

# Transitioning Residential Neighbourhoods: A Case Study of Jayalaximpuram, Mysore, India

B. Shankar, D.Vidhya

**Abstract:** In India, large cities are experiencing rapid population and spatial growths. The rising land costs are making the construction of reasonably priced. Local and Planning Authorities are encouraging to transition to commercial retail establishments or higher-density residential uses that supports the need to supply housing apartments by designating streets and areas. Many streets in residential areas have altered into commercial, public and semi public activity and apartments. Transition of land uses is inevitable in large cities like Mysore. Thus, the residential areas are affected greatly in terms of increasing density and overloading the existing infrastructure facilities by changing dynamics of land use. With a result of this, the residential areas are transforming into mixed land use. The City of Mysore is on the large and emerging metropolitan cities in the State of Karnataka. Jayalaximpuram residential neighbourhood is one among many residential areas which was developed immediately after Independence. The neighbourhood is experiencing rapid land use transformation. The paper presents the residential neighbourhood transformation due changing dynamics of land use in Jayalaximpuram, Mysore and proposes planning strategies for addressing the transitioning of residential land use.

**Keywords:** Transitioning, Diversity, Residential, Neighbourhood, Mixed Land Use.

## I. INTRODUCTION

Transition of land uses is inevitable in large cities like Mysore. The rising land costs are making the construction of reasonably priced housing more and more difficult. Local and Planning Authorities are encouraging to transition to commercial retail establishments or higher-density residential uses that supports the need to supply housing apartments by designating streets and areas. These kinds of land use decisions are becoming more and more critical to the promotion of economic well-being. Residential land use transition is also evident where development pressures mount at the environs of neighbourhoods in older areas that have become more intensively developed over the years. There is a need to address transition to more intense uses in areas where it would not be well-suited. The City of Mysore city is experiencing changing dynamics in residential areas namely Jayalaximpuram which need to be recognized and addressed properly by the Planning Authority in its development control regulations.

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## II. BACKGROUND OF MYSORE

Mysore is the second largest city in the State of Karnataka and it had a population of 887,446 as per 2011 provisional census figures and it increased from 7,85,800 in 2001. The name of Mysore was derived from *mahisha* (a demon). Formerly, the city was the state capital and head quarters of the Princely State of Mysore. It is situated at a distance 140kms from Bangalore, on the southern part of Karnataka State at 12° 18' North latitude and 76° 12' East longitude, and at an altitude of 770 mts above mean sea level. The city lies in a saucer shaped basin flanked by Chamundi hills on the south-east and a raised platform near Hinakal village on the west. The city has a salubrious climate and the temperature varies from 12° C to 35° C. The average annual rainfall is 798mm. The city spreads across an area of 128.42sq.kms.

## III. LAND USE PATTERN OF MYSORE

The general land use pattern of Mysore city owes its origin to its past. The old city is predominantly the central business district, which scattered around the palace. The land use for different periods from 1966 to 2009 is given in table 1.

Table 1: Land Use for the Period from 1966 to2009

Land Use	1966		1997		2009	
	Area in Hect..	% age	Area in Hect.	% age	Area in Hectare.	% age
Residential	2997.57	40.40	3057.30	42.60	6747.52	47.75
Commercial	211.25	2.41	182.23	3.00	467.04	3.30
Industrial	614.32	13.49	1021.01	8.73	1281.63	9.07
Parks and Open Spaces	625.25	5.49	415.77	8.9	765.36	5.42
Public and Semi-Public	1230.67	11.32	856.45	17.49	1517.34	10.74
Traffic and Transportation	911.77	20.22	1530.73	12.95	3238.01	22.91
Public utility	23.87	0.49	37.26	0.34	-	-
Water sheet	37.23	2.41	182.68	0.53	-	-
Agricultural	384.45	3.77	285.34	5.46	6747.52	47.75
Total	7036.38	100	7568.77	100	14131.97	100

Source: Mysore Urban Development Authority, Mysore

**IV. BACKGROUND OF JAYALAXMIPURAM**

Jayalaxmipuram residential layout was developed in the year 1950, in the name of Jayalakshmi Ammani, the elder daughter of the Maharaja Chamaraja Wodeyar IX and it is experiencing fast growth.

