

## Household Preferences for Residential Location: Case of Pune Municipal Corporation Limits

### **KEYWORDS**

Prof. Parag Govardhan Narkhede

Ph.D Scholar, University of Pune

## Prof. Dr. Milind V.Telang

Director, Ph.D Research Center, University of Pune

ABSTRACT The present study explores the responsiveness of various factors which are significant in selecting Residential Location within the Pune city and estimate their relative influence on the choice probability. The Current and Future Household preferences were chosen for the above study. The Spearman's rank correlation method was used for exploring the relationship between preferences made for residential location. The results highlight that residential location decision is relatively sensitive to the Budget, Location and least sensitive to Community factor. Also, from the growth and investment perspective, regions that have high concentration of business activity at present and good Infrastructure – Amenities will have a comparative advantage over other regions that have saturated on this.

### CITY GOVERNANCE - PUNE MUNICIPAL CORPORATION

Pune Municipal Corporation is spread over an area of 243.84 sq.km with a population of about 31.15 Lakhs in 2011. In the past decade (2001-2011) it has experienced a population growth rate of 22.7 percent. Over the years PMC has grown in the pattern of concentric rings. The driving forces for growth are primarily the development of IT industry in addition to the economic boom in the automobile sector which forms a major portion of the industries in and around Pune. The ever increasing pressure of population has led to the growth of the adjoining suburbs and the city has expanded outwards filling in spaces between it and the suburbs. The urban sprawl has taken place in all directions but more significantly in the eastern, southern and south-western directions. Significant changes in land use are evident in the eastern part of the city. The peripheral growth has resulted into the increased residential areas and area under transportation network and facilities

Pune has indicated the impacts of globalization process not only with the changes on capital and business areas, but also with the new housing trends. While the new housing trends which display the features of community preferences, has been directing towards the various directions, the developers have an active role on the accelerating of this process. Pune being the Educational hub, IT sector, automobile sector, service industries and in close proximity to Mumbai, has become one of the cities in which community preferences are most rapidly advanced.



Map 1 Chronological Development of Pune from 1820 -2011 Source: Town Planning Department, Pune- 2011, CDP for

### Pune

The city is divided in to 4 zones as mentioned in the above table. The administrative wing of PMC is divided into 14 wards, further divided into 76 electoral wards.

ZONE I	ZONE II	ZONE III	ZONE IV
Aundh	Dhole Patil Road	Bhavani Peth	Bibwevadi
Ghole Road	Nagar road	Kasba Peth	Dhankawdi
Kothrud	Sangamwadi	Sahakar Nagar	Hadapsar
Warje-Karve- nagar		Tilak Road	





Map 1 Map showing Zones – Administrative wards (14) -

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### Electoral Wards (76) of PMC Source: PMC, 2011

The overall livability of a place is dependent on the population density of that place, in case of Pune as per the Provisional figures from Census of India, 2011; the population density is 12,777 persons/ Sq.Km (approx. 127 pph). The average population density of Pune city being on the lower side of the permissible limits of the UDPFI guidelines for metropolitan cities. The average population densities in the core city wards are higher than the density in the wards on the periphery. This overcrowding is the consequence of being the old historic city with specialized and intense trade and commerce activities being taken up; the overcrowding indicated by the densities call for decongestion of these areas.

Table 2 Ward-wise comp	arison of Area - Por	pulation Distribution – I	Density of PMC (2001-201	11)
Table 2 Ward-Wise comp	anson of Area - I op		Density of 1 Mic (2001-201	,

