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Implementation of Principles of New Urbanism on Malegaon City (Nashik District)

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Abstract: ***In the past era the towns were formed by settlements of people around their place of work. The workers used to construct temporary residences as close to their workplace such as factories and industries to reduce travelling distances. These temporary residences eventually converted into permanent residences and in the same way entire towns were established.***
Due to lack of planning and haphazard uncontrolled land usage various problems started to grow in these towns. This project focuses on one such town named Malegaon in Nashik district in Maharashtra. This town was formed by accumulation of handloom workers around handloom industries which have been in this city for many decades. Improper distribution of land and lack of planning of development have given rise to problems such as traffic congestions, poverty, riots between multiple communities, lack of employment opportunities other than looms and overall deprivation of standard of living.
This project focuses on solving a few of these problems by implementation of principles of new urbanism on the Malegaon city. The principles upon implementation will help to improve transportation efficiency, easier access to public facilities and utilities, elevation of standard of living of the citizens and overall development of the area.
Keywords: New Urbanism, Malegaon, Nashik, Walkability, Connectivity, Diversity, Housing, Transportation, Sustainability, neighborhood, Density, Architecture

I. INTRODUCTION

In the 21st century the primary approach for planning in urban spaces is generally based on accommodating as many people in area as possible while keeping secondary the consideration for ease of access to the community centres, recreational activities and amenities secondary. This was a result of increasing land and construction costs and the need for high-speed development of the available lands. Due to this not only the physical distance between the residents and units which are a part of their day-to-day activities has increased but also the mindset of the people towards ease of access of such amenities has also changed compared to that of previous centuries. Multiple important places have been found to be ignored due to lack of access through proper transportation and this changed mindset of people.

Concept of new urbanism provides sustainable solution to such problems by keeping the residences at the centre and providing all amenities, recreational places, retail shops etc. within walkable distances. New urbanism focuses on human scaled design while minimising the transportation costs thereby reducing all the problems associated with it such as pollution due to carbon emission and traffic congestion.

New urbanism also involves making use of the ignored places which can be changed into something that will improve the appearance of the community as a whole and thereby optimize the land usage.

Principles of new urbanism considered for this project are as follows:

A. Walkability

Most needs are within a 10-minute walk of home and work. Street design is friendly to pedestrians, because buildings are close to the street and have porches, windows, and doors. Streets have lots of trees and on-street parking, with parking lots and garages placed behind buildings and houses, often connected to alleys. Streets are narrow, which slows traffic dramatically.

B. Connectivity

An interconnected street grid disperses traffic and encourages walking.

C. Mixed use and Diversity

Neighbourhoods, blocks, and buildings offer a mix of shops, offices, apartments, and homes. The neighbourhood welcome people of all ages, income levels, cultures, and races.

D. Mixed Housing

Zoning allows the close proximity of a wide range of housing types, sizes, and prices.

E. Quality Architecture And Urban Design

Buildings emphasize beauty, aesthetics, and comfort and establish a sense of place; public spaces function as civic art, establishing an attractive, quality public realm.

F. Traditional Neighbourhood Structure

Neighbourhoods have definite centres and edges, with public spaces near the centre. Each neighbourhood contains a range of uses and densities within a 10-minute walk.

G. Increased Density

Buildings, residences, shops, and services are close together to make walking more convenient, services and resources more efficient, and living areas more enjoyable.

H. Smart Transportation

A network of high-quality public transit connects cities, towns, and neighbourhoods, while pedestrian-friendly design encourages more use of bicycles, rollerblades, scooters, and walking as daily transportation.

I. Sustainability

The community uses respect for natural systems and eco-friendly technologies like energy efficiency to minimize effects on the environment. The community connects strongly with surrounding farmland, encouraging land preservation and local food consumption.

J. Quality of Life

These design principles produce a life that is well worth living by providing places that enrich, uplift, and inspire the human spirit.

II. METHODOLOGY

The methodology used in this project is shown in the flowchart below. Initially a problem area will be identified and complete data relevant to principles of new urbanism will be collected for that area. Principles of new urbanism will be studied in detail using literature review which will give us an insight into the work done in the past. By application of principles of new urbanism, the problems identified will be rectified and improved arrangement/layout will be reached which will be submitted as final proposal.

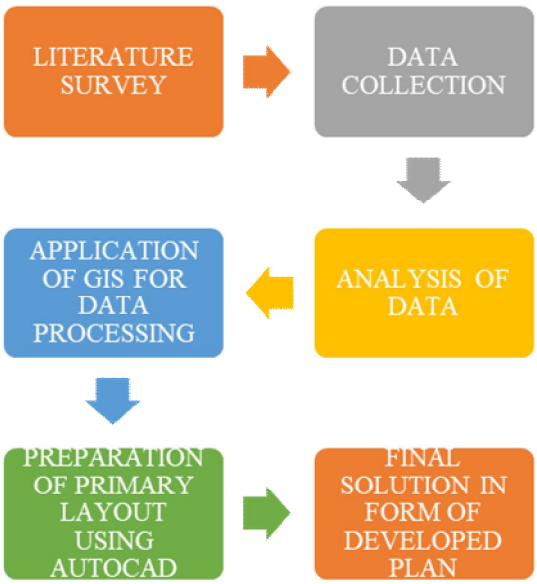

Figure 1 Methodology

III. DATA COLLECTION

A. *Study area profile*

1) *Location:* The Malegaon is taluka headquarter of Malegaon taluka in Nashik district of Maharashtra state. It is situated on the latitude of 20 degree 32 minutes north and longitude of 74 degree 35 minutes east. Its height above mean sea level is 1404 ft. It is situated on Mumbai Agra N.H. 3 at a distance of about 116 Km. from Nashik towards Agra side. Malegaon town has no railway facilities. The nearest railway station is Manmad junction on central railway which is about 38 Km from Malegaon and is connected by state highway. The Gujarat and Madhya Pradesh state borders are about 100 Kms from Malegaon town.

