

# Determinants of Urban Quality of Life

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## ABSTRACT

A fundamental purpose of urban planning is to facilitate a better Quality of Life to the residents. Residents in return seek to fulfil their needs from their surroundings. This Quality of Life that is directly affected by the physical settings can serve as a criteria to judge a locality or a city. Hence the first task in determining Quality of Life of people is to find out what are their exact expectations from their surroundings and which expectations are of priority and it could be determined how well the surroundings are able to fulfil people's expectations. This paper examines the various parameters of this urban quality of life. Through a public opinion survey of adult citizens of Pune City, Maharashtra, India the relative importance of each parameters are found out thereby weighing and prioritizing people's expectations from their surroundings and deriving the key indicators. Difference of opinion of various population groups among the survey samples is analyzed using ANOVA test.

**Keywords:** People's Priority Expectations, Urban Quality of Life Parameters, immediate surroundings

## I. INTRODUCTION

Urbanization is a world phenomenon with growing sizes as well as number of the cities specially in countries like India. Large mass of people are living in urban areas trying to meet their needs and aspirations so that life in general is satisfactory and fulfilling. For long, achievements in certain sectors like that of health and education have been considered to generalize people's Quality of Life. But with the advent of social indicators and talk about the well-being of people being a subjective matter, satisfaction levels of people have gain importance. There is a fundamental assumption underlying many approaches to planning and design that places may be designed to enhance the quality of people's lives (Marans, 2012). This Quality of Life (QoL) has multiple dimensions some personal like income, relationships etc while some served by the environment they are living in. Urban Planning by an large tries to address this strive

of improved quality of life based on spatial location. The way landuses and amenities are distributed has immense impact on what people experience and how satisfied they feel about their immediate environment and accessibility. The exact needs and expectations of people from the place where they stay and their relative priorities of needs should then serve as the indicators of their QoL. While there have been a lot of research in determining the QoL of people, few cater to the importance that people place to the various physical parameters based on which QoL is determined.

This paper looks into determining and prioritizing the parameters of Quality of Life that are affected by physical surrounding conditions. Various parameters from past studies and literature are grouped and a weighing process was carried out through seven point likert scale in which people rated each group of parameters based on the importance the particular

parameter has in determining their QoL. Thus the importance of each parameter is established and the difference of opinion among various groups of people is analyzed. The results are based on the survey of the adult respondents of the city of Pune, Maharashtra, India.

## II. DEFINITIONS OF QOL

The quality of life at a national or global scale is measured by the Physical Quality of Life Index (PQLI), devised in the 1980s by M.D. Morris as a measure of development. The PQLI is the average of three characteristics: Literacy, life expectancy and infant mortality. However, the term is often used in urban studies of towns or cities to represent a multiple index of different criteria that reflects residents' housing standards and the environmental conditions in which they live. Other indicators, such as traffic levels, complete the picture of a particular area (Royal Geographical Society)

**Inferring Key Words:** Multiple criteria, Conditions in which people live

In urban studies Quality of Life can also be defined as the satisfaction that a person receives from surrounding human and physical conditions, conditions that are scale dependent and can affect the behaviour of individual people, groups such as households and economic units such as firms (Robert W. Marans, 2011).

**Inferring Key Words:** Satisfaction received from surrounding human and physical conditions

QoL can be treated as the outcome of conditions that are perceived to exist and the degree to which they meet the desires and expectations of individuals (Massam, 2002).

**Inferring Key Words:** Conditions meeting expectations

Urban QoL in general terms may be described as to represent how well human beings needs are met or the extent which individuals or community perceive

satisfaction in various domains of urban life. Three dimensions of human development; a healthy life, knowledge, and a decent standard of living. These dimensions can be considered reflective of the three – social, economic and environment (Bardhan, 2011).

**Inferring Key Words:** How needs are met, standard of living is met

Thus Urban Quality of Life can be defined as 'Satisfaction received from meeting of needs and expectations by the surrounding physical conditions'.

In this sense, the surrounding physical needs, preferences and expectations of people can be considered as the parameters which can be used to determine the QoL.