Ward No.	Ward	Area (Sq km) 2001	Area (Sq km) 2011	Population 2001	Population 2011	Density (pph) 2001	Density (pph) 2011	Comparison with UDPFI Norms (125-175 pph)
1.	Aundh	44.63	40.75	1,67,886	1,80,264	40	44	Below the standard
2.	Kothrud	10.05	16.26	2,02,316	2,09,046	203	129	Within the standard
3.	Ghole Road	12.78	12.75	2,00,527	1,71,150	158	135	Within the standard
4.	Warje	12.04	15.21	1,13,985	2,32,325	97	153	Within the standard
5.	Dhole Patil Road	8.48	14.64	1,00,039	1,55,007	118	106	Below the standard
6.	Nagar Road	30.75	29.1	1,43,323	2,38,014	50	82	Below the standard
7.	Sangamwadi	21.72	29.35	2,10,617	2,61,307	98	89	Below the standard
8.	Kasba Peth	2.8	5	2,27,270	2,22,084	855	445	Above the standard
9.	Bhavani Peth	2.32	2.9	2,14,306	1,91,287	941	661	Above the standard
10.	Sahakarnagar	9.92	9.2	1,21,660	2,03,124	163	221	Above the standard
11.	Tilak Road	18.14	14.71	2,07,103	2,40,140	116	164	Within the standard
12.	Dhanakwadi	3.61	10.84	2,11,100	2,36,021	696	218	Above the standard
13.	Bibvewadi	22.43	18.35	2,17,331	2,95,447	107	161	Within the standard
14.	Hadapsar	28.01	24.78	2,01,010	2,80,215	73	113	Below the standard
	Total	227.68	243.84	25,38,473	31,15,431	118	127	

### Source: Census of India & Provisional figures from Census of India, 2011, CDP for Pune – 2041, CMP, CSP of PMC

The dynamic process of population growth is beyond the control of the authorities; it is actually a function of land prices and ease of accessibility to work place and availability of basic services. As a result, population growth is being witnessed in the fringe areas of the city and just outside the PMC limits, especially in the southwest direction.

### FACTORS FOR HOUSEHOLD PREFERENCES

An extensive list of factors has been identified which are expected to influence the decision making processes for Residential location, Ownership pattern and Type of housing. These factors have been broadly classified under seven categories and presented in Table below.

Factors	
	Location
Geographic	Connectivity to other relevant parts of city
	Surrounding Environment
	Community
Social & Culture	Safety and Security
	Distance for Amenities and Infrastructure
Employment	Proximity to Work station

	Housing type (Bungalow, Flat, etc)	
Design	Architectural style	
	Design of Spaces both Internal, External	
	Size/ Area	
Economy	Cost and Affordability factors	
	Transportation Cost	
	Policies like VAT, FSI and may other	
Policy / Political	Political motives in certain area	
Hybrid factors	Specific Choice of a Household for a Housing Location. E.g. An Household having choice of good school for his children, may prefer Housing location around it, inspite of High cost, long distance to Work station. This usually falls under HIG having various choices, where Economy, Employment criteria don't play a role.	

Based on the above Factors, the variables identified for the Questionnaire are Budget, Location, Design of the House, Amenities, Infrastructure, Investment and Community.

### APPROACH FOR SURVEY & ANALYSIS

The Survey was conducted by a comprehensive two step approach for analyzing the data:

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### SUB-MARKET ANALYSIS

Housing Market is further dependent on the movement and analysis of various submarkets of any city. Within these markets, a substantial variation exists across neighbourhoods in the type of housing available, the quality of public services, the level of infrastructure and the quality of life generally. Keeping these submarket differences, it has been observed and empirically proved that housing markets are best conceptualized as quasi-independent submarkets.

### SUBMARKET DELINEATION

Within each city, submarkets were delineated keeping in mind a set of common real estate characteristics, like price dynamics, geographical proximity, and real estate behaviour. It is important to note that each of the submarket was further differentiated into high, high-mid and mid segments. These segments were unique in each submarket in terms of the price bracket that they represent, further reinforcing the point of their quasi-independence. For example, the high end segment of Kandivali area is treated differently from the high end segment of Worli area (in terms real estate prices), unlike a situation where the city of Mumbai has a single highend price segment.



Map 5 Map showing the Sub-Markets comprising the Housing Market of Pune city Source: Google maps 2012

### SAMPLING

In order to understand citizens' perceptions and to validate the need of assessment carried out based on factors affecting Household preferences for Residential location, a citizen's survey with a respective quota sample size representing the population of city is much more important for analysis. In following way the Sample size required was calculated:

Considering the values: N (31, 15,431), P (0.5), A (0.04), Z (1.96), R (0.5)

The sample size required, n = 615

The study was quantitative in nature; a stratified quota sampling was done to contact all segments of gender, age and SEC (socio- economic category) in the city of Pune. The total sample size was 615 which were randomly selected.