Figure 2 Location map of Malegaon

2) *History:* Malegaon town has historic importance. There is a fort on the eastern bank of river Mosam that was built by Maratha sardar Naro Shankar Raje Bahadur in 1755. It was built by workers from Delhi and was completed in a span of 10 years. After construction of the fort these workers were settled at Malegaon. For protection of this fort Raje Bahadur had maintained an army of Momin soldiers who in future started the handloom industry in Malegaon. During the pre-independence period Malegaon became well known centre in handloom industry. As a result of industrialisation, the handlooms were converted into power looms and at present Malegaon is one of the biggest power loom industry centre in Maharashtra.

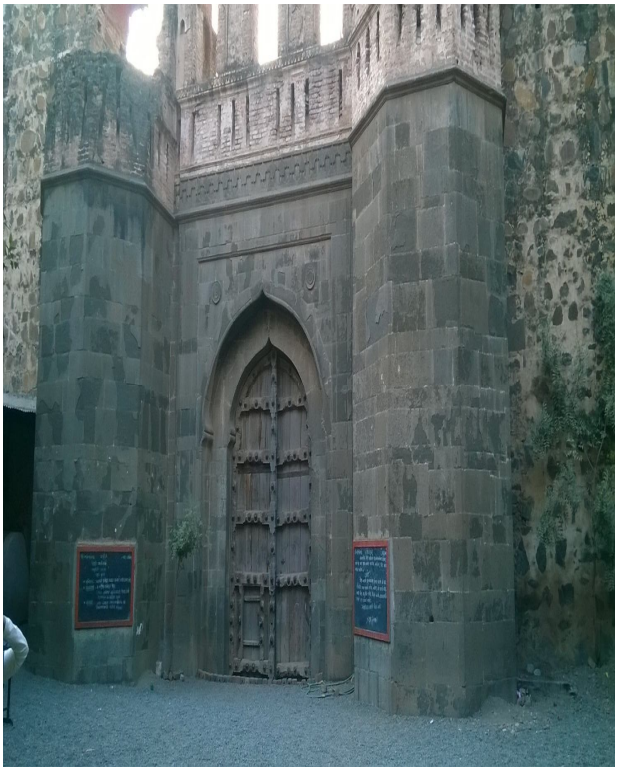
Figure 3 Malegaon Fort

3) *Population:* The population of Malegaon town has slowly but steadily increased over the last hundred years. From mere 19,054 in 1901, the total of population of the town had reached 4,09,403 in 2001. As shown in Table 2.1, the town witnessed highest addition in number of persons during 1981-1991, but highest annual growth of the population in the town was during the decade of 1951-61. During 1991-2001, the growth rate of population in comparison to other decades has slowed down indicating that perhaps the town is becoming economically moribund/stagnant and as such not able to attract higher number of migrants. However, it is projected that population of the city will increase to 4,76,641 in 2011, 5,47,769 in 2021, and 7,61,154 in 2051 (also see Figure 2.1). Another peculiar aspect of the demographic characteristic of the town is that more than half of its total population lives in slums.

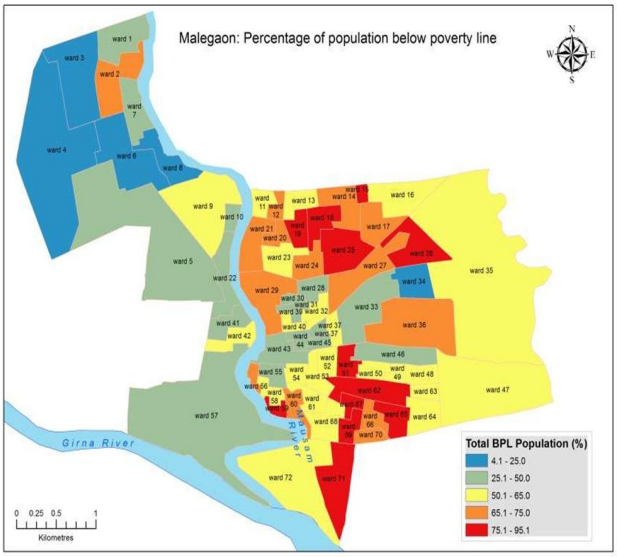

Figure 4 Population below poverty line

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Table 1 Sampled household families and population by ward

Ward No.	Number of sampled households	Number of individuals by sex		Total surveyed population	Percentage		
		Male	Female		Male	Female	Total
1	3	122	83	205	59.51	40.49	100
2	31	81	85	166	48.80	51.20	100
3	30	75	72	147	51.02	48.98	100
4	36	93	86	179	51.96	48.04	100
5	30	77	70	147	52.38	47.62	100
6	30	80	72	152	52.63	47.37	100
7	31	101	101	202	50.00	50.00	100
8	30	89	81	170	52.35	47.65	100
9	31	96	87	183	52.46	47.54	100
10	34	88	82	170	51.76	48.24	100
11	33	98	80	178	55.06	44.94	100
12	31	120	84	204	58.82	41.18	100
13	60	235	194	429	54.78	45.22	100
14	61	216	220	436	49.54	50.46	100
15	31	89	73	162	54.94	45.06	100
16	31	108	96	204	52.94	47.06	100
17	30	93	78	171	54.39	45.61	100
18	31	116	117	233	49.79	50.21	100
19	31	113	118	231	48.92	51.08	100
20	62	243	213	456	53.29	46.71	100