## III. PARAMETERS OF QOL

The parameters of QoL are many and are differently affected by different causal factors. The parameters also vary depending on the requirement of study. In spite of the variance it is observed that the parameters considered across literature can be categorized into two: personal (like family life, education level, income, religion, health etc) and environmental i.e. affected by physical surroundings (availability of services, safety, pollution etc). While social studies and health studies consider both, the later is found to be more relevant in urban/ neighbourhood QoL. It is worth observing that the parameters link to the basic Maslow's hierarchy of needs proposed in 1943 as indicated in Figure 1.



**Figure 1.** Maslow’s Hierarchy of Needs (Maslow, 1943)

mainly satisfied externally which can be related to the urban or QoL. The social, esteem, and self-actualization needs constituted the higher-order needs. These higher-order needs are generally satisfied internally, i.e., within an individual (MSG, 2018) but the physical setting in which people live may furnish better or poorer opportunity to fulfil higher order needs.

Table 1 indicates the parameters/ sub parameters of QoL considered in some literature studies to determine a composite QoL index. While some studies group similar parameters, some treat all parameters as individual indicators.

The physical and the safety needs constituted the lower-order needs. These lower-order needs are

**Table 1.** Parameters of QoL through literature

	Champbell, Converse & Rodgers 1976	Andrews & Withey 1976	Murrell, Schulte, Hutchins & Brockway 1983	Bestuzh & Lada 1980	(Cummins, 1998)	(Rahman, 2005)	(Permen, 2011)	(Robert W. Marans, 2011)	(Heptagon Shape, 2012)	(Dhingra et. al., 2016)	(Bardhan, 2011)
<b>Physical &amp; Material well being</b>	Standard of living	Economic	Income	Material well-being	material well-being	Health	<b>Neighborhood Level</b>	<b>Objective, Subjective and Behavioural</b>	<b>Urban QoL</b>	<b>Crime</b>	<b>Built Environment</b>
Financial Security, Health and personal Safety	Savings	Income, living standard, Job	Standard of Living	Housing	health	Work	public services	Employment, Per-capita income, School and education	<b>Environment</b> : Air, water, land	Safety	Poverty
<b>Relation with other people</b>	Housing	<b>Family</b>	Housing	Family Life, Marriage	intimacy	Financial/ Material well being	schools	Crime	Material, energy, waste	Privacy	Migration
	Health	<b>Relation with others</b>	Family Life, Family Activities	Health	safety	Belonging	general appearance of neighborhoods	Health, death rates	<b>Mobility</b>	Congeniality	Socio-cultural

Relation with spouse, children, relatives, friends	Marriage, Family Life, Friends hips	<b>Local Area</b>	Community, Neighborhood	Work, Education	community	Personal Safety	perceived safety	Air quality	Accessibility, Walkability & Cyclability, Public Transport	<b>Environment</b>	Growth direction
<b>Social Community &amp; civic activities</b>	Neighborhood	Safety, security	Health	Cultural Activity, Leisure	emotional well-being	Quality of Environment	fellow-residents	Residential density, Parks, grocery stores	Traffic Load	Traffic Congestion	Env. Externalities
helping/encouraging others	Government	Neighborhood	Job	Transportation & Communication	productivity	Emotional Well-being	nuisance of noise	Public transport, Vehicles, Congestion and crowding	<b>Psychological</b>	Pollution	
activities related to government	Amount of Education	Local Government	Personal Accomplishments	Environment		Relationships		Litter	Community Identity, Pleasing Milieu	<b>Physical</b>	
	Usefulness of Education, Job	weather	leisure time, Amount of fun	Social Security, Health Services				Neighbors, family and friends	<b>Political:</b> Policies and strategies, Rights	Appearance & Cleanliness, Infrastructure, Housing	
<b>Personal Development and Fulfillment</b>	Self	<b>Oneself</b>	Politics	Values, Racial Relationships				government	<b>Physical:</b> Land use, layout, building quality, maintenance	<b>Heritage</b>	
<b>Recreation</b>	Non-work Activities	<b>Larger society:</b> Society's standards	Government's performance	Deviant Behaviors				desire to move	<b>Social:</b> Social Equity and Inclusion, Connectedness	Restoration, Respect	
	Religion	<b>Others</b>	Goods and Services	Political				participation in sports	<b>Economical</b>	<b>Social</b>	

(Kerce, 1992)

Among the multiple possible indicators it is essential to find out which are the indicators that are affected by directly and indirectly by physical surroundings like movement, crime, social interaction etc (Bardhan,

2011) and to what extent. Some parameters can be broken into smaller more measurable sub-parameters.