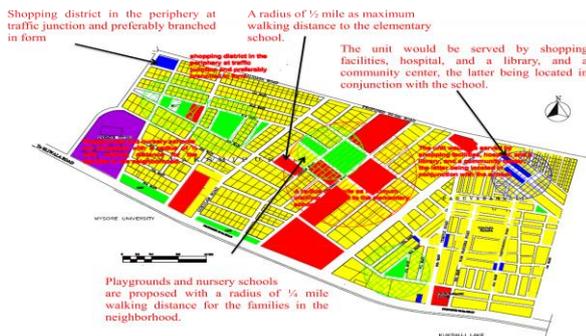
The area at that time was considered to be in periphery of Mysore city. The area was surrounded by urban villages namely Padavarhalli, Vontikoppal and Kumbarkoppal and newly developed neighbourhoods of Vanivilasa Mohalla. The neighbourhood had a population of 4012 in 1991 increased to 4935 in 2001 and 5785 in 2011. The sites of sizes viz. 40'x60', 50x80', 60x80 and 80'x 120' and 120x180' or higher were designed and allotted to the local residents. The number of houses in these neighbourhood have increased from 917 in 196 to 1157 in 2011. The bigger size plots on major roads has an added advantage for the builders to construct the multi dwelling units with compromising very less on the setbacks. The roads designed at that time were very large enough to sustain the dense population along with the then parking facilities. And thus, vertical growth of residential buildings has gained a prominent role in Jayalaxmipuram.

**Table 1: Growth Trends of Population and Housing**

	1991	2001	2011
Population	4012	4935	5785
Male	1999	2463	2881
Female	2013	2472	2904
Houses	917	983	1157
Road length	18.5	18.5	21.2

**V. NEIGHBOURHOOD CONCEPT OF JAYALAXMIPURAM**

The earlier neighbourhood design of Jayalaxmipuram is given in fig.1.

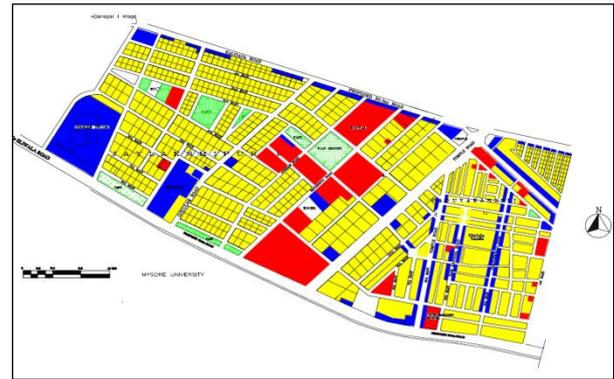


**Fig.1 Concepts of Jayalaxmipuram Neighbourhood Design**

Jayalaxmipuram Neighbourhood was designed for population between 4,000 and 5,000. It was developed as a low density of 10 families per acre for dwelling area. It had extent of 98.54 hectares. It is served by shopping facilities, hospital, and a library, and a community center, the latter being located in conjunction with the school. Major arterials pass at one end of neighbourhoods, and green buffer is provided to the highway with a service road at the edge of the neighbourhood. The circulation system has been designed to avoid major traffic in the layout except on the edges and mid of the layout namely Gokulam Road.

**VI. LAND USE OF JAYALAXMIPURAM: 2011**

The land use in 2011 as per the primary survey conducted by the researchers is depicted in the fig.2.



**Fig.2 Land Use of Jayalaxmipuram: 2011**

**Table 2: Land Use of Jayalaxmipuram 1960**

Land Use	Area in hectares	Percentage	Norms
Residential	49.40	50.12	45-50
Commercial	5.13	5.21	3-5
Public and semi public	8.67	8.80	8-10
Park and open space	7.10	7.21	12-15
Traffic and transportation	28.37	28.80	20-25
Total	98.54	100	100

In 1960, the land use in this neighbourhood was residential which accounts for 50.12 per cent followed by Traffic and Transportation 28.8 %, Public and semi-public 8.8%, Parks and open spaces 7.21% and commercial 5.21%. The educational institutions, specialized hospitals, popular hotels are located in this area. It is considered as one of the posh localities of the city. The area has many modern shopping malls. The busiest street is Kalidasa road which is always buzzing with activity, with many foreigners and IT-BT professionals shopping in the area.

**Table 3: Land Use Pattern in Different Periods**

Land Use	1960		2009		2012	
	Area in hectare	% of land use	Area in hectares	% of land use	Area in hectares	% of land use
Residential	49.40	50.12	47.60	48.31	45.64	46.3
Commercial	5.13	5.21	6.23	6.33	8.41	8.54
Public and semi public	8.67	8.80	10.07	10.22	14.80	15.0
Park and open space	7.10	7.21	7.40	7.50	7.40	7.50
Traffic and Transportation	28.37	28.8	29.80	30.24	29.80	30.2
Total	98.54	100	98.54	100	98.54	100



