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LIST OF ABBREVATIONS

ACRONYMS	FULL FORMS
APCD	AIR POLLUTION CONTROL DEVICES
APMC	AGRICULTURAL PRODUCE MARKET COMMITTEE
ASI	ARCHITETURAL SURVEY OF INDIA
ASICS	ANNUAL SURVEY OF INDIA'S CITY-SYSTEMS
ATVT	ASSERTIVE TRUSTING VIVACIOUS TACTFUL
AUDA	AHEMDABAD URBAN DEVELOPMENT AUTHORITY
BAUDA	BHARUCH ANKLESHWAR URBAN DEVELOPMENT AUTHORITY
BHK	BEDROOM HALL KITCHEN
BMW	BIO-MEDICAL WASTE
BOD	BIOLOGICAL OXYGEN DEMAND
BOOT	BUILD, OWN, OPERATE, AND TRANSFER
BOT	BUILD–OPERATE–TRANSFER
BPL	BELOW POVERTY LINE
BRTS	BUS RAPID TRANSIT SYSTEM
BSUP	BASIC SERVICES FOR URBAN POOR
CBMWTF	COMMON BIO MEDICAL WASTE TREATMENT FACILITY
CCTV	CLOSED CIRCUIT TELEVISION
CDM	CLEAN DEVELOPMENT MECHANISM
CEPI	COMPREHENSIVE ENVIRONMENTAL POLLUTION INDEX
CEPT	CENTRE FOR ENVIRONMENTAL PLANNING AND TECHNOLOGY UNIVERSITY
CMP	COMPREHENSIVE MOBILITY PLAN
CPHEEO	CENTRAL PUBLIC HEALTH AND ENVIRONMENTAL ENGINEERING ORGANIZATION
CRRI	CENTRAL ROAD RESEARCH INSTITUTE
CRZ	COASTAL REGULATION ZONE
CSS	CENTRE FOR SOCIAL STUDIES
CT	CENSUS TOWN
D.O	DISSOLVED OXYGEN
D.U.	DWELLING UNIT
DB	DECIBEL
DDO	DRAWING AND DISBURSING OFFICER
DEWATs	DECEMTRALIZED WASTEWATER TREATMENT SYSTEMS
DFC	DEDICATED FREIGHT CORRIDOR
DGPS	DIFFERENTIAL GLOBAL POSITIONING SYSTEM
DIC	DISTRICT INDUSTRIES COMMISSIONER
DILR	DISTRICT INSPECTOR OF LAND RECORDS
DMIC	DELHI MUMBAI INDUSTRIAL CORRIDOR
DP	DEVELOPMENT PLAN
DPR	DETAILED PROJECT REPORT
ECS	EQUIVALENT CAR SPACE
ERDAS	EARTH RESOURCE DATA ANALYSIS SYSTEM ACADEMIC & SCIENCE
ESP	ELECTRO STATIC PRECIPITATORS
ESRs	ELEVATED SERVICE RESERVOIRS

ETC	et cetera
EWS	ECONOMICALLY WEAKER SECTION
FDIs	FOREIGN DIRECT INVESTMENT
FP	FINAL PLOT
FRL	FINISHED ROAD LEVEL
FSI	FLOOR SPACE INDEX
GDCR	GENERAL DEVELOPMENT CONTROL REGULATION
GDP	GROSS DOMESTIC PRODUCT
GEB	GUJARAT ELECTRICITY BOARD
GHB	GUJARAT HOUSING BOARD
GIDC	GUJARAT INDUSTRIAL DEVELOPMENT CORPORATION
GIS	GEOGRAPHIC INFORMATION SYSTEM
GM	GRAM
GoI	GOVERNMENT OF INDIA
GOVT.	GOVERNMENT
GPCB	GUJARAT POLLUTION CONTROL BOARD
GSDP	GROSS STATE DOMESTIC PRODUCT
GSRs	GROUND LEVEL SERVICE RESERVOIRS
GSRTC	GUJARAT STATE ROAD TRANSPORT CORPORATION
GWSSB	GUJARAT WATER SUPPLY AND SEWAGE BOARD
HA	HECTARE
HADA	HAZIRA DEVELOPMENT AUTHORITY
HH	HOUSEHOLD
HIG	HIGHER INCOME GROUP
HPCL	HINDUSTAN PETROLIUM CORPORATION LIMITED
IAS	INDIA ADMINISTRATIVE SERVICE
ICSSR	INDIAN COUNSEL FOR SOCIAL SCIENCE RESEARCH
IEMs	INDUSTRIAL ENTREPRENEUR MEMORANDA
IIPS	INTERNATIONAL INSTITUTE FOR POPULATION SCIENCES
INTACH	INDIAN NATIONAL TRUST FOR ART AND CULTURAL HERITAGE
IPT	INTERMEDIATE PUBLIC TRANSPORT
IT	INFORMATION TECHNOLOGY
ITES	INFORMATION TECHNNOLOGY ENABLED SERVICES
ITMS	INTERNATIONAL TRAFFIC MANAGEMNET SYSTEM
JnNURM	JAWAHARLAL NEHRU NATIONAL URBAN RENEWAL MISSION
KRIBHCO	KRISHAK BHARATI COOPERATIVE LIMITED
Kwh	KILOWATT HOUR
LGV	LARGE GOODS VEHICLE
LIG	LOWER INCOME GROUP
LIT	LITERS
LNG	LIQUEFIED NATURAL GAS
LPCD	LITRES PER CAPITA PER DAY
LRT	LIGHT RAIL TRANSIT
MGY	MUKHYAMANTRI GRUH YOJANA

MIG	MIDDLE INCOME GROUP
MIS	MANAGENMENT INFORMATION SYSTEM
MLA	MEMBER OF LEGISLATIVE ASSEMBLY
MLD	MILLIONS OF LITERS PER DAY
MoHFW	MINISTRY OF HEALTH & FAMILY WELFARE
MoHUPA	MINISTRY of HOUSING and URBAN POVERTY ALLEVIATION
MoUD	MINISTRY OF URBAN DEVELOPMENT
MP	MEMBER OF PARLIAMENT
MRT	MASS RAPID TRANSIT
MSMEs	MICRO, SMALL & MEDIUM ENTERPRISES
MSW	MUNICIPAL SOLID WASTE
MT	METRIC TON
MTA	METRIC TONS ANNUALLY
Mwe	MEGAWATT ELECTRIC
NH	NATIONAL HIGHWAY
NHFS	NATIONAL HEALTH FAMILY SURVEY
NIUA	NATIONAL INSTITUE OF URBAN AFFAIRS
NMV	NON-MOTORIZED VEHICLE
NRSA	NATIONAL REMOTE SENSING CENTRE
NTPC	NATIONAL THERMAL POWER CORPORATION
NUTP	NATIONAL URBAN TRANSPORT POLICY
OD	ORIGIN-DESTINATION
ONGC	OIL AND NATURAL GAS CORPORATION LIMITED
ORR	OUTER RING ROAD
PEARL	PEER EXPERINCE AND REFLECTIVE LEARNING
PPH	PARTS PER HUNDARD
PPP	PUBLIC PRIVATE PARTNERSHIP
RAY	RAJIV AWAS YOJANA
RCC	REINFORCEMENT CEMENT CONCRETE
RCDP	RURAL HEALTH AND COMMUNITY DEVELOPMENT PLANNING
ROB	ROAD OVER BRIDGES
SBR	SEQUENCING BATCH REACTORS
SC	SCHEDULED CASTE
SCADA	SUPERVISORY CONTROL AND DATA ACQISITION
SGCCI	SOUTHERN GUJARAT CHAMBER OF COMMERCE & INDUSTRY
SH	STATE HIGHWAY
SIHS	
SMC	SURAT MUNICIPAL CORPORATION
SMIMER	SURAT MUNICIPAL INSTITUTE OF MEDICAL EDUCATION & RESEARCH
SMSs	SPECIAL MONITORING STATIONS
SOI	SURVEY OF INDIA
SPM	SUSPENDED PARTICULATE MATTER
SSI	SMALL-SCALE INTEGRATION
ST	SCHEDULED TRIBE

STP	SEWAGE TREATMENT PLANT
SUDA	SURAT URBAN DEVELPOMENT AUTHORITY
SVNIT	SARDAR VALLABHBHAI PATEL NATIOINAL INSTITUTE OF TECHNOLOGY
SWM	SOLID WASTE MANANGEMENT
TCM	THOUSAND CUBIC METER
TIFAC	TECHNOLOGY INFORMATION FORECASTING AND ASSESSMENT COUNCIL
TP	TOWN PLANNING SCHEMES
TPM	TOTAL PRODUCTIVE MAINTENANCE
TTP	TERTIARY SEWAGE TREATMENT PLANT
UASB	UPFLOW ANAEROBIC SLUDGE BLANKET REACTOR
UDPFI	URBAN DEVELOPMENT PLAN FORMULATION & IMPLEMENTATION
UHI	URBAN HEAT ISLAND
UK	UNITED KINGDOM
ULB	URBAN LOCAL BODY
USD	UNITED STATE DOLLAR
UT	UNION TERRITORY
VAMBAY	VALMIKI AMBEDKAR AWAS YOJANA
W.C.	WATER CLOSET

1 INTRODUCTION

Urbanisation is one of the most glaring realities of the 21st century. All over the world, people are moving towards the cities. The bright lights of the cities, the perception that cities give greater opportunities and the desire to be at the heart of a 'fast life' is drawing people to cities. India is home to some of the world's largest cities.

Urbanisation levels in India are increasing. From 28.1% of the population in 2001, we now have 31.16% of the population living in urban areas. The urbanisation in India as elsewhere, has catapulted cities as the engines of national development, a source of employment. Urbanisation is unequivocal, hence it is better we accept it as an opportunity. We have to strike a balance between the urban and non-urban areas that will take nation to further heights of progress in the 21st century.

The state of Gujarat is not untouched by the phenomena of fast urbanisation. State is accelerating towards the process of urbanisation and modernisation due the fast growing economy of the State. The rapid pace of industrialisation during the past five decades in Gujarat is one of the prime factors contributing to urban growth. With the total population of 6.03 crores (10th most populous Indian state), the urban population has risen from 37% in 2001 to 43% in 2011, making it one of the fastest growing urbanized states.

Diamond city Surat's population grew from 2.8 million in 2001 to 4.5 million in 2011 — a phenomenal rise of 58.68%. Surat is Gujarat's 2nd most populas city, India's 8th most populas city. It is the 73rd largest urban area in the world. Surat ranks 4th fastest growing city in a global study of fastest developing cities conducted by The City Mayors Foundation, an international think tank on urban affairs. In fact, it is the fastest growing Indian city in terms of economic prosperity. Surat gained fame and recognition for being the '3rd Cleanest City' in India in 2011, awarded by INTACH. In 2013 Surat was conferred with two awards 'Best Urban City of India' and 'Best City to Live in India' constituted by Annual Survey of India's City-Systems (ASICS). UK-based charity, The Ecological Sequestration Trust (TEST) in 2013, has selected Surat as one of the three cities in the world, to be developed as 'Global Eco-cities'.

Backed by a dynamic team of officials and with the unwavering support of the people, Surat Urban Development Authority (hereinafter referred to as "SUDA") - is all set to take top class facilities to the villages so that both urban and rural areas can effectively contribute in our quest for sustainable and inclusive development of an important industrial hub and commercial centre of the country today.

The preparation of 'Development Plan 2035' was initiated in 2013. Based on the primary and secondary data available, the Status Survey Report was prepared for the old SUDA boundary comprising of SMC and 95 villages admeasuring 715 sq.km. Before this draft Development Plan could be submitted under section 9, the State Government in Urban Development and urban Housing Department by the notification dt. 9.12.2015 and 18.12.2015 extended the limits of SUDA boundary by adding another surrounding 100 villages. This increased the SUDA's jurisdiction to 1351 sq.km.

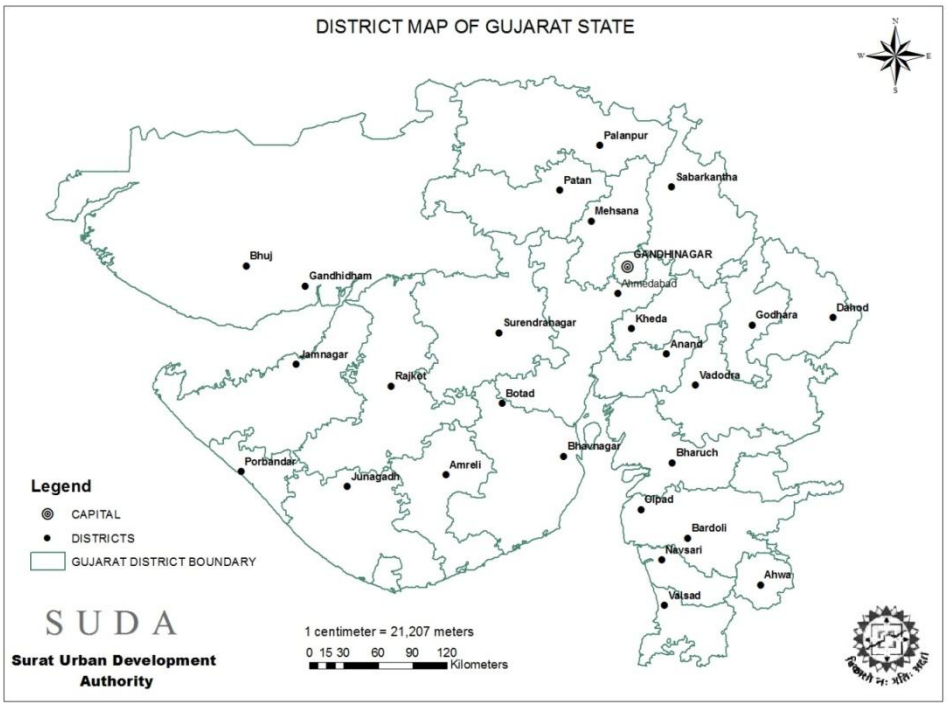
Since the status survey report of SMC area and 95 villages was already prepared, a separate chapter for additional 100 villages has been added at the end of this in chapter 7.

It is also necessary to mention that the State Government has framed The Gujarat Metropolitan Planning Committees Act, 2008 (Guj. 18 of 2008) and has also come into force. By the notification dated 11/03/2016, the Surat Metropolitan area has been declared under the said Act, 2008 which includes the SMC and Sachin Municipality area. The Metropolitan Committee for Surat was also constituted by the notification of the State Government dt. 11/03/2016 except for the elected members. The Draft Development Plan to be framed under the provisions of the Gujarat Metropolitan Planning Committees Act, 2008, is not in place as on today. Thus, the Draft Development Plan – 2035 of SUDA which is prepared under the provisions of the Gujarat Town Planning and Urban Development Act, 1976 is being submitted to State Government under section 9 and is to be published under section 13 of this Act.

1.1 URBANIZATION IN GUJARAT

Urbanization in Gujarat has been on the rise ever since Gujarat was declared as a separate state in 1960, about 55 years ago. As per 1961 census, only 25.77% of the population was living in the urban areas of Gujarat which rose to 42.6% as per the recent census of 2011. Only two states, Tamilnadu (46%) and Maharashtra (45%) are more urbanized than Gujarat.

Figure 1: District Map of Gujarat state



About 75% of the total urban population of the State is living in the 8 Municipal Corporations. Surat Municipal Corporation (SMC from here on) is the second largest Municipal Corporation in the State after Ahmedabad.

Figure 2: Urbanization in Gujarat from 1961 to 2011

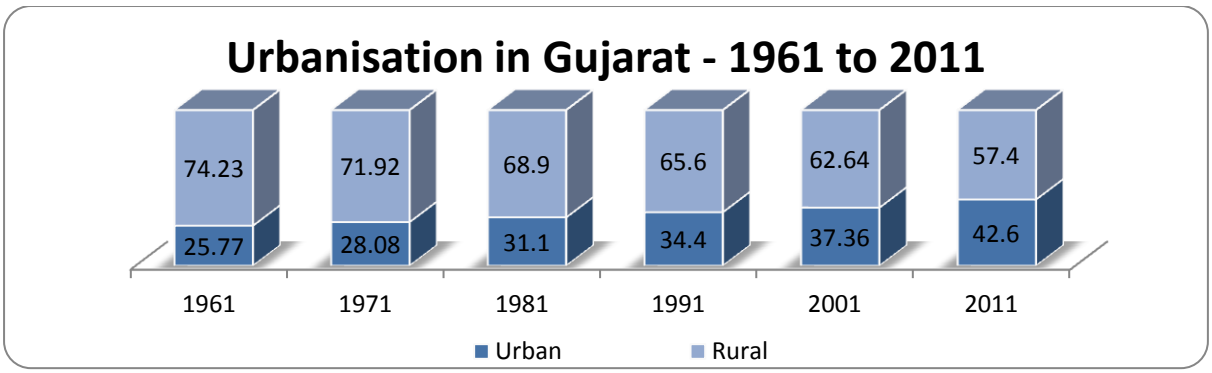


Table 1: Population of 8 cities (municipal corporation limit) of Gujarat-2011

Sr. No.	Municipal Corporation	Population
1	Ahmedabad	55,70,585
2	Surat	44,67,797
3	Vadodara	16,66,703
4	Rajkot	12,86,995
5	Bhavnagar	5,93,768
6	Jamnagar	5,29,308
7	Junagadh	3,20,250
8	Gandhinagar	2,92,752
	Total	**1,47,28,158 (Total urban population of the state 2,57,45,083)** (57% of the total urban population of the State)

1.2 HISTORICAL BACKGROUND OF SURAT

Surat - an important industrial hub and commercial centre of the country today boasts of a great historical and cultural heritage. The city of Surat has glorious history that dates back to 300 BC. The history of Surat takes us back to the epic age of Mahabharata and Ramayana. According to mythological beliefs, Lord Krishna stopped in the city during his journey from Mathura to Dwarka. According to The Editors of Encyclopaedia Britannica (Last Updated 13.12.2013), the great explorer Hiuen Tsang referred the Surat City as 'Sowrata' and described it as a business town on the shore of Arabian Sea near Gujarat. The Brahmin Pundits of the 13th century called the city as 'Suryapur'.

The city is believed to have been founded by a Brahmin named Gopi, who built the Gopi Tank (water reservoir) in 1516 and named the area 'Surajpur' or 'Suryapur'. He developed and improved the city with the establishment of place called 'Gopipura'. During this period Surat was described as city of great trade. The city was divided into two parts, old and new. The old city pattern developed with administrative centre at Chowk on bank of river Tapi. Trade and business were concentrated in

Chowk bazaar and Mulla chowk. The inner wall city was mostly developed as an administrative centre and as a specialize market.

In 1520, it was named 'Surat'. It was plundered by Muslims in the 12th and 15th centuries. In 16th century, Surat become a victim of various raids. In 1514 the Portuguese traveller Duarte Barbosa described Surat as a leading port. The Portuguese raided Rander and Surat between 1530 and 1535

and burnt the port. On account of these raids, King Akbar build the fort of Surat in 1540-46; evidence of which can be found even today. Surat regained its prosperity as a modern city during the later part of the sixteenth century. The Surat Port was considered important by the European traders. The British and the Portuguese waged battles against each other to gain supreme control over the trading route. The French and the Dutch also arrived in the city with merchandising objectives. In past this was a glorious port with ships of more than 84 countries anchored in its harbour at any time. Surat thereafter became the emporium of India, exporting cloth and gold. Its major industries were textile manufacture and shipbuilding. The British established their first Indian factory (trading post) at Surat (1612). The city gradually declined throughout the 18th century. The British and Dutch both claimed control, but in 1800 its administration was passed to the British. It prospered again with the opening of India's railways. The ancient art of manufacturing fine muslin was revived, and Surat's cottons, silks, brocades, and objects of gold and silver became famous. The Tapi River grew into a major port for exports and as an important stopover for Muslim pilgrims bound for Mecca. By the early years of the 18th century, Surat had become a prosperous city with many weaving and spinning mills, textile and paper factories. Surat was also a flourishing centre for ship building activities. The whole coast of Tapi between current locations of Athwalines and Dumas was specially meant for ship builders. As the British developed Mumbai into a major port and administrative centre, Surat faced a severe blow and its ship building industry also declined. By the mid-19th century Surat was a stagnant city of 80,000 inhabitants. During the post-independence period, Surat has experienced considerable growth in industrial activities (especially textiles) along with trading activities. Concentration of these activities combined with residential developments has resulted in considerable expansion of the city limits. Modern Surat's main claim to fame is its position as the centre of diamond processing for the world diamond industry.

Surat is now considered one of the cleanest city of India and is also known by several other names like 'The Silk City', 'The Diamond City', 'The Green City', etc. It has the most vibrant present and an equally varied heritage of the past. Some of the important historical events related to the present SMC is tabulated below.

Table 2: History of SMC

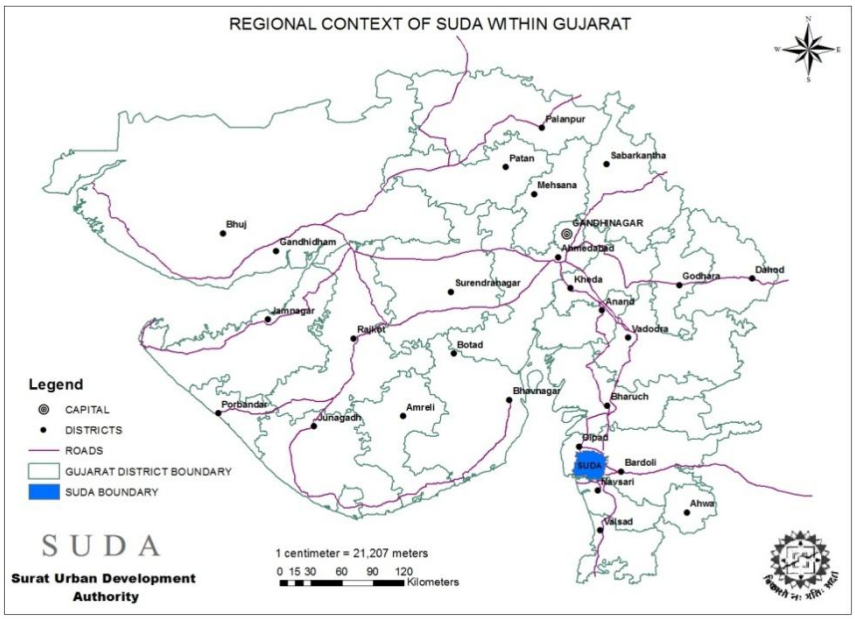
YEAR	EVENTS
1850	The Government enacted an Act for the development of the city. The Govt. was empowered to open a Department related to Municipality, on the request of the eminent citizens to effectuate the said Act. The Govt. appointed a committee called 'The Municipal Committee', which consisted of its officers and the eminent citizens to run the said Department
1852	The Municipality came into existence, legally, and its first meeting was held on 15.8.1852
1860	Erection of Surat Railway Station
1867	Municipality's Office was shifted to its existing building
1898	Water supply began through Municipal Water Works (1.1.1898)
1901	New Act of Municipality came into force
1946	The Municipality was re-established on 8th February, 1946
1966	Conversion of Municipality into Municipal Corporation on 1st October, 1966

1.3 LOCATION AND LINKAGES

Surat city is located on the southern part of Gujarat state in the western India. It lies near the mouth of the Tapti River at the Gulf of Khambhat (Cambay). It is one of the most dynamic city of India with one of the fastest growth rate due to immigration from various part of Gujarat and other states of India. It is major urban centre on the Ahmedabad-Mumbai regional corridor. The city has grown on both the sides of river Tapi.

Regional setting of SUDA is shown in Figure – 3.

Figure 3: Regional context of SUDA within Gujarat



Surat is well connected by road and rail with major cities and town of the states as well as neighbouring states of Maharashtra and Madhya Pradesh. Surat is well connected to one of the busiest Delhi – Mumbai National Highway No. 8. It is located on the western side of this National Highway No. 8. It is approximately 300 km in south from the State capital Gandhinagar and about 250 km from Ahmedabad. Vadodara is 170 km north of Surat. Mumbai is 260 km in south.

The spatial extent of SUDA admeasures 715 sq.km.

Main railway station in Surat is located near the city centre. For the air linkage there is domestic airport within the boundary of SUDA. Nearest international airports are at Ahmedabad and Mumbai almost equidistant at about 250 km.

The SUDA area is located between latitudes 21º03’ and 21º19’ North and longitudes 72º41’ and 73º00’ East which covers 715 sq.km. It is 13 m above mean sea level.

Within a periphery of 25 km from the boundary of SUDA, there are 3 urban centers Municipalities (namely Olpad in the north-western part, Navsari in the south- east and Bardoli to the west. The Bharuch Ankleshwar Urban Development Authority(BAUDA) is located in the northern direction.

Figure 4: Regional Context of SUDA with neighbouring Authorities

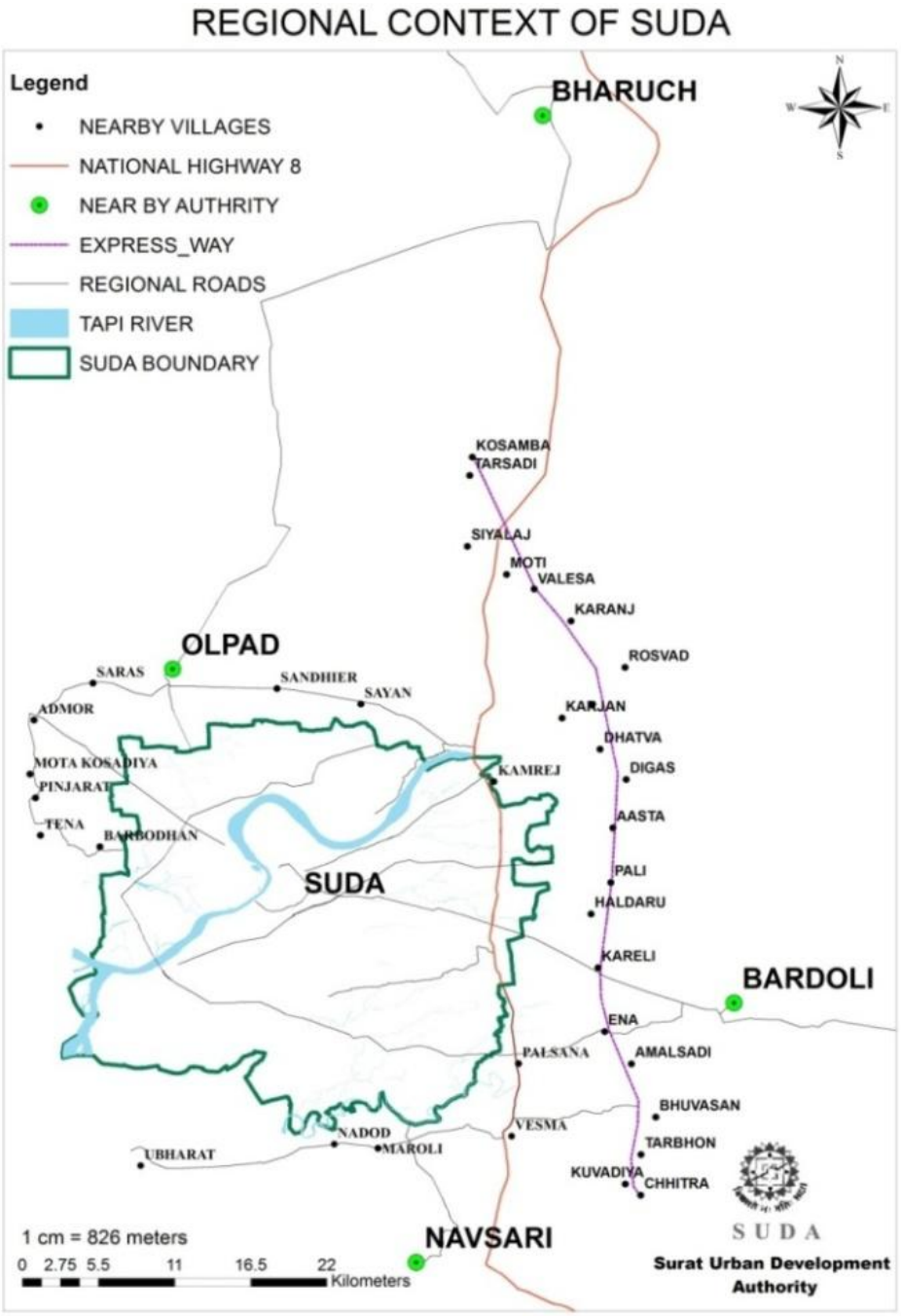
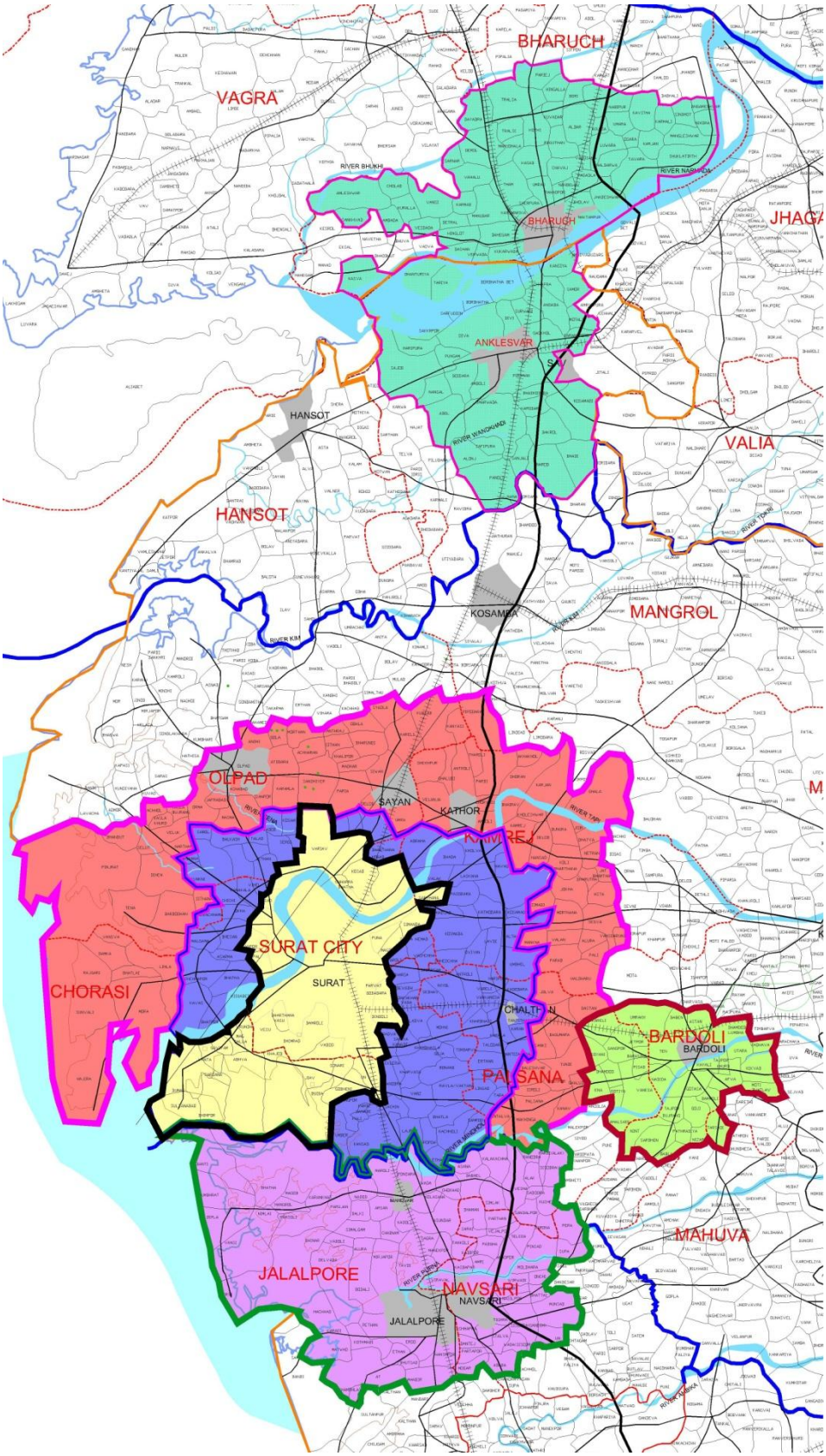


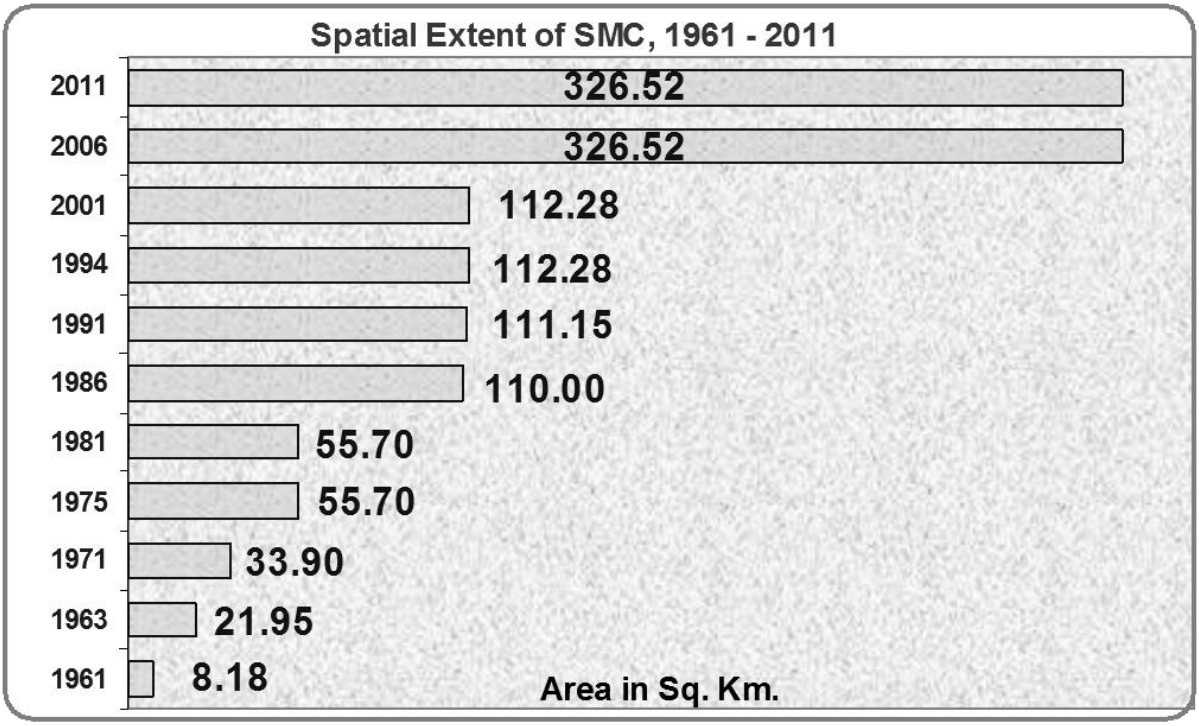
Figure 5: Regional map of various development authorities in south Gujarat



1.3.1 SPATIAL EXTENT & GROWTH OF SMC

On 1st October, 1966; when the Surat Municipality got the status of Municipal Corporation, it was only 8.18 sq.km. By 1971, the SMC area increased to 33.90 sq.km. After four years in 1975, the northern area at Ved, Dhabholi and Singhanpore were included in the SMC area, increasing the SMC area to 55.70 sq.km. After 11 years, in 1986 the SMC area was again expanded by including the area of Nana Varachha, Majura, Bhatar, Althan, Umra, Piplod, Jahangirabad, Jahangirpura. The area of SMC was 110 sq. km. in 1986. In 1994 its jurisdiction was extended to cover 112.28 sq.km. In 2006, the state Government in a major decision extended the jurisdiction of SMC by almost 3 times.Today,

Figure 6: Spatial Extent of SMC



SMC cover an area of 326.52 sq.km.