## A. Study Parameters

From the above parameters the ones that are most frequently occurring and are likely to be affected by physical environment (as indicated in urban quality of life studies) are listed below. They are such categorized that either all of them are likely to be positively affected or negatively affected

### Social Mix

- Mix of different income groups
- Mix of owners and renters

### Interactions with people

- Interactions/ neighbouring
- Cultural Life

### Activity

- Leisure /Recreational
- Old age group activity
- Children activity (play area)
- Women activity

### Affordability

- Property Value
- Rental Value
- Cost of Living

### Occupation

- Local Job Opportunity
- Business Survival

### Natural Environmental

- Air Quality
- Noise Levels
- Temperature

(Heat Island effect)

- Greenery

### Perceived Environment (Cleanliness)

- Solid Waste Management
- Sanitation
- Hygiene
- Congestion and Crowding

### Visual/ Appearance

- Visual Quality
- Pleasing Milieu

### Dwelling Unit

- Building Quality
- Space, natural light and ventilation
- Management and Maintenance

## Services

- Parks
- Religious centers
- Schools
- Clinics

## Commercial Facilities

- Fitness centers
- Grocery and other stores
- Eateries
- Entertainment centers

## Mobility

- Time for local travels
- Cost of Local Travels
- Requirement and Ease of Parking
- Walkability and Cyclability
- Residence Accessibility
- Traffic Load
- Access to Public Transport

## Safety from Traffic

Easy walk to school , stores

## Security

- Petty Crimes
- Heinous Crimes
- Eve teasing
- Terror Targets
- Nuisance Points
- Safety of children

## Vigilance

- Public Vigilance
- Night Time Security

## Health

- Communicable Diseases
- Scope for physical exercise
- 

These parameters have been weighted by citizens based on their importance in determining their QoL.

## B. QoL Parameter Weighing Process

The purpose of weighing is to assign weightage to parameters so that while computing a composite index of QoL the actual importance of different

parameters is captured. This process additionally indicates the preferences of people regarding their QoL.

Multi criteria decision making with AHP / ANP/ SMART/ Ranking etc through people's opinion survey was considered as there are multiple parameters which might be in trade-off relationships. But finally a **Simple Additive Weighing Process through 7 point likert scale** was finalized as the parameters are to be ultimately evaluated as an effect of external physical surroundings their interrelation is of lesser importance; too many parameters could make MCDM process complex and the questionnaire should be easily comprehensible and answerable by general citizens. Basic statistical tools are used to analyze their reliability and interpret trends. Anova test is run to further understand variations among groups.

Non-slum population above 20 years of age which is 2441598 for Pune city (PMC, 2017) is considered for the survey as slum dwellers are beyond the preview of formal neighbourhoods.

Checking the practicality 95 samples were targeted with 95% confidence level and margin of error of 10. This 95 samples were further stratified based on age, gender and marital status as requirement of families with children would differ from those without children.

Although care was taken to cover different spatial areas snow ball sampling was done as critical analysis by the respondents was required. Further fewer senior citizens are surveyed than what was targeted because most of them did not live independently and were living with population of younger age group and their requirements were covered by the responses of the younger age group.

#### IV. PEOPLE'S OPINION SURVEY RESULTS

The people's opinion survey results is presented in terms of survey sample characteristics, survey trend's

in terms of z-score and normality testing, ANOVA testing, parameter weight ages and open ended answer discussion. SPSS software has been used to do the statistical analysis.

#### A. Survey Sample Characteristics

52 % of the respondents were male and 48% were female. Their age wise distribution is indicated in Figure 2.