21	36	102	107	209	48.80	51.20	100
22	30	75	64	139	53.96	46.04	100
23	35	137	105	242	56.61	43.39	100
24	30	95	95	190	50.00	50.00	100
25	30	103	96	199	51.76	48.24	100
26	30	83	66	149	55.70	44.30	100
27	31	115	102	217	53.00	47.00	100
28	30	88	71	159	55.35	44.65	100
29	31	93	91	184	50.54	49.46	100
30	30	65	71	136	47.79	52.21	100
31	30	59	80	139	42.45	57.55	100
32	42	105	109	214	49.07	50.93	100
33	31	73	62	135	54.07	45.93	100
34	30	58	61	119	48.74	51.26	100
35	31	100	99	199	50.25	49.75	100
36	32	103	102	205	50.24	49.76	100
37	32	125	117	242	51.65	48.35	100
38	29	129	121	250	51.60	48.40	100
39	30	101	102	203	49.75	50.25	100
40	31	107	118	225	47.56	52.44	100
41	31	111	98	209	53.11	46.89	100
42	30	111	102	213	52.11	47.89	100
43	30	123	113	236	52.12	47.88	100
44	32	107	103	210	50.95	49.05	100
45	31	127	124	251	50.60	49.40	100
46	30	135	103	238	56.72	43.28	100
47	31	109	104	213	51.17	48.83	100
48	33	131	121	252	51.98	48.02	100
49	32	133	126	259	51.35	48.65	100
50	34	129	106	235	54.89	45.11	100
51	34	127	120	247	51.42	48.58	100
52	32	153	114	267	57.30	42.70	100
53	30	120	106	226	53.10	46.90	100
54	30	117	108	225	52.00	48.00	100
55	30	112	130	242	46.28	53.72	100
56	33	111	102	213	52.11	47.89	100
57	30	86	88	174	49.43	50.57	100
58	33	96	108	204	47.06	52.94	100
59	31	122	105	227	53.74	46.26	100
60	31	115	122	237	48.52	51.48	100
61	31	102	111	213	47.89	52.11	100
62	32	125	113	238	52.52	47.48	100
63	30	134	98	232	57.76	42.24	100
64	32	115	133	248	46.37	53.63	100
65	32	125	123	248	50.40	49.60	100
66	33	132	126	258	51.16	48.84	100
67	30	103	105	208	49.52	50.48	100
68	31	109	110	219	49.77	50.23	100
69	34	143	124	267	53.56	46.44	100
70	30	112	107	219	51.14	48.86	100
71	30	104	112	216	48.15	51.85	100
72	33	122	102	224	54.46	45.54	100
Total	2354	8,050	7,498	15,548	51.78	48.22	100

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Table 2 Recorded and projected population of Malegaon

Year	Population	Decennial Variation	Decadal Variation (%)	Annual Growth Rate (%)	Projected Population (based on 1951-2001 recorded population)
1901	19,054	--			
1911	19,060	6	0.03	0.31	--
1921	23,505	4,445	23.32	2.33	--
1931	29,442	5,937	25.26	2.53	--
1941	36,780	7,338	24.92	2.49	--
1951	55,022	18,242	49.60	4.96	--
1961	1,21,408	66,386	120.65	12.07	--
1971	1,91,847	70,439	58.02	5.80	--
1981	2,45,883	54,036	28.17	2.82	--
1991	3,42,595	96,712	39.33	3.93	--
2001	4,09,403	66,808	19.50	1.95	--
2011	--	--	--	--	476641
2021	--	--	--	--	547769
2031	--	--	--	--	618897
2041	--	--	--	--	690025
2051	--	--	--	--	761154

