neighborhood (New Rastyquarter)



B. Space Syntax Data (Zone's Description)

No.	index	value
1	No. of Axial lines (L)	51
2	No. of Convex space (C)	65
3	No. of Islands (I)	46
4	No. of Buildings (dwelling units + activities)	1013

Table (5) Space Syntax Data for the zone (Reference: by researcher)

C. Space Syntax Analysis

No.	index	value
1	Convex Articulation	0.064
2	Convex Deformation	0.93
3	Axial Articulation	0.05
4	Axial integration of Convex spaces	0.784
5	Grid Axiality	0.30

Table (6) Space Syntax Analysis for the zone (Rasty)

(Equations adopted from: Hillier, 1984, p.98)

Results

The research classifies axial lines to three categories for the purpose of analysis; low, average and high value and calculate the percentage for each value to give a clear indication for the spatial pattern, from other hand the correlation between local and global parameters also give clear understanding for the system.

Connectivity	Repeat	%	Level
2.00-3.00	27	53	low
3.01-6.00	19	37	AVR.
6.01-13	5	10	high

Table (7)
Connectivity Analysis
Depth Map 10

Integration [HH]R3	Repeat	%	Level
1.19-1.520	13	25	low
1.521-2.09	28	55	AVR.
2.091-3.40	10	20	high

Table (8) Local integration [HH] R3 Analysis

Depth Map 10

Integration [HH]R7	Repeat	%	Level
1.06-1.420	18	35	low
1.421-1.870	24	47	AVR.
1.871-3.29	9	18	high

Table (9) Global integration [HH] R7 Analysis
Depth Map 10

Mean Depth	Repeat	%	Level
1.98−2.840	16	31	low
2.841−3.460	25	49	AVR.
3.461−4.04	10	20	high

Table (10) Mean Depth Analysis

Depth Map 10

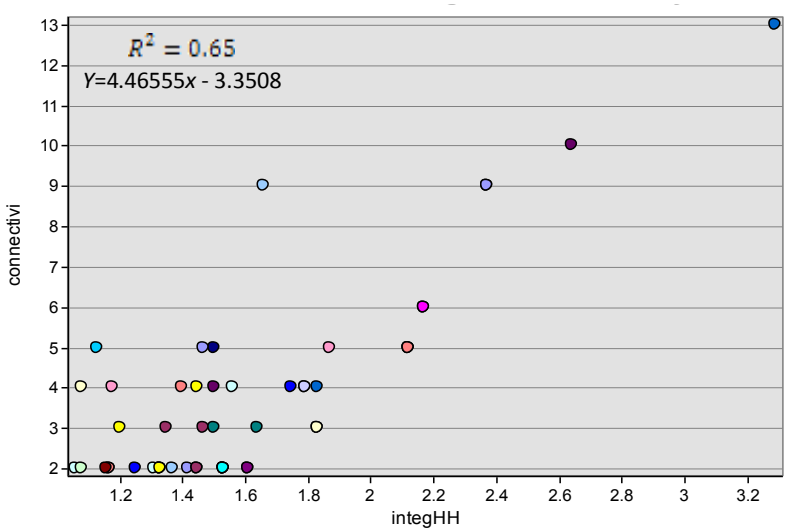
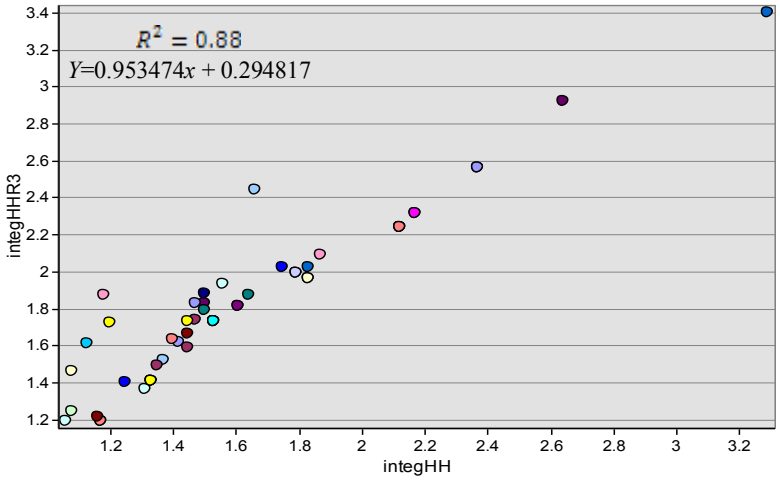