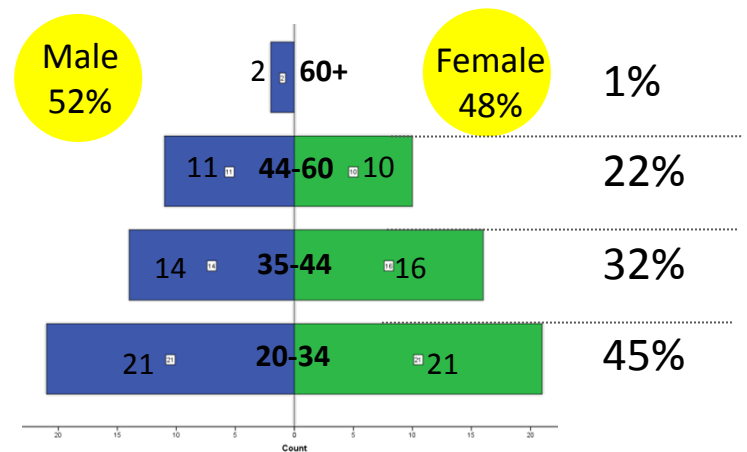


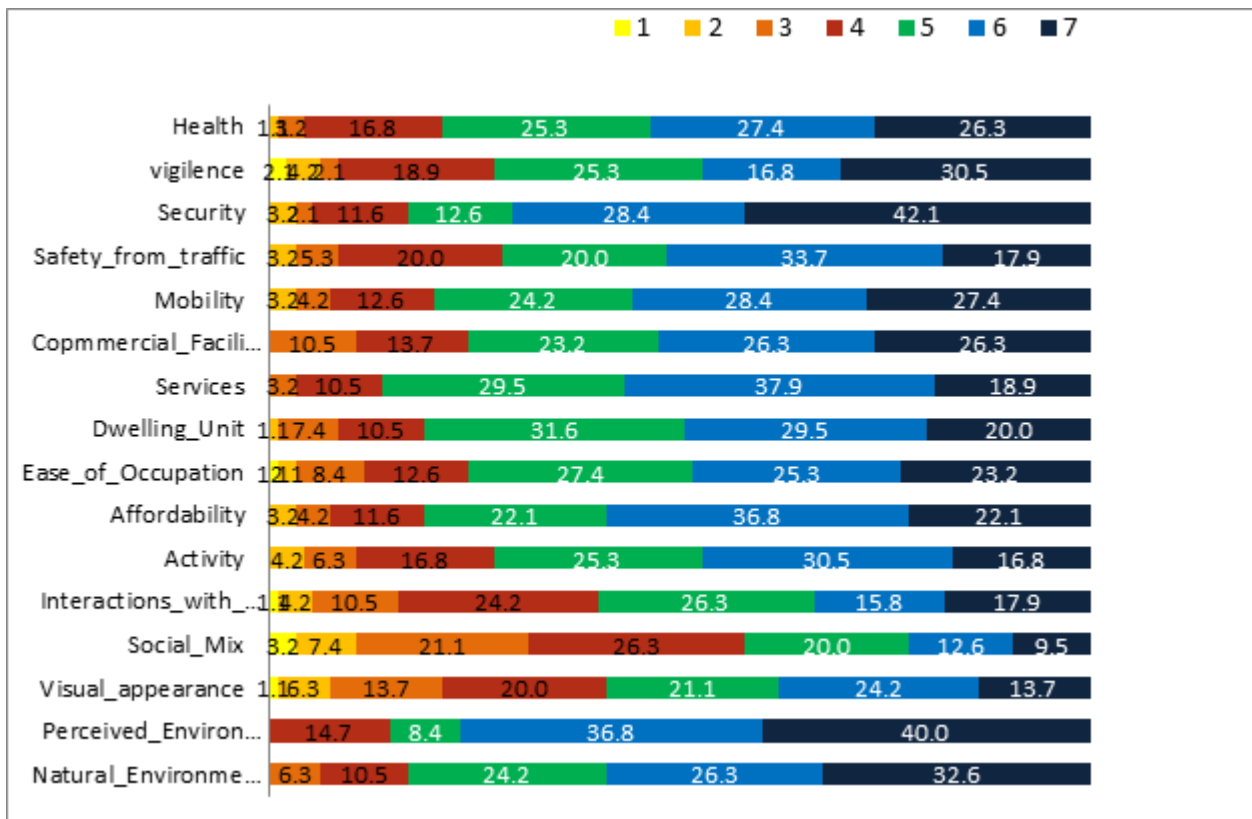
Figure 2 Age Sex Pyramid of sample population