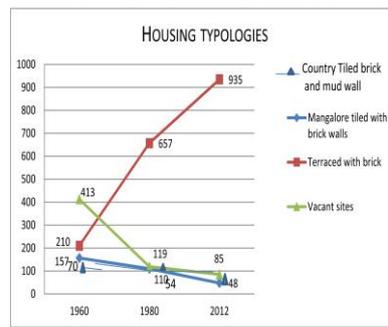
The total area covered under residential use is 45.64 hectares. This works out to 46.32% of the total built up area. The net residential density of population, as per 2001 census works out to be 5645 persons per sq km in 2012. The residential use has decreased from 49.40 hectares to 47.60 hectares from 1960 to 2009 and 45.64 in 2012. The area under commercial use is 8.41 hectares forming 8.54% of the total built-up area. Under Commercial use, the areas utilized for retail business, whole-Sale business, ware-houses, shopping mall, cinema theatres, hotels etc., are included. Commercial activity is predominant in this area so the commercial use has increased from 5.13 hectares to 6.23 hectares from 1960 to 2009 and 8.41 hectares in 2012. Hotel industry is predominant in this area; most of popular restaurants and hotels are located in this area. The area under public and semi-public uses is about 14.80 hectares which works out to be 15.0% of the total built-up area. This includes the area utilized for public offices, educational institutions and hospitals. The major specialized hospitals namely Chandrakalla Hospital, Basappa Memorial Hospital are located in this area. Most of the recognized institutions are also located in Jayalaxhmipuram . It is becoming a regional-hub for education. All levels of educational institutions from primary school to post graduation levels are located in this area. Mahajana College is one of the prime institutions in this area has educational facilities from pre-school to post-graduation level. An area of 9.45 hectares is covered under Park and open space use which accounts for 4.08 per cent of the total developed area and it very low when compared to the planning standards of size and population of the area. The area under traffic and transportation is 287.40 hectares which accounts for 23.01% of the total built-up area.

**VII. HOUSING TYPOLOGIES IN JAYAXMIPURAM**

By 1934, the City Improvement Trust Board had developed 570 sites and 100 model houses at an estimated costs of Rs. 350,000. The model houses were built with brick masonry with mud mortar, country tiled with lime plastering. A set back occurred in the progress of the City Improvement Trust Board between 1931 and 1937, perhaps due to the world wide economic depression during that period. As a result, the sites formed in Jayalaxmipuram was not be sold as the area was not attractive enough at that time for shelter to purchase sites and build houses. The Board decided to develop the area at its own funds and reduce the rate from 30 paise to 15 or 7 paise per square meter, remotest sites in the extension was the cheapest. Over a period of time, by 1950 the housing typologies have changed from Country and to Mangalore tiled in 1960 to terraced structures in 2011 and the details are given the table 4.

**Table.4: Housing Typology in Jayalaxmipuram**

Year	1960	1980	2011
Country Tiled brick and mud wall	70	54	-----
Mangalore tiled with brick walls	157	110	48
Terraced with brick	210	657	935
Vacant sites	413	119	85



Model house constructed in 1955



**Fig.3 Housing Transformations in Jayalaxmipuram**

**VIII. RESIDENTIAL TRANSITION**

The residential transition and its gravity can be known through its diversity and the diversity can be measured by using: Hirschmann- Herfindahl Model. In this model, it is assumed that households like a mixed residential urban environment in terms of different land uses other than housing in the present system, where employment is an indicator for land use, this suggests that not just the number of jobs, but also the composition of total employment in different activities of mixed land use. Therefore, it is to define a diversity index so as to be able to examine the impact of a mixture of employment and housing on property values. Let  $H_h$  denote the number of households in a neighbourhood of house  $h$  and  $E_{gh}$  the number of employees in sector  $g$ . The diversity index for house is the inverse of the Hirschmann- Herfindahl index:

$$D_h = 1 / (\sum_{\forall g} (P_{gh}^2) + P_{Hh}^2)$$

In other words  $P_{gh}$  and  $P_{Hh}$  represent employment and household shares of the sum of employment and households respectively. If the activity is only housing the index is one and the index value increases as activities in the neighbourhood becomes more diverse.

where  $P_{gh} = E_{gh} / (H_h + \sum_{\forall g} (E_{gh}))$  and  $P_{Hh} = H_h / (H_h + \sum_{\forall g} (E_{gh}))$ .