Chart (1) Correlation between Global integration & Connectivity (Degree of intelligibility)-IBM SPSS Statistic 20



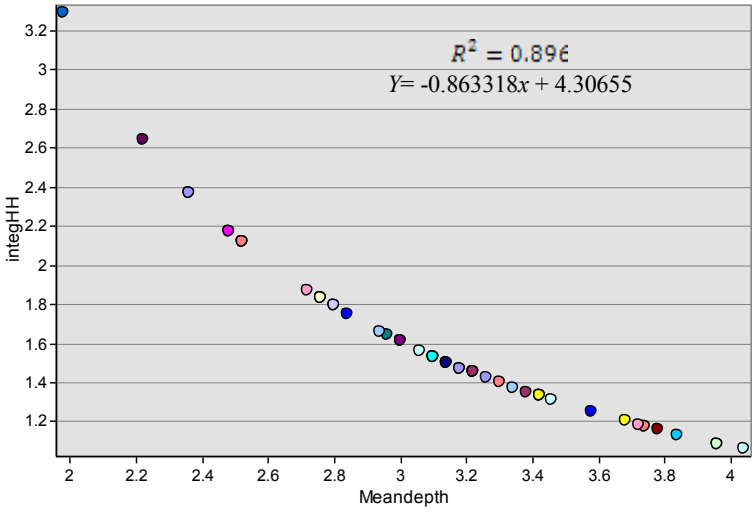
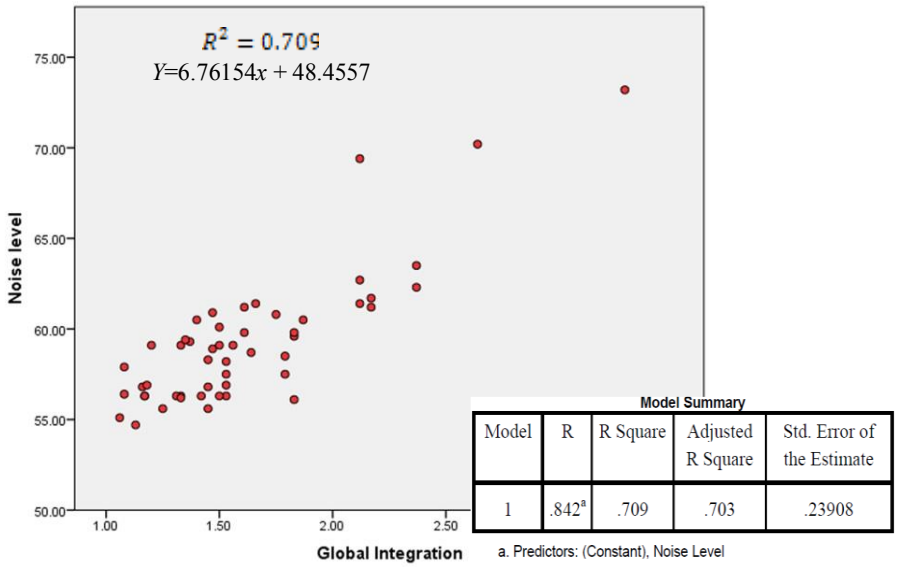


Chart (3) Correlation between Global integration & Mean Depth–IBM SPSS Statistic 20



Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.842[a]	.709	.703	.23908

a. Predictors: (Constant), Noise Level

Chart (4) Correlation between Global integration & Noise level - IBM SPSS Statistic 20

Results Discussion

A. In table (6):

* The value of (convex articulation=0.064) indicates less breakup and more synchrony, this value also indicate that social activities in the zone articulated with each other to create coherent activity system.

* The value of (convex deformation=0.93) indicates little deformation of the grid.

* The axial articulation of the system (0.05) refers to the high degree of axiality. This value is resulted from main roads which contain commercial activities and hotels in the zone. From here commercial and hotels have a high axiality.

* The axial integration of convex spaces (0.784) indicates lower degree of axial integration of convex spaces.

* The value of (grid axiality=0.30) refer to the (Griddy system).

B. In table (7) Connectivity values refer to the only (10%) of the spaces have high connectivity, (53%) with low connectivity, and (37%) average value.

C. Table (8) Local integration values refer to the (25%) of the spaces with high segregation, and only (20%) high integration connected with commercial uses.