Out of this sample 26% of respondents had children of less than 10 years of age in the house, 29% respondents with children between 11 to 18 years and 44% respondents had no children living in their house. 74% of the respondents had children. 47% of the respondents were employed with other institutions, 14% were self employed, 9% had their own business or practice 29% were not in work force. This would impact on people's need of social interactions and travel demand. Respondents were asked to categorize themselves into income groups. 13% of them were lower and higher income groups each while 75% of the respondents were middle income group. This is likely to affect people's opinion about affordability. While 53% of the respondents had cars, 39% had two wheelers and only 7% did not have any vehicle ownership. Further, only 15% of the respondents did not have driving ability. This has an impact on the people's need of access to public transport and walkability. While 52% of the respondents lived in societies, 23% lived in

standalone apartments and 15% lived in bungalows. The above mentioned categories are used as groups to determine difference of opinions through one way ANOVA test.

A basic percentage distribution of the rates for all the parameters is shown in **Error! Reference source not found.** Rating of 1 indicates that the parameter is not important in determining QoL while rating of 7 indicates that the parameter is extremely important in determining QoL.

### V. PARAMETER RATING OVERVIEW



**Figure 3.** Percentage Distribution of Ratings  
(Figures indicate percentage of sample giving the particular rate)

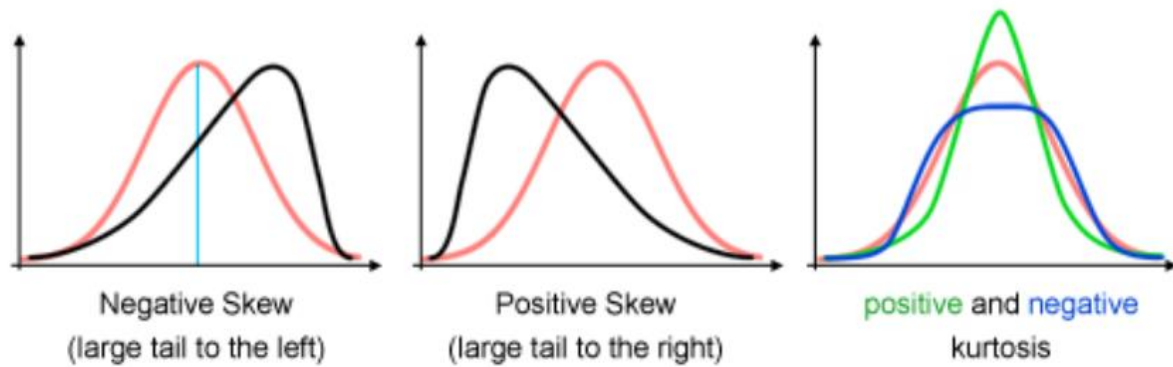
It is observed that for almost all parameters higher rating (5 / 6/ 7) is given by most respondents. This means all these parameters play vital role in determining their Quality of life. While all parameters received the highest rating of '7' meaning that it is extremely important to at least some people, Perceived Environment (cleanliness, solid waste management etc) received a minimum rating of '4' meaning it is of importance to everyone.

#### A. Sample's Normality Testing

Normality of samples is checked to understand the trends in which the parameters received ratings through Standard Deviation, Skewness and Kurtosis. Normal distribution of samples is one of the requirements of ANOVA test which is later done to understand difference of opinions among population groups.

Skewness is a measure of symmetry, or more precisely, the lack of symmetry. Kurtosis is a measure of whether the data are heavy-tailed or light-tailed

relative to a normal distribution (NIST/SEMATECH, 2012). This is exhibited in Figure 3.



**Figure 3.** Skewness and Kurtosis concept (Scratchapixel, 2016)

Skewness and Kurtosis for all the parameters have been calculated in SPSS.

Table 2 indicate the minimum and maximum rating received by the parameters, the mean, standard deviation, Skewness and Kurtosis values of all the parameters.