Data sets of Jayalaxhmipuram

$$P_{gh} = E_{gh} / (H_h + \sum_{\forall g} (E_{gh}))$$

$$P_{gh} = 796 / (4012 + \sum_{\forall g} (796))$$

$$= 796 / (4012 + 2388)$$

$$P_{gh} = 0.124$$

Type	No of shops	Average no of employees	Total no of employees
Hotels	16	10	160
Retail shops	115	3	345
Super market	3	10	30
Service station	7	5	45
Banks	5	15	60
others	52	3	156
		Total	796

$$P_{Hh} = H_h / (H_h + \sum_{g} (E_{gh}))$$

$$P_{Hh} = 4012 / (4012 + \sum_{g} (796))$$

$$= 4012 / (4012 + 2388)$$

$$P_{Hh} = 0.626$$

The diversity index for house is the inverse of the Hirschmann Herfindahl index:

$$D_h = 1 / (\sum_{g} (P_{gh}^2) + P_{Hh}^2)$$

$$D_h = 1 / (\sum_{g} (0.124^2) + 0.626^2)$$

$$= 1 / (\sum_{g} 0.0153 + 0.39)$$

$$= 1 / (0.0459 + 0.39)$$

$$= 1 / 0.435$$

$$D_h = 2.30$$

If activities in the neighbourhood of the house under consideration are fully concentrated in one sector, or when only households occupy in the neighbourhood of house  $h$ , we find  $D_h=1$  and this index increases as activities in this neighbourhood become more diverse. In this sector  $D_h=2.30$  this indicates activities are in this neighbourhood.

### XI. CHALLENGES

The major phenomenon of transitioning residential land use resulting into mixed land use pattern is difficult to get alter. The commercial activities have intruded into residential areas especially all along major roads. In order to address the transitioning residential areas, Jaipur city was planned to introduce mixed residential and non residential activities in the zonal development Plans by identifying the various use-zones/activities to be permitted in various parts of the proposed Mixed Land Use Area. The mixed use in the same building like residential cum commercial or residential cum institutional or residential cum services industry could be permitted as per the Land use Zoning Code. In case of Bangalore, Mixed land used was proposed in Master Plan and the honourable High Court of Karnataka directed the authorities to disallow fresh construction of non-residential nature in areas classified as residential in the Revised Master plan 2015. Strictly speaking, land use changes are not permitted as per zonal regulations. However, there is a potential scope to address the diverse neighbourhood of mixed land use due to transitioning of residential areas by way of introducing a Mixed-land-use concept by amending

the Karnataka Town and Country Planning Act, 1961 and regulations.

### XII. PLANNING STRATEGIES

The transitioning of residential areas need to be recognised in the Master Plans. Recent trends in the large city's development dynamics indicate a maturing neighbourhood into institutional and commercialising trends and a decrease in traditional housing typologies resulting in market demand changes and preferences. These trends inevitably result in more land uses transitioning to meet the new demands of the area. As a result of needs and demands, change causing inevitable transition of land uses in residential areas. The impact of land use transition need to be anticipated well in advance and planned for to ensure that it occurs in a manner beneficial to the city planning and to the overall community. Encourage less intensive commercial uses, small offices and compatible uses adjacent to existing residential neighbourhoods by allowing adaptive reuse of single-family units on the edge of neighbourhoods. Adopt additional zoning districts to provide more options for appropriate intensity of development, such as neighbourhood business districts and transition districts.

Besides, mixed land use has positive and negative environmental impacts. Therefore, formulation of a balanced policy of mixed use considering its environmental impact and the socio-economic is need of an hour. Non-residential activity on residential premises should be permitted selectively and carefully, taking into consideration community needs, environmental impact and provision for safe and easy traffic circulation and adequate parking. Mixed Use streets to be identified based on traffic/parking studies. For identification of mixed use streets in zonal regulations, mixed use may be permitted on ground floor, in residential plots facing streets/road of minimum 15.0 or 18.0 meters. Only selective commercial/ non-residential activity should be allowed in the residential premises by considering the needs of the residents, environmental concerns, secure and painless traffic movement and ample of parking space. Permissible use of land includes the retail shops, convenience stores and any other specific use or professional activity not considered harmful for the society. The front setback should be used only for parking purpose. The premises are to be entered only from the service lane, but, the direct entry from the main road to be avoided. The planned nature of the residential area is to be preserved.

### XIII. CONCLUSIONS

The City of Mysore is experiencing changing dynamics in residential areas. Jayalaximpuram is the one of the old residential layouts developed immediately after the Independence India. The diversity index for house is the inverse of the Hirschmann- Herfindahl index and in this neighbourhood  $D_h = 2.30$  this indicates activities are diverse in this neighbourhood, Jayalaximpuram has been transitioning into mixed land use pattern and is difficult to get alter. A well developed policy would set the tone for harmonised development of existing residential areas in to transitional area and mixed land use area by rezoning of existing residential areas.



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