B. Household Sizes

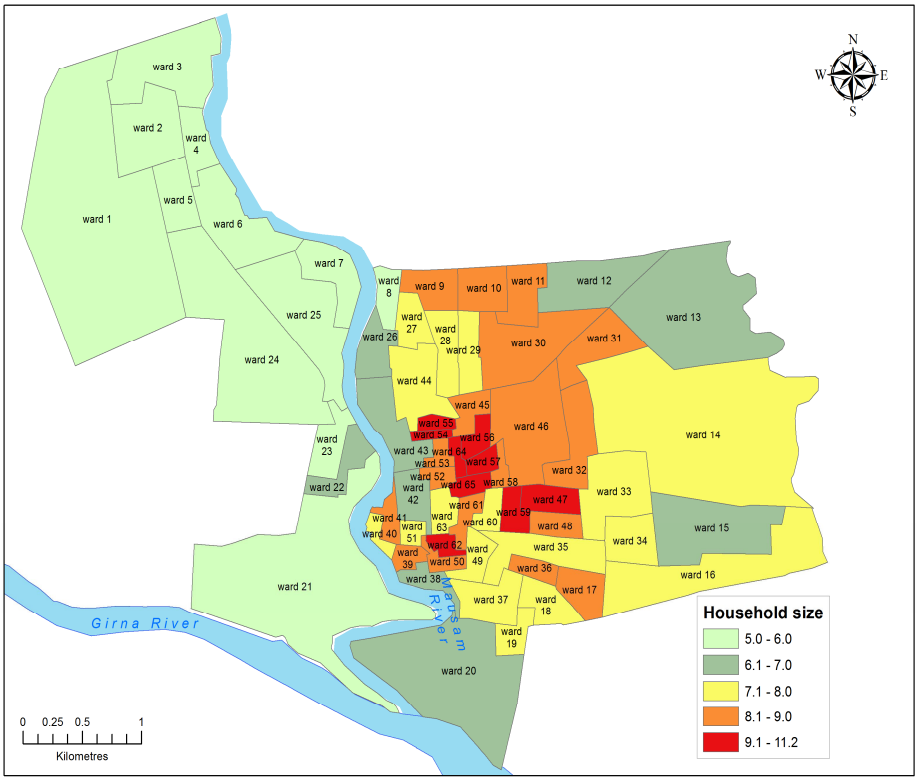

Figure 5 Household size in Malegaon (2001)

C. Sex Ratio and age Structure

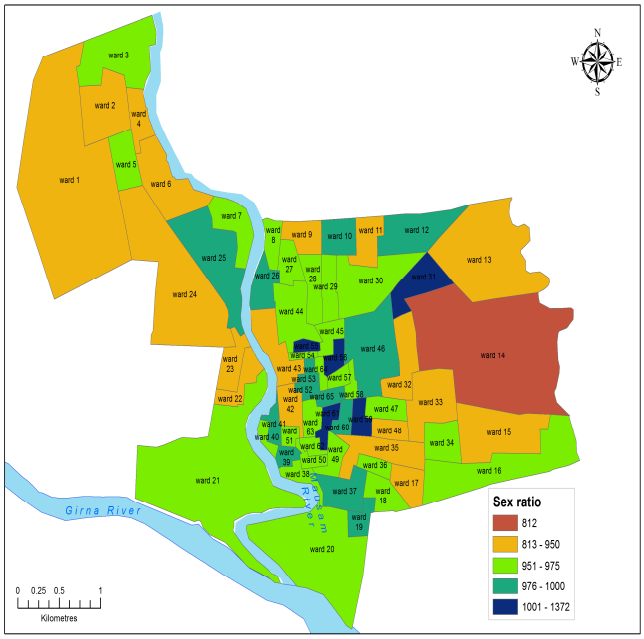

Figure 6 Wardwise sex ratio in Malegaon

D. Economic Activity Status of Population

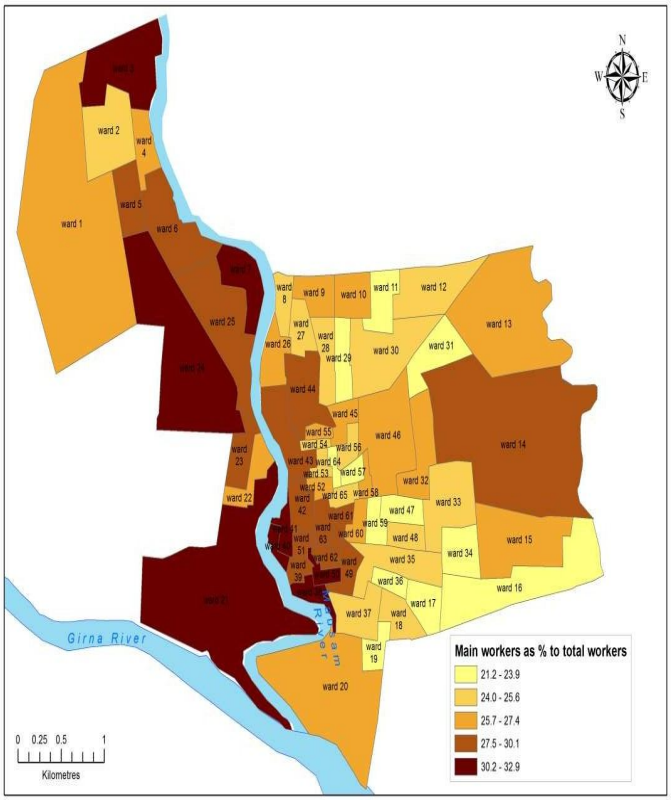

Figure 7Share of main workers to total workers in Malegaon

E. Type of Work and Monthly Income

Table 3 Monthly earning by type of work in Malegaon

Type of Work	Mean	N	Std. Deviation
Administrative Govt. Employee grade 'A '	30933	7	21810
Administrative Govt. Employee grade 'B'	7339	22	6034
Advocate	12375	4	12051
Agents	2921	28	1813
Bag making	3800	2	3111
Baker	4678	9	6387
Builder	13600	5	6309
Carpenter	2467	15	1750
Clerk/ Supervisor	7373	55	5938
Cloth weaving - handloom/power-loom	2376	2071	1886
Computer programmer	5714	7	4461
Doctor	9960	20	10804
Drivers taxi/ rickshaw (own vehicle)	3133	15	1529
Engineers	17538	13	11472
Event managers	800	1	.
Executive in private sector	6500	3	3122
Fabrication (grill & shutter work)	3007	28	3460
Farming	4881	21	5886
Giving own vehicles/ shops/ flats on rent	2000	2	
Goaetry	1000	1	.
Hawkers	2238	140	1496
Hotel Owner	6056	16	4308
Hotel workers/manager	1818	49	770
Housewife	4	2828	160
Interior decorator	2000	1	.
Lecturer/ Professor	43250	4	20549
Manual worker	1893	279	1042
Masonry/painter	2176	103	1037
Mechanic	2793	57	2542
Nurse	1200	4	589
Poultry	1200	1	.
Primary school teacher	10210	69	7817
Religious service	2336	22	1807
Scrap- dealers	2971	28	1356
Secondary school teacher	15240	20	10029
Shop- general	3164	377	5669
Student	5	4516	231
Student plus working	1945	20	1794
Tailoring and embroidery	1482	144	1659
Taxi/ Rickshaw drivers	2849	176	2282
Any other	2978	793	4379
Total	911	15548	2724