The Total Sample size was further distributed in two aspects:

### **Current Housing Preference:**

The Household which own a house is being considered for the Survey Questionnaire.

### Future Housing Preference:

The Household / Prospective buyers who say they plan to buy a house in the next five<sup>1</sup> years are considered for the Survey Questionnaire.

### Table 4 Distribution of Total Sample Size

	Weightage As- signed	Samples (n)
Future Housing Prefer- ence	33 % (202)	205
Current Housing Prefer- ence	67 % (412)	410
Total Samples	100 %	615

# Table 5 Distribution of Current Housing Preference Sample Size

Sub-Markets	Administrative Wards	Weightage As- signed	Samples (n)
North – West Region	Ward No. 1, 2, 3	8 % for each ward	96
South – West Region	Ward No. 4, 11, 12	8 % for each ward	96
Central Region	Ward No. 8, 9	3 % for each ward	26
North – East Region	Ward No. 5, 6, 7	8 % for each ward	96
South – East Region	Ward No. 10, 13, 14	8 % for each ward	96
TOTAL		100 %	410

Note: The Central region is assigned lesser weightage as it has came to Saturation stage due to increase in Price segments, unavailability of land and choice of ownership by inheritance.

### INTERVIEWS OF HOUSEHOLDS

Factors of the Household Preferences were identified and based on it a systematic structured Questionnaire for Current User Preference and Prospective Buyer Preference was prepared for the Interviews. The Questionnaire consisted of close-ended questions formulated aiming to ensure more in-depth information is provided. Household was randomly selected and by formally seeking their permission the Interview was taken.

### HOUSEHOLD PREFERENCES CURRENT USER PREFERENCE

The respondents who own a House, and the preferences considered while buying are analyzed. (Samples, n = 615)

Listing of Variables based on Weightage				
What was the preference for selecting the Current House?		If Location was the prefer- ence, what was the criterion for selecting this Location?		
Variable			Variable (n=312)	
1	Budget (380)	1	Nearness to other parts of City (125)	
2	Location (312)	2	Social Environment (84)	
3	Infrastructure (156)	3	Proximity to Work Place (41)	

4 Design of the House (130)		4	Proximity to Transport Service (39)
5	Amenities (128)	5	Physical Environment (23)
6	Investment (112)		
7	Community (92)		

### Source: Primary Survey, 2012

Listir	Listing of Variables based on Weightage				
If Community was the preference, what was the criterion for selecting this Location?		What is the Preference for Joint Family Residence as per Occupation?			
	Variable (n=92)		Variable (n=615)		
1	Near to Family & Rela- tives (33)	1	Industrialist (265)		
2	Cultural Opportuni- ties (21)	2	Businessmen (215)		
Z	Friendliness of the Community (21)	3	Servicemen (135)		
3	Size of Population (11)				
4	Religious Worship (6)				

### Source: Primary Survey, 2012

Servicemen migrated for service purposes prefer to stay with family for settlement purpose and opt for buying 1-2 Bhk Flat type. The most common Age group buying the Flat system is 21 – 30 years. While, most of the Businessmen, Industrialist prefer buying Flat for Investment purpose. Industrialist and Businessmen prefer a Joint Family residence and prefer buying a 3 Bhk or more type for accommodation.



### Figure 8 Preference for Flat type as per Occupation Source: Primary Survey, 2012

### FUTURE USER PREFERENCE

The respondents looking ahead to purchase a House in next 5 years are only considered. (Samples, n = 205)

Listing of Variables based on Weightage			
What is the reason for Buying House in next 5 years?		What type would you pre- fer for Residential Property in Pune?	
	Variable		Variable (n=205)
1	Investment (196)	1	Flat (113)
2	Changing Family needs (133)	2	Bunglow/ Villa/ Row-House (55)
3	Proximity to Workplace (102)	3	Plot (37)
4	Distance to other Ser- vices (61)		
5	Want Physical – Social Environment (57)		
6	Need/ want to relocate (44)		
Sources Brimany Summer 2012			