**Table 2.** Mean, Standard Deviation, Skewness and Kurtosis of Parameters

Parameter	Min	Max	Mean	Std Dev	Skewness	Kurtosis
Natural Environment	3	7	5.68	1.214	-.606	-.539
Perceived Environment	4	7	6.02	1.041	-.851	-.427
Visual appearance	1	7	4.81	1.504	-.321	-.708
Social Mix	1	7	4.28	1.514	.048	-.521
Interactions with People	1	7	4.89	1.447	-.221	-.487
Activity	2	7	5.22	1.322	-.588	-.193
Affordability	2	7	5.52	1.254	-.897	.492
Ease of Occupation	1	7	5.32	1.386	-.686	.091
Dwelling Unit	2	7	5.41	1.198	-.542	-.147
Services	3	7	5.59	1.016	-.466	-.176
Commercial Facilities	3	7	5.44	1.302	-.431	-.881
Mobility	2	7	5.53	1.303	-.766	.115
Safety from traffic	2	7	5.29	1.295	-.569	-.290
Security	2	7	5.87	1.307	-1.193	.865
vigilance	1	7	5.34	1.513	-.763	.246
Health	1	7	5.53	1.236	-.683	.541

As Skewness and Kurtosis values are close to 0, all parameters thus can be accepted to have normally distributed rating.

## VI. ANOVA TEST FOR DIFFERENCE OF OPINION AMONG VARIOUS GROUPS

The one-way ANOVA compares the means between the groups one is interested in and determines whether any of those means are statistically significantly different from each other (Lund Research Ltd, 2013). The basic assumption of ANOVA test is that the dependent variable is normally distributed, there is homogeneity of variances and



independence of observations. All these are satisfied by the samples of this study.

F ratio (designated simply as F), the ratio of how much variability there is between the groups relative to how much there is within the groups. df is degrees of freedom and p is significance level.

If no true difference exists between the groups, then the F ratio should be close to 1. If the p value from the ANOVA is significant (less than 0.05 or your chosen alpha level), then one can conclude that the groups are not all the same (because the means varied from each other by too large an amount).

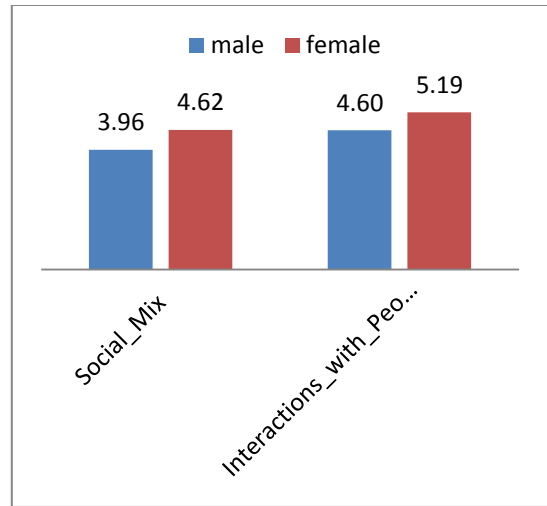
ANOVA tests have been done to see whether significant difference of opinion exists between different groups like male and female or owners and renters etc. Only those factors are presented here which showed significant difference.

**A. One way ANOVA based on Gender**

The difference of opinion on importance of ‘social mix’ and ‘interaction with people in their neighbourhood’ among men and women is statistically significant. This could be because some of the women in the survey were home makers and neighbourhood provides the only social interaction opportunity to them. They are hence also more concerned with the social mix in their neighbourhood. People did not mind people of different caste or religion but had issues with people with different literacy level and marital status.

**Table 3.** One way ANOVA based on Gender

		Mean Square	F	Sig.
Social Mix	Between Groups	10.303	4.674	.033
	Within Groups	2.205		
Interactions with People	Between Groups	8.192	4.036	.047
	Within Groups	2.030		



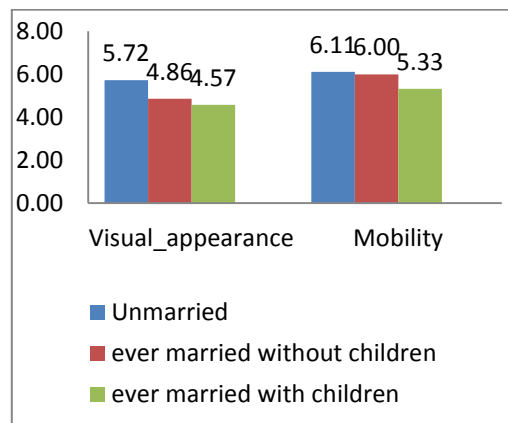
**Figure 4.** Mean rating of parameters based on gender

**B. One way ANOVA based Marital Status**

Difference of opinion for visual appearance and mobility is statistically significant among people of different marital status. Both are more important to unmarried people than to people who are married for whom other parameters that affect family life are more important.