F. Educational Attainments

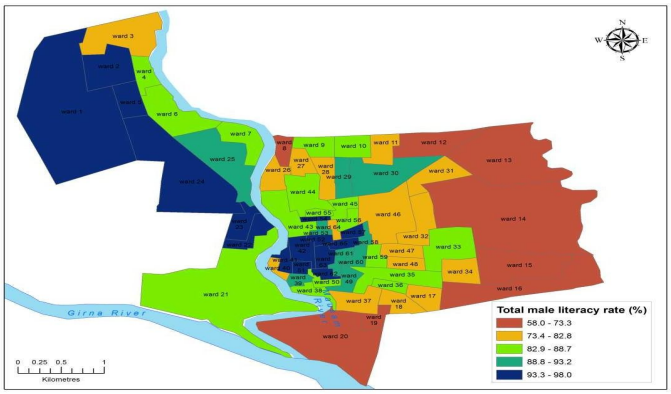

Figure 8Male literacy rate % in Malegaon (2001)

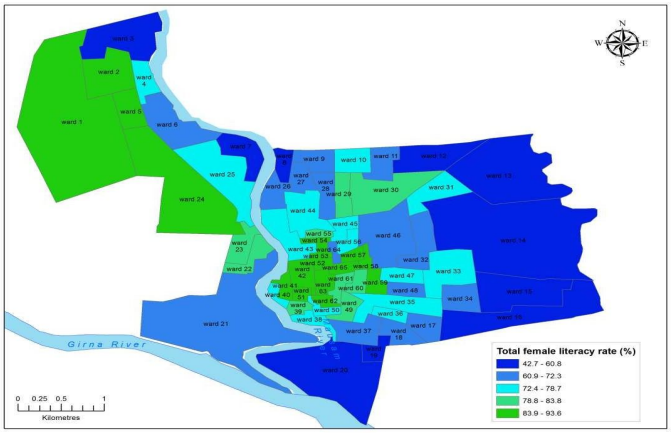

Figure 9 Female literacy rate % in Malegaon (2001)

G. Health Infrastructure

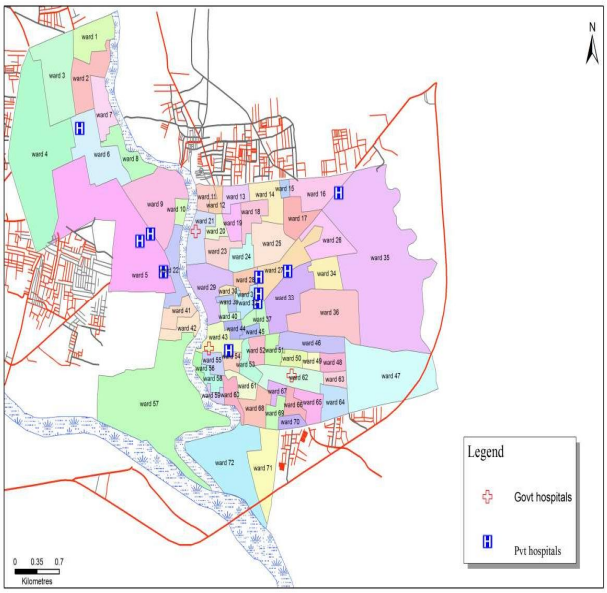

Figure 10Location of some health facilities in Malegaon

H. Textile industry in Malegaon

Table 4 Workers engagement in power looms and plastic industries in Malegaon

Ward name	Power looms		Plastic and sizing industries	
	No. of power looms	No. of workers	No of industries	No. of workers
Sanghmeshwar Part-1	179	70	0	0
Sanghmeshwar Part-2	175	86	0	0
Sanghmeshwar Part-3	44	5	0	0
Camp Part -1	0	0	0	0
Camp Part -2	0	0	0	0
Camp Part -3	0	0	0	0
Islampura Part-3(A)	267	709	2	10
Islampura Part-3 (B)	0	0	0	0
Islampura Part-4	8699	2900	7	84
Islampura Part-5	8	2	0	0
Islampura Part-6	7209	2403	8	96
Islampura Part-7	899	300	2	24
Islampura Part-8	1419	473	1	12
Navapura Part-1	4364	1455	2	0
Navapura Part-4	14966	4990	10	120
Islampura Part-1	349	116	0	0
Islampura Part-2	153	51	0	0
Navapura Part-2(A)	4528	1251	3	36
Navapura Part-2(B)	0	0	0	0
Navapura Part-3(A)	1098	272	0	0
Navapura Part-3(B)	1494	371	0	0
Navapura Part-2(C)	1253	245	1	5
Other areas of Malegaon	9090	2945	3	36
Total	56194	18644	39	423

IV. DATA ANALYSIS

From the data collected so far, we are able to identify some basic problems in the current plan of Malegaon town. By application of principles of new urbanism, we are able to provide some solutions to overcome these problems. These solutions will also be reflected in our final proposal in the form of a new development plan for Malegaon.