When the SUDA was constituted in 1978, at that time its jurisdiction of 722 sq.km; including administrative boundary of SMC (admeasuring 55.70 sq.km.) and surrounding administrative boundaries of 148 Gram Panchayats (admeasuring 666.30 sq. km.). Later on, in 1979, the Delad village of Kamraej taluka was deleted from the list of villages included in the development area as this village was not in contiguity. So, the jurisdiction of SUDA was limited to 715 sq. km. The present jurisdiction of SUDA still extends to 715 sq.km. which includes the area under SMC and now surrounding 95 villages. Since the constitution of SUDA in 1978, the boundary of SUDA has not changed but the spatial extent of SMC has increased over a period of time from 1978 to 2011. The change in area of SMC and surrounding villages within the jurisdiction of SUDA since its constitution is shown in the Table below. At present in the SUDA area almost 45% is the jurisdiction of SMC.

Table 3: Spatial Extent of SUDA in Sq. Km.

Year	SMC	SUDA (Excl. SMC)	Total SUDA
1978	55.70 (8%)	666.30 (92%)	722
1979	55.70 (9%)	659.30 (91%)	715
1981	55.70 (9%)	659.30 (91%)	715
1994	112.28 (16%)	602.72 (84%)	715
2001	112.28 (16%)	602.72 (84%)	715
2006	326.52 (46%)	388.48 (54%)	715
2011	326.52 (46%)	388.48 (54%)	715

1.4 SURAT URBAN DEVELOPMENT AUTHORITY, SUDA

1.4.1 CONSTITUTION OF SUDA

The Government of Gujarat in Panchayats, Housing and Urban Development Department constituted the Surat Urban Development Authority vide Government notification number GHB/23/ UDA/1177/646(5)-Q2 dated January 30, 1978, in exercise of the powers conferred by sub sections (1), (2) and (4) of section 22 of the Gujarat Town Planning and Urban Development Act 1976 for the development area consisting of Surat Municipal Corporation and 148 villages admeasuring 722 sq. km.

The Surat Urban Development Authority has started functioning from 1/02/1978. By the said notification, the State Government appointed the following members of SUDA as per the provisions of section 22(4) of the Act as shown in the **Table –4** below.

Table 4: Members of SUDA first Board, 1978

Sr. No.	Name	Position
1	Sh Bhagwandas Kishanlal Lakhsadiya	Chairman
2	Sh Ahmadmiya Saluji Chairman, Standing Committee, SMC	Member
3	Sh Desai Jayantilal Maganlal Patel Chairman, Udhna Nagar Panchayat	Member
4	Deputy Secretary Panchayats, Housing & Urban Development Department	Ex-Officio Member
5	Collector, Surat District	Ex-Officio Member
6	President, Surat District Panchayat	Ex-Officio Member
7	Chief Town Planner, Gujarat State	Ex-Officio Member
8	City Engineer, SMC	Ex-Officio Member
9	Shri A. Prasad, IAS	Member - Secretary & Chief Executive Authority

After the amendment in the Section 22 of the Act in 1999, the Municipal Commissioner was added as ex-officio member of the Urban Development Authority. The present board members of SUDA are shown in the Table below.

Table 5 :Members of SUDA Board, 2016

Sr. No.	Name	Position
1	Sh. M.Torwane, IAS	Chairman
2	Chairman, Standing Committee, SMC	Member
3	Dr Rajender Kumar, IAS , District Collector, Surat	Member - Secretary & Chief Executive Authority
4	Municipal Commissioner, SMC	Ex-Officio Member
5	President, District Panchayat	Ex-Officio Member
6	District Development Officer	Ex-Officio Member
7	Chief Town Planner, Gujarat State	Ex-Officio Member
8	Financial Advisor, Govt. of Gujarat	Ex-Officio Member
9	City Engineer, SMC	Ex-Officio Member

1.4.2 STATUTORY FUNCTIONS OF SUDA

The section – 23(1) of the Gujarat Town Planning and Urban Development Act, 1976 contemplates following *powers and functions* of the Urban Development Authority:

(1) The power and functions of an urban development authority shall be:

(i) To undertake the preparation and execution of town planning schemes under the provisions of this Act, for the urban development area;

(ii) To undertake the preparation and execution of town planning schemes under the provisions of this Act, if so directed by the State Government;

(iii) To carry out surveys in the urban development area for the preparation of development plans or town planning schemes;

(iv) To guide, direct and assist the local authority or authorities and other statutory authorities functioning in the urban development area in matters pertaining to the planning, development and use of urban land;

(v) To control the development activities in accordance with the development plan in the urban development area;

(v-a) To levy and collect such scrutiny fees for scrutiny of documents submitted to the appropriate authority for permission for development as may be prescribed by regulations;

(vi) To execute works in connection with supply of water, disposal of sewerage and provision of other services and amenities;

(vi-a) To levy and collect such fees for the execution of works referred to in clause(vi) and for provision of other services and amenities as may be prescribed by the regulations;

(vii) To acquire, hold, manage and dispose of property, movable or immovable, as it may deem necessary;

(viii) To enter into contracts, agreements or arrangements, with any local authority, person or organization as the urban development authority may consider necessary for performing its functions;

(ix) To carry any development works in the urban development area as may be assigned to it by the State Government from time to time;

(x) To exercise such other powers and perform such other functions as are supplemental, incidental or consequential to any of the foregoing powers and functions or as may be directed by the State Government.

1.4.3 JURISDICTION OF SUDA

When SUDA was constituted in 1978, the jurisdiction of SUDA included the area of then Surat Municipal Corporation (55.70 sq.km.) and surrounding 148 villages (666.30 sq.km.) spanning over 4 Talukas of Surat District admeasuring total of 722 sq.km. In 1979, Delad village of Kamrej taluka was deleted from the list and accordingly the total area of SUDA becomes 715 sq.km.

In 2006, the area of Surat Municipal Corporation was substantially extended whereby some villages of SUDA area were merged with the boundary of SMC. Now, the jurisdiction of SUDA includes the area of SMC (326.52 sq.km.) and surrounding 95 villages (388.48 sq.km.). Thus, SUDA has two major planning components viz., SMC area and surrounding 95 Gram Panchayats.

Refer **Table 6** below for the list of components of the SUDA area.

Table 6: Villages under jurisdiction of SUDA, 2014

A	**SMC**					**319.52 sq.km.**
B	**Gram Panchayats**					
	Talukas					
Sr. No.	**Olpad**	**Choryasi**		**Palsana**	**Kamrej**	
1	Ambheta	Asarma	Kumbharia	Antroli	Abrama	
2	Ariyana	Bhanodra	Lajpor	Chalthan (CT)	Bhada	
3	Balkas	Bharthana Kosad	Malgama	Erthan	Chhedchha	
4	Gothan	Bhatha	Mohni	Haripura	Kathodara	
5	Jothan	Bhatia	Okha	Kadodara (CT)	Khadsad	
6	Kanad	Bhatpor	Pali	Karala	Kholvad	
7	Kosam	Bhesan	Pardi Kanade	Karan	Kosamadi	
8	Kunkni	Bonand	Popda	Kharbhasi	Kosmada	
9	Sarol	Chichi	Ravla Alias	Lingad	Ladvi	

			Vaktana			
10	Saroli	Dakhkhanvada	Sabargam	Niyol	Laskana	
11	Segwachhama	Deladva	Sachin (CT)	Sedhav	Navagam	
12	Segwasyadla	Devadh	Samrod	Talodara	Oviyan	
13	Sherdi	Eklera	Saniya Hemad	Tantizaghda	Pasodara	
14	Sonsak	Goja	Saniya Kanade	Taraj	Umbhel	
15	Talad	Ichchhapor (CT)	Saroli	Vadadala	Valak	
16	Vadod	Kachholi	Talangpor	Vankaneda	Valthan	
17	Vaswari	Kansad	Timbarva	Vareli	Vav	
18		Kapletha	Umber			
19		Karadva	Vankala			
20		Kavas	Vanz			
21		Khambhasla	Vedchha			
22		Kharvasa	Vihel			
Total						**388.48 sq.km.**
C	**River (not included in Village and Ward boundaries)**					**7 sq.km.**
Total SUDA						**715 sq.km.**

NOTE: CT = Census Town

The other metro city of Gujarat is Ahmedabad. In 1978, the State Government constituted the Ahmedabad Urban development Authority (AUDA) also for the area including Ahmedabad Municipal Corporation and surrounding 333 villages admeasuring (888 sq.km.) The area of AUDA was extended in 2009 by which 68 surrounding villages were added. Now the jurisdiction of AUDA extends to 1800 sq.km. Considering the recent census data available, the SUDA is compared with the AUDA to have a glimpse of the demographic profile of these two development authorities, having the state's two largest metropolitan city.

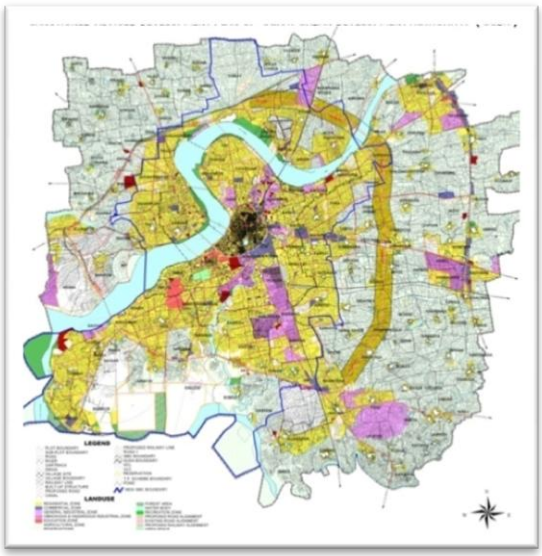
Table 7: Comparison of the SUDA with AUDA & Gujarat State, 2011

Sr. No.	Factors	SUDA	AUDA	Gujarat
1	Area (in sq .km)	715	1866	196024
2	Population	48,05,101	64,62,354	6,04,39,692
3	Density (per sq.km.)	6720	3463	308
4	Decadal Growth Rate (2001-11)	55.29%	-	19.28%
5	Sex Ratio	756	887	919

1.5 PLANNING PRELUDE

The modern history of town planning in Gujarat dates back to early part of the twentieth century, when the erstwhile Bombay Presidency took the lead in enacting the first town planning legislation in the country viz. The Bombay Town Planning Act, 1915, which came into force on 6th March 1915. This Act mainly provided for the preparation of town planning schemes (TP Scheme) for areas in course of development within the jurisdiction of local authority i.e. within municipal limits. After independence, the recognition of the need for viewing urban development as one whole integrated development was felt. It was observed that the TP schemes prepared under the 1915 Act, resulted in the piecemeal planning, having no relation with the adjoining areas. Thus, to have a planned development of every square inch of the land within the municipal limits, the need for another enactment was unavoidable. This leads to the enactment of The Bombay Town Planning Act, 1954. The concept of 'Development Plan' was introduced for the first time, as the main planning instrument, retaining the TP Scheme for implementation of the Development Plan. Around mid-seventies, due to rapid industrial growth, coupled with increasing level of urbanization, it was observed that even the Act of 1954 had not been adequate for the comprehensive and meaningful planning of the urban areas. The realization that the preparation of a Development Plan only for areas confined to the municipal boundaries would not meet the challenges of urban development, which usually spilled over beyond municipal boundaries, the Gujarat Town Planning and Urban Development Act, 1976 along with the Rules was enacted in the state which made the provision for formation of Urban / Area Development Authorities. This Act came into force from 1.2.1978. Accordingly, SUDA was constituted by the State Government notification of 30.01.1978.

Figure 7: Past Planning Effort Development Plan 1986 and 2004



Under the provisions of this 1976 Act, SUDA prepared its first development plan which came into force from 31.01.1986. Since as per section 21 of the Act, the development plan is to be revised once in 10 years, SUDA prepared the revised development plan in 1997 which ultimately sanctioned in 2004 and came into force from 15.09.2004. As part of implementation of development plan SUDA has prepared 23 Town Planning Schemes and SMC has prepared 129 TP schemes.

2 METHODOLOGY

2.1 INTRODUCTION

The Draft Development Plan 2035 is prepared with the objective to formulate a meaningful physical development plan to regulate and guide the urban growth in the development authority area in a planned and healthy manner as per the provisions indicated in the Gujarat Town Planning and Urban Development Act - 1976 and Gujarat Town Planning and Urban Development Rules - 1979. As per this Act, the Development plan shall be indicating the manner in which the use of land shall be regulated and the manner in which the development therein shall be carried out.

The exercise is taken based on the aim and objectives set out for the development plan for catering to the projected population of next 20 years i.e. up to 2035.

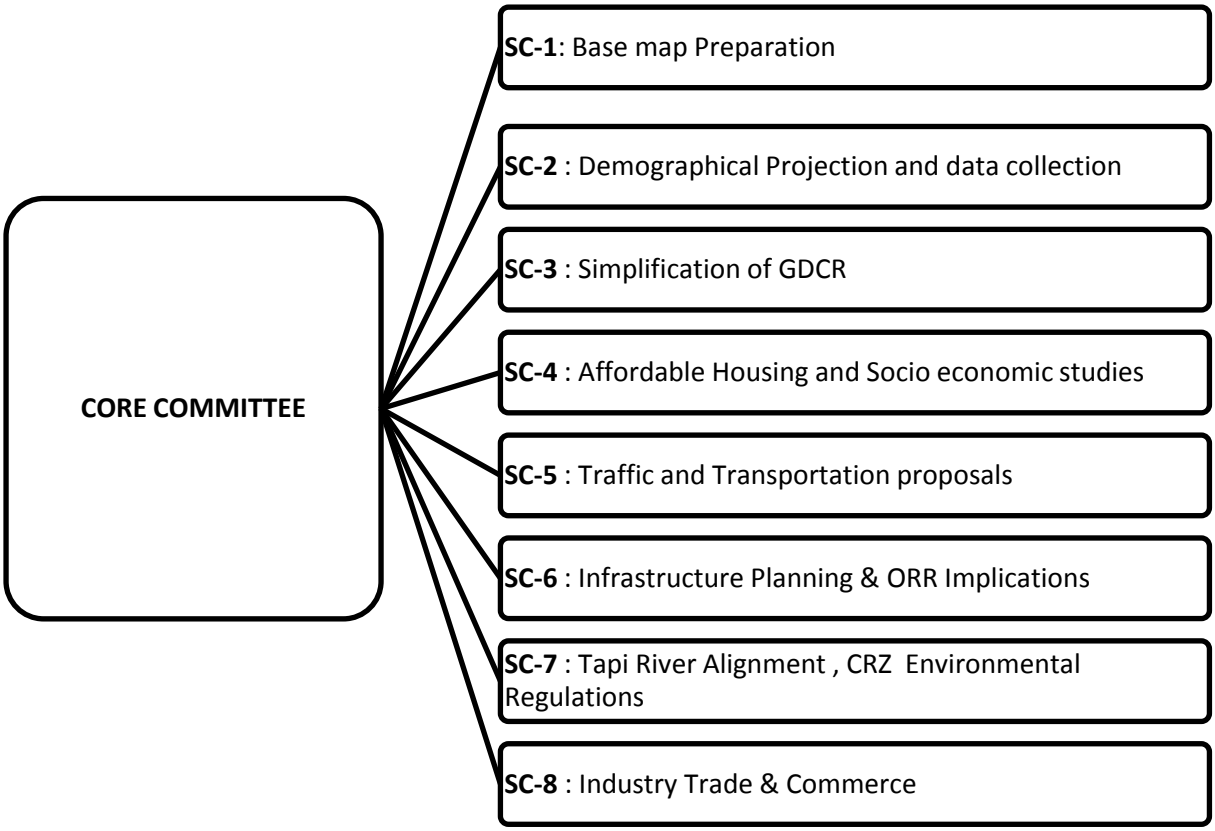
2.2 PROCESS

Process of preparation of draft development plan involves generating the up-to-date land use map of the development area using revenue maps. This time the base map and the existing land use map of the SUDA area including the SMC area has been prepared using the recent satellite imageries (2012) with the help of GIS technology in 1:2000 scale. Land use survey was done to identify the directions of physical growth. After preparing the base map and undertaking the land use survey, ultimately a database shall be developed in GIS.

The preparation of the Draft Development Plan started with the assessment of the existing conditions and accounting for the potential resources and constraints. The assessment is done in terms of urbanization of the State, region and of the study area. Satellite imageries were used to assess the land cover and land use of the study area for studying the spatial extent of land under agricultural use, forest, water logged, built-up area \ use, open land etc. Assessment of existing housing stock, built area and social as well as physical infrastructure available to the people was undertaken. The extent of implementation of the development plan in force was also studied to know how much is achieved as per the plan proposal and where the market force has not allowed developing as per the proposals.

For the preparation of the Draft Development Plan, a number of study groups were formed for arriving at the proposals of the Draft Development Plan. All the background papers on technical aspects were put up before the Core Committee for their consideration and approval. The Core Committee also obtained advice and assistance of a number of other experts and officials and utilized their experience and knowledge in their respective fields. Following eight sub- committees were formed as shown in the Figure 8 below.

Figure 8: Committees for prepartion Draft Development Plan 2035



The assessment was made on the basis of secondary data collected from various agencies, on-the-spot surveys, studying the existing urban development policies of the State and on the basis of views expressed in the brain storming sessions of eight sub-committees of experts,formed by SUDA. The stakeholders were taken into confidence by organizing the workshops to know the issues at the grassroot level which are affecting the general public. Extensive public consultations were carried out at different stages of the Development Plan. The inputs from the consultations were studied and reviewed in detail, objectives to fulfil the vision are formulated based on the inferences from the stake holdings.

Conceptualization for planning the SUDA area was based on the above assessment. Proper distribution of the residential, industrial, commercial zone, as well as open and recreational spaces is to be suggested to evolve overall urban form for entire SUDA area for the year 2035.

The preparation of Draft Development Plan included the planning for the following:

A) Land Management

1) Land- use, for proper utilization of land for residential, commercial, industrial, institutional, recreation, transportation, agricultural & allied usages.
2) Housing, having proposals for supply of housing with infrastructure development and strategies for overall improvement.
3) Traffic and transportation, with long and short term strategies to take up development phase wise.

4) Development control regulations, for proposed and anticipated development pattern considering the holistic and integrated growth.

B) Infrastructure Development

1) Water Resources Development and Drainage
2) Solid Waste Management
3) Assessment of social infrastructure including education, health, recreation and community facilities
4) Utility services for water supply, sewerage, drainage, electricity, etc.

C) Economic

1) Augmentation of financial resources
2) Investment plan
3) Estimates of revenue and resources with respect to implementation of different stages of Draft Development Plan

2.3 DETAILED METHODOLOGY

Following is the detailed methodology adopted for the preparation of draft development plan.

2.3.1 DIGITAL BASE MAP CREATION

Preparation of base map is the most important task in preparation of any development plan. The remote sensing techniques were used for preparation of the base map of SUDA area. It involves:

1. 0.6 m resolution Pan Sharpened Multi-spectral Quickbird satellite imageries of 2012 procured by SMC from NRSA Hyderabad and revenue base maps of all the villages coming under development plan area were obtained.
2. Carrying out DGPS Survey in all villages taking 2 points per village.
3. Rectification and geo referencing of the satellite imagery using DGPS control survey.
4. Geo-referencing, digitization, and mosaic of revenue maps. The revenue sheets were properly digitised and edge matched to form revenue villages and mosaic to form the Draft Development Plan Area.
5. Block No. level spatial database generation of the rectified digital revenue maps.
6. Surveys were carried out for existing land use data collection.
7. Interpretation of satellite imagery with ground verification to prepare the digital base map and existing land use map in GIS format.
8. Ground validation by field surveys: Validation to confirm the exiting land use
9. Quality checking.
10. Attachment of attribute data
11. The GIS database with revenue cadastral, imageries and image derived land use is developed on ArcGIS platform.
12. Survey of India topographic map is mainly used for the preparation of base map like transportation networks, water bodies location, etc. As a reference map (Software used ESRI-Arc GIS, AutoCAD, ERDAS).

The geo-database is proposed to be developed on ArcGIS platform as a desktop application for viewing, querying and reporting of various spatial and non-spatial information, within the development authority area. The GIS database is to be prepared with mutually registered layers generated from cadastral maps, satellite image, field survey inputs, existing land use, proposed land use, etc.

2.3.2 FIELD SURVEY, DATA COLLECTION

- Review of extent of implementation of Revised Development Plan 2004 was done.
- The regional resource potentials of the hinterland was studied in detail in the context of major economic activities, broad land use, major transportation and communication network, tourism potentials, heritage preservation, regional level infrastructure facilities and broad environmental, ecological and conservation measures.
- The micro level study of land use and infrastructure developments including solid waste management.
- Sample household survey was undertaken for socio economic data i.e. demography, housing, physical and social infrastructure besides the census data of 1991, 2001 and 2011 (secondary source data).
- Survey was undertaken to quantify the travel need, road network inventory, traffic volume, assessing passenger terminals, commuter survey of IPT, parking at critical areas, OD survey and goods transport for preparing traffic and transportation plan.
- Existing development control regulations and its implementation was analyzed to identify the gaps and necessary modifications are suggested.
- Economic base study of industries, commercial and tourism activities were done.
- All the data mentioned above were compiled and analyzed to identify the trends, potentialities and issues of the core (SMC area) and peripheral areas (outside SMC) of the development area.
- Resources mobilization for plan implementation has been suggested.

2.3.3 PREPARATION OF STATUS REPORT

The Status Report was prepared and was presented in the interactive workshop / seminar before the stake holders.

2.3.4 PREPARATION OF DRAFT DEVELOPMENT PLAN

After getting feedback from Interactive Workshop / Seminar, the Draft Development Plan was prepared including the General Development Control Regulations- GDCR.

The proposals included:

Table 8: Proposals for Draft Development Plan 2035

Sr. No.	Category
1	Land use Plan
2	Traffic and Transportation
3	Water Resources Development and Drainage
4	Environment
5	Solid waste Management
6	Social Infrastructure
6	Zoning Regulation
8	Utility Services
9	Economic Plan

All the development proposals is translated over revenue maps by adopting GIS with detail database of land use and other planning information. This database is also integrated / geo-referenced with the satellite imagery for viewing. Later on, MIS shall be evolved for review and monitoring on-going development over the GIS data base prepared.

The final stage in preparation of the Draft Development Plan is the formation of the policies and proposals; this is done by accessing the gaps and deriving the demands for future. This involves the proposals for land use zoning, urban services both physical and social and policies in terms of the General Development Regulations for controlling the developmental activities within the Authority area.

With the completion of the preparation of the Draft Development Plan, a copy is send to the State Government as per the requirement under section 9 of the Act. The next step is the publication of theDraft Development Plan in the official gazette of the Government of Gujarat under section 13 and inviting objections and suggestions from the general public.

3 BASE MAP PREPARATION

3.1 INTRODUCTION

Base map essentially is a map depicting background reference information such as landforms, roads, landmarks, and political boundaries, onto which other thematic information is placed. Preparation of base map is the most important task in preparation of any development plan. The base map forms the foundation on which the planning proposals are superimposed for the development of the city.

3.2 CONVENTIONAL BASE MAP

Earlier, two development plans were prepared using the conventional method. The first base map for development plan was hand drafted and the base map for first revision of development plan was made using AutoCAD.

Figure 9: Conventional Base Maps

3.3 DIGITAL BASE MAP

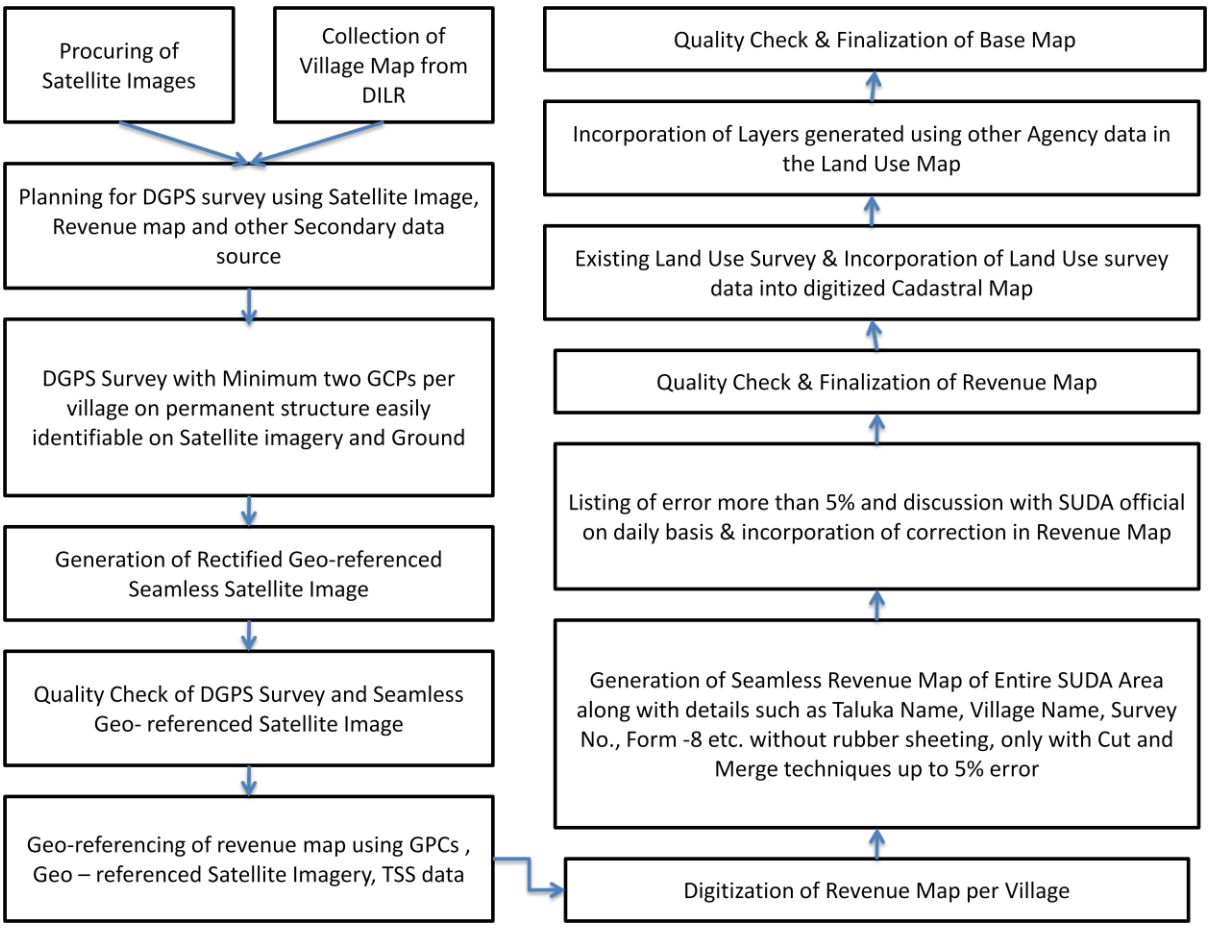
The remote sensing techniques were used for the first time in preparation of the digital base map of the SUDA area. All the village and ward maps, TP scheme maps were converted to one single digital format which was then geo-referenced. All the different maps were put together to form one complete map, errors were identified and rectification was done followed by attaching layers of different types of information. All the TP area and non TP area maps were digitized, geo-referenced and put together to form the final base map. A complete list of data layers attached to the base map is provided at the end of this subsection.

3.3.1 INPUT DATA

1) High Resolution (0.6m) Quick Bird Satellite Imagery
2) DGPS survey
3) Cadastral Maps
4) Layout Plans
5) SOI Toposheets

3.3.2 PREPARATION OF BASE MAP

Figure 10: Process of Base Map preparation



3.3.3 STAGES OF MAP PRPEARATION

1. 0.6 m resolution Pan Sharpened Multi-spectral Quickbird satellite imageries of 2012 procured by SMC from NRSA Hyderabad and revenue maps of all the villages coming under development plan area were obtained.
2. Carrying out DGPS Survey in all villages taking 2 points per village.
3. Rectification and geo referencing of the satellite imagery using DGPS control survey.
4. Geo-referencing, Digitization, and mosaic and of revenue maps. The revenue sheets were properly digitised and edge matched to form revenue villages and mosaic to form the Development Plan Area.
5. Block No. level spatial database generation of the rectified digital revenue maps.
6. Surveys were carried out for existing land use data collection.

7. Interpretation of satellite imagery with ground verification to prepare the digital base map and existing land use map in GIS format.
8. Ground validation by field surveys: Validation to confirm the exiting land use.
9. Quality checking.
10. Attachment of attribute data.
11. The GIS database with revenue cadastral, imageries and image derived land use is developed in ArcGIS platform.

Visual interpretation techniques were used to interpret the satellite image, which is the main input data for preparation of Landuse / Landcover map of the area. Survey of India topographic map is mainly used for the preparation of base map like transportation networks, water bodies location, etc. as a reference map. (Software used ESRI-Arc GIS, AutoCAD and ERDAS).

The geo-database is proposed to be developed on ArcGIS platform as a desktop application for viewing, querying and reporting , various spatial and non-spatial information within the development authority area. The GIS database is to be prepared with mutually registered layers generated from cadastral maps, satellite image, field survey inputs, existing land use, proposed land use, etc.

Following is the list of data layers attached to the base map:

- Authority Name
- Taluka Name
- Zone Name (in SMC Area)
- Ward Name (in SMC Area)
- Village Name
- Plot Status (Survey No./Block No./ City Survey No./FP No.)
- Plot No
- TP Status
- TP.No.
- TP Name
- OP Number
- Existing Land Use
- Proposed Zone

3.4 ADVANTAGE OF GIS MAP

1. A GIS map facilitates for analysis of different themes and used for preparation of plan proposals.
2. GIS improve the decision-taking process.
3. GIS enables the user to obtain rapid access to what he requires and, at the same time, to check that his requirements will not impinge unduly on the interests of others.

4. The GIS allows most kinds of basic statistical spatial analysis to be carried out with relative ease.
5. The GIS will enable a comparative analysis of the dynamics of different land use interests and its flexible data handling capabilities are of central importance in helping to produce the overall assessment of input to the strategy being explored for preparation of Land-use map.

4 REVIEW OF SANCTIONED DEVELOPMENT PLAN 2004

4.1 INTRODUCTION

Before framing the policies and proposals of the Draft Development Plan of SUDA, it was be essential to review the goals, policies and proposals of the Sanctioned Development Plan of SUDA 2004 so that achievements made and the shortfalls observed could be considered while framing the proposals of the Draft Development Plan of SUDA 2035. This chapter discusses in detail the objectives and policies of Sanctioned Development plan 2004. It also analyzes in detail, the projects and implementation of the projects and proposals of Sanctioned Development Plan in the past decade.

4.2 REVIEW OF AIMS AND OBJECTIVES OF THE SANCTIONED

4.2.1 DEVELOPMENT PLAN

After the constitution of SUDA in 1978, the first development Plan; as per the provisions of the Gujarat Town Planning and Urban Development Act, 1976 was sanctioned by the State Government in 1986 which came into force from 3rd March, 1986. As per the provisions of section 21 of the Act, the development plan is to be revised once in 10 years. SUDA started the process of revision of this principal development plan and accordingly published the draft of the first development plan in 1996 within 10 years. The draft development plan was ultimately sanctioned by the State Government in 2004 which came into force form 15th September, 2004. This is the DP which is under implementation and refereed as DP -2004 hence onward.

The proposals of DP-2004, was based on the following broad principles.

1. To minimize the spread of urbanization in agriculturally rich fertile irrigated area and to utilize the maximum khar land for future urbanization.
2. Urban growth along the main corridors.
3. Identify new development areas to ease the pressure on Surat city.
4. Better environmental living condition by maximum utilization of existing infrastructure.

The main objective of the DP-2004 was to achieve efficient functioning by restructuring the city, by means of conservation, redevelopment or new development with long term perspective to guide future development. One of the important considerations while formulating the DP-2004 proposals was to protect the best of existing character of Surat and to develop its structure and suggest appropriate measures to overcome remedies obstructing the healthy growth of city. The DP-2004 had identified following 9 objectives that focused on various aspects of creating good living environment, providing effective infrastructure, augmentation of financial resources, coordination of various developmental activities, etc.