### Source: Primary Survey, 2012

Listing of Variables based on Weightage

What Price range would you prefer for Residential Property in Pune?		What is the Preference of the People in Future for Flat Type?	
	Variable (n=205)		Variable (n=205)
1	40 – 60 Lakhs (116)	1	2 Bhk (92)
2	30 - 40 Lakhs (82)	2	1 Bhk (60)
3	60 – 90 Lakhs (12)	3	3 Bhk (41)
4	Above Rs. 1 Crore (5)	4	Other (12)

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### Source: Primary Survey, 2012

Listing of Variables based on Weightage				
What criteria have you considered for selecting the Location Preference?		What should be the priority in development by PMC?		
	Variable (n=205)		Variable (n=205)	
1	Budget (241)	1	Improvement in existing condition/ Re- development (303)	
2	Location (187)	2	New Development in existing (210)	
3	Design of House (116)	3	New Development beyond Municipal Limit (102)	
4	Amenities (111)			
5	Investment (88)			
6	Infrastructure (85)			
7	Community (58)			

Source: Primary Survey, 2012

### STATISTICAL ANALYSIS METHOD

Using the data collected from the Interviews; following Spearman's Rank Co-relation method was chosen as a tactic to identify which characteristics had a significant impact on the Residential Location (i.e. Co-relation between Variables).

Spearman's rank correlation is a nonparametric measure of statistical dependence between two variables. It assesses how well the relationship between two variables can be described using a monotonic function. It is appropriate for both continuous and discrete variables, including ordinal variables and if there is more than one independent variable.

### UNIT OF ANALYSIS

The study will depend on two variables:

Independent Variable - Factors of Household preferences

Dependent Variable - Housing Location

### **CO-RELATION BETWEEN VARIABLES (CBV)**

CBV: Co-relation between all factors: Spearman's Rank Corelation

### Table 6 Co-relation between all Factors by Spearman's **Rank Co-relation method**

	x% Significance level		s's significants level
Locotion - Budget	SPC 0.3	Amenities - Design of House	LPC 07
Locotion - Amendies	SPC 0.1	Ameratias - investment	MPCOA
Locotion - Design of House	MPC 0.6	Amenites - Infrastructure	LPC 07
Location - Investment	MPC 0.425	Amendias - Commanity	LPC DP
Locotion - Infrastructure	MPC 0.4	Design of House - Investment	MPC 0.63
Locotion - Community	NCO	Design of House - Infrastructure	LPC-Da
Budget - Ameraties	LPC 0.9	Design of House - Constructly	MPC 0.4
Budget - Design of House	MPCOA	Investment - Infrastructure	SPC0.8
Budget - Investment	LPC own	Investment - Community	MPC 0.4
Budget - Infroitructure	MPC 0.4	Infrostructure - Community	MPC 0.6
Budget - Community	LINCOM		

Correlation is significant at the 0.05 level (2-tailed): 0.9000

Budget has strong co-relation with Amenities, Investment, and Community.

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Amenities have strong co-relation with Design of House, Infrastructure, and Community.

**Design of House has strong co-relation with Infrastructure.** Location has medium co-relation with Investment, Design of House, and Infrastructure.

Budget has medium co-relation with Design of House, and Infrastructure.

Amenities have medium co-relation with Investment.

# Design of House has medium co-relation with Investment and Community.

Investment has medium co-relation with Community.

Infrastructure has medium co-relation with Community.

CBV: Co-relation with Location: Spearman's Rank Co-relation

### Table 7 Co-relation with Location by Spearman's Rank Corelation method

	5% \$ignificance level
Location - Nearness to other parts of City	LPC 0.7
Location - Social Environment	MPC 0.675
Location – Physical Environment	SPC 0.3
Location – Proximity to Transport Service	LPC 0.9
Location – Proximity to Work Place	LPC 0.9
Location – Distance to other Services	LPC 0.7

Location has strong co-relation with Proximity to Transport Service, Proximity to Work Place, Nearness to other parts of City, and Distance to other Services.

Correlation is significant at the 0.05 level (2-tailed): 0.9000

Location has medium co-relation with Social Environment.