D. Table (9) Global integration values refer to the (35%) of the spaces with high segregation, and only (18%) high integration.

E. Table (10) Depth values refer to the only (20%) is depth spaces and (31%) are shallow spaces connected with local market with high accessibility.

F. Chart (1) explains the correlation between connectivity and integration HH, which reflects the degree of intelligibility of the zone, the correlation coefficient is (R2= 0.65) which indicates a weak correlation and unintelligible system (character of gridiron plan).

G. Chart (2) explains the correlation between global and local integration, which reflects the degree of synergy between them, the correlation coefficient is (R2=0.88) which indicates a strong correlation and high degree of synergy.

H. Chart (3) shows the correlation between global integration and mean depth, R2= (0.89) (strong negative relation), that means integrated spaces connected with(commercial and hotels activity) have few steps to reach to the space(high accessibility).

I. Chart (4) indicates the correlation between noise level and integration HH, R2= (0.70) (strong positive relation), that means integrated spaces will be noisy spaces(commercial , hotels, models, and restaurants).

Conclusions:

The spatial analysis shows that most of the activities in the zone haven't taken into account noise level standards. We found that health centers in the zone connected to the high noise level with integrated spaces which have low privacy and high traffic activity. Educational activity is distributed randomly in the zone and they didn't serve the entire zone in term of maximum distance. Commercial activity spread along main streets and mix with other activities usually away from pedestrian sidewalks, hotels and motels have attached to residential dwelling units and played negative impact in the zone.

A. Syntactical analysis indicates the following:

1) By the values of integration and segregation, we note that only (18%) are integrated spaces which have high accessibility and poor privacy, these spaces represented by commercial activities.

2) The values of segregation (35%) give calm spaces for the residents with high privacy (residential activity).

3) The zone has a weak intelligibility*,make dweller confuses to reach social activities in the neighbourhood.

4) The zone has high degree of synergy (connected system).

B. The Spatial Distribution of Urban Activities: The main activities such as heart center (health activity), schools and commercial activities are distributed randomly in the zone and have had negative impact on the street network which is related to the integrated spaces in the system figure 4 and 5 (connectivity& integration map), from other hand the spatial location of the activities worked out of the planning standards which are mentioned in the theoretical part .Educational activity is distributed randomly in the zone and they didn't serve the entire zone in term of maximum distance. From above we verify and prove