**Table 4.** One way ANOVA based on Gender

		Mean Square	F	Sig.
Visual appearance	Between Groups	9.489	4.509	.014
	Within Groups	2.104		



**Figure 5.** Mean rating of parameters based on marital status

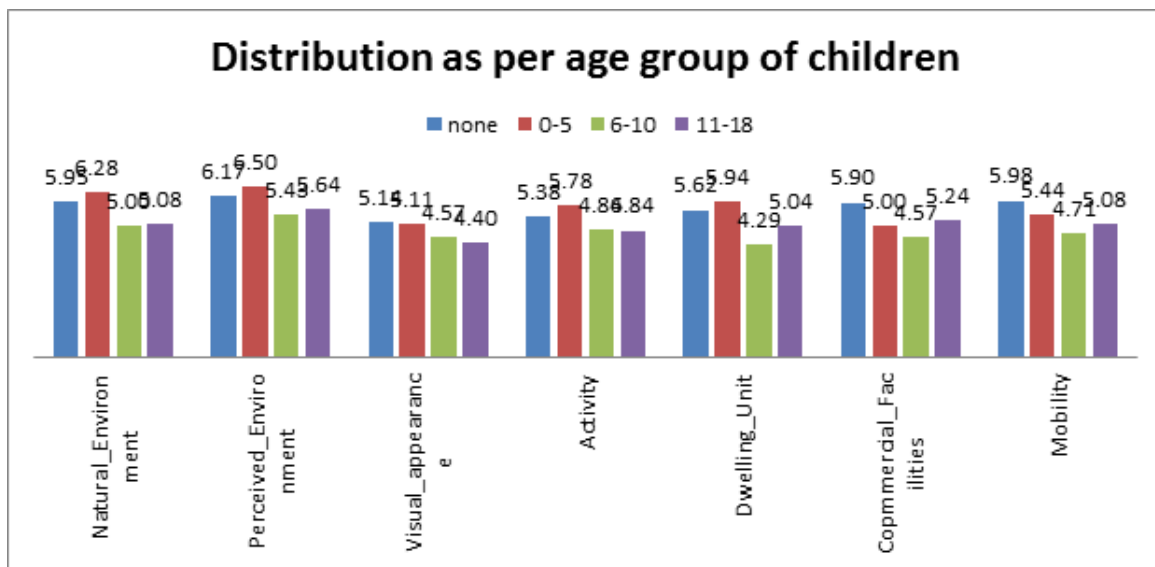
**C. One way ANOVA based on age group of children**

Difference of opinion regarding environment, appearance, activity, dwelling unit, commercial facilities and mobility among the status of people with children is statistically significant.

**Table 5.** One way ANOVA based on age group of children

		Mean Square	F	Sig.
Natural Environment	Between Groups	5.793	4.519	.002
	Within Groups	1.282		
Perceived Environment	Between Groups	2.871	2.856	.028
	Within Groups	1.005		
Visual appearance	Between Groups	7.322	3.595	.009
	Within	2.037		

		Groups			
Activity	Between Groups	4.615	2.847	.028	
	Within Groups	1.621			
Dwelling Unit	Between Groups	4.938	3.856	.006	
	Within Groups	1.280			
Commercial Facilities	Between Groups	4.718	3.021	.022	
	Within Groups	1.562			
Mobility	Between Groups	4.582	2.917	.026	
	Within Groups	1.571			



**Figure 6.** Mean ratings of Parameters based on age group of children

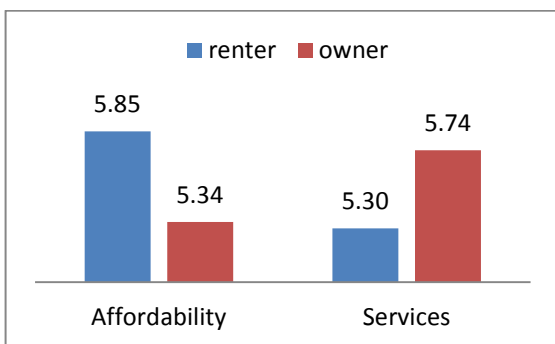
Environmental parameters are more important to parents with small children while commercial and mobility facilities are more important to people with older children and with no children.