CBV: Co-relation with Community: Spearman's Rank Co-relation

# Table 8 Co-relation with Community by Spearman's Rank Co-relation method

	5% Significance level
Community - Cultural Opportunities	LPC 0.875
Community - Size of Population	LPC 0.75
Community – Near to Family & Relatives	NC
Community - Friendliness of the Community	MNC -0.5
Community – Religious Worship	MPC 0.4

Correlation is significant at the 0.05 level (2-tailed): 0.9000

Community has strong co-relation with Cultural Opportunities and Size of Population.

Community has medium co-relation with Religious worship.





# Figure 22 Ward wise Housing Distribution by Tenancy Source: Household survey 2009, Mashal, CDP for Pune

High Occupied Tenancy: Dhankwadi, Kothrud, Aundh, Ghole Rd, Nagar Rd, Bibvewadi as compared to other Wards.

High Rented Tenancy: Kasba Peth, Tilak Rd, Sangamwadi, Bhavani Peth, Dhole Patil Rd, Warje.

High Vacancy Level: Sahakarnagar, Bibvewadi, Kasba Peth, Nagar Rd.

Another reason for the vacant stock can be the number of dilapidated houses which may be the Wada's in the old city; the newly constructed houses that are unsold due to the owner's expectation for rise in housing prices, may also have contributed to the vacant houses.

### INFERENCES

In the analysis for Household preferences, each parameter was identified in a manner that captures the cause and effect relationships of such parameters with the growth of residential development in the city. Hence, the split of city was done into five zones to capture the quantum and direction of such growth. This split into different zones is based on the heterogeneous characteristics with respect to access to Employment centres, Infrastructure, Amenities and demography.

Though the study is within PMC limits, but Residential activities are not only influenced due to city limits, but the entire

metropolitan region also acts as an external influences. The population base of a city is a crucial indicator of the potential of its Housing Market.

The extent of business activity and thrust on infrastructure development are critical factors affecting the Housing Market. The direction of Regional growth within a city is a factor in determining the fate of a particular Residential property.



# Figure 23 Criteria for Selecting a Residential Location based on Age Group Preferences Source: Survey and Analysis, 2012

Socio-demographic variables such as age, education and income also vary extensively for prediction of Household preferences. However, people being similar in demographic variables may show different preferences and behavioural patterns. This has to do with the growing variety in household variables and housing behaviour as a result of individualisation in many countries.



Figure 24 Criteria for Selecting a Residential Location based on Age Group Preferences Source: Survey and Analysis, 2012

Criteria for Selection for Residential Location: CURRENT FUTURE



Figure 25 Criteria of Selection for Residential Location in

PMC

### Source: Survey and Analysis, 2012

While, Budget and Location being the deciding factor influencing the Prospective Buyer, other factors like Amenities (Proximity to School, Colleges, Recreational areas etc), potential growth of the area, along with Design of the House are preferred over luxuries like Gymnasium, Swimming Pool and more. These preferences also reflect the shift of choice towards more Architectural sensitive Design of Space.



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### Figure 26 Reasons for Buying Source: Survey and Analysis, 2012

The reasons for buying include Investment, Changing Family needs, Proximity to Work place and Distance to other Services (Health – Education – Transport – Recreation facilities). Increasing demand and price trends of Housing sector has led the Prospective Buyer's view for Residential Location Choice as an Investment then followed by Changing Family needs. Which ultimately reflects that market conditions have overcome the shelter needs of an Prospective Buyer towards profit oriented approach.

The demand of Residential units has been largely driven by growth in the services, IT, ITeS and Automobile sectors. What sets Pune apart is a wide range of houses suiting various financial pockets, a multiple choice of Locations and ample availability of land. The core of the residential market is definitely moving to the eastern and western periphery of Pune, wherein some of the areas are on the line of gaining an upmarket profile.

The most preferred Residential regions by the Prospective Buyer lies within North-West Region, South-West Region and North-East Region which are also having the highest supply of units (%share) for 2013P.