1. To create definite urban form.
2. To establish supportive transport network with regards to existing city and regional network with which effective mass-transportation system can be developed.
3. To develop residential (hub) nodes with self-sufficient infrastructure and amenities to ease the pressure on the main city.
4. To aim for evolving poly-nucleated structure for the area as against the present mono centre structure keeping in view development in urban fringe area.
5. To identify and suggest possible water resources and indicate possible drainage disposal system for over all urban area.
6. To take into consideration the impact of the heavy industrial growth in HADA area, increasing port activities, development activity like O.N.G.C., KRIBHCO, etc. in Ichchhapore and to identify the activities in the vicinity of these planned area.
7. To develop environmental balanced planning with provision of open spaces, recreational areas, amusements parks catering to the regional needs as a whole.
8. To identify and suggest preservation of historical monuments and architectural heritage.
9. To regulate and control the development in the planned manner.

Considering need for economical use of urban land, the overall density of 240 PPH was envisaged for future development of SMC area and 80 PPH for SUDA area excluding SMC area. Approximately 187 sq.km. area from SUDA limit along with 112.28 sq.km. of SMC area totalling approximately 300 sq.km. area was proposed for future urbanization for the projected population of 2011 in the DP – 2004. The proposed urbanization area of SUDA was broadly divided in Residential, Commercial, Industrial, Educational and Recreational zones.

In the past decade, significant work has been done towards achieving these aims and objectives. Below is an assessment of the work and the projects that have taken place since 2004.

4.2.2 GROWTH AND DISTRIBUTION OF POPULATION IN URBAN AND RURAL AREA FOR 2011

During preparation of the proposal for the DP in 1996, the official census data of 1991 was considered according to which the population of whole SUDA area was only 18 lakhss. All the projections and proposals were made on the basis of census data of 1971, 1981 and 1991. After the epedemic plague in 1994, major initiatives for development were taken in SMC area and employment opportunities were generated leading to population explosion particularly in the municipal corporation area. The projected population fell short of the actual population as per 2001 census for both the areas of SMC as well as the area of SUDA excluding SMC. The census of 2001 recorded the population of SUDA at more than 31 lakhss although in the DP -2004 had projected only 27.50 lakhss. In the subsequent decade, the population of SMC increased dramatically. The total population of SUDA as projected in DP-2004 for 2011 was only 42 lakhss and actual as per census 2011, it is about 6 lakhss more than what was projected. Thus, the population projections in the sanctioned DP of 2004 fall short of the actual population growth in the last two decades.

Table 9: Population as per different census

Year	As Projected In RDP 2004 (Pop. in lakhss)	As Per Census (Pop. in lakhss)
1961	-	3.55
1971	-	5.58
1981	-	11.20
1991	-	17.80
2001	27.50	31.05
2011	42.00	48.05

4.2.3 DEVELOPMENT OF GREEN SPACES, OPEN SPACES AND PLACES OF PUBLIC ACTIVITIES AND RECREATION

Table 10: Details of gardens

Sr. No.	Zone	Gardens (A)	Shantikunj/ Shantivan(B)	Area (ha)
1	Central	12	1	4.11
2	West	24	6	31.43
3	Southwest	18	2	18.34
4	South	10	5	14.04
5	Southeast	4	6	0.54
6	East	8	6	11.33
7	North	14	3	10.55
Sub Total		90	29	
SMC Total		**(A+B)=119**		**90.36**
SUDA		**40**		**21.24**
Total		**159**		**111.60**

Total Parks and gardens in SUDA region area 159 out of which 119 are developed in SMC area and remaining are the existing gardens in area outside SMC within SUDA limits.

4.2.4 PUBLIC PARTICIPATION FOR COMPREHENSIVE DEVELOPMENT OF URBANISABLE AREA

As per the provisions of the Act, the Development Plan proposals are implemented through the mechanism of Town Planning Schemes where public participation is extensively involved at each and every stage of planning. As per the Sanctioned Development Plan-2004 the total Urban area proposed i.e. 365.11 sq.km. was comprised of different land uses such as Residential, Commercial, Industrial and recreational uses. Town Planning schemes were prepared for these zones.

Before the extension of SMC boundary in 2006, SUDA had prepared 45 TP Schemes, then all these planned area were merged in the SMC limit and now SMC is implementing these schemes. The details of area under TP scheme and percentage of urban area developed are shown in the Table below. Under the Development Plan -2004, total 129 TP schemes were prepared for the area under SMC and a total of 23 TP schemes were prepared for area under SUDA.

Table 11: Status of DP through T.P. Scheme

Authority Area	Total Area (sq.km.)	Total Urban Area Proposed	No of TP Scheme	Area Under TPs (sq.km.)	Implementation (%)
SMC	326.51	239.80	129	179	**75**
SUDA (Outside SMC)	388.64	125.31	23	48	**39**
Total SUDA	**715.12**	**365.11**	**152**	**227**	**62.1**

4.2.5 EFFECTIVE TRANSPORTATION NETWORK

With a view to have efficient transportation system as well as to avoid the congestion at important road junctions various new roads, bridges, flyovers, underpasses in SUDA were proposed in the Development Plan - 2004. Surat is known as city of flyovers. The implementation status is shown in the following table no. 12.

Table 12: Details of transportation projects implemented under DP 2004

Sr. No.	Criteria	Status	SMC	SUDA (Excluding SMC)	SUDA Total
1	Bridges	Proposed in DP 2004	3		3
		Implemented	2 constructed 1 under construction 23 creek bridges constructed	-	2 constructed 1 under construction 23 creek bridges constructed
2	R.O.B	Proposed in DP 2004	2	1	3
		Implemented	3	-	3
3	Flyovers	Proposed in DP 2004	Not proposed		
		Implemented	11 flyovers 2 BRTS flyovers 6 BRTS Flyovers under progress	1 flyover at Sachin	14 flyovers 6 under progress

4.2.6 90 M WIDE OUTER RING ROAD

As discussed earlier, the Development Plan which is in force as of now was based on the census data of 1991 and population projected for 2011 was only 42 lakhss which has now reached to about 50 lakhss as per 2011 census. In this revised Development Plan -2004, the ring road was not envisaged when it was sent to the State Government for sanction in 1996.

The increasing population has generated lot of industrial, commercial, recreational educational and other activities. The demand for residential areas has also increased to cater to the fast growing population. Considering the traffic and transportation need of the rapidly growing Surat city the need for the comprehensive and integrated approach toward traffic and transportation planning was strongly felt. Keeping the future expansion of the fast growing city of Gujarat in mind, SUDA planned, a 90 m wide 66-km long outer ring road on the periphery of the city. This road will provide easy access to all parts of the mega city and also in the future to the twin city of Surat and Navsari. The land use along this outer ring road is conceptualized so that the city gives the look of the mega city with sky line giving competition to the developed cities of India as well as the world.

Out of the 66 Km length of this road, 29 km is proposed in the SMC area while rest of the 37 km passes through 27 villages of the SUDA area. The alignment of 90 m wide outer ring broad is proposed in such a manner that about 37 km is proposed on the existing National Highway (20 km) and State Highway (17 km) which are in fact part of the 60m wide road proposed in revised Development Plan. The rest of the 29 km north – south stretch on the eastern side of SUDA area is proposed as new alignment in the Agricultural Zone. SUDA decided to develop the 29 km of the proposed 90 m wide outer ring road which is passing through the agricultural zone in the First phase so that the ring can be completed with the 37 km of the existing portion of the NH and SH by means of preparing 11 TP Schemes. For preparing the TP Schemes, 500 m on both the sides of the ring road alignment is converted to the special residential zone so that the TP schemes can be prepared as per the provisions of the Act, 1976. The draft TP Schemes have been prepared and submitted to Govt for sanction. The eight draft schemes of SUDA and draft schemes of SMC were sanctioned by the State Government in March, 2016.

SUDA decided to get the possession of road by virtue of TP schemes and for developing the world class infrastructure, major portion of the finance to be generated by charging the developer 40 percent of the prevailing Jantri rate for the F.S.I. to be used more than 0.6 and up to 4. Some finance could also be generated by selling the plots allotted to the appropriate authority for the purpose of sale and also by the way of incremental contribution.

4.2.7 RESERVATION DEVELOPED

After the DP -2004 came into force, as per the provision of section 19 of the Act, variations in this sanctioned development plan proposals were made at different point of time in the public interest by the State Government as indicated in the list below:

Table 13: Details of reservations under DP 2004

Total no of Reservations	No.	285
	Area	59.82 sq.km.
Reserved for SMC	No.	208
	Area	17.04 sq.km.
Reserved for SUDA	No.	24
	Area	9.66 sq.km.
Reserved for Others	No.	53
	Area	33.22 sq.km.
No. of reservations Acquired	No.	99
	Area	15.35 sq.km.
Deleted Reservations u/s 19	No.	13
	Area	0.66 sq.km.
No. of Reservations Still Existing	No.	173
	Area	43.91 sq.km.

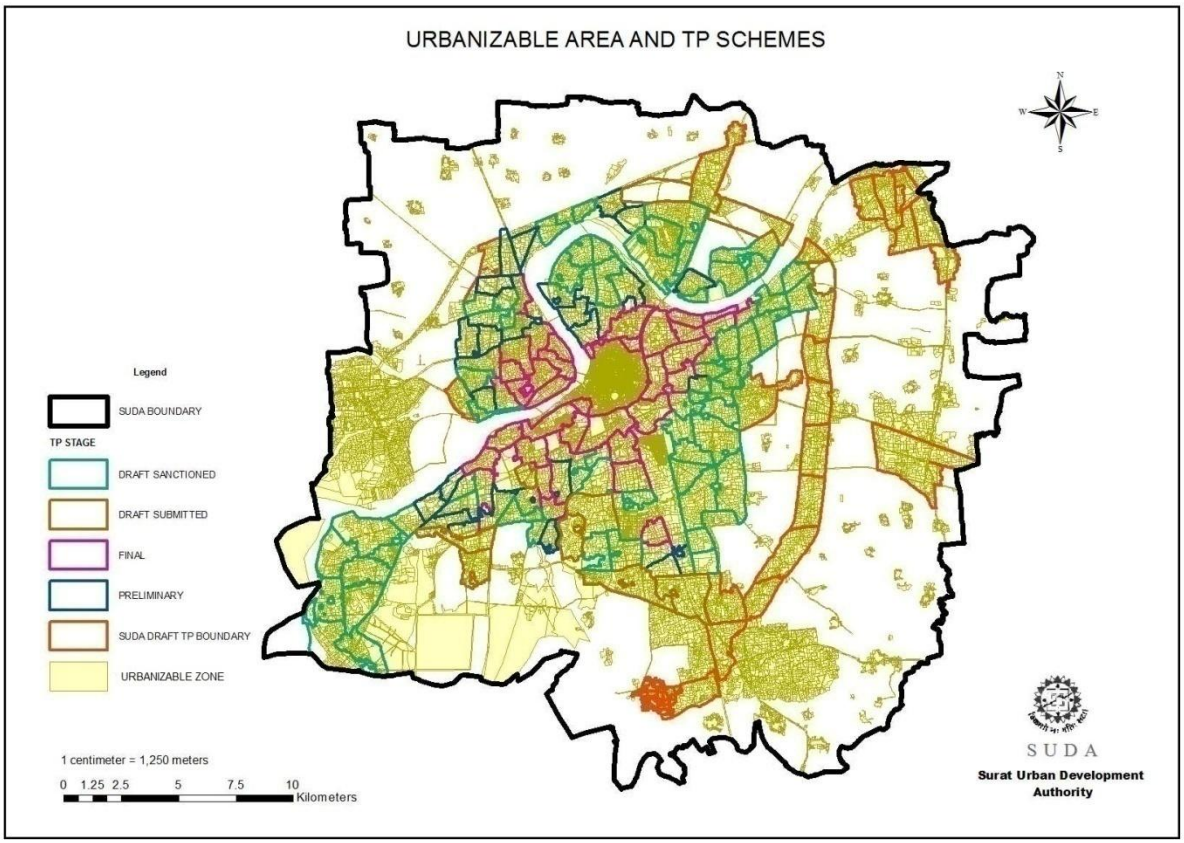
Total 285 number of reservations were proposed in DP 2004. Out of these 285, 13 reservations with an area of 0.66 sq.km. were deleted.

4.3 OBSERVATIONS

» The population growth of the city was 6 lakhss persons higher and faster than the anticipated growth in the DP 2004.

» There is still a 92 sq.km. of land available for development within Residential zones through micro level planning mechanisms in the zones in the sanctioned development plan of 2004. This can be helpful to accommodate the future growth of the city.

Figure 11: TP Scheme map



5 PHYSICAL FEATURES

5.1 PHYSIOGRAPHICAL CONDITIONS

The city of Surat is located on banks of Tapi river. The area within SUDA has a gradual slope towards the western and southern side of the city, having a natural drainage system towards Tapi River. The coastal area of south western side slopes towards Mindhola River. The city is divided in two parts by Tapi river. The development in the SUDA area has taken place on both the sides of the river. The coastal line at Hazira, Mora, Damka, Limla, Dumas, Bhimpore, Abhawa, Gavier, Sarsana and Vesu i.e. the land between the mouth of river Tapi and Mindhola is at low elevation.

The altitude of Surat is around 13 m above mean sea level.

5.2 FLOOD PRONE AREAS

Surat lies in the flood plain and also lies in an estuarial region. There are number of creeks in the south- western part of the city. The city has been historically susceptible to flooding. Development of Surat in the past has been affected a number to times due to the high flood in Tapi.

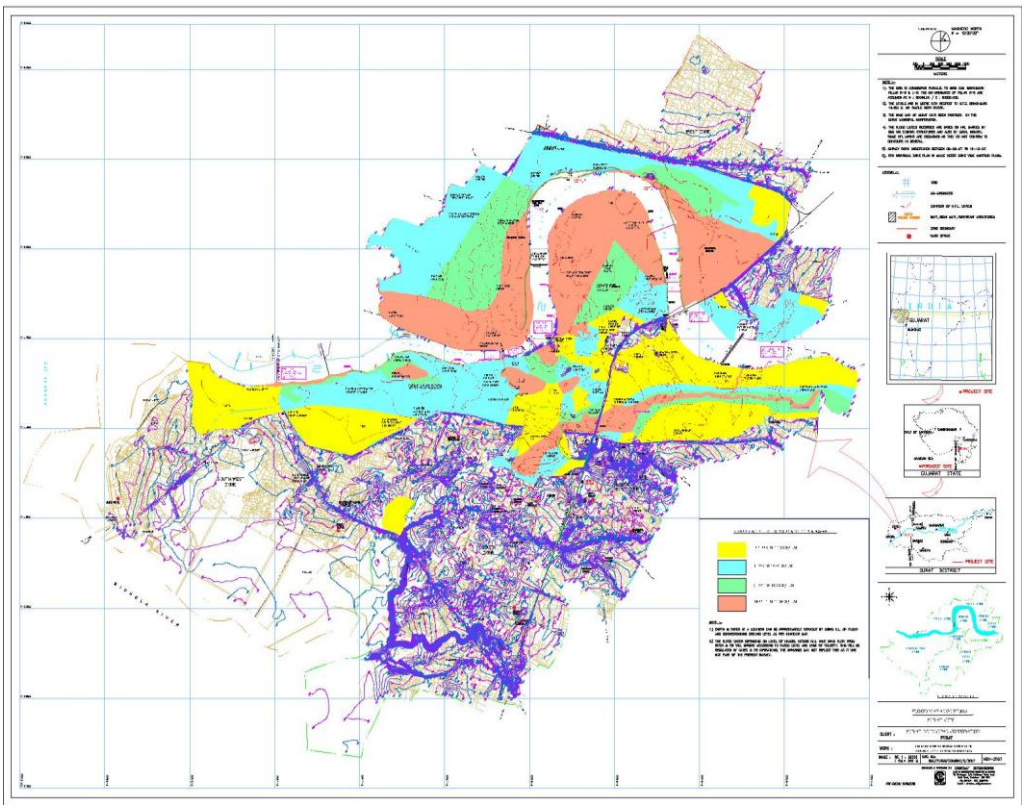
Flood risk exposure and vulnerability of the city has increased over the past few decades. Flood in the year 2006 covered almost the entire city and affected nearly two-third of the Surat city population. Since the altitude of Surat is less than 13 m above mean sea level, even with a sea level rise of one meter, the area under high tide zone particularly western parts of the city which are less than 10 m above mean sea level may be highly impacted. Now with the Ukai dam and the flood embankment scheme undertaken by the State Government, this area is safe from low intensity floods. The height of Nehru bridge is however one of the controlling point for further strengthening of flood embankment.

Ukai reservoir has been designed for a gross storage of 6.9 million acres feet at F.R.L. 345. During the floods, this can be raised to the high flood level of about 351 to hold the excess water of about one million acres foot. Any further rise in flood level could endanger the up-stream area by sub-merging them. The plan shows the provision of embankment scheme. According to this scheme the development of Rander- Adajan is still under the flood affected zone. The embankment scheme has to be further strengthened.

The walled city area has no good drainage system. There are few pockets of low lying area, where water gets logged in the rainy season. It is observed that the area of Navasari Bazar, Khapatia Chakla, Panini Bhit, Vada Chauhta area get flooded in rainy season. The other affected area is across the railway line towards the southern side of Kamrej which is also low lying area having the natural drain towards Khakra Khadi.

The flood prone area in the figure no. 12 shows the flood affected area in the SUDA.

Figure 12: Flood Map of SMC Area



5.3 WIND DIRECTIONS

Surat is experiencing predominant wind direction from south-west to north-east, the breeze is mostly from the sea towards the main city.

5.4 CLIMATE

Surat has a tropical savannah climate, moderated strongly by the Sea to the Gulf of Cambay with a summer dry season. There are three distinct climatic seasons in this region. March to June is the summer season. May and June are the hottest months. The highest recorded maximum temperature is 45.6 °C in the months of May and June. The summers are extremely hot and dry. Scorching heat and hot winds are typical characteristics of it. It is very uncomfortable to move around in the daytime.

Late June to early October is the rainy season. It is generally breezy during these months. The scenic quality of the place is greatly enhanced with the onset of monsoon. Most of the areas remain pleasant and comfortable throughout the day. October and November see the retreat of the monsoon.

November to February is the winter season. The month of January is the coldest with average minimum temperature of 14.3°C. The lowest recorded temperature of 4.4 °C is in the month of January. Weather remains pleasant most of the day.

The month wise mean sea temperature is as shown in the Table 14 below:

Table 14: Surat Mean Temperature

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
25 °C	25 °C	25 °C	27 °C	29 °C	29 °C	29 °C	28 °C	28 °C	29 °C	28 °C	26 °C

Table 15: Climate data for Surat

Climate Data for Surat, Gujarat													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C	38.3	41.7	44.0	45.6	45.6	45.6	38.9	37.2	41.1	41.4	39.4	38.9	45.6
Average high °C	30.3	31.7	35.4	37.2	36.4	33.9	30.7	30.5	31.7	34.4	33.3	31.1	33.05
Daily mean °C	23.3	23.6	27.4	30.3	31.2	30.2	28	27.7	28	28.3	25.8	23	27.23
Average low °C	14.3	15.6	19.5	23.4	26	26.6	25.4	25	24.4	22.2	18.3	15	21.31
Record low °C	4.4	5.6	8.9	15.0	19.4	20.2	19.9	21	20.6	14.4	10.6	6.7	4.4
Precipitation mm (inches)	0 (0)	0 (0)	1 (0.04)	0 (0)	4 (0.16)	213 (8.39)	453 (17.83)	302 (11.89)	194 (7.64)	31 (1.22)	6 (0.24)	1 (0.04)	1,205 (47.45)
Avg. rainy days	0	0	0	0	0	6	14	11	7	1	1	0	40
% humidity	57.5	56	55.1	62.9	71.8	79	86.2	86.4	82.3	70.2	62	61.3	69.2
Mean daily (sunshine hours)	9	10	9	10	10	7	4	3	7	9	9	9	8
Source : Wikipedia													

5.5 RAINFALL

The southwest monsoon in Surat normally occur in the duration of month of June to month of September. Normal rainfall is about 1400 – 1700 mm.

Table 16: Rainfall Details

Rainfall	Normal RF(mm)	Normal Rainy days	Normal Onset	Normal Cessation
SW monsoon (June-Sep)	1400 - 1700	45-56	3rd week of June	4th week of September

The yearly rainfall details of Surat are shown in the table below. The highlighted cells are the years when river Tapi was flooded.

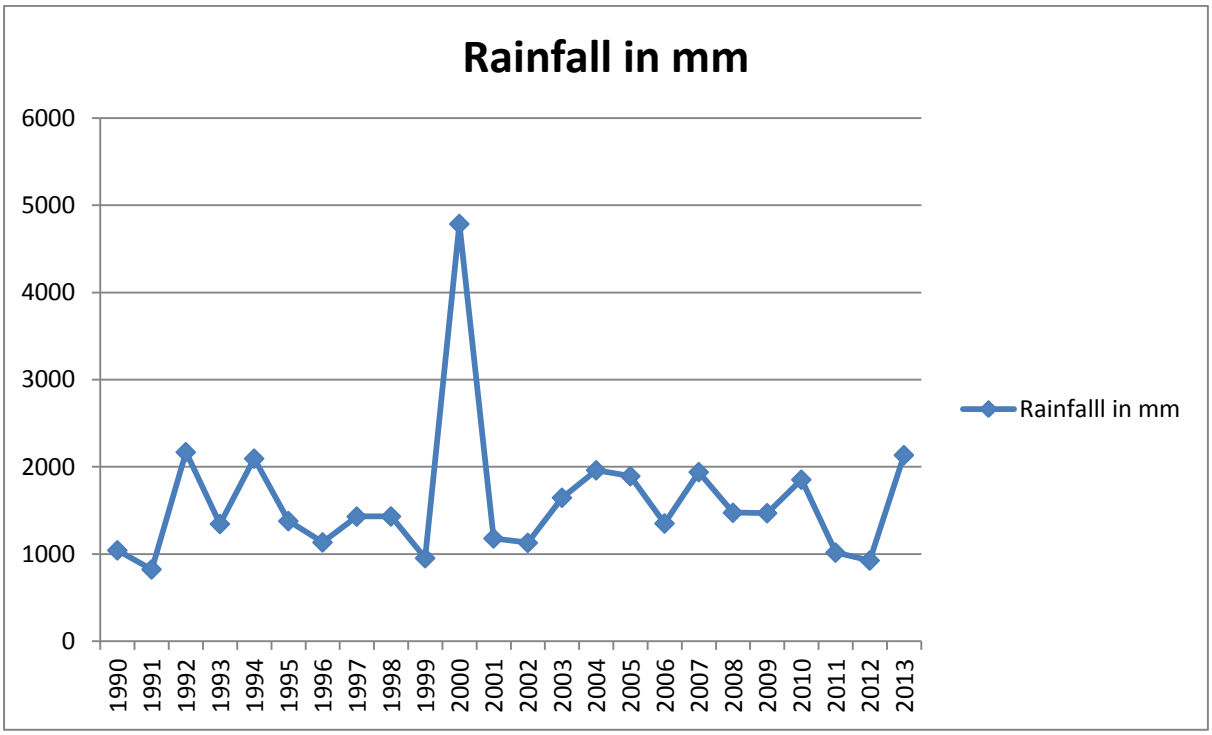
Table 17: Yearly seasonal Rainfall

Sr. No.	Year	Seasonal total Rainfall in Inch/ Dokda	Seasonal total Rainfall (m)	Seasonal total Rainfall (m)
1	1990	42.32	1044.09	1.04
2	1991	32.48	825.01	0.83
3	1992	85.4	2169.02	2.17
4	1993	52.43	1346.1	1.35
5	1994	82.5	2095.5	2.1
6	1995	54.28	1379.4	1.38
7	1996	44.67	1134.8	1.13
8	1997	40.6	1431.04	1.43
9	1998	56.39	1432.6	1.43
10	1999	37.56	954.2	0.95
11	2000	30.92	4785.8	4.79
12	2001	46.5	1180.5	1.18
13	2002	44.57	1129.8	1.13
14	2003	66	1647	1.65
15	2004	77.31	1962.02	1.96
16	2005	74.46	1894	1.89
17	2006	53.22	1352	1.35
18	2007	76.22	1940.6	1.94
19	2008	57.95	1475.02	1.48
20	2009	57.77	1470	1.47
21	2010	72.99	1854	1.85
22	2011	40.25	1018	1.02

23	2012	36.64	927	0.93
24	2013	84.32	2135	2.14

Source: Flood and Weir Department, SMC

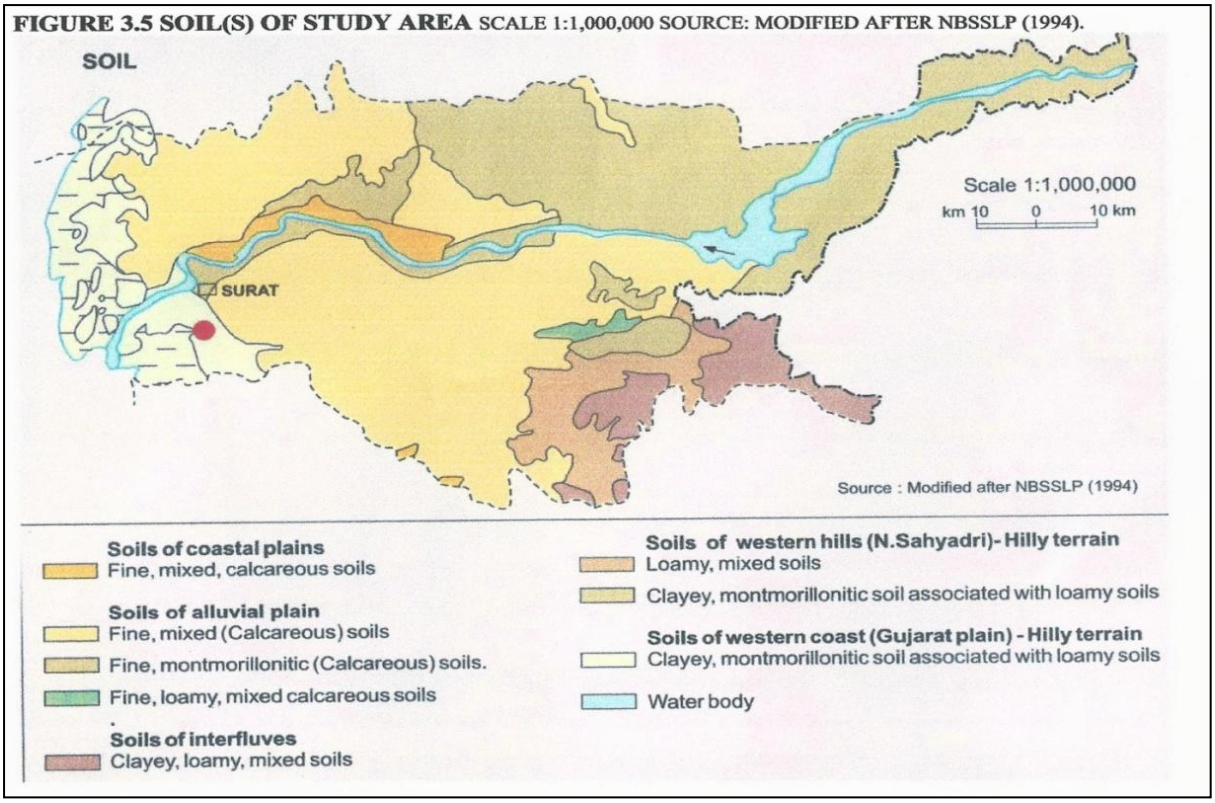
Figure 13: Seasonal Rainfall in mm



5.6 GEOLOGY

Surat mainly falls under coastal plains. It has fine mixed and calcareous soils. Some part of SUDA also falls under alluvial plains. Thus Surat mainly consists of fine mixed and montmorillonitic type of soil.

Figure 14: Soil Map of SUDA



5.7 HYDROLOGY

The Tapi River runs through the city of Surat, is one of the major rivers of peninsular India with a length of around 715 km. It is one of only three rivers in peninsular India that run from east to west. The river covers 3601 ha of the total land under SUDA along with small portion of Mindhola estuary as well on southern part of SUDA area. SUDA region have about 898 no. of small and large size lakes covering about 548 ha of land area under lakes and pond.

SUDA and SMC have developed walk way on river front and some of the lakes and Sea – shore for recreational purpose. Notable examples include Gaviyar Lake, Lake at Subhash Garden, Dummas Beach, Sultanabad – Dummas, Umbher lake, Gopi Talav; Out of total, 13 lakes have been interlinked as of today for managing storm water during the monsoon.

Figure 15: Waterbodies in Surat

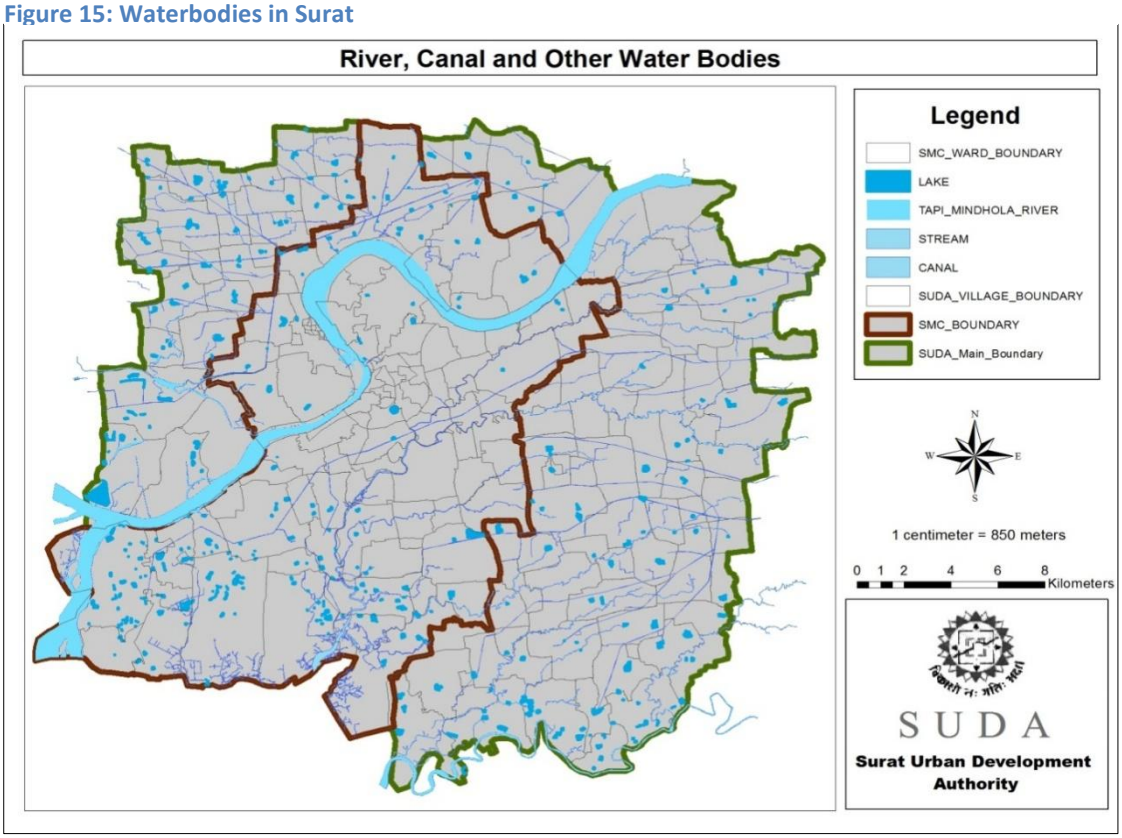


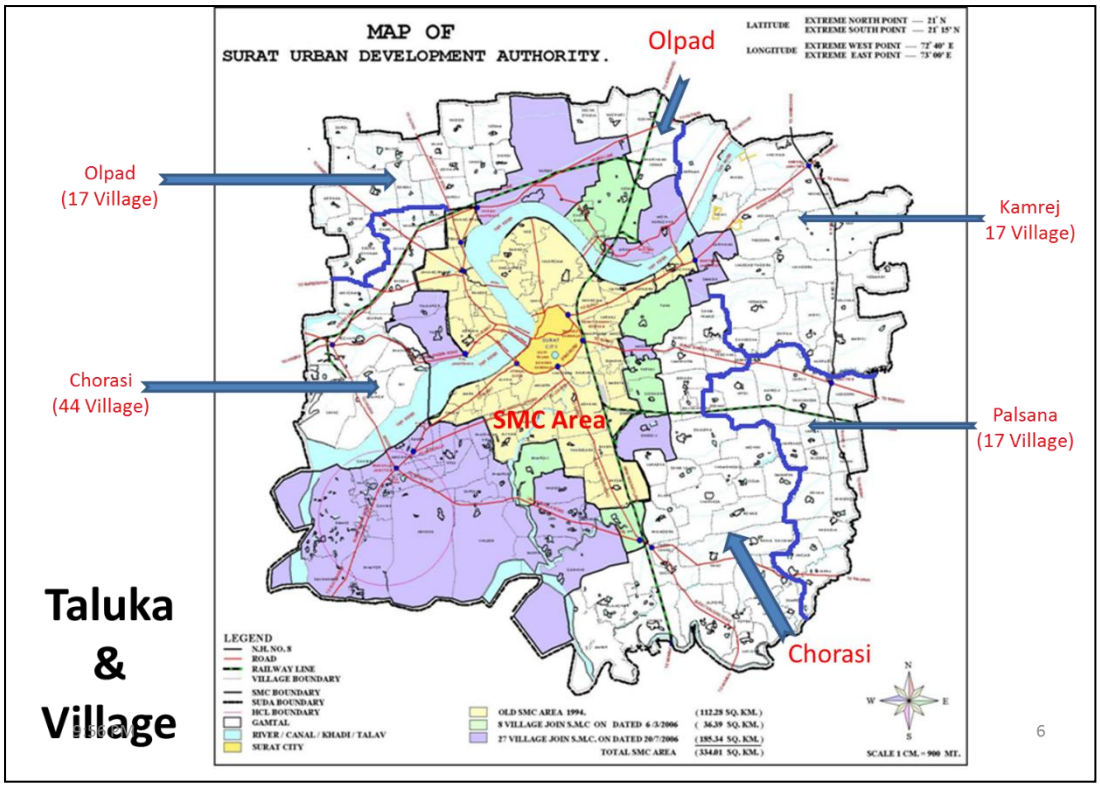
Table 18: Details of Ponds in the SUDA area

Sr. No.	Authority	Name of Taluka / Zone	Total Number of Villages / Ward	Number of Ponds or Lake in The Taluka / Ward	Area of The Water Body per Taluka / Ward (ha)
1	SUDA	Kamrej	17	53	26.020
2		Palsana	17	56	33.658
3		Olpad	17	117	71.444
4		Choryasi	44	373	238.647
5	SMC	North Zone	15	19	7.480
6		Central Zone	16	01	7.539
7		West Zone	22	39	24.098
8		East Zone	19	13	4.280
9		South West Zone	24	185	85.750
10		South Zone	15	42	48.639
11		South East Zone	14	00	0.0
TOTAL			**220**	**898**	**547.555**

6 SOCIAL AND DEMOGRAPHIC PROFILE

Over a period of time, Surat has seen a rapid movement in increase of population with remarkably higher growth rates in past a few decades. The population has been rising with development activities and growth in health, educational and economic opportunities. This section discusses the population growth in past, demography and social aspects of the Surat Urban area under administration of SUDA.