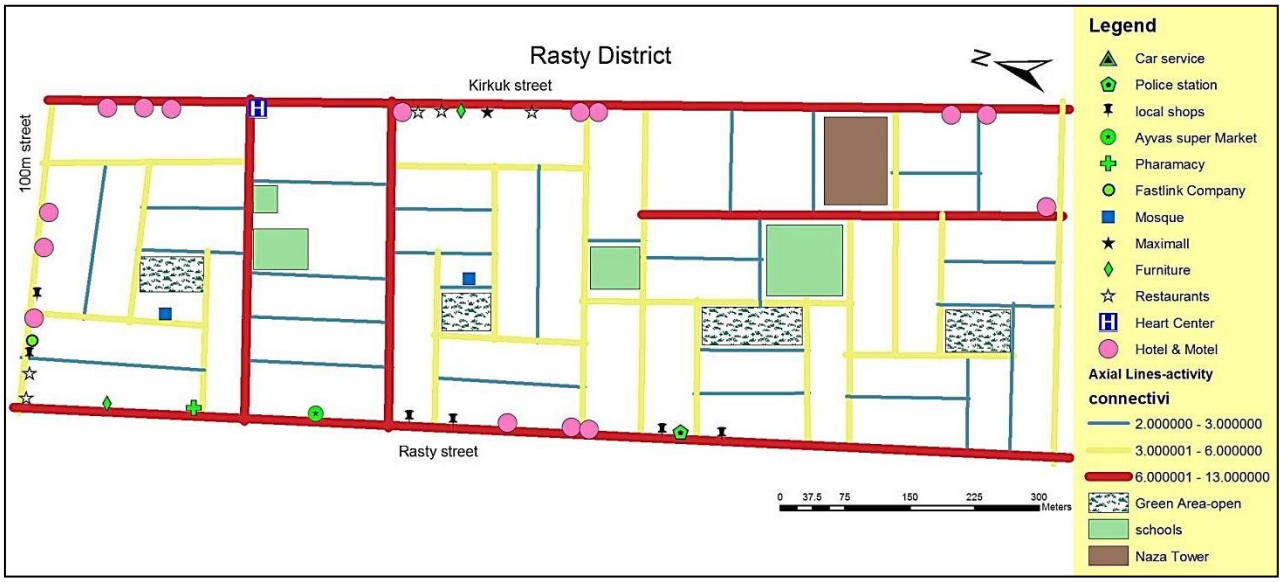


Figure (4): Connectivity & Activities location

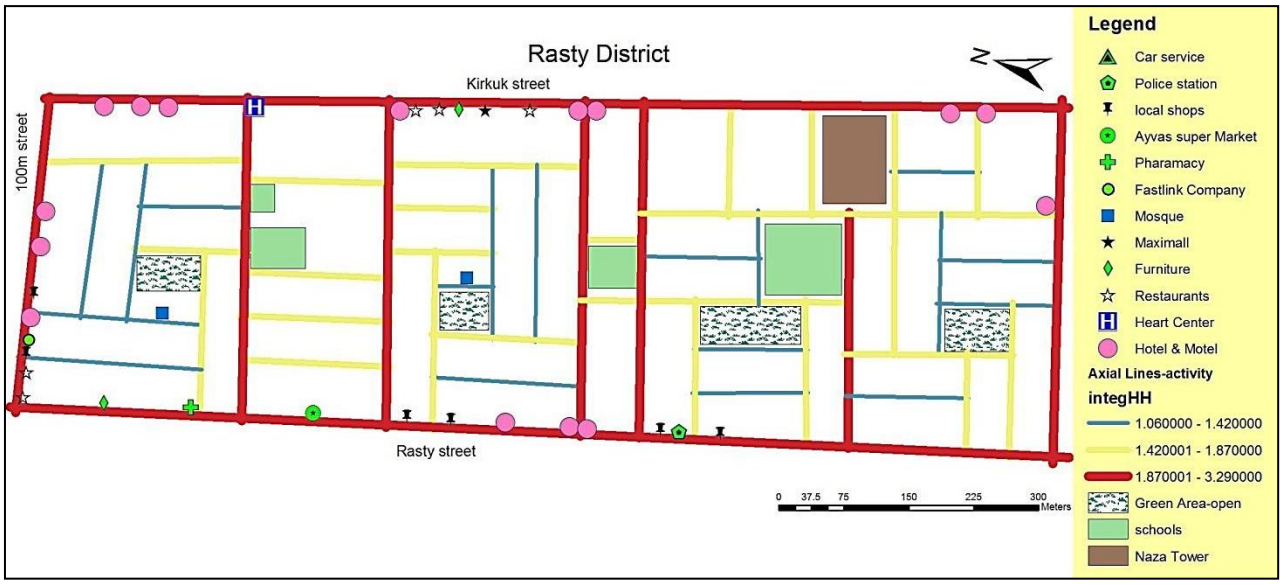


Figure (5): Global integration HH & Activities Location

C. Noise Level in the Zone:

Sound level meter figure (7) had been used as instrument to measure noise level directly in the zone, the measurements had taken in every space (roads) and main facilities (heart hospital, schools…etc.) at peak hours (morning at 8:30 am and afternoon at 2:30 pm) to be used in our analysis as average value. Table (11) explains comparison between noise level standard and noise level which was measured in the zone, the measurements indicate that noise level in the zone is higher than standard level, and most of the activities connected with high noise level fig.(6).

Zone	Noise level–Day period–standard level (dB)	Noise level–Day period–measured (dB)
Pure residential zone	50	**55.2**
Mixed residential zone	55	**58.3**
Schools, hospital	57	**65.7**
Commercial zones	65	**70.5**