A. Suggestion of Improvements as per Collected Data

1) Principle: Walkability

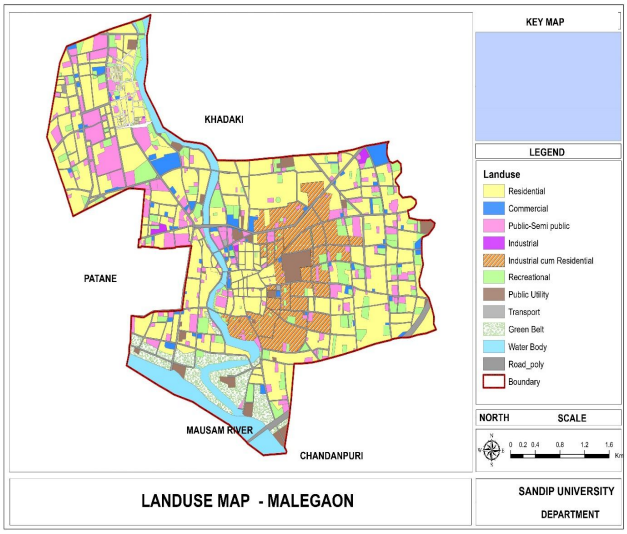

Figure 11 Street map of area

a) Observations: as per the data collected it is observed that at present most of the functional units are at walkable distance from each other i. e. workplace and residence are already close to each other. Because of restricted vehicular traffic movement roads are not crowded all time. But there are certain specific time spans in a day in which the roads are so crowded that it is impossible to commute.

Figure 12 Narrow streets

b) Suggestions: Rearrangement of some routes and road elements can reduce the crowding in these specific time spans and increase the walkability for the residents.

2) *Principle:* Connectivity

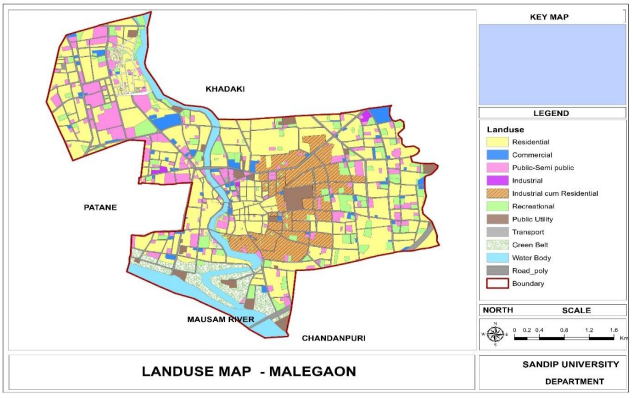

Figure 13 Road connectivity map

a) *Observations:* most of the transportation is done by autos as per the collected data. This increases the number of vehicles occupying the roadway at a given time and at the same time increases the CO2 output thereby damaging the environment. Also, there are no proper connections established between major market places and residential areas as the handloom workers have occupied the land around the looms in a disorganized manner.

Figure 14 Modes of transportation

b) *Suggestions:* It is possible to reduce the number of vehicles on the road at a time by promoting the use of city buses. The city buses should be allowed to drive in loops around the city at least 3 time a day.

Some of the existing roads can be permitted for only one-way traffic along upward or downward directions while some of the roads need to be switched to two-way traffic to manage the traffic congestion problems effectively

Routes of city bus should be reorganized to connect residential and commercial area and residential area with schools and colleges.

3) *Principle:* Mixed use and Diversity

Figure 15 Diversity among habitants

a) *Observations:* From the collected data it is evident that apart from the riots and some minor scuffles in most of the areas in Malegaon multiple communities are living with each other in harmony but still the household businesses haven't been able to prosper on the onset of power loom boom. Most of the people in vicinity allow people from all income levels, ages, cultures and races to coexist. Contribution of women towards the business is also not considerable.

b) *Suggestions:* The working places for businesses other than the handlooms should be placed in front of the houses which will provide easy access to the business for customers. Traditional businesses should be given incentives or short-term interest free loans to promote the small-scale businesses. Housewives should be encouraged to take part in running or at least contributing in small or medium scale businesses which will ensure overall growth of females in the area.

4) *Principle:* Smart transport

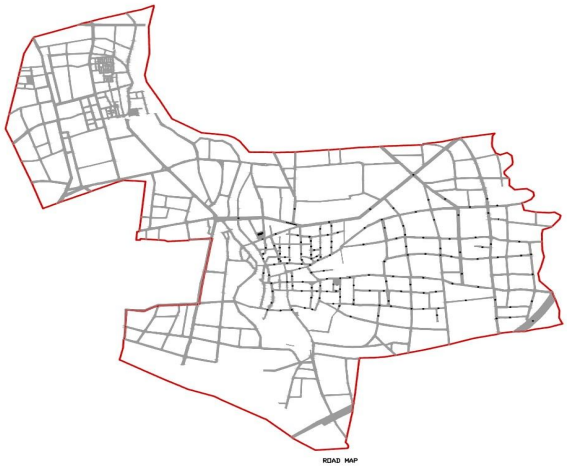

Figure 16 Road route map

a) *Observations:* Most of the transport in the city is still being done by autos, cycles and scooters which is problematic with respect to environmental damage as well as traffic congestion. The routes are also not well organised and thus cause more traffic at the peak hours.

b) *Suggestions:* more city buses can be used to increase the use of public transport by increasing bus frequency. Flyovers can be constructed to reduce the traffic congestions during peak hours.