**D. One way ANOVA based on house ownership status**

While affordability is significantly more important to renters, services is more important to owners.

**Table 6.** One way ANOVA based on house ownership status

		Mean Square	F	Sig.
Affordability	Between Groups	5.597	3.662	.059
	Within Groups	1.528		
Services	Between Groups	4.149	4.156	.044
	Within Groups	.998		



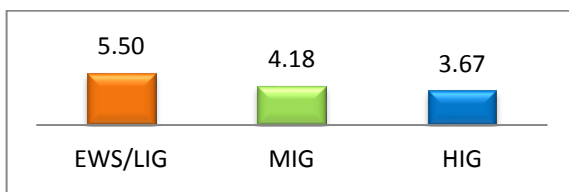
**Figure 7.** Mean rating based on house ownership

**E. One way ANOVA based on Income Group**

As per income group only social mix has significant difference between income groups. Lower Income Groups found social mix to be more important.

**Table 7.** One way ANOVA based on income group

		Mean Square	F	Sig.
Social Mix	Between Groups	11.520	5.512	.005
	Within Groups	2.090		



**Figure 8.** Mean of rating of social mix based on income category

Difference as per housing typology, occupation for any housing typology, driving ability, vehicle ownership, age is not significant.

It can be concluded that most parameters are of importance irrespective of the sub groups they belong to. And hence average can be safely used to calculate weightages.

**F. Relative importance of QoL determining parameters**

Based on the average rating that the parameters received they are sorted in order as indicated in Table 8.

**Table 8.** Order and Weightage of QoL Determining Parameters

Parameters	Mean	Weightage out of 100
Perceived Environment	6.02	7.02%
Security	5.87	6.85%
Natural Environment	5.68	6.63%
Services	5.59	6.52%
Mobility	5.53	6.44%
Health	5.53	6.44%
Affordability	5.52	6.43%
Commercial Facilities	5.44	6.35%
Dwelling Unit	5.41	6.31%
vigilance	5.34	6.22%
Ease of Occupation	5.32	6.20%
Safety from traffic	5.29	6.17%
Activity	5.22	6.09%
Interactions with People	4.89	5.71%
Visual appearance	4.81	5.61%
Social Mix	4.28	5.00%

Perceived environment which includes cleanliness, hygiene, sanitation, crowd and congestion which people need to deal with on daily basis is found to be of utmost importance in deciding one's urban QoL. Security from crime is next as safe living without fear is important for a better QoL. Natural Environment that includes air pollution, noise is next as better environment is desirable but does not affect people

until they are in extreme levels. It can be said that surrounding features that directly affect the living quality in a dwelling unit is most important to people as people can't change these by themselves.

Access to surrounding features like recreational facilities, commercial facilities, mobility (public transport), scope for exercise (health) etc are second in priority as people can make certain other arrangements for these facilities. Hence access to facilities and services are important to people but can be traded-off for the previously mentioned environmental and security parameters.

Parameters which are affected by personal characteristics and are which does not affect daily life directly like interaction with people, social mix, recreational activities, occupation are third in priority.

However, certain constraints like affordability, lack of mobility options, nature of job etc lead people to compromise the above parameters resulting in poorer QoL. In the light of the current trends of online social platforms, services and home deliveries of goods second and third priority parameters might be losing importance.

Indicator of QoL can thus be computed either objectively by looking into the actual performances of each parameter (that is how well the needs of people is met by their surroundings) through quantitative statistics or subjectively by looking into the experiences and satisfaction people have regarding these parameters (Diener, 1997). The weightages as indicated in Table 8 can be used for the parameters to compute composite QoL index.

## VII. CONCLUSION

Any kind of physical planning and intervention is likely to affect the QoL of the people residing there either positively or negatively or both. It is possible that certain facilities enhance people's experience regarding certain aspects but simultaneously would adversely affect some other aspect. In such a scenario which aspect is of priority to people and what they are ready to trade off is important. This study has shown that people desire clean, quiet and safe place to stay and any activity that may sabotage this is not

desirable. Although commercial activities are desirable, if they adversely affect the peace and quiet of their residence then they can be compromised. While urban planning directly caters to the second aspects their negative externalities have to be catered to with vehemence as that is people's first priority.

The relative weightages of the Urban QoL parameters is established and can be further used to determine the QoL life of people in various urban contexts.

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