Figure 16: Taluka and Villages in SUDA



6.1 POPULATION GROWTH TRENDS

The administrative boundaries of the SMC have been expanded time to time due to the need of accommodation of increasing number of citizens. However, SUDA has never so far had any spatial expansion of administrative limits since its establishment in year 1978 under The Gujarat Town Planning & Urban Development Act, 1976. ***Table 19*** showing details of spatial extent of Surat urban spread over a period of time.

Table 19: Spatial spread of Surat

Year	Area (sq.km.)			
	SMC	%	SUDA	%
1664 (Inner wall Area)	1.80	100	-	-
1707 (Outer wall Area)	7.40	100	-	-
1901	7.40	100	-	-
1941	7.40	100	-	-
1951	7.40	100	-	-
1961	8.18	100	-	-
1963	21.95	100	-	-
1971	33.90	100	-	-
1975	55.70	100	-	-
1978	55.70	7.17	722.00	92.83
1981	55.70	7.23	715.00	92.77
1986	110.00	13.33	715.00	86.67
1991	111.15	13.45	715.00	86.55
1994	112.28	13.57	715.00	86.43
2001	112.28	13.57	715.00	86.43
2006	326.515	31.35	715.00	68.65
2011	326.515	31.35	715.00	68.65

Source: City Development Plan, Surat (2006-2012)

Table 20 below states the population and density within SMC and SUDA areas respectively based on area of administration.

Table 20: Population of SMC with extended area in 2006 and SUDA exclusive of SMC

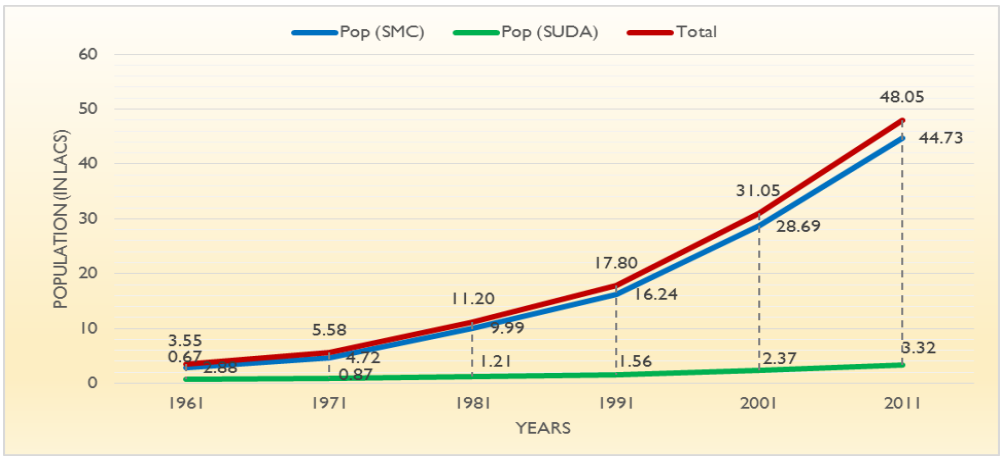
Year	SMC area			SUDA area (Except SMC)			SUDA area		
	Population	Density per sq.km	Growth Rate	Population	Density per sq.km	Growth Rate	Population	Density per sq.km	Growth Rate
1981	9,99,373	3,066	--	1,20,993	306	--	11,20,366	1,552	
1991	16,24,135	4,982	62.52 %	1,55,501	393	28.52 %	17,79,636	2,465	58.84 %
2001	28,68,603	8,799	76.62 %	2,36,521	597	52.10 %	31,05,124	4,301	74.48 %
2011	44,67,797	13,721	55.75 %	3,37,304	838	42.61 %	48,05,101	6,655	54.75 %

Source: SUDA, derived from Census 2011

Growth rate in both of the tables remarkably identify the difference of development pace accommodating citizens near their workplaces.

Interestingly, Table 20 shows the derived population growth and density for entire of Surat city (i.e. SMC and SUDA both combined). Here, with the effect of SUDA area population growth is visible and affecting the SMC population rise giving it moderate trend. Still, the decadal growth rate of the population in area is alarmingly above 54% which has reduced by around 20% from the previous decade.

Figure 17: Surat Population trends



As clearly observed in the Figure 17, SMC population is increased at a very higher growth rate comparison with rest of SUDA. It indicates that SMC serves as a growth magnet which attracts the people for living. Composition of population in administrative area of SMC and four Taluka are shown in Table 21. The major contribution (almost above 90%) in total population is through Surat city whereas rest is distributed almost equally among four Taluka forming rest of SUDA.

Table 21: Population composition in SUDA region

Sr. No.	Area	Population & percentage share in total population							
		1981		1991		2001		2011	
1	S M C	9,99,973	89.20 %	16,24,135	91.26%	28,68,603	92.38%	44,67,797	93.10 %
	Total (SMC)	9,99,373	89.20 %	16,24,135	91.26%	28,68,603	92.38%	44,67,797	93.10 %
2	Olpad Taluka	16,173	1.44 %	17,799	1.00%	20,632	0.66%	19,657	0.40%
3	Chorasi Taluka	54,030	4.82 %	68,078	3.83%	1,06,974	3.45%	1,69,053	3.51%
4	Palsana Taluka	20,787	1.86 %	27,886	1.57%	49,691	1.60%	77,185	1.61%
5	Kamrej Taluka	28,562	2.55 %	39,920	2.24%	56,848	1.83%	71,409	1.49%
	Total (Rest of SUDA)	1,20,993	10.80 %	1,55,501	8.74%	2,36,521	7.62%	3,37,304	7.00%
	Grand Total	11,20,366	100.0 0%	17,79,636	100.00 %	31,05,124	100.00 %	48,05,101	100.0 0%

Source: SUDA, derived from Census 2011

It is observed that Surat city with area of 326.52 sq.km. i.e. 45.22% of SUDA area comprises 93.10% of total population of the urban agglomeration. The trend has been similar over the past decades and subsequently there has been spatial expansions observed for Surat city limits to accommodate the newly populated peri-urban pockets. Detailed note on village-wise population in context to city as well as SUDA administration boundaries can be referred in Annexure**.**

6.2 POPULATION DENSITY

The city experienced an increase in the density of population despite an increase in area between 1971 and 1981. However, in 1991, the population density declined due to a proportionally larger increase in the area compared to the population. In 1971, the city, with a population of 4,71,656 was spread over an area of 33.90 sq. km. resulting in a population density of 139 PPH.

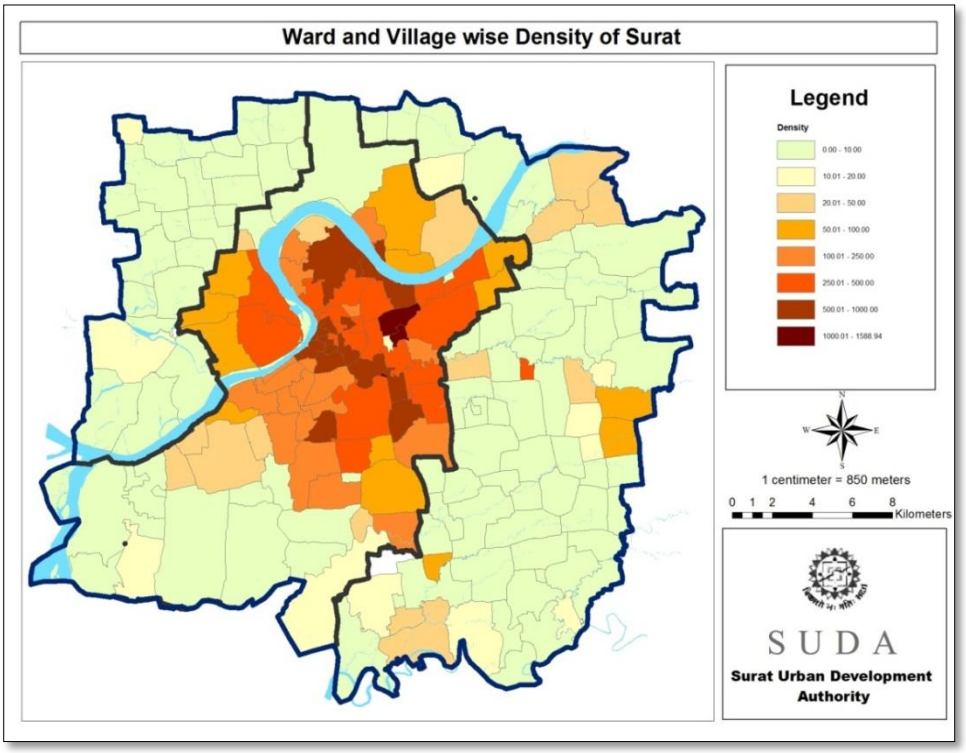
Table 22: Population density in SMC and SUDA areas

Year	SMC area (latest area)		SUDA area (Excluding SMC)		SUDA area (with SMC)	
	Population	Density per sq.km.	Population	Density per sq.km.	Population	Density per sq.km.
1981	10,13,188	3103.03	1,23,793	323.96	11,36,981	1604.45
1991	16,34,605	5006.21	1,60,749	420.67	17,95,354	2533.51
2001	28,76,374	8809.31	2,41,314	631.50	31,17,688	4399.52
2011	44,67,797	13683.28	3,37,304	859.21	48,05,101	6768.04

Source: SUDA, derived from Census of India

Table 22 shows the data of the population density as recorded in last four census decades. In 2006, city limits witnessed spatial expansion reaching 326.52 sq.km. and with population density of about 137 PPH. The density in SUDA area is comparatively very low which gives rise to opportunity for development. The highest density of population in Municipal Area is observed in Walled city area. In particular in certain localities like Gopipura, Wadifalia, etc. the density of population is stated to be around 1000 persons per hectare. New areas brought in under the jurisdiction of SMC in 1986 are by and large sparsely populated, though along the two prominent corridors, viz. Nana Varachha Road and Udhna (Navsari) road, the population density is moderately high.

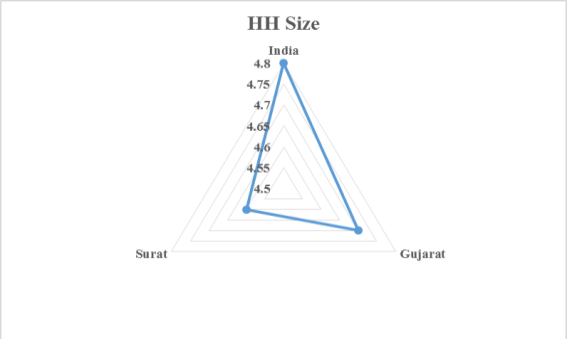
Figure 18: Density of Surat in 2011



6.3 HOUSEHOLDS

Out of all the spatial administrative constituencies, the average household size was reported as 4.85 persons per family in 2001 which has reduced to 4.60 persons in 2011 in the Census showing a declining growth in household size by 5.45%. The survey on Household size was released through NHFS-3 on 11th April, 2007 by the IIPS, Mumbai designated by the Ministry of Health and Family Welfare (MoHFW, GoI) which shows that Surat has lower average household size (for 2011) than that of the Country as well as the State. (Figure 19)

Figure 19: Household sizes in SUDA



Source: NHFS-3, by IIPS through MoHFW, 2007

The table no 23 below shows the household size and rates for reported during Census 2001 and 2011.

It was observed that the wards of Surat city area (102 No.) have declined trend during the decade however, the number of households have increased by 39.92%. Moreover, except Olpad taluka constituencies, the HH has increased over past decade. Following table shows the growth of accommodating households in different taluka under SUDA administration.

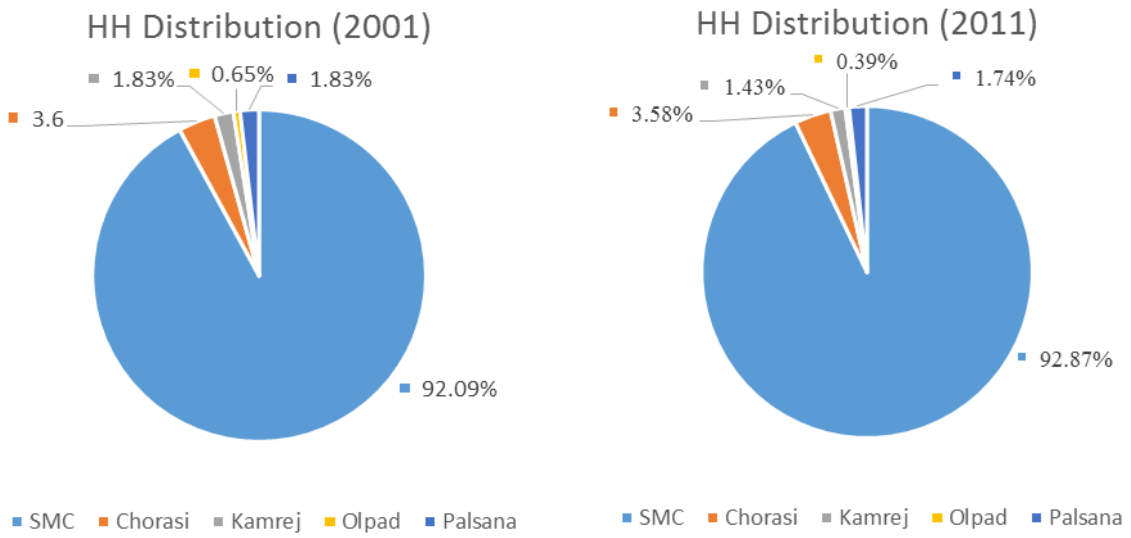
Table 23: Household data of Surat district

	2001	2011	Growth Rate (%)
SMC	5,86,230	9,75,797	66.45
Chorasi	22,934	37,583	63.87
Kamrej	11,652	15,062	29.27
Olpad	4,135	4,052	-2.01
Palsana	11,629	18,249	56.93
Total	6,36,580	10,50,743	65.06

Source: Census of India, 2001 and 2011

Following charts show the composition of households accommodated in SMC and other taluka under SUDA administration. It shows that with increase in number of households accommodated in different taluka level constituencies, the Surat city has retainined its accommodating capacities (with spatial expansion in 2006).

Figure 20: Household distribution in SUDA (2001 and 2011)



6.4 SEX RATIO

Surat being industrial and commercial activities oriented city, the sex ratio in the areas has been lower than the national and state average. However, the growth of male and female persons has been almost equal during Census 2001 and 2011. Following table show the male-female growth rates in the said duration.

Table 24: Male and female populations

Administrative constituency	Male population			Female population		
	2001	2011	Growth rate	2001	2011	Growth rate
SMC	16,30,846	25,43,623	55.97%	12,45,528	19,24,174	54.49%
Chorasi	57,667	93,677	62.44%	44,476	68,822	54.74%
Kamrej	29,998	39,480	31.61%	26,850	31,929	18.92%
Olpad	10,716	10,001	-6.67%	9,916	9,656	-2.62%
Palsana	30,523	43,934	43.94%	21,060	32,985	56.62%
Total	**17,59,750**	**27,30,715**	**55.18%**	**13,47,830**	**20,67,566**	**53.40%**

Average sex ratio for the area in Census 2001 was reported as 809 females per 1000 males which had reduced to 803 during Census of India, 2011. National average for the 2011 was reported as 908 and for Gujarat as 909 females per 1000 males.

Figure 21: Sex ratio in Surat

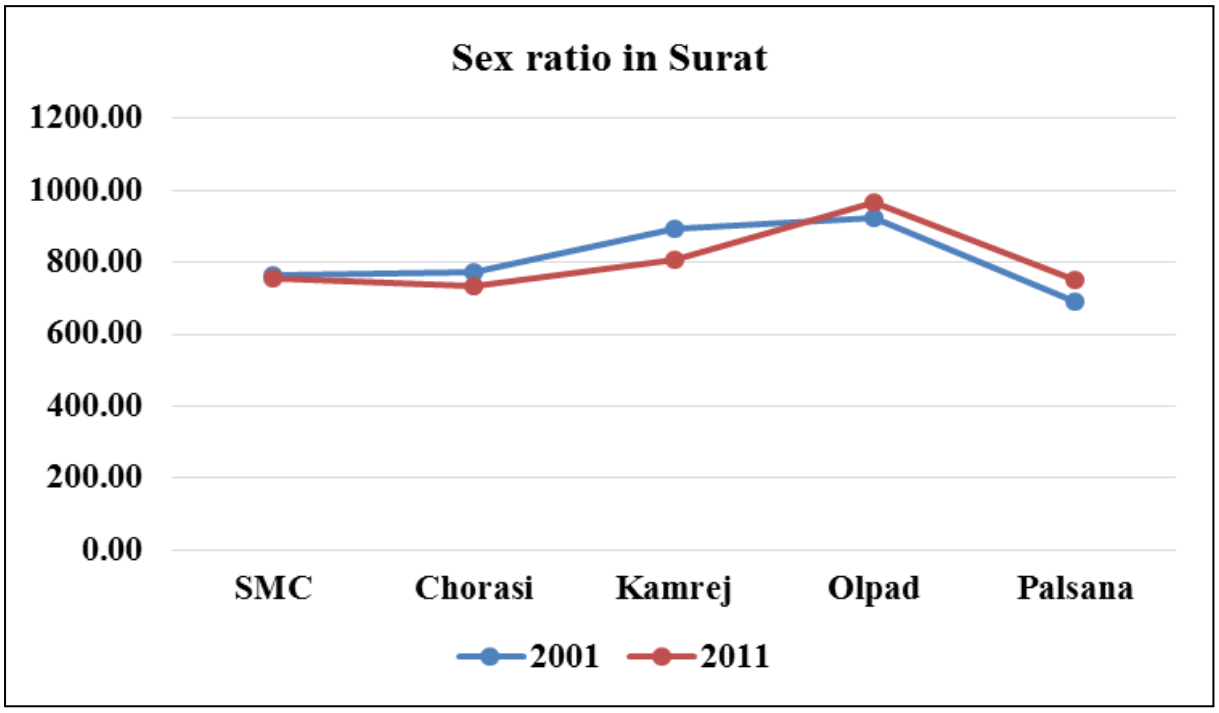
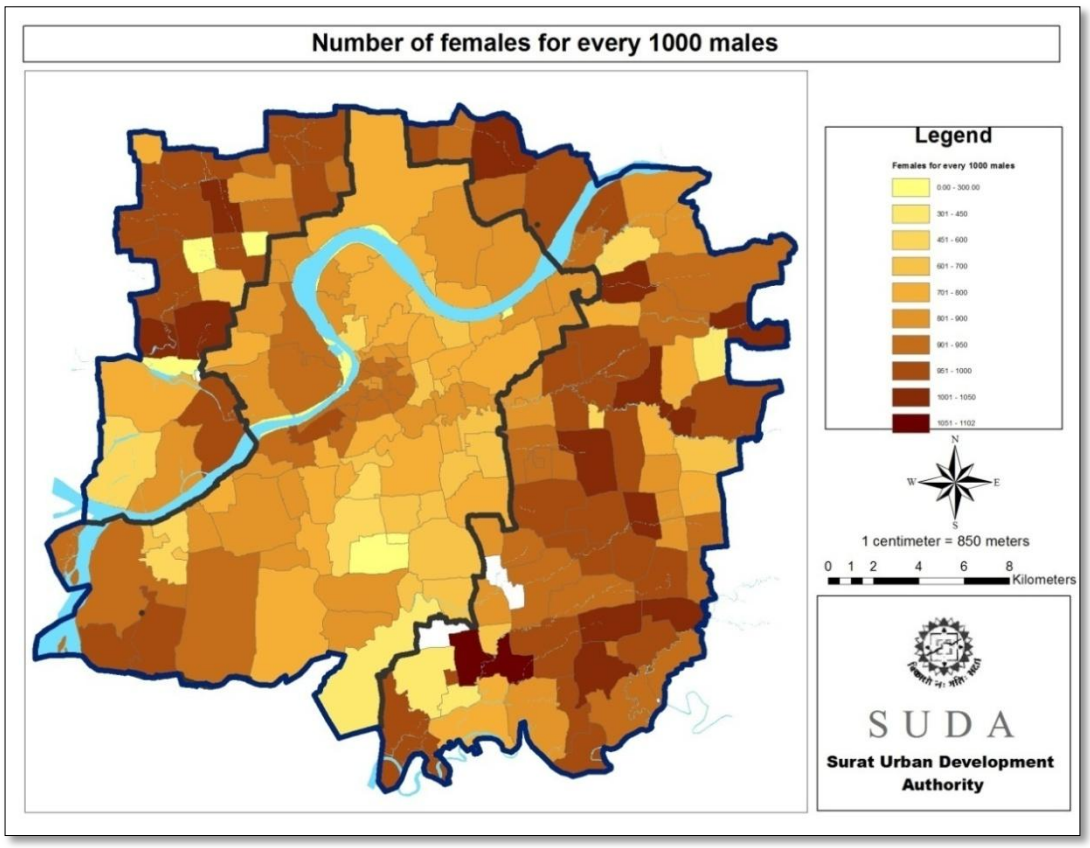


Figure 22: Female population for every 1000 male

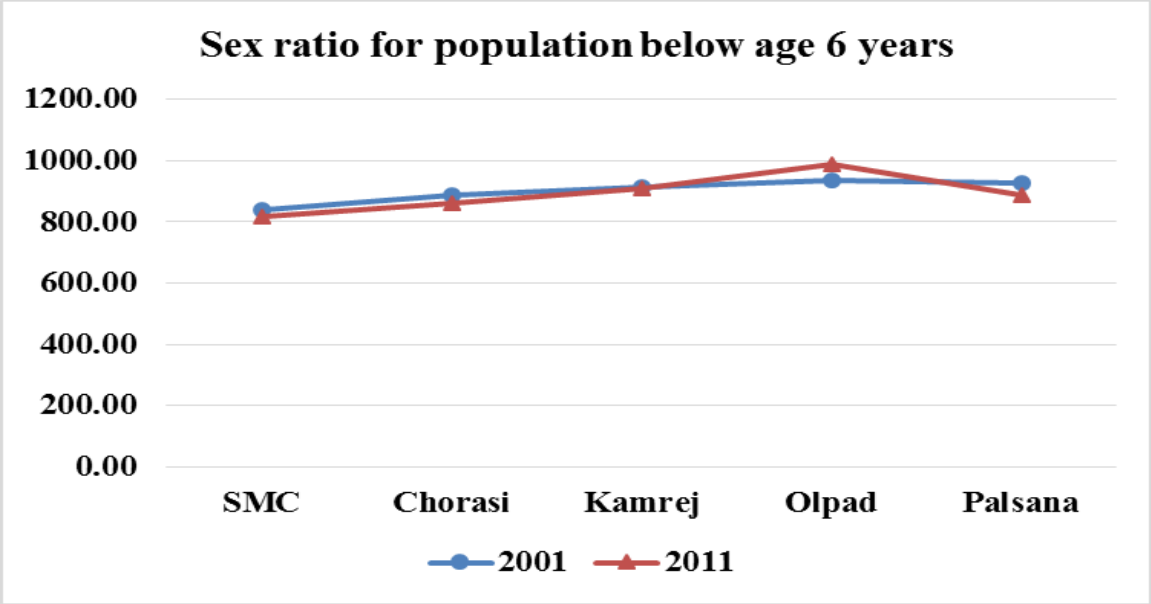


Except for Olpad area, other places have shown not only male predomination in the society but also reduction in female share in the total population. However, for the population of age below 6 years, the ratio is higher showing a very little improvement in the social balance in the city. The same was reported as 900 for the Census 2001 that has reduced to 891 in Census 2011 although reduction, the same is higher than the average of citizens.

Table 25: Population of age below 6 years

Administrative constituency	Male population			Female population		
	2001	2011	Growth rate (%)	2001	2011	Growth rate (%)
SMC	1,83,520	3,01,237	64.14	1,53,836	2,45,728	59.73
Chorasi	7,958	11,232	41.14	7,073	9,652	36.46
Kamrej	4,406	4,624	4.95	4,026	4,201	4.35
Olpad	1,478	1,104	-25.30	1,380	1,090	-21.01
Palsana	3,643	5,781	58.69	3,375	5,127	51.91
Total	**2,01,005**	**3,23,978**	**61.18**	**1,69,690**	**2,65,798**	**56.64**

Figure 23; Sex ratio for population below 6 years of age



6.5 SC/ST COMPOSITION

Table below shows the composition of Scheduled Caste(SC) population in the city. The recorded data shows that the SC population share has reduced from 3.61% to 2.42% during 2001 and 2011 respectively. However, there is a net increase of 4.13% in the SC population during the decades.

Table 26: SC population composition in Surat

	2001		2011		Growth rate (2001 to 2011)
	SC	% share of SC	Total SC	% share of SC	
SMC	1,00,272	3.49%	1,05,572	2.36%	5.29%
Chorasi	3,557	3.33%	4,378	2.69%	23.08%
Kamrej	5,054	8.89%	3,364	4.71%	-33.44%
Olpad	1,094	5.30%	668	3.40%	-38.94%
Palsana	2,380	4.57%	2,103	2.73%	-91.05%
Total	**1,12,357**	**3.61%**	**1,16,085**	**2.42%**	**3.32%**

Source: SUDA, derived from Census of India

Table below shows the composition of Scheduled Tribe(ST) population in the city. The recorded data show that the ST population share has reduced from 5.50% to 4.02% between 2001 and 2011. However, there is a net increase of 9.97% in the ST population during the decades.

Table 27: ST population composition in Surat

	2001		2011		Growth rate (2001 to 2011)
	ST	% share of ST	Total ST	% share of ST	
SMC	1,13,317	3.94%	1,31,622	2.95%	16.15%
Chorasi	26,291	24.58%	28,401	17.48%	8.03%
Kamrej	13,504	23.75%	15,452	21.64%	14.42%
Olpad	6,193	30.02%	6,070	30.88%	-1.99%
Palsana	11,916	22.89%	11,229	14.60%	-5.77%
Total	**1,71,221**	**5.50%**	**1,92,774**	**4.31%**	**12.59%**

Source: SUDA, derived from Census of India

6.6 LITERACY

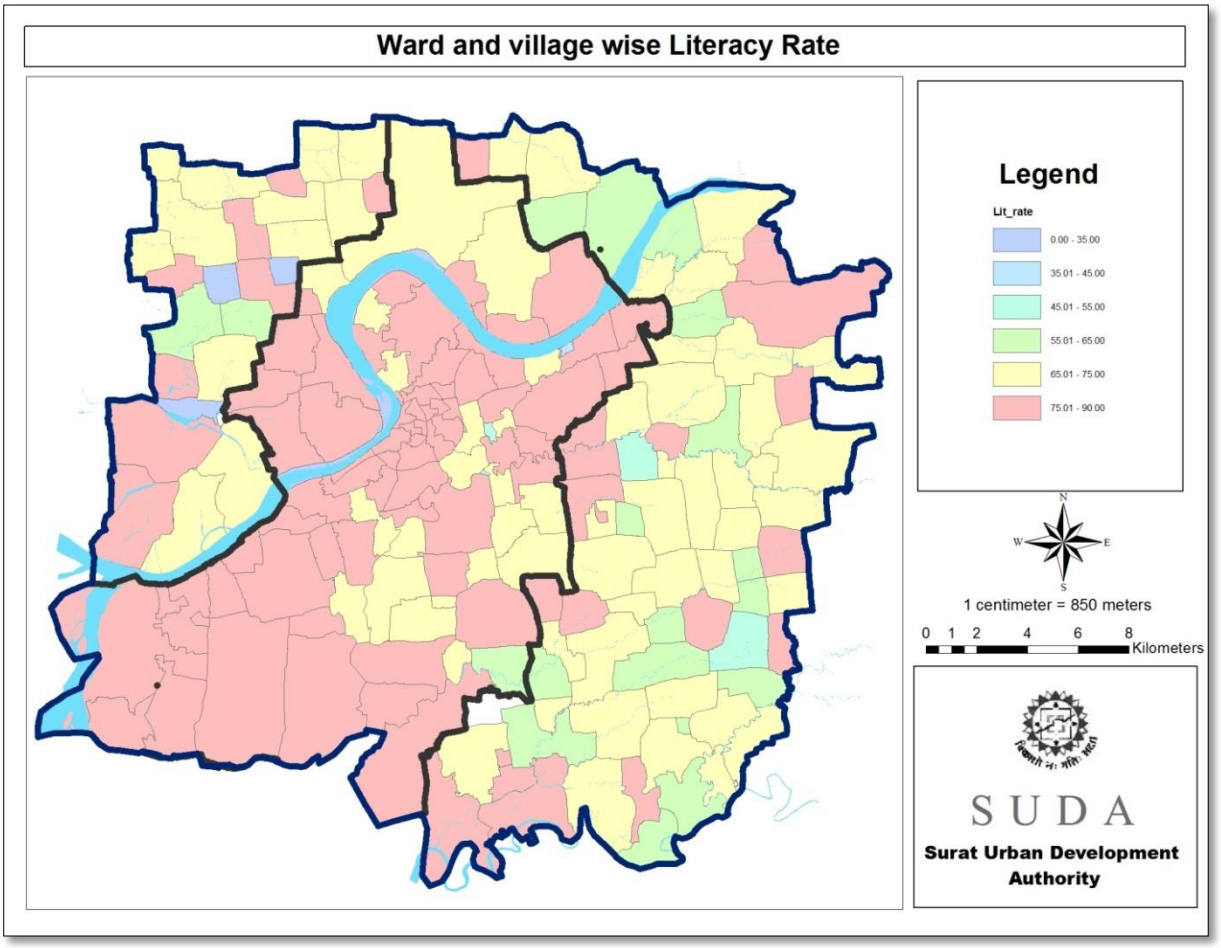
In Surat, literacy numbers have improved a lot over the period of time. In 2001 it was reported at 70.47% whereas by 2011, it was 96.03%. Literate male participation was 42.77% and 45.59% with female contribution at 27.70% and 31.15% during 2001 and 2011 respectively. Over all, growth was observed at 52.39% for the decade. The national average for 2001 and 2011 was reported as 74.04% and 82% respectively whereas for the same period it was reported as 69.14% and 77.30% for Gujarat state.

Table 28: Literacy in Surat

	2001		2011		Growth rate (2001 to 2011)
	Literate persons	% of total	Literate persons	% of total	
SMC	20,48,170	71.21%	42,76,884	95.73%	108.81%
Chorasi	69,479	64.95%	1,52,408	93.79%	119.36%
Kamrej	29,850	52.51%			
Olpad	12,737	61.73%			
Palsana	33,486	64.31%	73,573	95.65%	119.71%
Total	**21,93,722**	**70.47%**			

Source: SUDA, derived from Census of India

Figure 24: Literacy rate in SUDA



6.7 WORK FORCE PARTICIPATION

Surat is a male dominant city; where the work force participation is governed by the males. Here, the main workers were reported at 37.94% and 38.93% during Census of India, 2001 and 2011 respectively. During these periods male participation was consistently over 90%.

Table 29: Main workers

	2001		2011	
	Main Workers	**% of population**	**Main Workers**	**% of population**
SMC	10,81,677	37.61%	17,30,143	38.72%
Chorasi	42,850	40.06%	70,493	43.38%
Kamrej	22,427	39.45%	28,178	39.46%
Olpad	9,525	46.17%	7,829	39.83%
Palsana	24,417	46.90%	31,193	40.55%
Total	**11,80,896**	**37.94%**	**18,67,836**	**38.93%**

Source: SUDA, derived from Census of India

Following table shows the male and female population recorded as main workers during Census decades 2001 and 2011.

Table 30 Male-Female composition as main workers

	Main Worker- Male		Main Worker- Female	
	2001	**2011**	**2001**	**2011**
SMC	91.68%	90.55%	8.32%	9.45%
Chorasi	82.93%	84.86%	17.07%	15.14%
Kamrej	71.90%	82.15%	28.10%	17.85%
Olpad	63.60%	73.44%	36.40%	26.56%
Palsana	84.71%	87.10%	15.29%	12.90%
Total	**90.61%**	**90.08%**	**9.39%**	**9.92%**

Source: SUDA, derived from Census of India

Following table shows the summary of total workforce participation under various categories along with marginal and non-workers. Here, the main workers are mentioned in four sub-categories.