5) *Principle:* Increased density

a) *Observations:* As per the data collected the area under question is already densely populated but most of the houses are low rise structures which reduces the availability of vacant land for recreational purposes.

Figure 17 Increased density

b) Suggestions: Redevelopment should be suggested focusing on construction of high-rise structures beginning with at least G+3 type buildings. This will reduce the density of housing and provide enough vacant land for provision of amenities such as garden or playgrounds.

The principles mentioned here onwards are automatically satisfied by implementation of above-mentioned measures.

6) Principle: Traditional neighbourhood structure

Figure 18 Traditional neighborhood structure

a) Observations: The handlooms were established a century ago in Malegaon and the housing was kept cl0oser to the looms by workers which are the reason why the most of the land usage of mixed type which means there is no fine boundary established between residential and industrial area.

b) Suggestions: The residential and industrial areas need to be reorganized so that a fine balance can be established between the two.

7) Principle: Quality of life

a) Observations: As the looms are close to the houses the noise pollution and air pollution due to fine fibre particles from power looms are a frequent observation.

b) Suggestions: There should be sufficient spacing provided between the houses and the power looms and the looms should be informed about measure to reduce the noise pollution. The workers should be equipped to wear the masks and other safety equipment for protection against the air pollution.

8) Principle: Quality Architecture

a) Observations: Most of the area consists of slum dwellings thus achieving aesthetic appearance is going to be a long feat for the Malegaon but still in order to boost the businesses some aesthetic improvements are still required to be made.

b) Suggestions: All name plates of the shops can be made of equal sizes so that a specific aesthetic pattern can be achieved which can keep the customers attracted to that specific row of shops or establishments.

Instead of providing the advertisements in the form of huge hoardings on main roads they can be provided in the form of smaller sign boards at the screening between roads and footpaths which will be much more economical and will bring more attention to the advertisements.

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V. PROPOSAL

Based on the suggestions mentioned in previous chapter we can now proceed to prepare our own development plan for Malegaon city. Upon implementation of this plan, we should be able to reduce the problems identified in data analysis and thus elevate the overall standard of living of people living in Malegaon city. Detailed development plans are submitted separately along with this report for consideration. Salient features of this development plan are mentioned below.