Map 6 IT/ ITeS Locations in PMC Source: Primary Survey, 2012



Map 7 Future Growth directions of PMC

Source: Survey and Analysis, 201

### Table 11 Ranking of Regions preferred based on Preferences

Ranking of Variable; bajed on Preference;							
Rank	Regions Preferred	Rank	Location Preferred	Supply (% Share) 2013P*	Vacancy Level (% Share) 2013P	Rating (G – Good, A B – Bad) by Observa	– Average, tion
		1	Sinhagad Road		<b>15</b> %	Social Environment	Α
		2	Warje			Walkability	Α
1	DECION	3	Ambegaon	22%		Amenities	G
	REGION	4	Dhayari			Infrastructure	Α
		5	Katraj				
		1	Kothrud		<b>19</b> %	Social Environment	G
	NODTH UTCT	2	Baner			Walkability	Α
2	REGION	3	Balewadi	44%		Amenities	G
		4	Aundh			Infrastructure	G
		5	Model Colony				
		1	Vimannagar		<b>18</b> %	Social Environment	Α
		2	Kharadi	14%		Walkability	G
	NORTH – EAST REGION	3	Kalyani nagar			Amenities	Α
,		-4	Koregaon Park			Infrastructure	G
		5	Vishrantwadi				
		6	Dhanori				
	SOUTH – EAST REGION	1	Magarpatta Township		17%	Social Environment	Α
		2	Hadapsar	20%		Walkability	A
		3	Kondhwa			Amenities	Α
4		4	NIBM road			Infrastructure	Α
		5	Gangadham area				
		6	Sahakamagar				
	CENTRAL REGION				0%	Social Environment	G
				0%		Walkability	A
5						Amenities	G
						Infrastructure	Α

The analysis is based on the year of completion of projects. Source: Propequity, ASPIA, 2012

### What would be the Future Preference for the Residential Location



### Table 12 Listing of Administrative Wards based on Future preference for Residential Location

Listing of Variables based on Weightage				Variable (Administrative Wards considered) (n = 205)
	Variable (Administrative Wards considered) 1 Nagar Rd ( Vimannagar, Kharadi, Kalyani nagar) (61)		7	Dhankawadi (Ambegaon, Katraj) (30)
			8	Bibvewadi (NIBM Rd, Kondhwa) (23)
1			9	Sangamwadi (Dhanori, Vishrantwadi) (13)
2	Hadapsar (Magarpatta, Hadapsar) (60)		10	Sahakarnagar (Gangadham area, Sahakarnagar) (12)
3	Aundh (Baner, Balewadi, Aundh) (59)		11	Dhole Patil Rd (Koreanon Parts) (9)
4	Tilak Rd (Dhayari, Sinhagad Rd) (48)			
5	Kothrud (43)		12	Central Peth (7)
6	Worrie (22)		13	Ghole Rd (Model Colony) (3)

Source: Survey and Analysis, 2012



### Table 13 Matrix Showing Location Attractiveness of PMC Wards for Housing





The most preferred locations for residential choice are Sinhagad Road, Kothrud, Warje, Vimannagar and Magarpatta Township from each respective Region which lie on the Eastern and Western periphery of the respective regions. Some of the areas which have been recognised as premium location for decades, this demand has further lead to Saturation of the specific area and increase in Price segments.

Large share of supply and demand in North-west region is

expected to result in saturation of Residential space. Thus the other regions must also be diverged in this race by upgrading them to fulfil the user preferences.

From the perspective of risk, Residential property investment fares better because asset price generally remains stable for certain period and gives maximum on Investment return scale.



### **Residential Activity Drivers**

### Figure 27 Residential Activity Drivers Source: Survey and Analysis, 2012

From the growth and investment perspective, regions that have high concentration of business activity at present and projections of meaningful increment in future will have a comparative advantage over others that have saturated on this. Growth of business activity will create abundant employment opportunities which in turn will lead to a rise in inward migration and high demand for residential property in these regions. Besides employment, the other important factor from the Growth and Investment perspective is Infrastructure and Amenities development.

The Residential Location would be preferred and region will benefit on account of the growth in Employment opportuni-

ties, Infrastructure and Amenities development.

These findings can have immense bearing on policy and regulatory frameworks for future residential development anticipated in the Master Plan of the city. Some of the Users are very sensitive to geographical parameters whereas others are more responsive to economic and social parameters. Changing the geographic, social and economic parameter values through various policies, actions and strategies can alter the attractive potential of these regions for target groups and help residential demand allocation along the lines of anticipated plan.

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