Table 31: Workforce participation

Category	2001	2011
Main worker male	10,70,062	16,82,469
Main worker female	1,10,834	1,85,367
Main worker total	**11,80,896**	**18,67,836**
Cultivators Male	9,909	14,095
Cultivators Female	1,367	1,500
Total Cultivators	**11,276**	**15,595**
Agricultural labour Male	21,888	23,916
Agricultural labour Female	17,199	15,406
Total Agricultural labour	**39,087**	**39,322**
Household Ind. Males	16,845	16,815
Household Ind. Females	9,487	10,659
Total Household Ind. Workers	**26,332**	**27,474**
Other Workers Male	10,21,420	16,27,643
Other Workers Female	82,781	1,57,802
Total Other Workers	**11,04,201**	**17,85,445**
Marginal workers Male	13,628	40,054
Marginal workers Female	19,144	33,972
Total Marginal workers	**32,772**	**74,026**
Non-worker Male	6,78,019	10,08,192
Non-worker Female	12,19,294	18,48,227
Total Non-worker	**18,97,313**	**28,56,419**

Source: SUDA, derived from Census of India

Total non-workers were reported at 60.95% and 59.53% of the total population during 2001 and 2011. The cultivators in the total of main works has participation less than a unit percent with minor shares from agricultural labor and household industry workers. Major participation is through other

workers category which comprises of a combination of seven Census sub-categories i.e. industrial category 3, 4, 5b, 7, 8 and 9. This is well observed in the figure.

Figure 25: Workforce composition in Surat

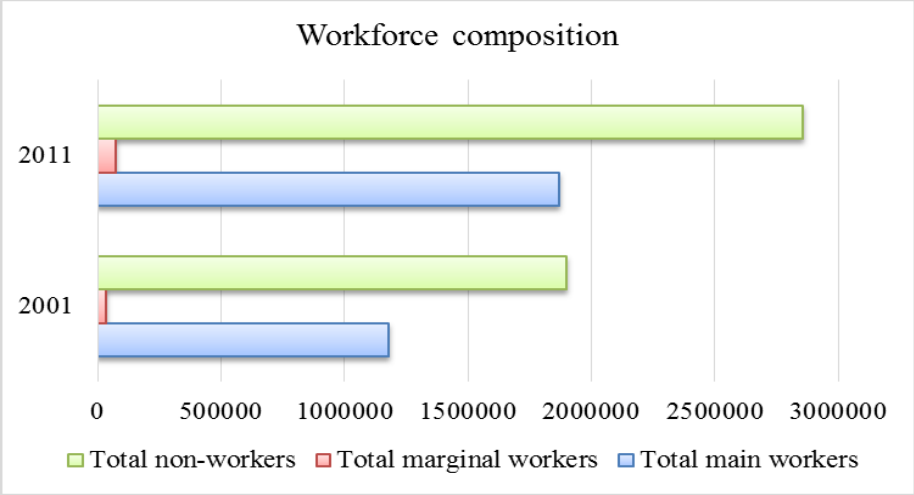
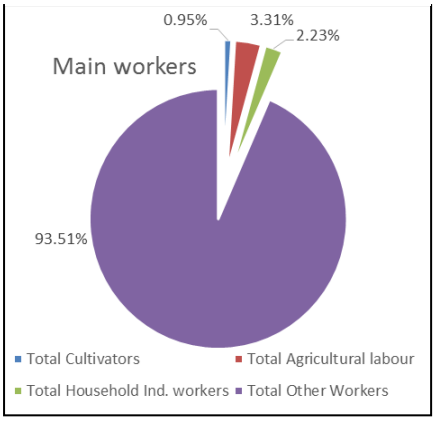


Figure 26: Main workers distribution



Above chart shows the predominating contribution from "Other workers" category which has other seven sub-categories as per Census of India, 2011. Such a sub-categorization has been adopted by the Census Bureau in the recent decadal survey only hence, trend of the same comparing past data is not possible however, these sub-categories mainly include work force from service sector, industrial and commercial units wherein there are 17.85 Lakhss of persons reported under the sub-category of main workers who are the wealthy contributors of the city.

6.8 MIGRATION

Surat has emerged as a national city with majority of the population comprising of migrants. Trends of migration in Surat exhibits rapid increase over the years. It is estimated that 60% of the city's population (Shah, 1997) and 80% of those living in squatter settlements (Das, 1994) were born outside the district of Surat.

Availability of employment and the industrial scenario of the city pull people from neighbouring states like Maharashtra, Madhya Pradesh, as well as states like Orissa, which are far from the state of Gujarat. This is reflected by increasing share of inter-state migrants than inter-district migration.

Table 32: Migrant Population in Surat as per Census 2001

Sr. No.	Last Residence	Total Migrants	% to Total
1	Surat Urban Agglomeration Population	29,00,729	
A	Total Migrants in Urban Agglomeration	16,19,967	55.85
B	India and Abroad		
B1	Last Residence elsewhere in India-Total	16,14,905	99.69
B2	Last Residence outside India	5,062	0.31
	Total (B)	16,19,967	100.00
C	Gujarat and India		
C1	Within the state of Gujarat	8,62,936	53.44
C2	Other States in India	7,51,969	46.56
	Total (C)	16,14,905	100.00
D	Major State contribution to Migration Population		
D1	Maharashtra	2,65,593	35.32
D3	Uttar Pradesh	1,61,994	21.54
D5	Orissa	90,135	11.99
D2	Rajasthan	84,757	11.27
D4	Bihar	53,549	7.12
D6	Andhra Pradesh	20,114	2.67
D7	Other States	75,827	10.08
	Total (D)	7,51,969	100.00
E1	Within The State of Gujarat		
E2	From Surat District	97,863	6.06
E3	In other district of Gujarat	7,65,073	47.38
	Total (E)	8,62,936	53.44

Source: RCDP, Surat (Census of India, 2001)

Migration to Surat is male dominant. This is also reflected in low sex ratio of the city. Unlike migration from Maharashtra, the flow of migration from specific regions in Ganjam and Puri in Orissa has been more recent. In the city, majority of Oriya migrants are engaged in textile sector, especially in power loom factories and dyeing and printing factories.

Around 70% are employed in informal sector activities, of which 40% are employed in the textile industry, 13% in the diamond polishing and cutting industries, 14% in small scale ancillary workshops and 32% in 'self-employed' street and home workers. The working conditions of these migrants are very poor. Their jobs are temporary and casual. They work for long hours with no break even for lunch. They work in two shifts each of 12 hours and wage rates are very low.

Table 33: Purpose of Migration

B	Purpose of Migration	% to Total Migrants
A	% Migrants to Total Population	55.85
1	Work/employment	29.19
2	Business	8.90
3	Education	0.46
4	Marriage	12.84
5	Move after birth	8.03
6	Moved with h/h	29.96
7	Others	10.62
8	Total	100.00

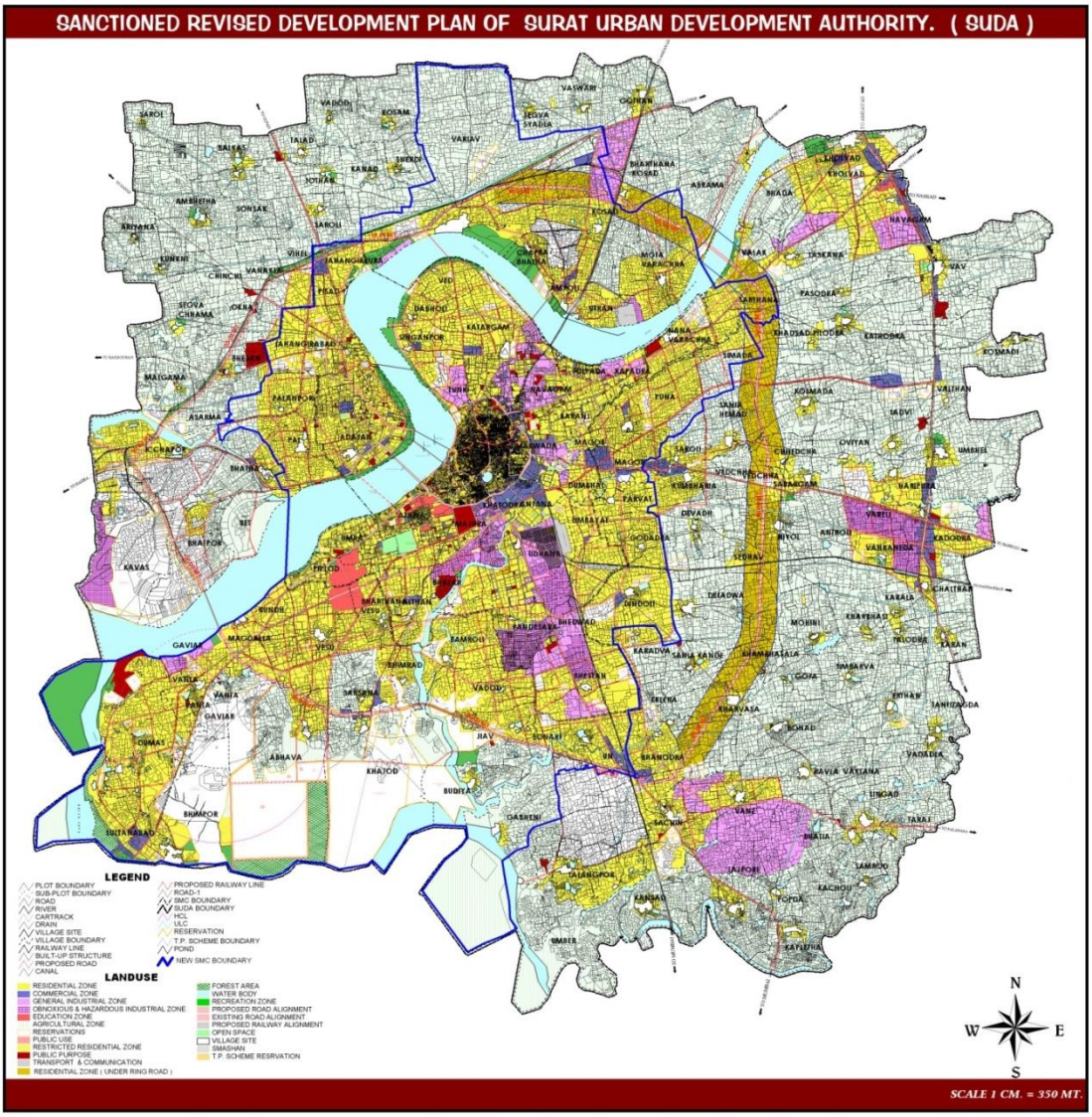
Source: RCDP, Surat (Census of India, 2001)

7 EXISTING LAND USE

7.1 DP 2004

This section gives a broad assessment of existing land use distribution. The last revision of development plans was done in 2004. The land use for SUDA as proposed in the first revision of development plan is showed below in the figure no. 27.

Figure 27: Development Plan 2004



The land use details as per the Revised Development Plan (SUDA) are shown in the table 34 below.

Table 34: Proposed Land Use in DP 2004

Land- Use	Proposed as per DP- 2004	
	Area (sq.km.)	% of Urbanized Land
Residential	204	54
Commercial	7.65	2
Industrial	43.94	12
Educational & Public Purpose	64.21	17
Garden & Recreational	12.36	3
Road, Transport and Communication	40.73	12
Total Percentage		
Urbanized Area	372.89	100
Non Urbanized Area	342.11	
Total	**715**	

NOTE: The above table includes zone change considering 90 m wide ORR proposal sanctioned by the State Government in 2012.

7.2 EXISTING LAND USE

Between 1978 and 2004, the urbanized area has increased almost 3 times.The development that has taken place in the city over a period last 12 years is vivid. The existing land use prepared from the digitized base map is used to analyze the existing situation of development within SUDA Region. Development has mostly occurred in the SMC boundary. SUDA area excluding SMC area has experienced development in clusters with mostly residential and industrial development. The existing land- use as per ground situation 2014 is as shown below in the figure.

Figure 28: Existing Land Use

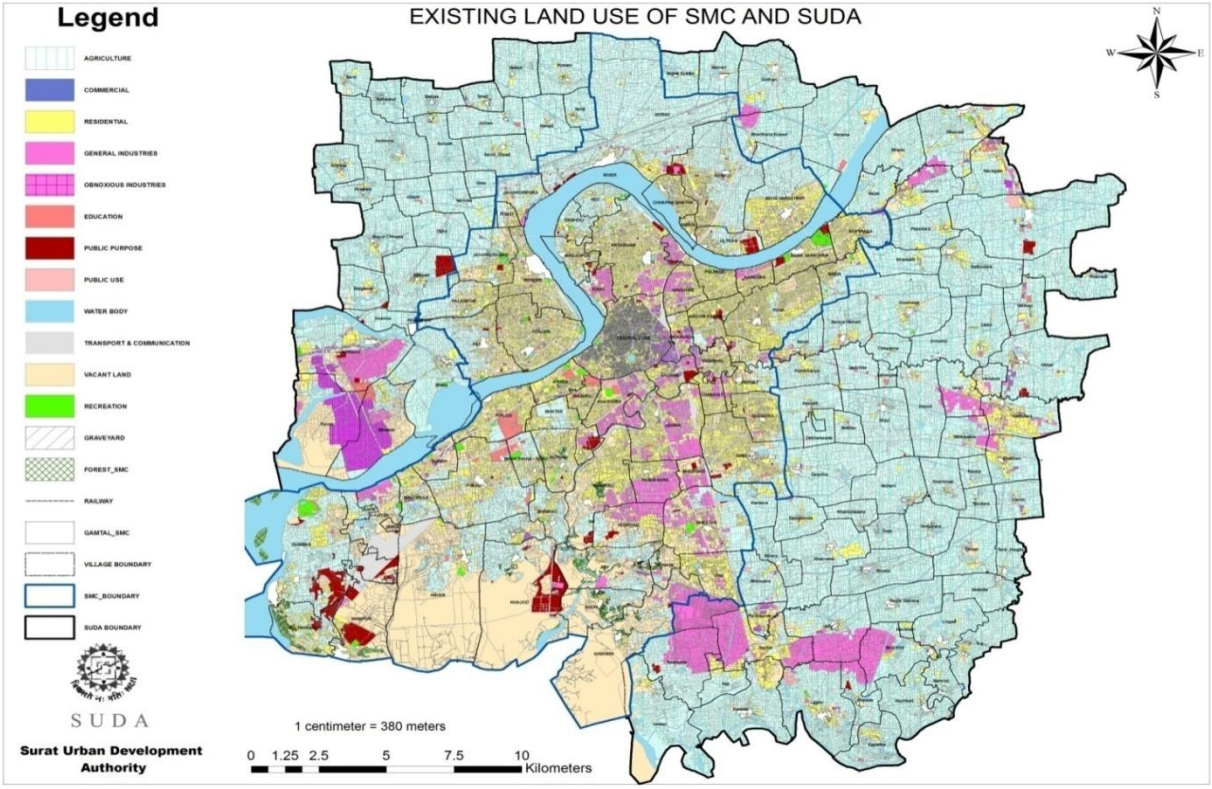


Table 35: Area as per Existing Land- use

Land Use	Existing - 2014
Residential	102.49
Commercial	4.66
Industrial	38.89
Educational & Public Purpose	13.6
Garden & Recreational	2.34
Road, Transport and Communication	35.31
Urbanized Area	197.29
Non- urbanized Area	517.71
Total	715

7.2.1 RESIDENTIAL LAND USE

It includes housing of different types; detached, semi-detached and row houses, group housing and basis. The dominant use in the city is residential which accounts for near about 55% of the total urbanized area. The development in the city is taking place in the southern and north-eastern direction with planned and unplanned colonies. Area under residential use has increased drastically, from 2695.6 hectare in 1978 to 10,666 hectare in 2014, indicating the extent of the sprawl of the city. The percentage distribution of residential area is 58.54 % in 2011, which is on a slightly higher side then prescribed standards, which range from 40 % to 45 % as per UDPFI guidelines. High rise

development is coming near the University area while low rise development is coming towards Varachha road on SH-66. A serious challenge in the city is the rapid growth of slum squatters and settlements. Area under slums covers 1.8% of total area of SMC in 2007. There are 406 slums covering an area of 579.15 hectare of the total area of 32,651 hectare of SMC. Mainly these slums are near the medium industry in south and south-east side of the city.

Figure 29: Residential Spill over

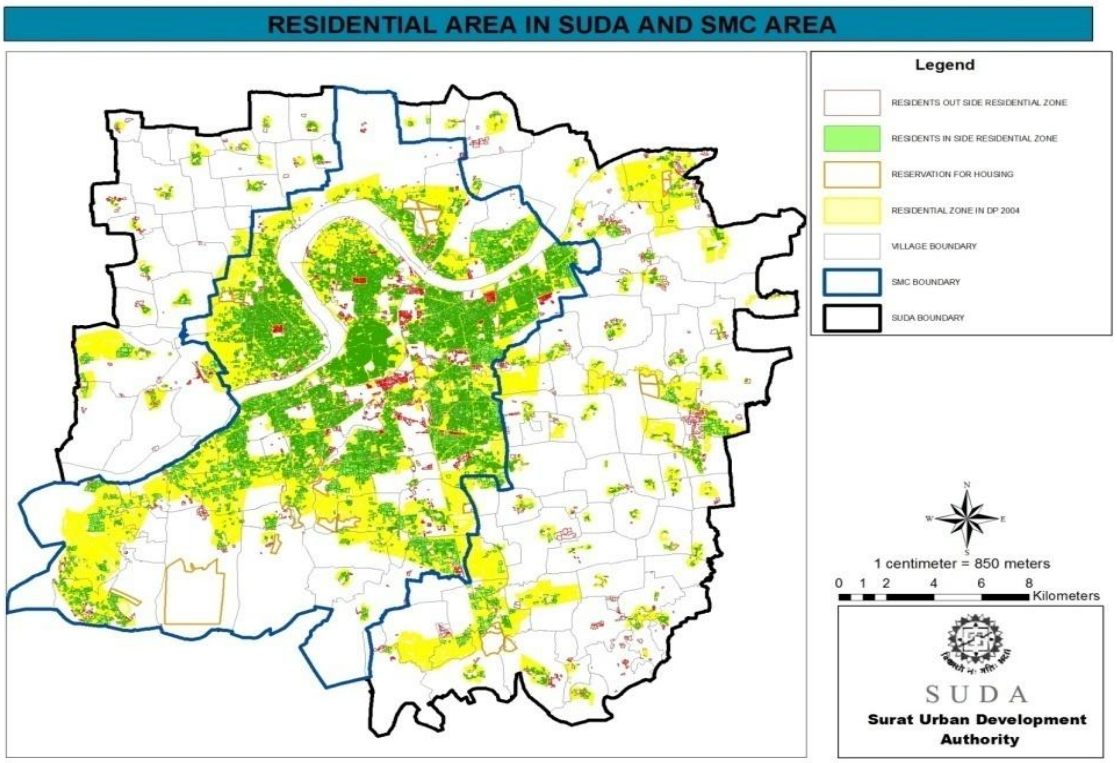


Table 36: Residential Spill over

Residential Land- use in SMC & SUDA Area	
Description	**Area (sq.km.)**
Land use zone in dp 2004	**204**
Existing residential land use	**102.49**
Residential development outside zone	**18.51**

Total residential area proposed is 204 sq.km. The developed residential area is 102.49 sq.km. out of which about 18.51 sq.km. is developed outside the proposed residential zone and can be considered as spill over.

7.2.2 COMMERCIAL LAND USE

Surat is one of the major trade centers in the region which is very efficiently connected by rail and road with the state capital Ahmadabad and other parts of the country. This has made Surat as an important trade and manufacturing centre of Gujarat. The concentration of commercial activity is in the walled city. Therefore being a densely populated area, it is having a problem of parking and informal activities. Other commercial activities are spread across the city. Commercial land use has increased almost three times in last three decades i.e. 141.3 hectare to 466 hectare, depicting importance of Surat as a trade centre.

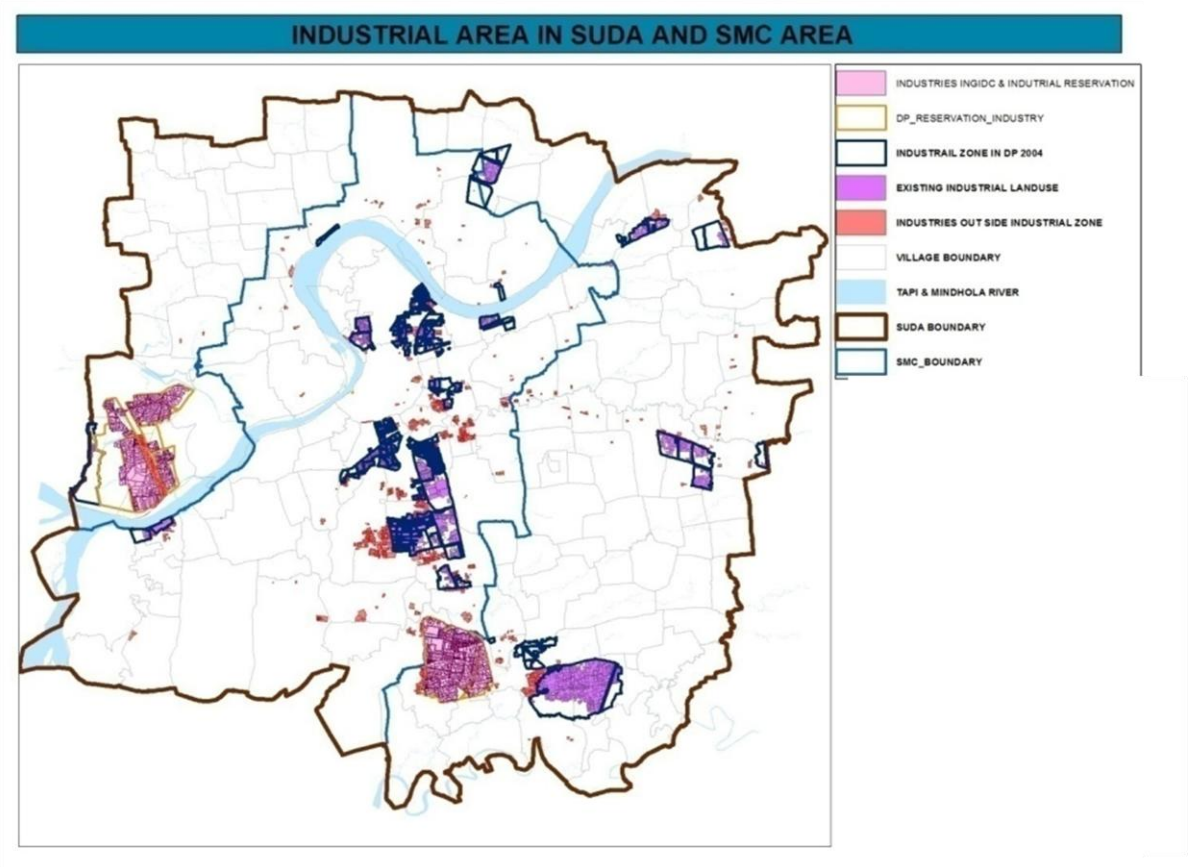
7.2.3 INDUSTRIAL LAND USE

The growth of industries shows a steep increase from 1978 to 1995 and then a steady progress over the years till date. Industrial land use is almost seven times the commercial land use in the city. The percentage distribution of land under industries is reduced to 17.74% from 21.04% between 1995 and 2004 but the actual land use under industries has been increased to 3023.4 hectare in 2004 from 2784 hectare in 1995. In 2014 the industrial area is about 3945 hectare. Industries are mostly establishing themselves on the southern side on the road leading to Sachin and to the west on the road leading to Hazira.

Table 37: Industrial Spill over

Industrial Land- use in SMC & SUDA Area	
Description	**AREA (Sq. Km.)**
Land use zone in dp 2004	**31.1**
Existing industrial land use	**38.89**
Industries outside industrial zone	**11.21**

Figure 30: Industrial Spill over



7.2.4 ROAD NETWORK AND TRANSPORTATION

The road network of Surat is primarily radial with all the regional roads leading out. Land under transportation land use is 9.16 % in 2004 covering an area of 1661.41 hectare, which has gone up to 3950 hectare by 2014 including the TP scheme and society level roads. This area covered by Road network and Transportation is saturated since 1995 showing no increase in 10 years.

7.3.5 PUBLIC AND SEMI PUBLIC

Areas allotted to public semi public use have shown reduction in percentage distribution. The area allotted under DP was 3350 hectare out of which the about 809 hectare has been developed in the existing land- use.

8 TRAFFIC AND TRANSPORTATION

The city is well connected by road, rail and air transport. Several National and State Highways pass through the city. It is also connected by the sea port. As a result, traffic coming to as well as passing through the city is very high. The city transportation system is predominantly road based. With the absence of a public transport system, dependence on individual modes and intermediate public transport is high. Though roads are generally wide, network design and development is not complete.

8.1 INTRODUCTION

8.1.1 REGIONAL LINKAGES

Railways: Surat is served by the busy north-south line of the Western Railways connecting Gujarat with Mumbai and other important centres. Branches of the railway line serve areas of Udhna, Jalgaon and Bhestan. A dedicated goods' line exists between Kosad to Hazira. Being located midway between Ahmedabad and Mumbai, the city is serviced by express, mail, passenger and local trains. The main line carries a lot of freight traffic due to the industrial belt between Ahmedabad and Mumbai and the sea ports in Gujarat and Mumbai. Three railway stations fall within the city area. The main station (Surat Railway Station) is located just outside the walled city abutting the ring road. The railway station at Udhna is also an important transport node within the city. The third railway station located at Utran is not significant as the development in the area is limited. Sachin and Maroli are located towards south of Surat.

Road Transport: Gujarat State Road Transport Corporation (GSRTC) is the regional public transport operator in Gujarat. Following are the key facilities for its intercity and inter-state services:

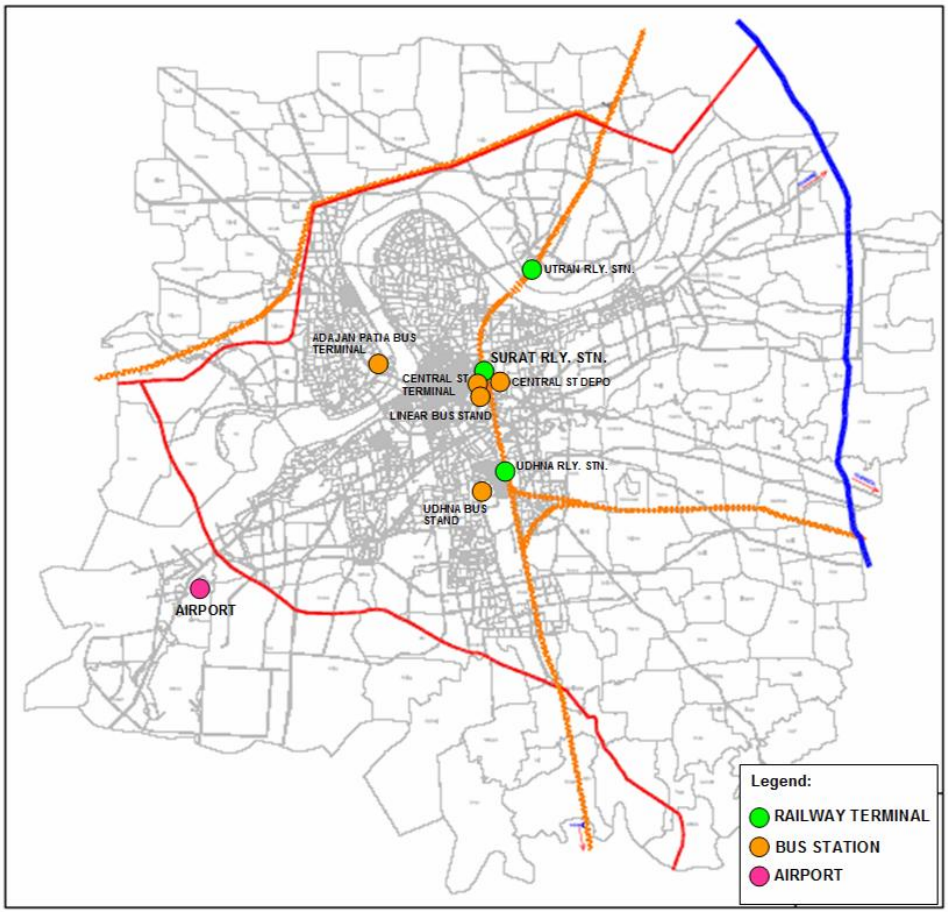
- The central depot is located near Railway Station (in the east)
- ST Terminal is located near Railway station (in the west). This is supported by linear terminal on ring road nearby.
- A terminal is located near Adajan Patiya (West of Nehru Bridge). This has additional facilities such as workshop, parking, etc.
- Near Udhna village, originally the bus depot was used for city bus services. With the start of bus service, the city has started utilizing the place as terminal.

The linear bus stand near railway station, Wadi Faliya and Kanskiwad were the main terminal points for city bus services. All these have been converted as city bus terminals starting from August 2007.Jeeps and matadors carry out passenger and goods services to the neighbouring villages and towns. Private bus operations also provide inter-city bus transport to various cities from Sahara Darwaja. In the absence of a separate bus terminal for private operators, their operations result in traffic congestion at Sahara Darwaja.

Air Port: The existing airport catering to domestic traffic is located to the south-west on the Surat-Dumas radial road. Daily air services to Delhi, Mumbai have begun recently.

Passenger Flows: CRRI has carried out a detailed study of passenger flows. About 3 lakhs passengers use the rail and bus terminals every day. Of these, the Surat railway station (1.7 lakhs passengers) and bus station (0.6 lakhs passengers) are important locations.

Figure 31: Transit Terminals of Surat



8.1.2 EXISTING ROAD PATTERN – HIERARCHY AND ITS FEATURES (WIDTH, ETC)

The roadway network of Surat is around 1914 km long. Other than the National Highway Authority, the State Roads and Buildings Department, and the two urban local bodies; SMC and SUDA are responsible for developing and maintaining road infrastructure. The street network in Surat may be classified as ring-radial form at city level and grid iron pattern is observed at the local level network.

As per the land use proposal, a total of 9.2 % of SUDA area is proposed under Transport and Communication use zone, which is relatively less. The movement in Surat is concentric; majority of the vehicular load is taken by the inner ring road which connects to all important roads. This results in congestion on the ring road.

Considering ROWs, the city is well placed with about 19% of its network having width exceeding 30 m. It is to be noted that many of these roads form part of NH/SH network. Another 37.5% of the network is wider than 12 m. Within the developed area, road density is higher but roads are

narrower. In old city, the area under roads (area of 28.29 sq.km.) is about 25% of the total area of old SMC limits. The road length within this area is 967 km. However, not all roads are developed to their full width.

Table 38: Road length of various type of roads in Surat

Sr. No.	DESCRIPTION .	GRAND TOTAL	Surfaced (km)				Unsurfaced (km)		
			W.B.M.	B.T.	C.C.	Total (4+5+6)	Motorable	Non-motorable	Total
1	2	3	4	5	6	7	8	9	10
1	Total road length as on 31.3.2012	2170	362	1524	32	1919	79	172	252
2	Road length added during 1.4.2012 to 31.3.2013 .(New roads)	370	132	119	0	252	64	53	117
3	Total road length as on year ended 31.3.2013 (total of Sr.No.1 & 2).	2540	494	1644	32	2171	145	225	369

Figure 32: Existing road network map of SUDA

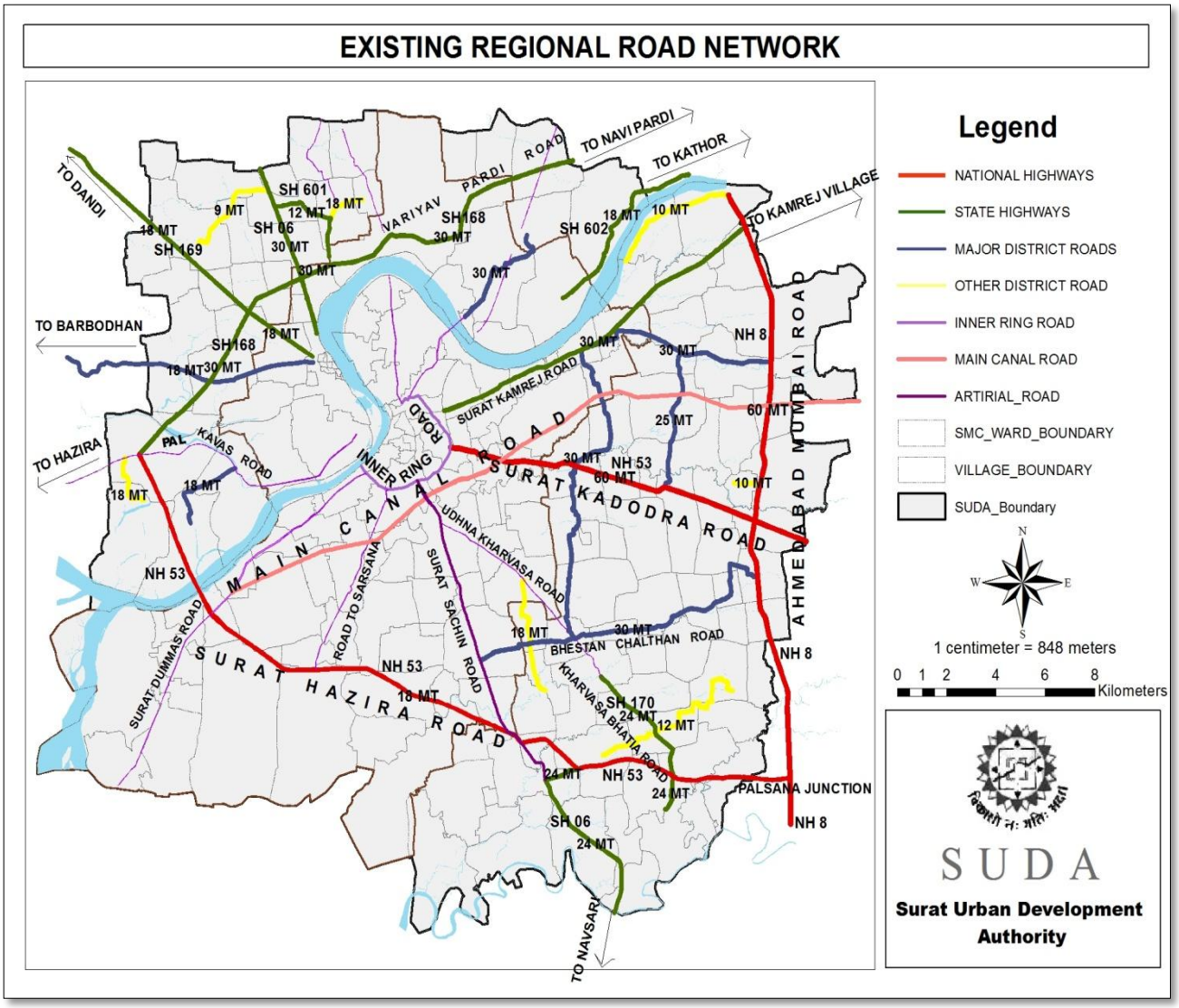


Table 39: Road length details

Sr. No.	Road Name	Length (km)	BT Length (km)	CC Length (km)
1	Inner Ring Road	11.40	4.4	7
2	Canal Road	8.80	8.3	0.5
3	Katargam Amroli Road	7.20	6.8	0.4
4	Varacha Road	6.70	4.4	2.3
5	Udhana Sachin Road	4.80	2	2.8
6	Udhana Magdalla Road	4.20	4.2	
7	City light Road	2.50	2.5	
8	Hazira Road	1.40	1.4	

9	Rander Road	3.60	1+2.6	2.6
10	Aaimata Junction Road	1.05	1.05	
	Total	**51.65**	**38.65**	**15.6**

Source: Survey by CEPT University

8.2 VEHICLES –PER CAPITA GROWTH AND ITS IMPLICATIONS ON CONGESTION

The vehicles registered in Surat RTO area has raised from four lakhs (in 1994) to thirty six lakhs (in 2012). Two wheelers comprise nearly 40% of the total number of vehicles while cars constitute about 17%. Currently, Surat has approximately 14 lakhs two wheelers and eighty five thousand auto rickshaws registered. The break- up of the vehicular composition in the city and the percentage change in the city is shown in table below:

Table 40: Growth of vehicles registered at Surat

Sr. No.	Type of Vehicle	Number of Vehicles			% Change per Year	
		2009-2010	2010-2011	2011-2012	2010-2011	2011-2012
1	2 Wheeler	12,70,400	13,70,899	14,95,610	7.3	8.3
2	3 Wheeler	74,814	79,980	84,099	6.5	4.9
3	Car	1,65,508	1,89,370	2,20,932	12.6	14.3
4	All Vehicles	30,81,994	33,46,031	36,74,266	7.9	8.9

The rate of growth has remained high at 9-10%. In the absence of public transport system in the city, the rate of increase in auto- rickshaws has been approximately 4.5 % whereas rapid increment in the rate of motorcars has been observed in last year, is approximately 10-10.5%.