A. Construction of Ring Road

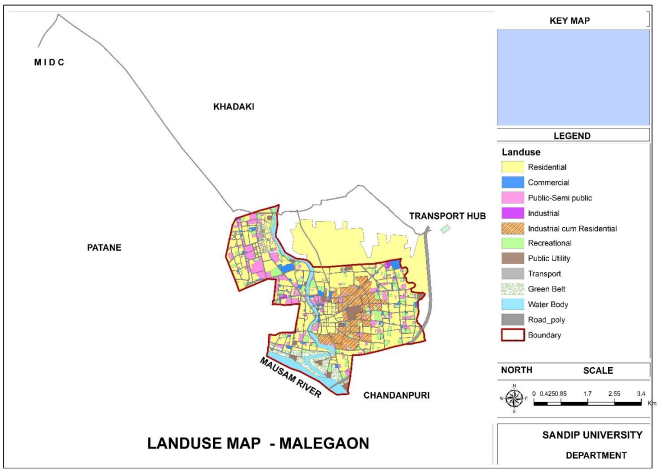

Figure 19 Ring road layout

B. Proposed Locations for Ring Road

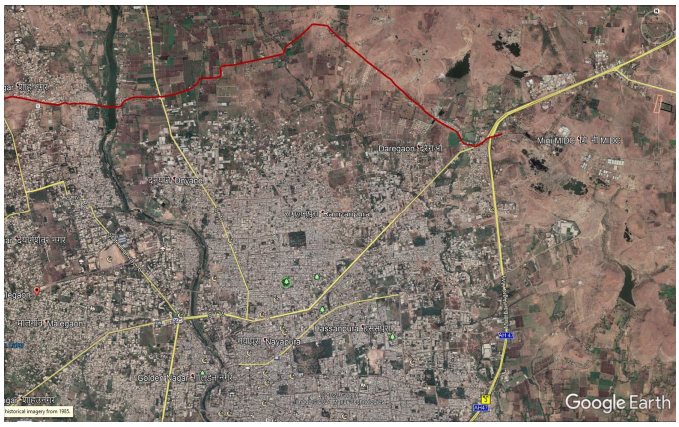

Figure 20 Location 1 for ring road

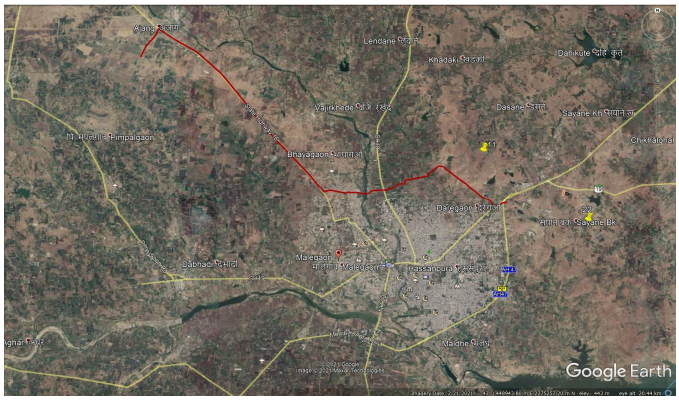

Figure 21 Location 2 for ring road

C. Final layout plan

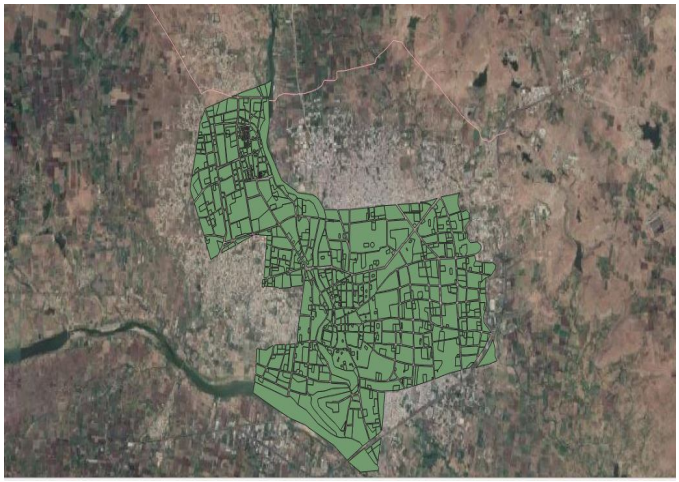

Figure 22 Final layout plan

VI. CONCLUSION

The proposed plan successfully makes use of principles of new urbanism for Malegaon area. Successful implementation of this plan will ensure increase in the quality of life of the individuals staying in this area while at the same time it will give a boost to the overall socio-economic development of the area. The proposed plan also consists of improvised transportation network which will contribute to faster and efficient transport of both men and materials within the area. The proper arrangement of residential and commercial spaces shown in the plan will also ensure sustainable growth of the households and increase the peace between multicultural neighbourhoods.

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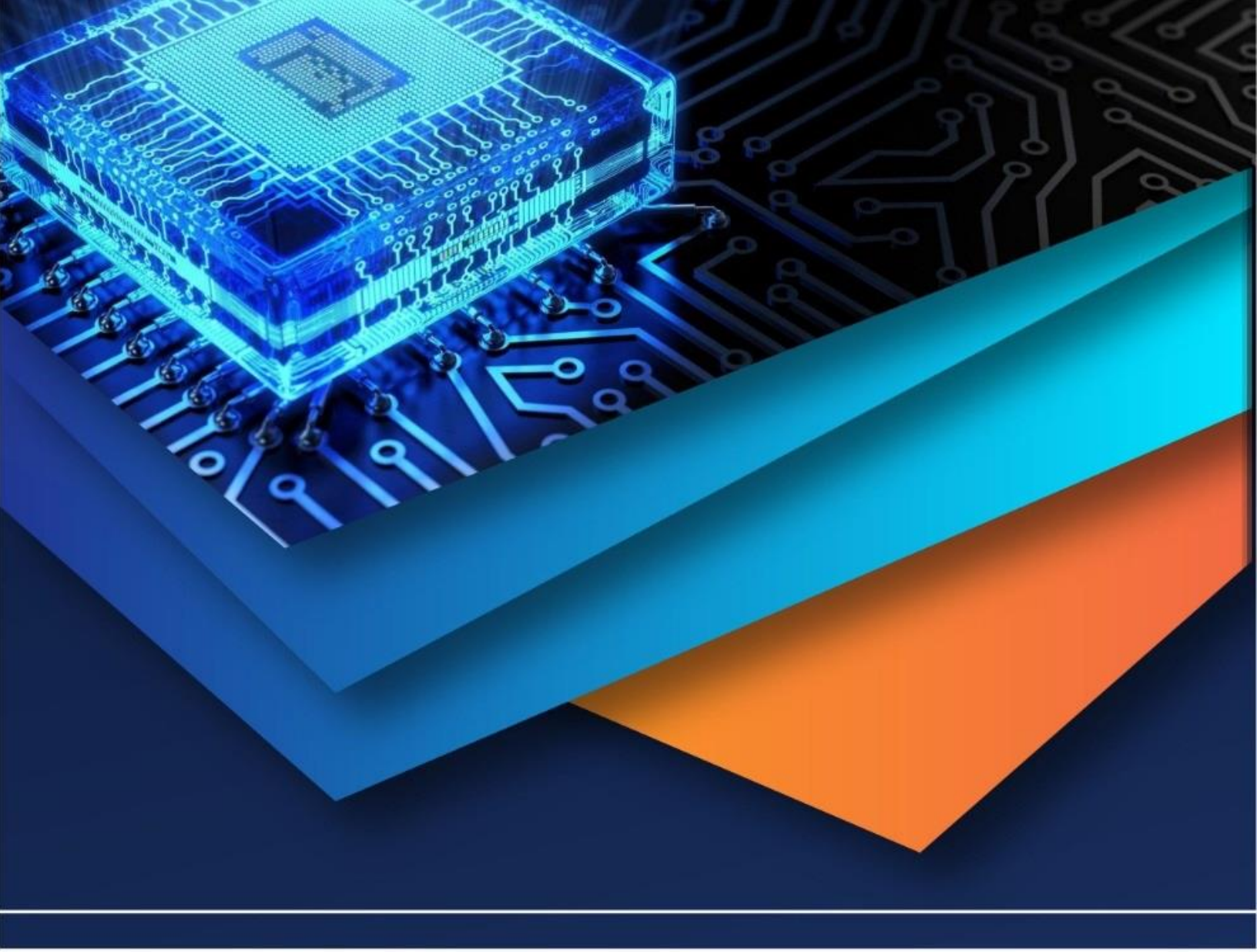

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