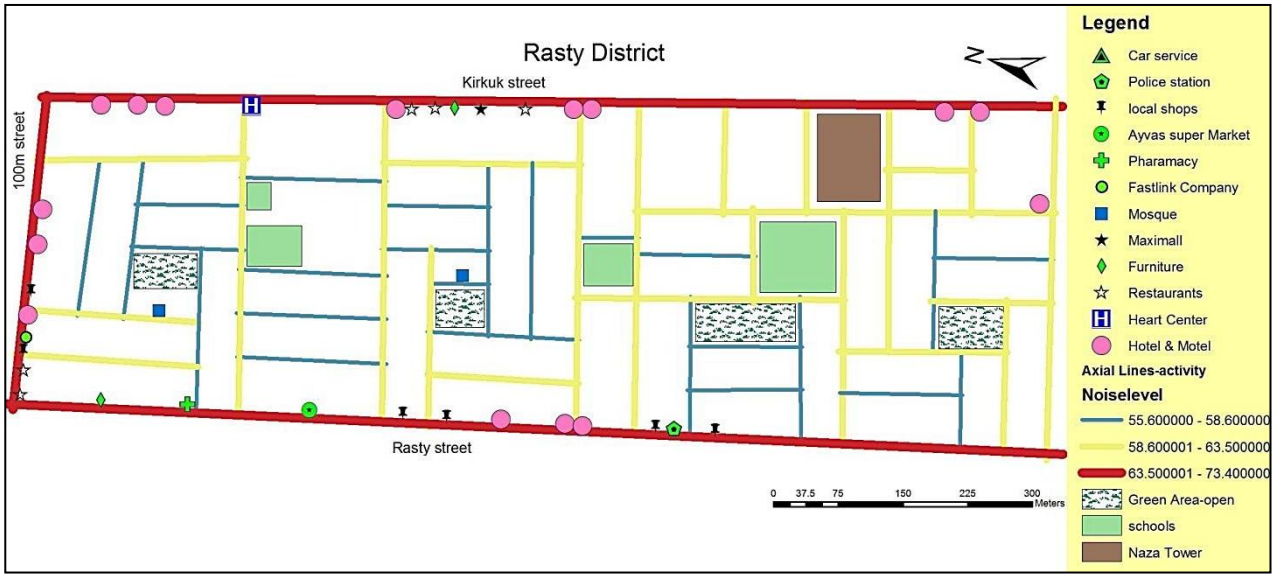


Figure (6) Noise level in the zone

Figure (7) Sound Level meter

Recommendations:

It's very important to study the spatial distribution of urban activities quantitatively to create efficient residential area, and to support the process with planning criteria at the level of location and capacity. Space syntax is an active tool to measure built environment and determines the integrated and segregated spaces, by this way we can easily read the spatial pattern of the city and to distribute the urban activities in the neighbourhood objectively. From other hand noise level must be taken into account in this process to create a calm environment for dwellers. To insure successful planning we

have to depend on Public participation which consider an essential process because the dwellers knew with all problems in their neighbourhood. Finally urban activities represent critical issue in the city and must study carefully to create good environment for city dwellers.

References:

[1] Spreiregen, Paul D., "**The Architecture of Towns and Cities**", the American Institute of Architects, McGraw- Hill Book company, USA, 1965.

[2] DeChiara, Joseph, Koppelman, Lee, " **Urban Planning and Design Criteria**", second edition, published by Van Nostrand Reinhold Company Ltd, New York, 1975.

[3] Hillier, Bill & Hanson "**The Social Logic of Space** ", Cambridge, Cambridge University Press 1984.

[4] Meyer, Michael D. & Miller, Eric J.," **Urban Transportation Planning**", McGraw-Hill higher education, New York, 2001.

[5] Moughtin, Cliff, "**Urban Design – Street and Square**",architectural press, an imprint of Butterworth-Heinemann Ltd, UK, third edition2003.

[6] Papacosta C.S. &Prevedouros P.D. "**Transportation Engineering & Planning**", prentice hall. USA, third edition 2001.

[7] Polservice, " **Housing Technical Standards and Codes of Practice**", design office, Miastoprojekt-Krakow, Poland, 1983.

[8]Rydin, Yvonne, **"Governing for Sustainable Urban Development"**, Typeset by JS Typesetting Ltd, Porthcawl, Mid Glamorgan, Earthscan in the UK and the USA, 2010.

[9] Williamson, Terry and Radford, Antony, " **Understanding Sustainable Architecture"**, Spon Press, 11 new fetter lane, London EC4P 4EE, 2003.

Arabic References

1- Aljwadi: الجوادي, مقداد واخرون " **مدونة الصوتيات – مدونة بناء عراقية** " , وزارة الاعمار والاسكان ,وزارة التخطيط ,الطبعة الاولى 2013,العراق.

2- Al-hety: الهيتي، صبري فارس " **جغرافية المدن** "، دار الصفاء للنشر والتوزيع، عمان، الطبعة الاولى 2002.

3- Al-moswy: الموسوي، هاشم عبود " **التخطيط والتصميم الحضري** "، حروف عراقية للطباعة والنشر والتحقيق، الطبعة الاولى ، بغداد ، العراق 2015.