8.3 BRIDGES, FLYOVERS, UNDER PASS, ETC.

At present there are 67 major and minor bridges and two sub ways in the city. There are nine bridges across River Tapi at various locations. One of them is a weir cum causeway and another is a railway bridge. The other eight are major roadway bridges.

Table 41: Details of Existing River Bridges

Sr. No.	Name of Work	Year of Completion	Length (m)
	Bridges over River Tapi		
1	Nehru Bridge over River Tapi	1966	620.27
2	Nr. Amroli over River Tapi	1982	627.12
3	Sardar Vallabhbhai Patel Bridge over River Tapi	1991	700
4	Weir cum causeway over River Tapi	1995	760

5	Swami Vivekanand Bridge	1996	625
6	Bridge Joining Nana Varachha and Mota Varachha	2001	800
7	New high level bridge beside existing bridge Nr. Amroli	2010	811
8	Bridge joining Dabholi to Jahangirpura	2011	1973.17
9	Bridge Joining kapodra to Utran	2012	1013.12

Table 42: Details of existing sub ways

Subways			
Sr. No.	**Name of work**	**Year of Completion**	**Length (m)**
1	Nr. Mohan bag on Varachha road	1999	77
2	Nr. Textile Market on ring road	2000	135

Under passes and over rail bridges have been constructed on 6 locations in the city (Table 43). The lane configurations are inadequate on a few of the existing underpasses resulting in congestion and formation of bottlenecks.

Table 43: Details of existing road over rail bridges and underpasses

Sr. No.	**Name of Work**	**Year of Completion**	**Length (m)**
	Railway Bridges		
1	R.O.B. At the place of railway level crossing no. 146 nr. Sumul Dairy	1998	910
2	Railway under pass no. 441 nr. Anjana	2001	47
3	At railway under pass no. 451 nr. Ashwanikumar	2001	61
4.	R.O.B. at Dindoli railway culvert no. 436	2006	750
5	At railway under pass no. 440 nr. Anjana Farm	2013	
6	Railway over bridge on Bhestan-Bhusaval railway loop line in South East Zone	2014	690

The 50 no. of creek Bridges(*Khadi bridge)* are as stated in annexure.

There are fourteen no. of flyovers existing/ under construction in the city. Details of the existing flyovers have been summarized below. It is evident that the congestion level continues to increase at the different locations on and near the flyovers.

Table 44: Details of Existing Flyovers

Sr. No.	Name of Work	Year of completion	Length (m)
	Fly Over Bridges		
1	Nr. Athwagate athwa fly over bridge	1997	692
2	On Dr. Babbasaheb ring road	2000	2400
3	On varachha road shri nathji fly over bridge	2003	2750
	Entry Ramp along with Shri nathji fly over bridge	2004	465
	Exit ramp along with Shri nathji fly over bridge	2008	280
4	On Ring road Udhna Gate Junction	2007	420
5	On Ring road Kadiwala Junction	2007	665
6	On Ring road Majura gate Junction	2008	433
7	Fly over bridge joining Ayker bhavan to Kadiwala junction	2008	947.70
8	On Varachha road Nr. Nana Varachha gam Junction	2008	463
9	Fly over bridge with subway Nr. Kapodara fire station on varachha road	2009	511
10	Nr. Parle Point junction	2010	1605
11	Nr. Gujarat gas circle in adajan	2012	1342
12	Nr. Evershine marble junction on udhana magadalla road	2013	449
13	Nr. Sosyo circle on udhana magdalla road	2013	447
14	Nr. Star Bazar,surat -Hazira road	2014	499

The other B.R.T.S. bridges are as given below:

Table 45: Details of B.R.T.S. bridges

Sr. No.	Name of work	Year of completion	Length (m)
	BRTS Bridges		
1	Anuvrat Dhwar, udhna magdalla road	Under Progress	1001.18
2	Sawaji Korat,Varachha	Under Progress	1252
3	Vishwa Karma, Varachha	2014	710
4	Sita nagar Junction ,Varachha	2014	678.14
5	On Rly culvert No. RC 454, Manisha Garnala, Amroli, Utran	Under Progress	1100.00
6	Bridge Joining from Ashwanikumar to Varachha	Under Progress	900.00
7	Pramukh Park, Bridge joining from Bhedwad to Dndoli	Under Progress	1207.23
8	Piyush Point,Pandesara	Under Progress	680.525

8.4 OTHER ELEMENTS

8.4.1 ISLANDS, CHANNELIZER, SIGNALS, ROUNDABOUTS, DIVIDERS, ETC.

Table 46: Road Elements

Total No. of Island	Athwa Zone – 20 West Zone – 27 North Zone – 14 South Zone – 09 East Zone – 18 Central Zone – 21
Total length of Divider	162 km
No. of Traffic Signal (under progress)	30
No. of VMS (under progress)	20
No. of Blinkers (under progress)	70

8.4.2 OTHER AGENCIES – GSRTC, RTO, TRAFFIC POLICE, TRAFFIC BRIGADE

8.4.2.1 GSRTC

Gujarat State Road Transport Corporation (GSRTC) is a passenger transport organisation providing bus services both within Gujarat and neighbouring states.

GSRTC came into existence on 1st May, 1960 on formation of Gujarat. From a modest beginning of 7 divisions, 76 depots and 7 divisional workshops and a fleet of 1,767 buses it has gone to:

- 16 Divisions
- 126 Depots
- 226 bus stations
- 1,554 pick- up stands
- 8,000 buses

This remarkable growth is an outcome of unflagging effort of more than 50,000 workforce, dynamic management and sustained support from the state govt. It has built up formidable technical facilities.

- Three level maintenance and repair facility- 126 depot workshops
- 16 divisional workshops and a central workshop
- 7 tyre retreading plant
- Bus body building plant (1000 bus bodies/ year)
- Ticket printing press

8.5 DETAILS OF R.T.O. SURAT

Table 47: RTO Surat details of registered vehicles

Category	Type	Year	2009-10	2010-11	2011-12
Transport vehicles	Goods vehicles	Truck/ lorries	20669	22383	24713
		Tanker	812	845	856
		Three wheelers, LGV	21548	23933	26391
		Other LGV	13571	15160	17666
	Passenger vehicles	Buses	1417	1556	1668
		Maxi	746	851	956
		School buses	514	644	738
		Private service vehicles	361	379	416
		Taxi	1964	2070	2254
		Auto rickshaw	74814	79980	84099
		Ambulance	343	369	397
		Trailor	9999	10242	10562
		Total transport vehicles	146838	158412	170716
Non Transport vehicles		Police van	143	148	150
		Motor cars and station wagon	165508	189370	220932
		Jeeps	13601	14610	14975
	Two wheelers	Motor cycle/ scooters	1091025	1190354	1312557
		Mopeds	179375	180545	183053
		Tractors	15683	16161	17096
		Others	2167	2515	2903
		Total non-transport vehicles	1467502	1593706	1751666
		Total	1614340	1752118	1922382

8.6 PARKING, PAY & PARK

The functions of current parking regulation of Surat are governed by the following agencies who work in coordination for management of the parking spaces and provision.

Table 48: Pay and Park facilities in Surat

Sr. No.	Place	Total No. of Parking Place	Parking Area (sq.m.)
1	Under Fly Over Bridge	05	30,036
2	Surat Dumas Road-Gaurav Path	03	7,739
3	Science Centre Basement	01	5,262

4	Multilevel Parking	03	22,836
5	Others	17	58,765
	Total	29	1,24,638

8.6.1 PAY AND PARK

Surat has 29 locations where pay and park facility are provided. Out of these 29 locations, only 11 are on-street pay and park along the major roads of the city. Elevated parking is also provided in the city. At present, there are five multilevel parking facilities; Mini Bazar, National textile market, Surat textile market, Sardar Smruti Bhavan and Khan Shad Ke Dela.

8.6.2 PAID PARKING SPACES

Free and paid delineated parking spaces are provided within the city, nearly 2000 cars (ECS) and 2000 two wheelers (ECS) can be parked on street under provisional parking spaces provided by Municipal Corporation.

8.6.3 PARKING FEES

Table 49: Parking fees

Sr. No.	Types of Vehicle	Maximum Charges to be taken		
		2 hrs	2 hrs to 4 hrs	> 4hrs
1	Heavy Vehicle &Medium Goods Vehicle	Rs.20	Rs.50	Rs.100
2	Light Vehicle , Car, Auto rickshaw etc.	Rs.10	Rs.15	Rs.10
3	Two Wheelers	Rs.5	Rs.10	Rs.10
4	NMV			
a	Cycle	Rs.1	Rs.2	Rs.3
b	Pedal Rickshaw	Rs.3	Rs.4	Rs.10

Surat, as observed has kept its goal at par of setting paid parking as one of its priority goals with 78% of the delineated parking as paid parking. It is comparatively extensive as compared to other Indian cities. However as observed there is also unmonitored on street parking around these paid parking locations.

Figure 33: Parking Locations in SMC

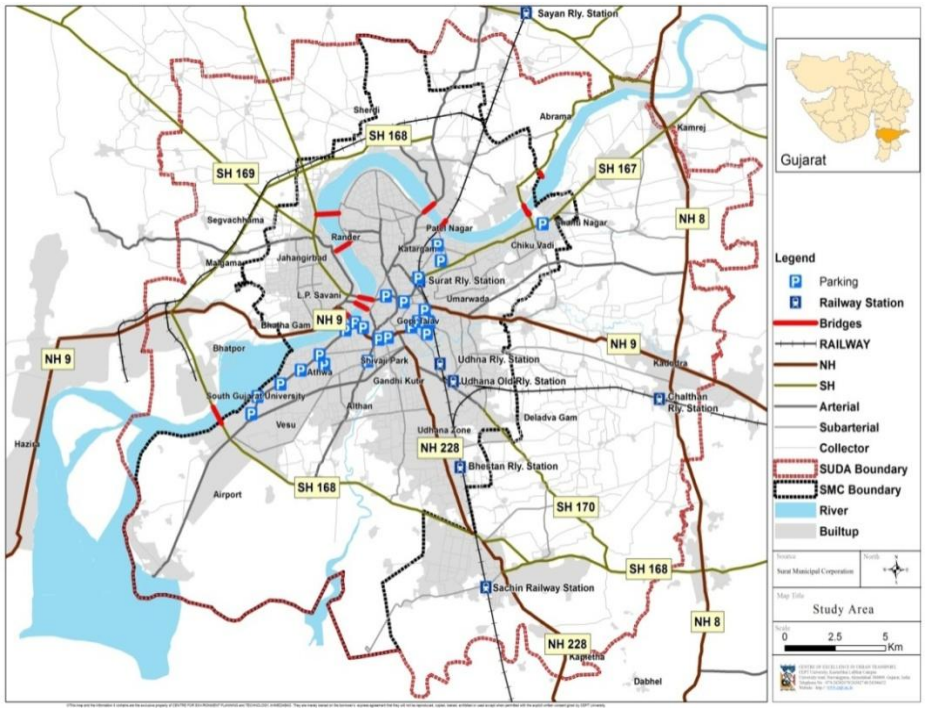


Table 50: Route classification based on headways

Sr. No.	Headways (Minutes)	Number of Route
1	<5	0
2	5 to 10	0
3	10 to 20	0
4	20 to 30	9
5	30 to 60	14
6	>60	20

Table 51: Transport services in Surat

Facts & Figures	Private Bus Services
Operators	Barmecha, Sun & Mahendra Travels
Total length of public transport network	173 sq.km
Total number of routes	43
Total number of Stops	337
Fleet size	126
Daily Ridership	66, 881
Mode share	6%
Depots	Railway station, Chowk

The total area served by public transport within SMC at 500 m buffer of the routes is 134.09 sq.km. i.e. 41% of SMC area. And the total area for the developed area served is 175.50 sq.km. i.e. 76%. The service coverage of public transport is high in terms of network.

About City Bus (under progress):

- Total No. of Routes: 27
- Total No. of Bus: 115 (+10 stand by)
- Total No. of Bus Stand: 84
- Total No. of Bus Stand under Planning: 40

8.7 PARALLEL (SUPPLEMENTARY) MASS TRANSPORTATION –RICKSHAWS, PRIVATE BUSES, SCHOOL BUSES

Absence of bus services in past has lead to emergence of autos and smaller vehicle based IPT service. They operate, illegally, as point to point services. Based on the services it has been observed that there are 123 informal established routes. An estimated 7.7 lakhs passenger trips are performed by auto rickshaws. A list of 30 major routes is presented below. figure 34 the major corridors on which these services operate.

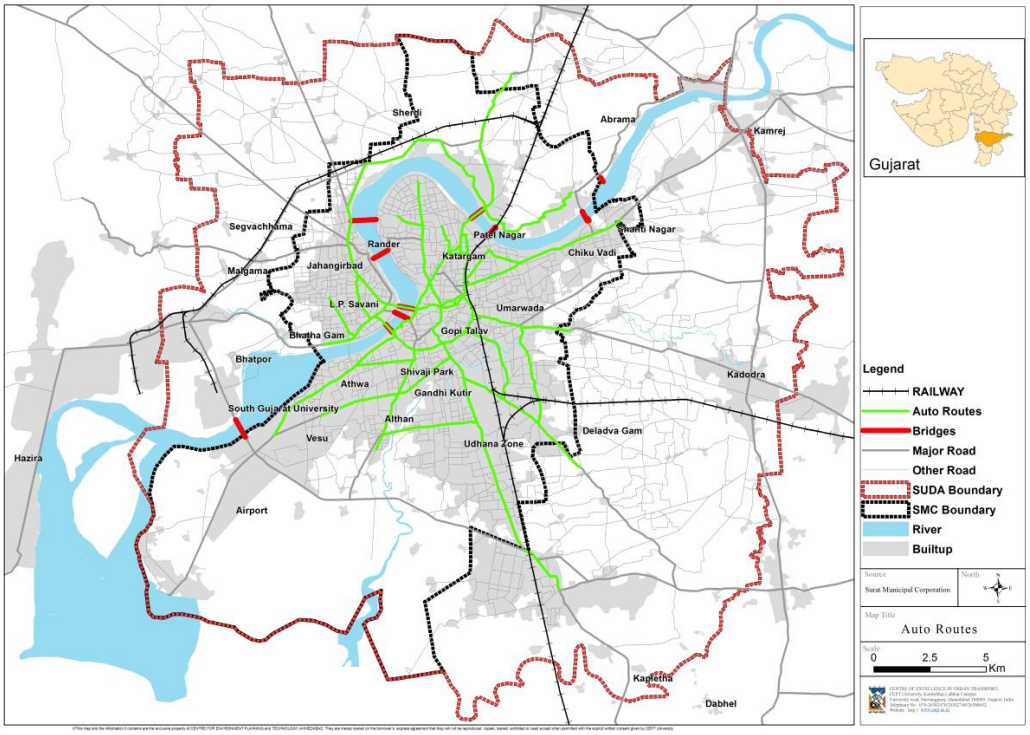
Table 52: IPT Routes and trips

Sr. No.	Route		Per Day	
	From	To	Auto Trips	Estimated Passengers @ 5/Trip
1	Ved Road	Piplod	4000	20,000
2	Lalita Chokdi	Piplod	3825	19,125
3	Ghod Dod Road	Piplod	3675	18,375
4	Mahidharpura	Station	3600	18,000
5	Station	Lalita Chokdi	3222	16,111
6	Bhagal	Ved Road	3106	15,531
7	Delhi Gate	Udhana Gate	3040	15,200
8	Aamroli	peoples	3000	15,000
9	Lal Darwaja	Udhana 3-Road	3000	15,000
10	Palanpur Patia	Hanipark Road	2800	14,000
11	Ashram	Peoples	2450	12,250
12	Bhagal	Lal Gate	2400	12,000

Sr. No.	Route		Per Day	
	From	To	Auto Trips	Estimated Passengers @ 5/Trip
13	Dabholi	Station	2400	12,000
14	Dabholi	Katargam	2400	12,000
15	Garnala	Lal Darwaja	2400	12,000
16	Station	Ved Road	2383	11,917
17	Station	Aamroli	2300	11,500
18	Chowk	Nanpura	2200	11,000
19	Bhagal	Chowk	2160	10,800
20	Peoples	Katargam	2125	10,625
21	Bhagal	Parle Point	2100	10,500
22	Mahidharpura	Adajan	2100	10,500
23	Varachha	Kapodra	2100	10,500
24	Station	Chowk	2053	10,267
25	Station	Bhavani-vad	1943	9717
26	Ashram	Station	1750	8750
27	Puna	Varachha	1742	8711
28	Station	Udhana	1733	8667
29	Adajan	Chowk	1714	8571
30	Variavi Bazar	Bhagal	1600	8000
	TOTAL	**30 Routes**	**75,323**	**3,76,617**
	Total	**All Routes**	**1,53,849**	**7,69,244**

Source: Traffic and Transportation Study: CRRI -Vol II, May 2007

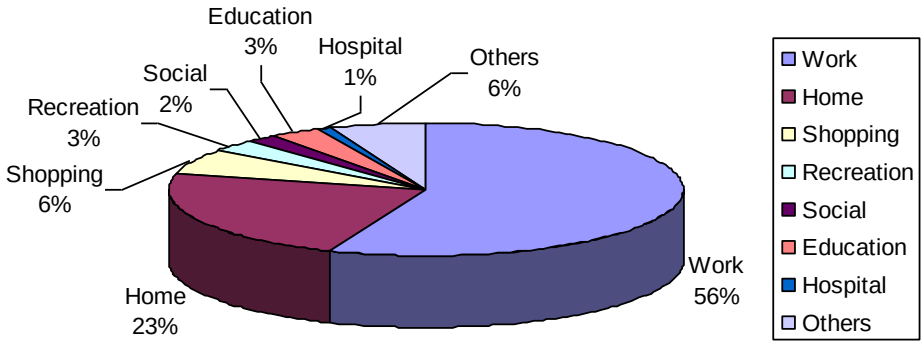
Figure 34: Existing major auto rickshaw routes



The auto trip characteristics are summarized below.

- Majority trips are for work/ business (> 80%)
- Most of these (95%) are performed using shared auto.
- They are generally daily users
- 36% use auto because there is no bus. Other choice factors include, fast/reliable (22%), Comfort (10%), cheaper (18%)
- Average trip length is 5 Km
- Average fare paid by passengers is Rs. 5.30 (Rs. 1/ km)

Figure 35: Rickshaw Trips by purpose



➢ **Pedestrian / Bicycle Traffic**

- All BRTS corridors are designed with cycle lanes.
- For Pedestrian Traffic at various 14 locations in the city foot over bridge are planned some of them are constructed and some are under construction.

➢ **Foot Over Bridges**

Table 53: Details about Foot Over Bridges

Sr. No.	Stage of Foot Over Bridges	No. of Foot Over Bridges
1	Existing Foot Over Bridges	05
2	Foot Over Bridges Under Progress	09
	Total No. of Foot Over Bridges	14

➢ **Traffic Brigade / CCTV Network – A Unique Experience**

- Total No. of 429 fixed cameras are installed at various roads in the city. Similarly 16 underpasses, 31 at flyovers and 29 are installed at river bridges.

8.8 BRTS CONCEPT AND IMPLEMENTATION

Surat had prepared a Comprehensive Mobility Plan (CMP) in 2008. The CMP looked at road network issues in Surat and suggested provision of additional rings to decongest the city centre. It also recommended the development of mass transit system in the form of BRTS. The DPR identified about 125 km as potential BRTS corridors and assessed each corridor to come up with a phasing plan. Accordingly, 30 km were identified in BRTS **phase I**. These 30 km included two corridors – one on the radial Surat Navsari road and the other on the canal road. Along with corridor identification, the DPR also identified other systems that would contribute to development of BRTS.

These included ITMS, transit infrastructure facilities, rolling stock, system type, institutional set up and operations and management plan. Four years after the proposal was approved by the MoUD and funds sanctioned under the JnNURM, many elements are under advanced stage of implementation. Now, looking at the potential of BRTS as a mass transit solution, the SMC wishes to increase the network. The plan presented through this report attempts to incorporate the requirements as specified under NUTP.

9 HOUSING

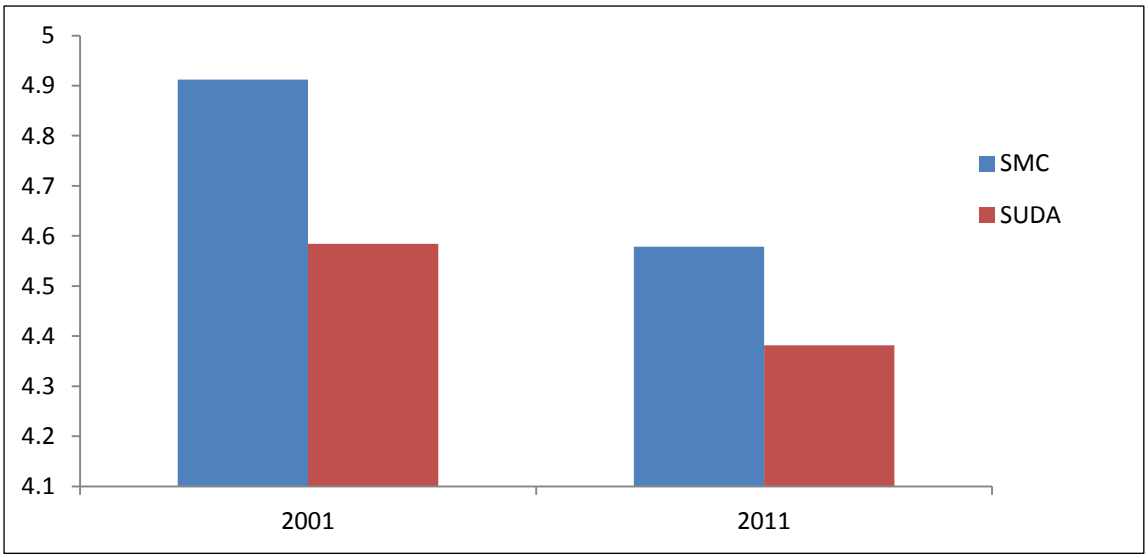
9.1 INTRODUCTION

House is the most basic need of human being after food and clothing that needs to be addressed on priority. It not only provides shelter to a household but also fulfils all basic utilities and needs of each member of the family. Therefore provision of housing for the entire population in the city is essential. In Surat demand for MIG and HIG housing exists besides LIG and EWS housing. Since Surat is becoming the most important industrial hub of the country, the need for LIG and EWS housing for industrial labour is of greater concern in and around industrial areas. This chapter examines the present housing status, housing need, housing issues and related strategies. The chapter then reviews various housing policies that are likely to impact the housing stock in the city in future and provide basic housing to the entire population in the city.

9.2 HOUSING SCENARIO

The current housing scenario for the city can be worked out through the average household projections for each of the administrative areas and the population of the city. The figure shows the past trend of Household Size by Administrative Areas for the years 2001 and 2011.

Figure 36: HH Size for Administrative Areas



Source: Census of India, Projection

The table below gives the details about the population, number of households and the household size for the administrative areas for the years 2001 and 2011.

Table 54: Population, Number of Households and Household Size of Administrative areas for the years 2001 and 2011

Sr.No.	Administrative Area	Population		No. of HHs		HH size	
		2001	2011	2001	2011	2001	2011
1	SMC	2876374	4467797	585532	975578	4.9	4.6
2	SUDA	239840	337304	52321	77593	4.6	4.4
	TOTAL	3116214	4805101	637853	1053171	4.9	4.6

Source: Census of India 2001 and 2011

The table below summarizes the housing requirement for SMC and SUDA regions. The total housing requirement for the year 2035 for entire SUDA region is 23.75 Lakhs.

Table 55: Housing Requirement Projections

Sr. No.	Administrative Area	Population			Housing Requirement		
		2021	2031	2035	2021	2031	2035
1	SMC	69,36,534	89,46,606	97,50,634	15,14,975	19,53,985	21,29,589
2	SUDA	5,27,961	6,80,954	7,42,151	1,20,494	1,55,411	1,69,378
	TOTAL	74,64,495	96,27,560	1,04,92,786	16,35,469	21,09,396	22,98,967

Source: Census of India and Projection

The residential development in the city which is approx 55% of the total urbanized area. The growth in the city is taking place in the Southern and North- eastern direction with major development of planned and unplanned colonies. Area under residential use has increased drastically, from 2695.6 hectares in 1978 to 10,666 hectares in 2014, indicating the extent of the urban sprawl. The percentage distribution of residential area is 58.54% in 2014, which is on a slightly higher side then prescribed standards, which range from 40 % to 45 %. There are 399 slum pockets of SMC . Mainly these slum pockets are near the medium industry in South and South- East side of the city.

9.3 HOUSING STOCK

As per census 2011, the Surat city population of 44.66 lakhs, with total number of 13,86,245 of census houses. There are 67.24% of houses which are used for wholly residential use and 15.11% of houses are lying vacant in the city. Below table shows decade growth for central zone. The maximum population density (49,971 person per sq.km.) is in Central zone in mere 8.18 sq.km. area. As discussed above the central zone provided maximum employment opportunities and formation of squatter settlements, which are the root cause of its densification.

The South-east Zone is highly inhabited with population of 7,48,304 (16.75% of total population). In respect to the population and area the East zone consists maximum numbers of Houses with 74.47% of it are optimally used for specifically residential purposes only. The table below is showing the total Housing Stock present in the city in the census year 2011.

Table 56: Housing Stock as per Census of India

Sr. No.	Zone	Area (sq.km.)	Population		Density per sq.km.	Decade Growth 2001-2011 (%)	Total No. of Census Houses	Wholly Residential	Vacant Houses
			Census 2001	Census 2011					
1	Central	8.18	413641	408760	49971	-1.18	153638	77666	21171
2	South West	111.912	242466	347447	3105	43.30	114734	71119	25996
3	South	61.764	407980	695028	11253	70.36	251079	165162	48001
4	South East	19.492	397257	748304	38390	88.37	221643	152624	26773
5	East	37.525	711516	1137138	30303	59.82	313105	233164	27853
6	North	36.363	416370	705163	19392	69.36	201978	140743	34940
7	West	51.279	287144	424986	8288	48.00	130068	91695	24772
TOTAL		**326.52**	**2876374**	**4467797**	**13680**	**55.29**	**1386245**	**932173**	**209506**

Source: Census of India 2001 and 2011

9.4 HOUSING NEED

The housing sector needs to be catered for meeting the existing backlog as well as to meet the future demands of the expansion happening in the city. The present deficiency of housing is computed as below, assuming household size of 4.5 for the entire city, based on the census 2011 population data and future housing projections. The table below shows the total shortfall in number of houses required for the population as per zones in the Surat city.

Table 57: Housing Shortfall existing in the year Census-2011

Year- 2011				
Zone	**Population**	**Total Houses**	**Average**	**Shortfall**
Central	4,08,760	77,666	5.3	13,170
South West	3,47,447	71,119	4.9	6,091
South	6,95,028	1,65,162	4.2	-10,711
South East	7,48,304	1,52,624	4.9	13,666
East	11,37,138	2,33,164	4.9	19,533
North	7,05,163	1,40,743	5.0	15,960
West	4,24,986	91,695	4.6	2,746
TOTAL	44,67,797	9,32,173	4.8	60,455

Source: Census of India 2011

The deficiency in the census year 2011 is based on the optimum household size (4.5 persons per Dwelling Units) thus is 60,455 households (Dwelling Units). The average household size is 4.8 persons per household which is higher than the prescribed Household size (4.5 persons per Dwelling Units) for the city.

The table below shows the total shortfall in the number of housing units for the total population in Surat city in coming years:

Table 58: Showing total Housing Shortfall in the projected year

	Year					
	1991	**2001**	**2011**	**2021**	**2031**	**2035**
Population	14,99,560	28,76,374	44,67,797	66,33,000	90,23,000	1,10,33,000
Total No. Of houses	6,81,750	7,52,441	13,86,245	21,53,571	29,29,545	35,82,143
Total Houses – Residential Use	4,36,744	4,77,508	9,32,173	14,63,878	19,04,205	23,28,393
Total Vacant Houses	99,267	1,17,236	2,09,506	3,39,619	4,41,775	5,40,187
Housing Requirement	3,33,236	6,39,194	9,92,628	14,74,000	20,05,111	24,51,778
Surplus	1,03,508					
Shortfall		1,61,686	60,455	10,122	1,00,906	1,23,385

Source: Derived from Census Information by SUDA

As per deficiency and surplus calculations, housing surplus is being only in the year 1991 and as the city expands in later decades the housing need increases with respect to population, therefore the backlog in the last census year 2011 is 60,455 houses for the population of 44,67,797 and for the year 2035 the housing requirement is 24,51,778 houses for 1,10,33,000 population. With the increase in population the housing need is also increasing for the population projected till 2035.

9.5 HOUSING GROWTH

Each zone has maximum number of properties which are residential which together comprises 58.5% of Residential use breakup for land use in the city.

East zone contains maximum number of residential properties. Also as mentioned above central zone is the core of employment activities, therefore the breakup of others type of properties are maximum in this zone. The residential development needs to be spread towards South and East zone, along with focus on education centres development in the city.

9.6 HOUSING SUPPLY AND DEMAND

The rise of Information Technology and Information Technology Enabled Services sector has changed the profile of the city and therefore city is emerging as a favourable investment destination. The city's infrastructure is improving steadily and it has recently seen the completion of a large number of road projects such as elevated roads and flyovers. Leading property developers of the country are implementing

residential and commercial projects in the city. Being the cleanest city of India and its accessibility from neighbouring cities such as Mumbai, Vadodara and Ahmadabad, Surat is catching attention of developers and investors.

The supply is being segregated into two sectors, Public and private. The major part of Housing Supply is from Private Sector which incorporates around 91.25 % of total housing supply in the city in the year 2014. The public sector supply is contributed by SUDA, SMC and Gujarat Housing Board.

Figure 37: Contribution of public sector in supply of Housing

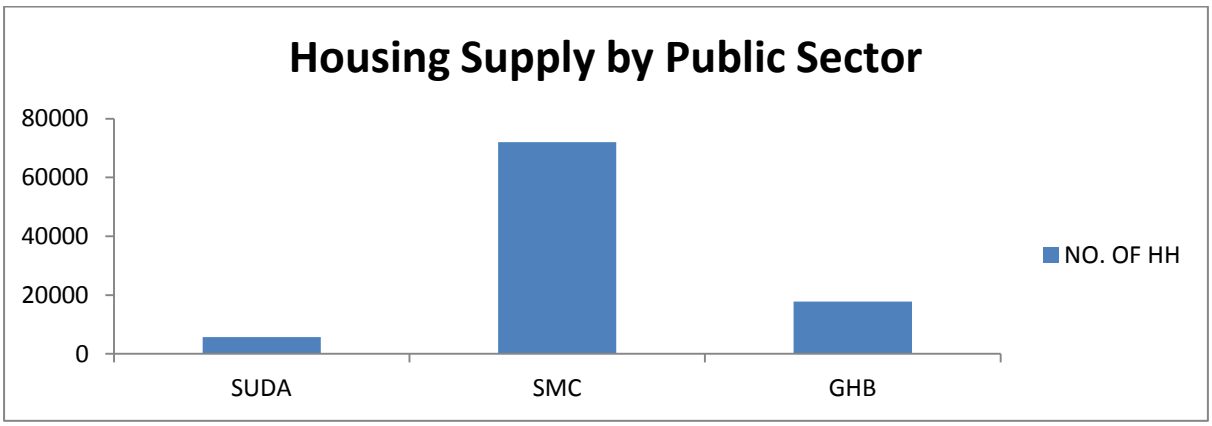
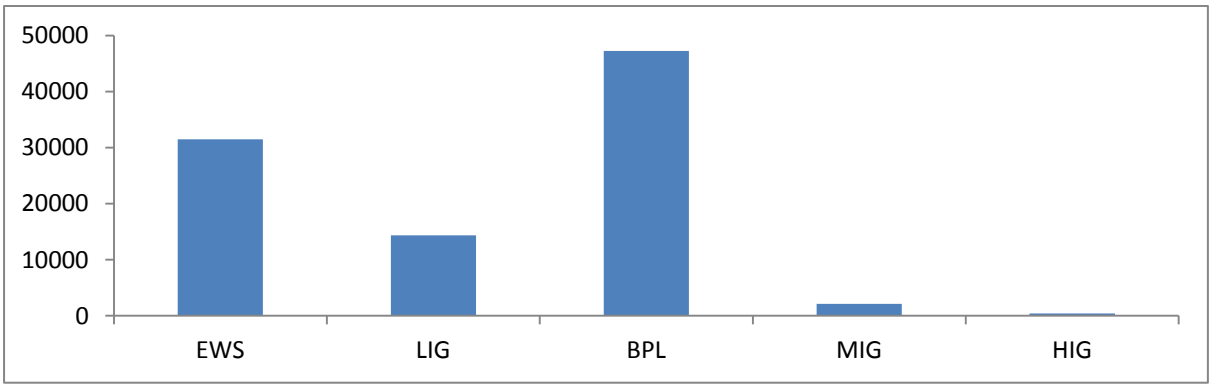


Figure 38: Housing under various category



Source: SMC, SUDA and GHB

Table 59: Contribution of public sector in supply of Housing in the Surat City

Sr. No.	Administrative Authority	Up to 2001	2001 to 2012	2013 to Till Date	Total
		No. Of Units	No. Of Units	No. Of Units (Under Construction Project)	
1	**SUDA**				
	EWS	483	1028		1511
	LIG		2472		2472

Sr. No.	Administrative Authority		Up to 2001	2001 to 2012	2013 to Till Date	Total
			No. Of Units	No. Of Units	No. Of Units (Under Construction Project)	
	Mukhyamantri Gruh Yojana (MGY)	LIG			611	1725
		EWS			1114	
	TOTAL					**5708**
2	**SMC**					
	JnNURM (BSUP)			46856		46856
	VAMBAY			372		372
	EWS		6243	7424		13667
	LIG			113		113
	Mukhyamantri Gruh Yojana (MGY)	LIG			2296	11023
		EWS			8727	
	TOTAL					**72031**
3	**GHB**					
	SIHS		738			738
	EWS		1641			1641
	LIG		7196			7196
	MIG		2103			2103
	HIG		387			387
	OTHER		2781			2781
	Mukhyamantri Gruh Yojana (MGY)	LIG			1633	2949
		EWS			1316	
	TOTAL		**21572**	**58265**	**15697**	**17795**
	GRAND TOTAL		**95534**			**95534**

Source: SMC, SUDA and GHB

Table indicates that from the public sector, SMC has been doing maximum work for poor people of the Surat city since last so many years. Up till now total 72,031 housing units have been constructed by SMC. After that GHB has performed major role by providing houses to the urban poor and the contribution is 17,795 houses. SUDA has also been proactive in construction of the houses for urban poor in the city since last few years. As on total 95,534 houses have been worked out by public sector in the Surat city which is approximately 8-9% of total Housing supply. The Private sector

supply is mainly targeted for the Middle Income Group (MIG) and Higher Income Group only; and hence the Lower Income Groups are often neglected.

The demand from Lower income Group for the required housing is on higher side, whereas options for them available in the market are at lower side but post slow down, in year 2014, Real estate developers in Gujarat are eyeing the affordable housing market. Rising demand from lower middle-class population, easy availability of housing loans and low interest rates have made the developers turn to building low-cost 1BHK and 2BHK flats in the range of Rs 4 to Rs 10 lakhs. Earlier, the builders focused more on catering to the demand of the higher-income groups by building luxurious apartments, bungalows and duplexes.

And as the maximum real estate projects are coming from private sector it can be understood, that the share of Housing Supply in Surat City is majorly dominated by Private sector than Public Sector. The supply by Public Sector is mainly for EWS, LIG and underprivileged sections of society, but supply by private sectors are concentrating on all sections and also introducing the concept of Affordable housing for the lower income group.

9.7 URBAN POOR

Slums are the agglomeration of unhygienic shelters arranged in congested manner without appropriate integral facilities like drinking water, roads, street lights and drainage being provided. Thus, conceptually slums are compact overcrowded residential areas (and not isolated or scattered dwellings) unfit for habitation due to lack of one or more of the basic infrastructure like drinking water, sanitation, electricity, sewerage, streets etc. These squatters are actually like blot on the urban panorama and also create unhygienic and dismal squalid environment and act as the source of spreading diseases in the city.

Slums have become an integral part of growing cities. The increase in industrial activities results in mass migration from other districts and neighbouring states. Due to the lack of resources and poor affordability coupled with inadequate availability of affordable housing, the migrants starts squatting on available public spaces creating in the process slum settlements with minimal available infrastructure. Rapid urbanization has led to rapid growth of slums in the cities.

Table below indicates Industrial locations in the Surat City where the Slums have developed nearby industries within SUDA and SMC boundary limit.

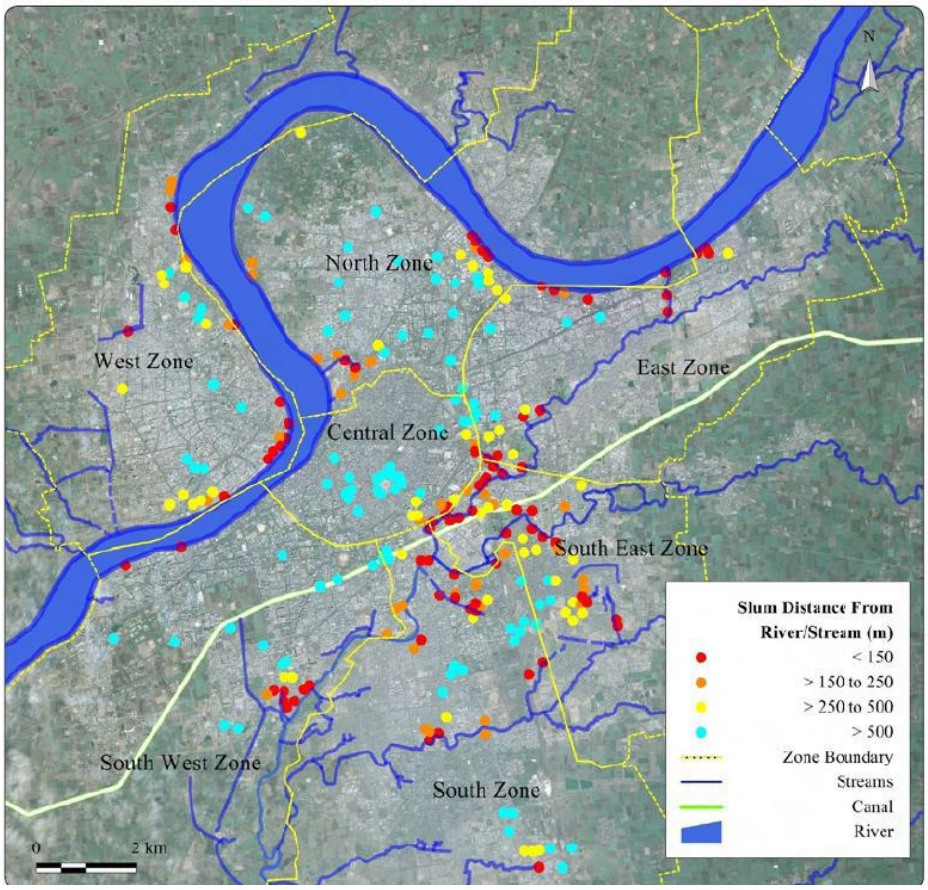
Table 60: Location of Industries where Slum pockets developed

Sr. No.	SUDA	SMC
1	Bharthana Kosad	Katargam
2	Gothan	Navagam
3	Lashkana	Tunki
4	Navagam	Umarwada

5	Vareli	Magob
6	Vankaneda	Dumbhal
7	Vanz	Anjana
8	Lajpore	Gandhikutir
9	Sachin	Bhatar
10	Bhatia	Althan
11	Gaviar	Udhna
12	Vanta	Bhewad
13	Kavas	Pandesara
14	Bhatpor	Bhestan
15	Ichhapor	Unn
16	Bharthana Kosad	Vadod
17	Kadodra	Bamroli

Source: Development Plan (SUDA)

Figure 39: Slum Locations near industries in Surat (2013-14)



Source: Slum up gradation department, SMC

Table 61: Slum Household Size for SMC areas

Sr. No.	Zones	Population		Detail of Slum (census-2001)				Detail of Slum (census-2011)			
		Census 2001	Census 2011	Slum HH	Slum Population	HH size	Census Vacant houses	Slum HH	Slum Population	HH size	Census Vacant houses
1	Central	413641	408760	9189	43775	4.8	28717	9889	49323	5.0	21171
2	South West	199668	347447	8961	31568	3.5	17926	7502	33982	4.5	25996
3	South	320087	695028	58213	75067	3.8	17323	17887	76025	4.3	48001
4	South East	334561	748304	-	148169		12822	30051	147050	4.9	26773
5	East	581138	1137138	19364	73998	3.8	16599	21334	90992	4.3	27853

6	North	334260	705163	9603	43697	4.6	8614	13541	58293	4.3	34940
7	West	250480	424986	11333	50450	4.5	15235	5665	25993	4.6	24772
Total		2433835	4466826	116663	466724	4.15	117236	105869	481658	4.54	209506

Source: Census of India and Projections by SUDA

As per survey conducted in 2013-14 under Rajiv Awas Yojana (RAY) around 399 Slums were identified. Of these 399 slums settlements, a majority of slums 144 were located along the Major Roads or the River, almost 75 Slums were located in the Khadi region or along the Railway other slums are located in the Gardens or in other places around the city.

Amongst the residents of the Slums the composition of the slums is as 42.37% of the slum population is SC, 27.77% of the Slum population is ST, 18.24% of Slums is Baxi- panch and 10.31% of population contains of the general population as per 2001.

Results of the analysis from the primary survey conducted in 2013-14 under RAY by SMC, an average household size of 4.54 was indicated in Surat slums. The average household sizes in the slums are higher than that of the city average.

It is observed that the encroachment on private land is being decreased in recent years by SMC efforts of relocation and re-shifting of slums on Public Land. Therefore out of total land occupied by Slums, 30% is on Private land in 2013-14.

Table 62: Land Area covered by Slum Pockets in the Surat City

Total no. of Slums	**399.00**	
Land Area Covered (Area in sq. m.)	Government Land	742559.88
	SMC Land	1705204.75
	Private Land	1148511.48
	On other Land	211409.65
	Total Area	3807685.76

9.8 HOUSING POLICY FOR URBAN POOR

SMC has prepared Slum policy considering Urban Poor as the integral part of the city and tried to cover all aspects of housing sector, such as need for Housing, short fall, available land policies, criteria and the problem identification and solution for urban poor.

Main objective of the policy are:

- To know the Socio-economic survey data of the Existing slum scenario in the city as whole and zone wise.

- To analyze all existing data considering socio-economic and physical parameters of existing slum settlements.
- Frame out the housing policy for urban, urban poor through the rating analysis of the existing condition with future development and vision for 2035.
- To prepare an Action plan for slum alleviation project sustainability in terms of Land and finance.
- To work out practical and efficient public private partnership initialize models for slum free city.

Since the residents of these slums create major work force as laborers and are participating substantially in total productivity of market. Therefore SMC has recognized the contribution of the urban poor in helping to build city prosperity and decided to make sufficient provision for them to have access to affordable land, and services. The ultimate goal of SMC is to make Surat a 'Slum Free City', and for this SMC has taken slum up gradation, relocation and rehabilitation programs. For this SMC has constituted Slum up- gradation cell to eradicate slums and to provide hygienic and aesthetical importance to Surat city.

The main Function of Slum up- gradation cell are:

- Slum Up Gradation
- Slum Relocation
- Slum Redevelopment

9.8.1 BUILT HOUSE APPROACH

Public sector of the Surat City has implemented several housing projects under Government's housing schemes for urban poor. Also, slum dwellers on road alignment and other such inappropriate location have been shifted to the houses built under these housing schemes. The built house approach for the rehabilitation of slum dwellers and urban poor is carried out under the following categories.

- LIG Housing
- EWS Housing
- VAMBAY Housing
- New Affordable Housing projects
- Rajiv Awas Yojana (RAY)
- Mukhyamantri Gruh Yojana (MGY)

SMC had constructed RCC Pucca houses for the slum beneficiaries. The hutments, which are required to shift from its original place to another place because of city development works, such affected slum households are provided the Built houses. The built house approach for the rehabilitation of slum dwellers is carried out for the three categories such as LIG, EWS & BPL housing.

9.8.1.1 LIG HOUSING

Under Government of India's 20 point program, the Government has given target to construct about 65 dwelling units. Against it, SMC has constructed 113 dwelling units on 2 different sites. The housing design for LIG Category is Ground + Three Storied RCC framed structure. On each floor, there are four dwelling units. The total built-up area of single Dwelling Units is 38.00 sq.m. (i.e. 408.88 sq.ft.). The unit has living room, Bed room, kitchen, W.C., Bath and balcony. The cost of the single dwelling unit is approximately Rs. 2,00,000/- including land, construction & infrastructure cost. The average housing density is 376 Dwelling Units/Hectare (i.e.1880 PPH).

9.8.1.2 EWS HOUSING PROJECTS

Under the Chief Minister's 15 point development program and Government of India's 20 point program, the Government has given target to construct about 7754 dwelling units including target for the Year 2005 -2006. Against which the SMC has constructed 7424 dwelling units on 23 different sites.

The construction work of 7424 Dwelling Units has been completed and possession to the beneficiaries has been handed over. Around 3533 units were handed over to the beneficiaries by draw and in 3891 unit hutments on road alignment and such other inappropriate locations have been shifted.

The housing design for EWS Category is Ground + Three Storied RCC framed structure. On each floor, there are four dwelling units. The total Built-up area of single D.U. is 22.45 sq.m. (i.e. 241.00 sq.ft.) The unit has single living room, kitchen, W.C., washing place and balcony. The land cost is not considered as part of total project cost. 1,49,596 sq.m. Land has been covered for 23 sites. The average housing density is 496 dwelling units/ha (i.e. 2481 PPH). Basic infrastructure like water supply, drainage, pucca roads and street lights are also provided by SMC.

9.8.1.3 VAMBAY HOUSING PROJECTS (BPL HOUSING)

The Central Government subsidized scheme Valmiki Ambedker Awas Yojana began in year 2002-2003. This is the scheme specially design for the families those who are living in slums and are below poverty line. It is estimated that about 51,934 (year 2002-03) household are living below poverty line in Surat City. The VAMBAY Housing Scheme is directly benefited to these families. Around 228 row houses on 3 sites are designed with single multi-purpose room, attached with toilet unit. Front ottah and a small backyard have been provided. The total built-up area of single dwelling unit is 20.16 sq.m.

9.8.1.4 NEW PROJECT OF AFFORDABLE HOUSING THROUGH PPP

SMC has approved (year 2009), the project of Satellite Residential Township of Bungalows along with EWS houses. The Location of proposed Housing is Moje Dumas. The Total Plot area is 51477.90 sq.m. and total plot area for development of 138 bungalows is 48732.13 sq.m., and for EWS, total 140 houses is the plot area is 2745.77 sq.m. which is 5.33% of total plot area.

9.8.1.5 JNNURM BSUP POLICY

The government of India has launched the Jawahar Lal Nehru National Urban Renewal Mission Scheme for the selected cities of the country. The JnNURM scheme has two submissions namely

Urban Infrastructure and Basic Service to the Urban Poor. Basic Services to the Urban Poor focus on access to infrastructure for the urban poor. This submission shall have a seven-point charter:

Security of tenure, Housing, Water supply, Sanitation, Education, Health and Social security cover. Eligible cities proposing projects for investment support shall be eligible for Central assistance 50 %, State assistance 20% and the 30 % contribution shall be of Urban Local Body/ beneficiaries. Under BSUP, SMC has received approval of & projects of construction of 42,175 houses for urban poor for relocation of slum dwellers in 2009. Surat is one of the eligible cities under JnNURM scheme.

9.8.1.6 THE RAJIV AWAS YOJANA (RAY)

Government of India has announced a scheme for slum dwellers and the urban poor named Rajiv Awas Yojana (RAY), aimed at creating a 'Slum Free India' by giving support to those states who are willing to assign property rights to slum dwellers.

The Ministry of Housing and Urban Poverty Alleviation (MoHUPA) has prepared Guidelines for 'Slum Free City' planning to assist the preparatory activities under RAY and this has been circulated to all States/UTs. RAY calls for a multi-pronged approach focusing on the following aspects:

- Bringing existing slums within the formal system and enabling them to avail the same level of basic amenities as the rest of the town/city.
- Redressing the failures of the formal system that lead to the creation of slums; and
- Tackling the shortages of urban land and housing that keep shelter out of reach of the urban poor and force them to resort to extra-legal solutions in a bid to retain their sources of livelihood and employment.
- Under RAY scheme SMC has done survey for Urban Poor and identified total 399 slum pockets exists in the city in year 2013-14.

9.8.1.7 THE MUKHYAMANTRI GRUH YOJANA (MGY)

The government of Gujarat has launched the Mukhyamantri Gruh Yojana (Gujarat Rural Urban Housing) Scheme under RAY for the all cities of the state under 12th Five Year Plan. The main goal of the MGY scheme is to provide housing to the urban poor who are coming under main two categories such as Economically Weaker Section (EWS) and Lower Income Group (LIG). To encourage housing sector government provides subsidy to urban poor under MGY scheme.

9.9 EMERGING ISSUES

9.9.1 OVER DENSIFICATION IN CENTRAL ZONE

The central zone has reached to saturation level with respect to population and residential density. With increase of slum settlement in around the zone, the property tax cannot be collected appropriately. The agglomeration of population in this central zone needs to be controlled.

9.9.2 CONCENTRATED DEVELOPMENT

The residential development is unevenly spread between central zone and south west zone. Residential development need to be controlled and spread evenly in all zones mainly in north and south zone.

9.9.3 LACK OF ACCESS TO LAND FOR AFFORDABLE HOUSING

With the speculative real estate market and increasing demand for affordable housing has played a crucial role in raising the prices in the housing market. Affordable housing remains a distant dream for many pushing them to sub-standard housing. But recently since many MOUs being signed, which shows a good sign of upbringing and implementing this idea into whole.

9.9.4 HOUSING PROJECTS WITH PUBLIC-PRIVATE PARTNERSHIPS

Over the years, the Municipal Corporation has implemented various schemes of housing. With ever increasing demand and continuous migration to the city over the years, the housing demand is ever increasing. The government alone may not be able to cater to the existing housing demand. Thus, it is inevitable for the government to play a role of regulatory authority proving access to the land for affordable housing to the private agencies. The city requires many more housing projects and area improvement schemes in the newly added area of the city.

10 GARDENS

The Public Parks and Garden Department was established with a mission to provide the best environmental condition to live in by providing the citizens with recreational area by creating parks, garden, ponds and lake near their neighborhood with reduced level of air and noise pollution by improving micro alignment at city level and to recharge ground water through ponds and lakes. This section broadly talks about the four main areas, different types of parks and open spaces in the city as well as, green streets and urban groves.

10.1 URBAN CHARACTERISTICS

10.1.1 PARKS & GARDENS

Parks are green landscaped areas that act as lungs of the city. Parks provide pollution free and pedestrian friendly areas for a varied range of social activities. The activities can include leisure, relaxation, formal and informal gatherings such as senior citizens' laughing club, and some active recreation such as jogging and so on. Parks can accommodate different recreational and leisure activities depending on their size and location. Parks need to be distributed such that their catchment areas cover most surrounding residential households within a comfortable walking distance. Parks and gardens can be categorized based on their size, location and use as shown below.

10.1.2 NEIGHBOURHOOD PARK

This category includes parks that are small but more evenly distributed throughout the residential areas. These parks usually serve the adjoining residential neighborhoods which are within a comfortable walking distance. Neighborhood parks can include sitting-out areas; children's play spaces and other provisions for passive recreation. Good examples of neighborhood parks in Surat city are Lokmanya Tilak Udhyan, Dr. Babasaheb Ambedkar Udhyan, etc.

10.1.3 COMMUNITY PARK

This category includes parks that can support more active recreational activities, landscape features and other supporting functions such as food stalls, public toilets, etc. These parks usually serve multiple residential neighborhoods within comfortable walking distance. These kind of activities are seen at the community park in the city located at Gandhibaug Chowk Bazaar.

10.1.4 CITY PARK

This category includes parks that are important at the city level. City parks are large landscaped areas that offer a wider range of recreational facilities and features. People from varied parts of the city utilize these places. Botanical Garden at Ugat is categorized as a city level garden in the city providing a landscaped area to the people for a wide range of recreational activities.

10.1.5 REGIONAL PARK

There is another category of parks which functions at the regional level. Regional parks are large areas, corridors or networks of open space which are publicly accessible and provide a range of

facilities and features offering recreational, ecological, landscape, cultural or green infrastructure benefits. Nature Park at Sarthana is a regional level park with variety of species living in their natural environment. Besides that there is no other regional level park in Surat.

Figure 40: Example of Community and City level Park

Community Park –Gandhibaug, Chowk

City Level Park –Botanical Garden, Ugat

Table 63: Category of Parks

Category	Area (ha)	Pedestrian access Catchment
Neighborhood	0 – 0.4	400 m up to 5 min walk
Community	0.4 – 2.0	800 m up to 10 min walk
City	2.0 – 80.0	800 m up to 10 min drive
Regional	More than 80.0	Up to 1 hour drive

Source: Comprehensive development Plan 2021 Part I: Existing Conditions, Studies & Analysis - AUDA

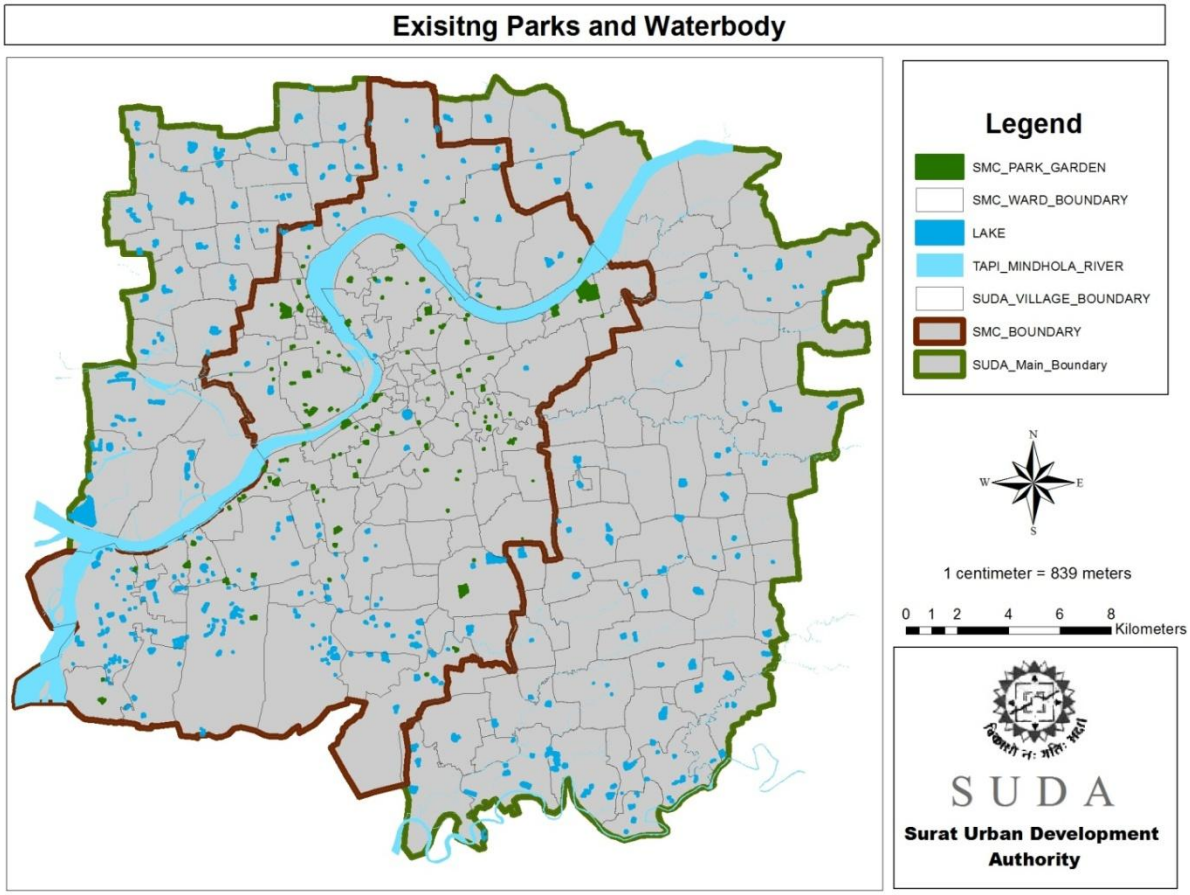
The parks and open spaces as per category in SMC & SUDA area are as below:

Table 64: Parks and Gardens in SMC and SUDA

Category	SMC		SUDA	
	No. of Spaces	Area (ha)	No. of Spaces	Area (ha)
Neighborhood	77	8.84	21	2.90
Community	32	29.23	18	16.11
City	10	52.29	1	2.23
Total	**119**	**90.36**	**40**	**21.24**

Source: Parks and Garden Department, SMC & Land Use Field Survey Data 2014 SUDA

Figure 41: Existing parks and gardens in SUDA



10.1.6 OPEN SPACES

Open spaces include publicly accessible spaces that can accommodate multiple active recreational uses such as expos, exhibitions, play grounds, etc. Open spaces in Surat are categorized as open spaces, gardens, playgrounds, recreational areas and green belts. Playgrounds are mostly included within the school premises and the rest of the areas are open for public use. Open spaces can include public spaces which act as spaces for social gathering. Open spaces also include public grounds and vacant government land which can accommodate different activities. Irrespective of public or private ownership the basic use of open spaces is for public use. Public grounds are larger in size. These spaces need not have extensive landscaping. Vanita vishram is the best example of open space for Surat city which is utilized for various activities in the city. SMC also rents party plots for weddings, social gatherings, etc.

10.1.7 PLAZA / CHOWK

This category of open space includes spaces that are predominantly for pedestrian use supported with informal activities. A plaza can be any gathering space on a street or between buildings or at a street intersection. These spaces have a sense of enclosure that can be of varying degrees, and can include soft and hard landscape features. Surat already has a chowk area in the core city. SMC has made efforts to relocate people on the street near chowk area and develop plaza with permanent

shops and open interaction space. Besides these Surat city can have a number of open plazas developed at places like Chowpati, and various malls, etc.

10.1.8 GREEN BELTS

Green belts include all streets that have landscaping and/or tree plantation. Green belts are an important part of the city-wide network of parks and open space. They enhance the experience and image of the city and make it pleasant and comfortable for the citizens as well as tourists/visitors. Green belts can also behave as green public spaces where a variety of recreational and leisure activities can take place. These should be planned to connect multiple significant parks, plazas and open spaces within the city and to form a citywide 'green network'. This green network would encourage the use of non motorized transport in the city and encourage the pedestrians to utilize the streets.

- **Planned green belts:** These include streets that have planned tree plantation and street landscaping elements. All major roads that are being planned in the recent years take care of tree plantation and green belts. Between 2005 and 2009 following efforts were made.
- 2,67,237 Nos. of trees were planted along the road side and road divider.

10.1.9 URBAN GROVES

Urban groves include all areas that have substantial natural or planned tree cover, with restrictions on development of any kind. Between 2005 and 2009 following efforts were made:

- 3,28,778 Nos. of trees are planted in large open space as mass plantation for shelter belt & Green belt.
- High density tree plantation is carried out around all water works, water treatment plants, sewage treatment plants, pumping stations and distribution stations.
- Tree plantation is also carried out in disposal sites and EWS plots reserved by authority.

Also Nature Park Sarthana which is situated at the North-East corner of Surat City, which is approachable by Surat- Kamrej Road. The site is covered with an area of 81 acres with river Tapi on the north side and Surat- Kamrej road is on its south side. The aim and objectives of the Nature Park are enlisted below:

- To breed endanger & extinct species found locally, regionally and countrywide in planned manner.
- To protect endangered & extinct species of wild life and to conserve them in natural environment.
- To create conservation awareness among public to get their support for conservation- preservation.

10.2 PARKS AND OPEN SPACES

At present parks, gardens, grounds and other open spaces that are used for leisure and recreational activities in the city amount to 285.03 ha. Existing waterfront parks and open spaces are also included in the calculations. The following table shows total area figures for parks by administrative zones in SMC and SUDA limits.

Table 65: Parks and Garden details of SUDA Region

Sr. No.	Zone	Gardens	Shantikunj/ Shantivan	Area (ha)
1	Central	12	1	4.11
2	West	24	6	31.43
3	Southwest	18	2	18.34
4	South	10	5	14.04
5	Southeast	4	6	0.54
6	East	8	6	11.33
7	North	14	3	10.55
Sub Total		90	29	
SMC Total			**119**	**90.36**
SUDA		**40**		**21.24**
Total		**159**		**111.60**

Source: Parks and Garden Department, SMC & Land Use Field Survey Data 2014 SUDA

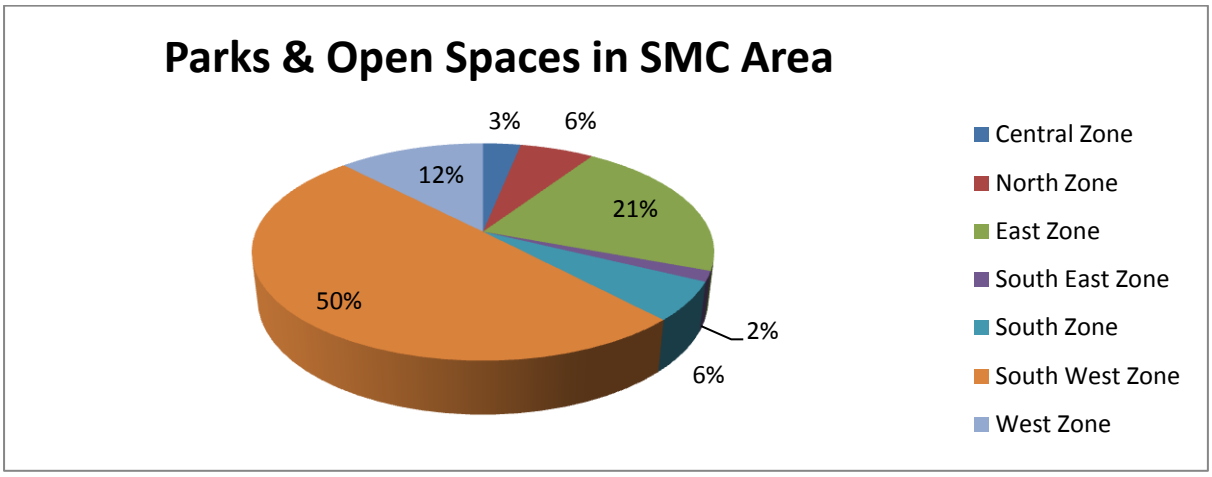
Table 66: Parks Garden and Open space details of SUDA area

Sr. No.	Administrative Zones	Area (ha)
1	Central Zone	8.34
2	North Zone	16.35
3	East Zone	56.28
4	South East Zone	4.05
5	South Zone	15.13
6	South West Zone	131.35
7	West Zone	32.28
SMC Subtotal		**263.78**
Rest of SUDA		**21.25**
TOTAL SUDA REGION (A+B)		**285.03**

Source: Parks and Garden Department, SMC & Land Use Field Survey Data 2014 SUDA

Currently, 2.63 sq.km. of area is under parks, gardens and open spaces out of 326 sq.km. of SMC area. This accounts of only 0.81 % of the total SMC area. These include parks and open spaces at all levels namely neighborhood, city and community level. It is seen that both SMC and rest of SUDA area do not have adequate provision of parks and open spaces. Hence efforts should be made to increase the area under them and create a green and healthy environment for the residents.

Figure 42 Zone wise percentage parks and garden in SMC area



Source: Parks and Garden Department, SMC

10.2.1 EXISTING GUIDELINES FOR PROVISION OF PARKS AND OPEN SPACE

TP scheme mechanism: TP scheme mechanism has guidance for parks and open space provision based on area. 5% land of the total TP scheme area is to be preserved as open space. The guidelines for provision of open space as per UDPFI and TP scheme are for overall provision and do not include key guidance covering aspects such as distribution of the open spaces and their catchment, minimum space standards for the open spaces etc.

10.2.2 ANALYSIS OF EXISTING PROVISION OF PARKS AND OPEN SPACES

At present, provision of parks and open space is linked to total area of developable land as per TP scheme guidelines or as an overall provision based on population as per UDPFI guidelines. While overall provision of parks and open space in the city is important, it is also necessary to assess the spatial distribution and catchment of these spaces, and also to assess the space standards of this amenity. Existing provision of parks and open spaces in Surat is analyzed by administrative zones as this provides a detailed picture of the varying conditions in the different parts of the city. The following criteria are used for analyzing the provision:

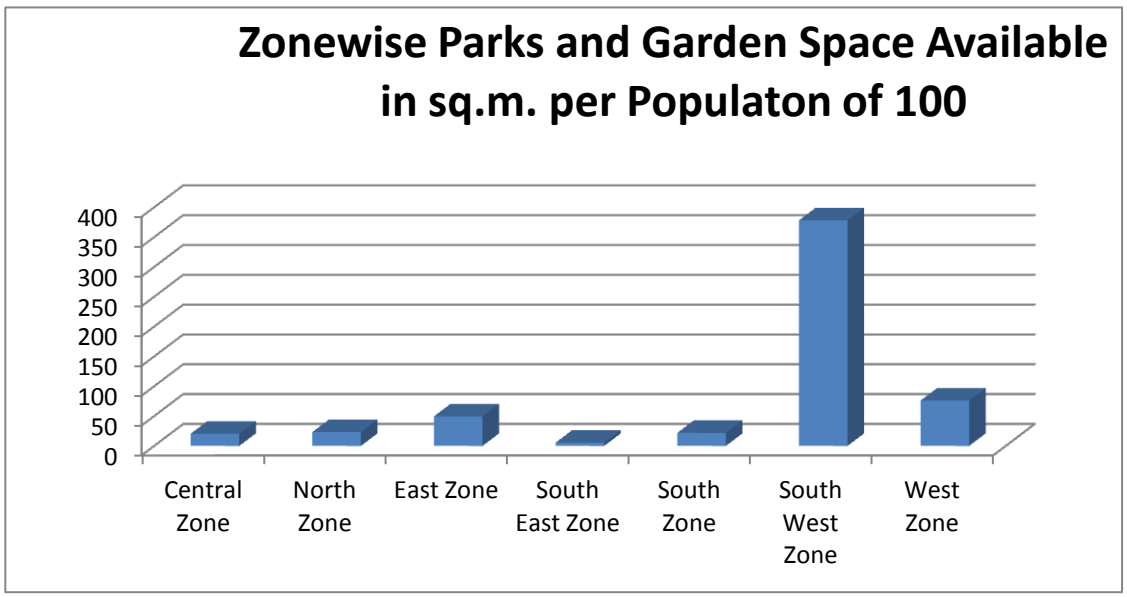
- Provision based on population
- Pedestrian access for residential households
- Average size and distribution

➢ Provision of Parks and Open Spaces Based on Population

Provision of parks and open spaces should be based on population and not on developable area. It is the population density that determines the demand for this public amenity. The following chart

shows the existing provision of parks and open space based on population of 100 persons by administrative zones / wards within SMC.

Figure 43: Zone wise Parks and Garden space available in Sq Mt per population of 100



Source: Parks and Garden Department, SMC

➢ Pedestrian Access to Parks for Residential Households

Pedestrian access analysis shows the distribution of parks within the city. This is useful in understanding the accessibility of this amenity by the surrounding households. Pedestrian access for parks is defined as the residential area falling within 5 minutes / 400 m walking distance from neighbourhood parks, and 10 minutes / 800 m from community and city level parks.

➢ Average Size and Distribution of Parks

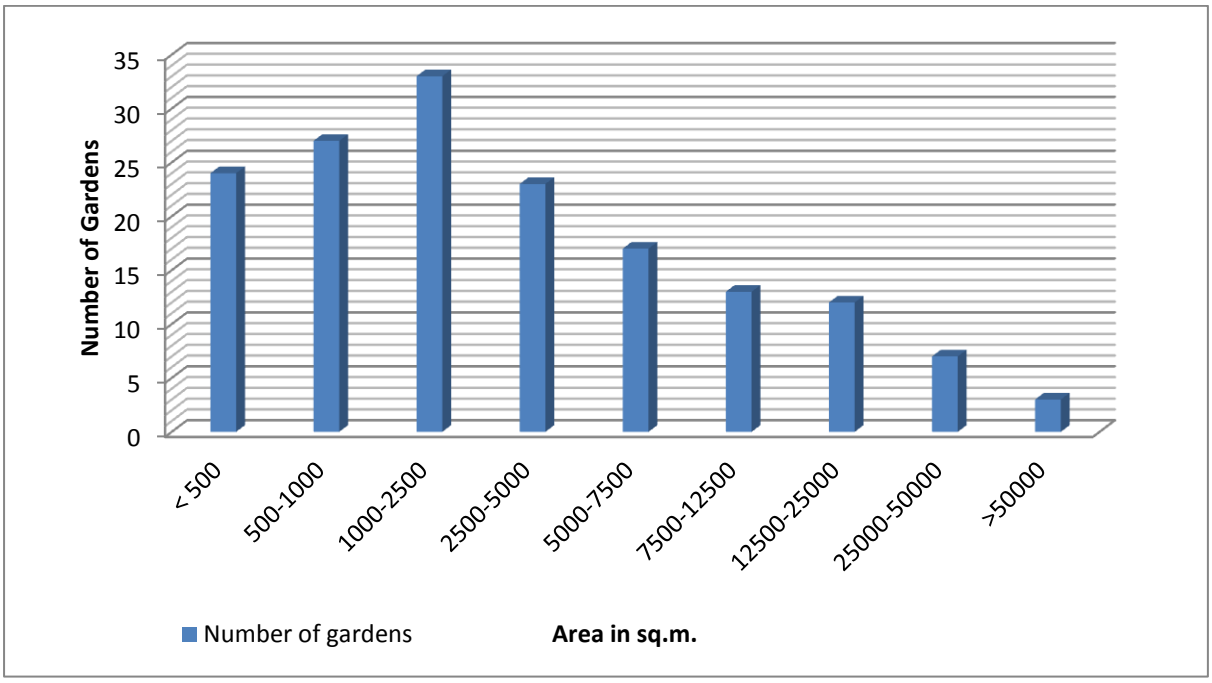
The size of any park or open space determines the overall population that can be served by it. The size also has an impact on the use and attractiveness of the space. For example, city level parks are larger in size and include other secondary uses such as botanical garden etc. These parks cater to the city as a whole and not just the immediate catchment. Neighbourhood level parks are smaller in size and primarily serve the immediate catchment area. Community level parks are shared between different neighbourhoods.

Nearly 53% of the parks and open spaces fall between 100 to 2500 sq.m., 14 % of them fall between 2500 to 5000 sq.m. and the rest 33% of them between 5000 and more. For Surat city, the area under parks and open spaces is quite low.

10.2.3 MECHANISMS FOR PROVISION OF PARKS AND OPEN SPACES AND MAINTENANCE

A detailed mechanism needs to be developed for provision of parks and open spaces. At present, the planning of new parks and open spaces is mainly through TP mechanism. However, in the existing developed areas, there is no specific mechanism for the provision of new parks and open spaces. Currently a lot of vacant plots are used as open space for recreational activities. The gardens are mainly developed and maintained by the department and some gardens and shantikunj are given on contracts for maintenance. SUDA does not develop any gardens. SUDA has no dedicated funding allocated for the implementation and maintenance of parks and open spaces within its boundaries. There are few Panchvatis and privately developed gardens in the villages.

Figure 44: Distribution of number of parks by area ranges (sq. m) in SMC



Source: Parks and Garden Department, SMC

10.3 OBSERVATIONS AND ISSUES

10.3.1 REQUIREMENT OF GREEN NETWORK

- There are few streets where plantation has been carried out within the city but they do not form a green network. A comrehensive green network is required.

10.3.2 INADEQUATE GREEN SPACE AT CITY LEVEL

- **Issue:** Lake front development along with garden can be taken up to develop more spaces like the botanical garden which can used at city level for recreational purpose.

10.3.3 LACK OF RECREATIONAL FACILITIES

- There has been a continuous decrease in the amount of open space present in the city over the past decade.
- At present facilities present to cater to the recreational needs of the population are inadequate.

10.3.4 INADEQUATE PARKING PROVISIONS FOR PARKS

- **Observation:** There is an insufficient availability of parking facilities for parks and open spaces in the city.

11 PHYSICAL INFRASTRUCTURE

11.1 INTRODUCTION

Basic physical infrastructure facilities, services, and installations needed for the functioning of a community or society are roads, water supply, sewerage, storm water lines and solid waste management. Roads have been in the chapter on Traffic and Transport. Hence, this chapter focuses on all services except roads, identifying the issues arising for these services in fulfilling the growing demand. Due to the increase in urbanization at a fast pace in Surat, there exists significant pressure on the urban infrastructure.

The Specific indicators generated basically present the current situations/status of civic amenities in Surat Urban Area. The service level and coverage indicators have been used for estimating the gaps in services via set norms as prescribed by CPHEEO manual. Based on the norms, requirements by the year 2021, 2031 and 2035 have also been estimated. Further, future requirements have been converted into monetary terms, assuming appropriate unit costs.

11.2 WATER SUPPLY

11.2.1 WATER SUPPLY CURRENT SCENARIO

Water Supply is one of the primary infrastructure services a city needs. The sources of water supply for the entire SUDA region are surface water and ground water. Tapi is a major source of Surface Water. Surface water is drawn by intake wells from perennial channel throughout the year. Ground water is drawn via bores. The entire water supply process takes place through various steps and water is received through the source in the treatment plant where it is treated. The treated water is stored in the storage reservoirs and then supplied to the city areas. The following sections describe how the water supply system in the city has developed from past to present.

The situation with regard to water supply in Surat Municipal Corporation has been analyzed in terms of “Source Sustainability”, apart from “Service Levels”, “Service Coverage” and “Service Efficiency”. These indicators are analyzed for assessing the existing service levels, coverage and efficiency.

11.2.1.1 EVOLUTION OF WATER SUPPLY

The water supply system for Surat city evolved over a period of more than hundred years.

Table 67: Water Supply scenario before 1995

Year	Event
23 April 1852	Surat municipality was established but there was no provision of public water supply at that time
1864	Sir Kawasji Jahangir of Surat had donated Rs.1.25 Lacs to construct a water works for the city

Year	Event
1867	Mr. Gragery prepared a plan to draw water from river Tapi near Kamrej and bring the same up to Delhi Gate by a pipeline
1894	Fardunji Taraporewala was appointed as an Executive Engineer in Surat by the British Government, who planned to build Infiltration wells in the river. In the same year, work for first water supply pipeline was started near Surat railway station by Mr. George Harrison, then Governor of Mumbai
1898	Varachha Water Works was inaugurated. It was then known as Lely Water Works in the name of Mr.Lely, then Collector of Surat. Rander municipal area also got water from this plant as Sheth Haji Yusuf from Rander shared one tenth of the expenditure.
1931	chlorination was used in Surat city water supply for the first time
1950	New Engine House & new overhead tank were started
1952	First surface water treatment plant was commissioned at Varachha
1984	20 new tube wells were constructed at Varachha & Sarthana to increase the water supply capacity
1985	Radial collecting wells (2 No.) were constructed at Sarthana and water distribution stations were constructed at Khatodara, Umarwada & Katargam
1995	gross average daily water supply was 180 MLD to a population of about 18 Lacs resulting in an acute shortage of water supply
1995	A weir-cum-causeway was constructed across river Tapi. Due to the construction of weir, a reservoir of about 31000 TCM (Thousand Cubic Meter) capacity became available for drawing surface water.

Source: Water Supply Master Plan 2041 , SMC

Table 68: Water Supply scenario post 1995

Year	Event
1997	New water works for the city was commissioned at Katargam
1997	120 MLD capacity water treatment plant was commissioned and increased to total 240 MLD in 1999. Raw water at this water treatment plant was fed by the intake well constructed in the river Tapi.
2001	240 MLD capacity raw water Intake Well & 120 MLD capacity Water Treatment Plant were commissioned at Sarthana Water Works
2003	200 MLD capacity Water Treatment Plant & 360 MLD capacity raw water Intake Well were commissioned at Rander Water Works
2006	City limit was extended from 112.27 sq.km. to 326.51 sq.km. area, merging 27 Grampanchayats & 8 Nagarpalikas into city.
2007	200 MLD capacity fully automatic water treatment plant with SCADA was commissioned at Sarthana Water Works
2009	two fully automatic water treatment plants with SCADA of 150 MLD capacity each were commissioned and inaugurated by Honorable Chief Minister of Gujarat, Shri Narendrabhai Modi at Katargam & Sarthana Water Works
2011	50 MLD water treatment plant was commissioned at Rander water works under

Year	Event
	JnNURM
2012	Water Supply Scheme (part) for Amroli, Kosad, Chhaprabhatha area of New North Zone of Surat was commissioned and inaugurated by Honorable Chief Minister of Gujarat, Shri Narendrabhai Modi
2012	360 MLD Intake well at Sarthana water works and 263 MLD Intake well at Katargam water works commissioned
2013	90 MLD capacity fully automatic water treatment plant with SCADA was commissioned at Kosad Water Works
2013	3 Nos. of UGSR of total **245 Lacs Liters** capacity with booster house for water supply scheme for Puna-Simada area of Surat under "Swarnim Jayanti Mukhya Mantri Shaheri Vikas Yojna"

Source: Water Supply Master Plan 2041 , SMC

11.2.1.2 CURRENT SERVICE LEVEL(YEAR 2014)

Presently, there is an availability of **1463 MLD** of surface water from different sources for SMC area against the total treatment capacity of **1268 MLD**. Water from all these sources is taken to treatment plants supplying water to the SMC region. SMC has developed well established, networked water supply system to supply the drinking water to the Citizens of Surat City. Present gross average daily water supply to the citizens of Surat City is **980 MLD** with net per capita water supply of **150 Liters per day**. Present water supply components like water works, booster house and water distribution stations are connected with water supply GRID network which helps to address water quantity and quality issues. Present population coverage of Surat city (including the extended city limit area in year 2006) is about 93% and it is planned to achieve the target of 100% population coverage by the end of year 2014.

Table 69: Water Supply available with SMC

No	Surface Water Source	Intake Well Installed capacity (MLD)	Water Treatment Plant Installed capacity (MLD)	Percentage Treatmemt plant installed from intake
1	Sarthana Water Works	600	470	78.33
2	Varachha Water Works	0	68	
3	Katargam Water Works	503	390	77.53
4	Rander Water Works	360	250	69.44
5	Kosad Water Works	0	90	
	Total	**1463**	**1268**	**86.67**

Source: Water Supply Master Plan 2041 , SMC

Other than these, the villages in the SUDA area receive water through GWSSB from Tapi river and private bore wells. GWSSB supplies to only 14 villages about 1.6 MLD of water the rest of the villages are dependent on private bores and there are about 223 bores in these villages.

Table 70: Water supply to villages under SUDA Region Areas through GWSSB

No.	Village	Water Supply (Litres)
1	Ambetha	139991
2	Ariyana	87703
3	Jothan	94056
4	Sonsak	153177
5	Kukni	64345
6	Balkas	68947
7	Talad	94563
8	Kanad	73462
9	Vadod	58006
10	Sarol	34213
11	Ichhapore	321000
12	Pardi Kande	100000
13	Bhatha	206000
14	Bhatpor	135000

Source: GWSSB, 2014

Table 71: Water Supply scenario in SUDA area

Sr. No.	Name Of Taluka	Total Number of Villages	Water Supply			
			Source Tapi - Supply By GWSSB	Number of Villages having Bores	Total Number of Bores	Number of Hand pumps Working
1	Kamrej	17	0	17	25	127
2	Palsana	17	0	17	45	110
3	Olpad	17	9	1	27	43
4	Choryasi	44	5	35	126	290
	Total	**95**	**14**	**81**	**223**	**570**
	Percentage villages		**14.73**	**85.27**		

Source: Primary Survey SUDA ,March 2014

However with the rapid development and rise in population, the city's demand on ground water resources is increasing tremendously. Although there is a huge potential of surface water resources, lack of piped supply network in all the developing urban areas creates significant pressure on existing ground water resources. As such, the village areas have to depend on the ground water, drawn from a number of bore wells located in different parts of the SUDA area.

11.2.2 WATER TREATMENT PLANT

In the entire of SUDA region, there are total five nos. of water treatment plants, operated by SMC in order to provide quality water to the urban developed and developing areas. Presently, the villages in SUDA area do not have any treatment plants. The five water treatment plants have a combined

treatment capacity of 1268 MLD. Moreover 2 newly constructed water treatment plants of total 110 MLD capacity are yet to be commissioned and work for 90 MLD capacity water treatment plant is in progress.

Present installed capacity of Water Works is **1268 MLD,** Present gross daily average water supply is **980 MLD** via 28 water distribution centres.

Table 72: Existing water treatment plants

Sr. No.	Surface Water Source	Water Treatment Plant	Current Utilisation (MLD)	Percentage Utilisation
1	Sarthana Water Works	470	355	75.53
2	Varachha Water Works	68	60	88.24
3	Katargam Water Works	390	350	89.74
4	Rander Water Works	250	200	80.00
5	Kosad Water Works	90	15	75.53
	Total	**1268**	**980**	88.24

Source: Water Supply Master Plan 2041 , SMC

Treatment Given to Water

- Pre-Chlorination
- Alum dosing/mixing
- Clari-flocculation by sludge blanket Lamella clarifiers / Conventional clarifiers
- Filtration by declining rate type rapid gravity sand filters
- Post Chlorination

11.2.3 WATER STORAGE

In order to store the treated water, the SMC has built a number of reservoirs comprising of Elevated Service Reservoirs(ESRs) and Ground level Service Reservoirs(GSRs)having a total storage capacity of 747.10 ML of water.

Table 73: Water Supply Process Details

Sr. No.	Water Supply Project	Year 2001	Year 2006-07	Year 2014
1	Intake Well (in MLD)	480	840	1463
2	Water Treatment Plants (in MLD)	428	628	1268
3	UGSR Capacity (in Lac lit)	3822	4450	7471
4	ESR Capacity (in Lac lit)	103	150	696
5	Pipeline (in km)	1850	2250	3030

Source: Water Supply Master Plan 2041 , SMC

Figure 45: Existing Water Treatment Plant locations

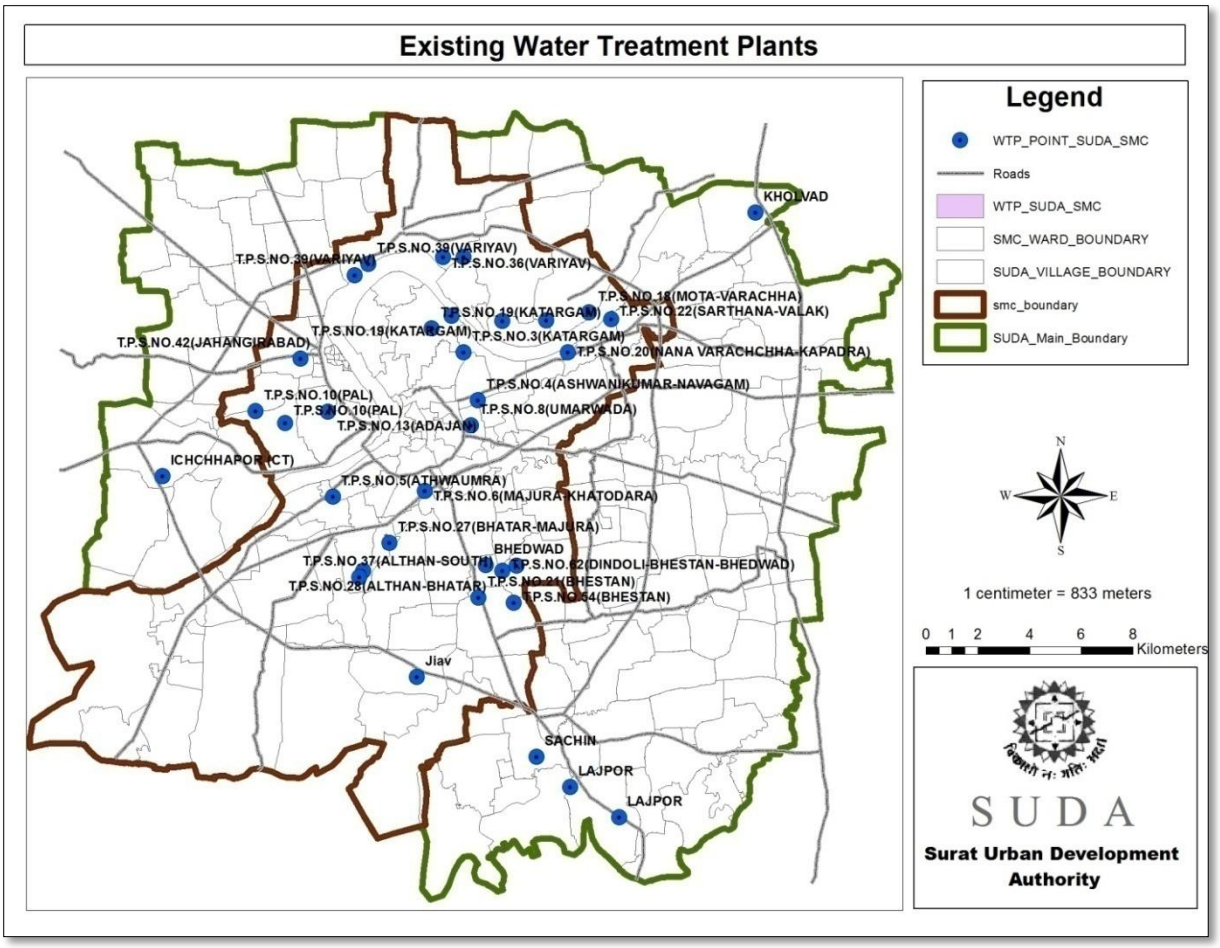


Table 74: Zone Wise ESRs and GSRs in SMC Area

Sr. No.	Zone	No. of Water Distribution Station	Capacity of Underground Water Tank (ML)	Capacity of Overhead Water Tank(ML)	Total Capacity(ML)
1	North zone	5	142.3	29.85	172.15
2	South zone	5	140.9	3.8	144.70
3	Central zone	1	19.2	0	19.20
4	West zone	4	104.9	2.8	107.70
5	East zone	6	155.3	6.0	161.30
6	South west	4	72.3	3.3	75.60
7	South East	3	42.6	23.85	66.45
	Total	**28**	**677.5**	**69.60**	**747.10**

Source: Water Supply Master Plan 2041 , SMC

In the areas within SMC and outside SMC but within SUDA jurisdiction the water is stored in ESRs and GSRs. The capacity details are as mentioned below.

Table 75: ESRs and GSRs in SUDA Area

Sr. No.	Name of Taluka	Total Number of Villages	Underground Tank		Overhead Tank	
			Number	Total Capacity (in Lakhs Litres)	Number	Total Capacity (in Lakhs Litres)
1	Kamrej	17	0	0	32	15.2
2	Palsana	17	2	4	36	17.3
3	Olpad	17	7	1.8	23	9.5
4	Choryasi	44	13	19.65	61	33.9
	Total	**95**	**22**	**25.45**	**152**	**75.9**

Source: Primary Survey SUDA , March 2014

11.2.4 EXISTING SCENARIO FOR WATER SUPPLY & DEMAND

Water utilized by the metropolitan and mega cities provided with piped water supply where sewerage system exists (as per CPHEEO Manual)for domestic uses is 150 lpcd. Considering the unaccounted for water as 20%, as well as considering water demands by the commercial, institutional and civic amenities the per capita water supply provided is **180 lpcd.**

Table 76: Demand- Supply Analysis for water supply

Sr. No.	Service Head	Service Levels, Demand and Surplus/Deficit for Year 2011			
		Available(MLD)	Supply MLD	Demand MLD	Deficit MLD
1	Daily Supply (SMC)	1463	980	1020	-40
2	Daily Supply via GWSSB (Urbanized area of SUDA excl. SMC) Per capita	1.6	1.6	59.71	-58.11
3	Daily Supply (Urbanized area of SUDA Incl. SMC)	1464.6	981.6	1079.71	-98.11
4	Treatment Capacity (SMC)	1268	980	1020	-40
5	Treatment Capacity (Urbanized area of SUDA excl. SMC)	0	0	59.71	-59.71
6	Treatment Capacity (Urbanized area of SUDA Incl. SMC)	1268	980	1079.71	-99.71

Source: Water Supply Master Plan 2041 , SMC & GWSSB, 2014

Taking into consideration the factors mentioned in the previous section for the water demand; it is worked out for the respective administrative areas in the SUDA region. The surplus/ deficit analysis is worked out in this section for each of these administrative areas.

The water demand constantly increases with the rise in population. The table shows that water demand is 1020 MLD against the treated water supply of 980 MLD. There is a deficit of 40 MLD of water in SMC area at present. Moreover the water available at source is 1463 MLD out of which only 980 MLD is utilized, which signifies that there is an availability of spare water at source. Therefore 40 MLD of water is not exactly the gap. Also the existing water supply network does not cover some of the area merged into city in year 2006 as work for the same is currently in progress. In order to serve the entire SMC area, work for all new water supply schemes will be completed by year 2015.

Area under SUDA receives water through Tapi, borewells and the respective village Grampanchayats. Due to this reason, the exact water supply in this region cannot be measured. The water received throughTapi canal undergoes primary treatment; is received by the villages which is supplied by GWSSB. The above table shows that the water demand is higher than the water supply which signifies that there exist a gap for the water supply. Water treatment plants are not available in the major growth centres like Kamrej, Palsana, Olpad and Choryasi Taluka.

11.2.5 OBSERVATIONS AND ISSUES

11.2.5.1 Compulsory Rain Water Recharge

Due to high rainfall water should be compulsorily recharged. SMC has already started initiatives for rain water recharging activities long ago like - giving subsidy to citizens for installing rain water recharging in private premises, rain water recharging in SMC's own premises and plots, making it mandatory for private plots larger than 4000 sq.m. and high-rise buildings.

11.2.5.2 Inadequate Coverage

7% of the municipal corporation is yet to be provided with network for water supply. By 2015, 100% coverage in SMC area shall be done. Out of 95 only 25 villages are provided with GWSSB water remaining 70 villages do not have conventional water supply network.

11.2.5.3 Exploitation of ground water

Most of the villages in the SUDA area are reliant on ground water and bores for water supply. Apart from municipal bores a large number of private bores supply water in the various village areas. This leads to exploitation of ground water source.

11.2.5.4 System (Transmission and Distribution) Losses and Unaccounted for Water

The gross average supply in the city is 150 lpcd (Gross LPCD - Including @ 20% Losses). It is estimated that transmission and distribution losses account for 20 percent of the total supply. Scientific and systematic water audit is required to check these figures and also amount of water unaccounted for.

11.2.5.5 Inadequate Treatment Facility and Coverage outside SMC Area

Presently there is a lack of treatment plants in area outide SMC jurisdiction and within SUDA limits. There is an underprovision of water supply network in the part of the developing areas of Kamrej, Palsana, Vav , Navagam , Kholvad , Sachin, Talangpore, Vanz, Ichhapore , Bhatha, etc.

11.2.5.6 Leakage and Contamination of Water at Household Connections

Although rehabilitation of old pipelines has been taken up in recent past, the problem of low pressure in water supply persists due to the existence of an aged network especially in central zone. Increasing population has also added to the already existing woes. Apart from these, the use of GI pipes for household connections leads to leakage and contamination of water in several areas of the corporation, further increasing the maintenance cost. A separate leak detection cell with latest leak detection equipments and sufficient trained staff will be required.

11.2.5.7 Alternate Source of Raw Water

- Since centuries, Surat city is substantially dependent on surface water of river Tapi for daily water supply.
- In the absence of any alternative source of water, city water supply may get hampered due to any unforeseen situation (like drought in consecutive years) in future.
- To create an alternate source of water, three options are being actively considered:
    - Constructing 2 new French wells – under construction stage at present.
    - Laying 58 Km. long pipeline from Kakrapar to Surat – Feasibility study report
    - Construction of Balloon Barrage - Feasibility study report

11.2.5.8 100% Water Metering

It is envisaged to implement 100% water metering on all consumer connections. At present all water connections above 15 mm size are metered. Majority of water connections in the city area before expansion in year 2006 are of 15 mm size, which are yet to be metered. In new area of city merged in year 2006, all connections including 15 mm size are metered.

11.3 STORM WATER DRAIN

11.3.1 STORM WATER SCENARIO

Initially there was no established full-fledged storm water drainage system in Surat city, except in some area in piece-meal manner. However, there were old peripheral wall in the walled area of the city and the moats outside this peripheral wall, which carried storm water of the city.

11.3.1.1 Storm Water Scenario Prior to 2001

- City did not have a well established storm water drainage system in the walled city area.
- There were military walls in the wall town and moats outside the military walls carried storm water of the city.
- These moats are covered with pipes and box as and when required.
- Till 80's about 23.74 km of storm drain laid in the city on piece meal basis.
- City area gradually increased to 112.28 sq.km. from walled city area of 8.18 sq.km.
- Storm water master plan was prepared in 1985-86 to cop up the storm drainage requirement. Master plan was proposed to cover the water logged area of entire city.
- Priorities were decided on the basis of vulnerability and first phase of master plan was carried out with financial aid of World Bank.
- Initially, about 15.00 km of storm drainage was laid covering area inundated of Athwa, Varachha, Katargam & Rander.
- Up to end of the decade, total storm drain in city was 152.00 km.

11.3.1.2 Storm Water Scenario: 2001-Till Date

Prior to Expansion of City Limit (2001-2006)

- Tune to the development of city, remaining storm water lines were laid as per the storm drainage master plan.
- Storm drainage of about 130.29 km were laid up to 2006.
- 32 Flood gates at different location were provided on storm drainage outlet in the city to prevent back water entry of Tapi during flooding condition of river.
- Up to end 2006 total storm drain in city was 321.54 km.

After Expansion of City Limit

- City limit expanded from 112.28 sq.km. to 326.12 sq.km. out of which 200.12 sq.km. are habitable.
- Strengthening storm drainage work by augmenting network in 112.28 sq.km. of old city area to the tune to the development. These will serve old areas of, West zone, North Zone, East Zone, South-East Zone, South Zone, South-West Zone and central zone with additional 200.16 km of storm drain.
- Out of new area, fast developing area of Vesu of Athwa Zone is covered with 43.82 km of storm drainage line.
- New area of East zone (Puna-Simada, Sarthana and magob (Part) is covered with 50.1 km of storm drainage line.
- 10 New Flood gates are constructed in Athwa zone, central zone and west zone.

11.3.2 EXTENT OF COVERAGE

The map for storm water coverage demarcates the area having storm water network lines installed and signifies that the areas have completed coverage of system to the extent of 144 sq.km. areas, remaining areas will be covered on need basis. Till date strom drainage is laid as below.

Table 77: Existinf storm drain network details in SMC area

Zone	Total Storm Drain Laid till date (km)
West Zone	119.85
North Zone	82.31
East Zone	105.67
South East Zone	71.20
South Zone	59.05
South West Zone	124.71
Central Zone	41.47
Total	**604.26**

Source: Storm Water Department 2014

The storm water network in SUDA area beyond the SMC limit is hardly available. There are about 16 villages in which network is laid for this storm water disposal. In all the other villages water runs off naturally into the creeks or river or natural water body near the village. The details are as below:

Table 78: Existing storm drain details of SUDA area

Sr. No.	Name of Taluka	Total Number of Villages	Storm Water Drain	
			Number of Villages in which Network is Available	Number Of Villages in which Water Runs off Naturally
1	Kamrej	17	2	15
2	Palsana	17	1	16
3	Olpad	17	0	17
4	Choryasi	44	13	31
	Total	**95**	**16**	**79**
			16.84%	**83.16%**

Source: Primary Survey SUDA ,March 2014

11.3.3 MINDHOLA RIVER REHABILITATION PROGRAM

Currently about six different creeks are meeting into Mindhola river thereby disposing strom water of the city and outskirt into Mindhola. Untreated Sewerage water of new South- East, South and South-West area are also disposed into these creeks. Therefore project is envisaged to provide sewerage system in unsewered area and providing embankment with road on Mithi and Kankar creek as a first phase.

- **Following benefits are envisaged.**
  - Gabion Pitching / Lining on sides of creek will help in prevention of direct disposal of sewage waste in to creek
  - Provision of 6.00 m wide road on banks of creek will help removing encroachment on sides of creek, will in turn prevent garbage disposal in to the creek
  - Lining on sides of creek smoothen the flow, thereby reduce vector borne diseases
  - Protect the quality of creek water, other surface water and ground water against possible pollution due to unscientific discharge of raw sewage
  - Improvement in aquatic eco system through maintaining adequate DO content of water bodies on downstream of the point of disposal

In second phase remaining creeks are also planned to be developed accordingly.

11.3.4 OBSERVATIONS AND ISSUES

- **Mixing of Sewage into Storm Drainage**
  - Storm water is discharged into river Tapi through 32 outlets in 5 administrative zone of the municipal corporation. Large quantum of sewage is let out through different

unauthorized connections into the storm water drains which ultimately disposed in to the Tapi river and untreated sewage disposed through storm drain that pollutes the river.

- As a part of "Tapi river Suddhikaran" SMC started project to identify unauthorized connection. In this project, site survey for all manholes of storm water will be carried out and unauthorized connection will be identified and detail report shall be prepared.

➢ **Temporary Pumping of Storm Water**

- High discharge in Tapi river from the upstream dam creates higher water level in in the river that goes beyond the invert level of existing storm drainage. this situation leads to closer of flood gate in order to avoid entering of river water into the city. During closing of flood, it creates worse scenario if rain occurs.
- To prevent water logging in this situation, temporary pumping arrangement are made every year with the available machineries with SMC.
- SMC has planned to provide Strom water pumping station at critical location.

➢ **Natural Waterways Need to be Preserved**

- With urbanization natural waterways are blocked. With development of area, ground percolation of water reduces thereby increases surface water flow. Therefore at one side water in the creeks increases and carrying capacity reduces in existing creeks/ nallas.

11.4 SEWERAGE SYSTEM

SMC had recently augmented their existing water supply scheme. Increased water supply is expected to result in a corresponding increase in wastewater generation. For the purpose; SMC had a master plan prepared for the augmentation of the wastewater disposal system.

The augmented sewerage system under six drainage zones has also resulted in the increase of population coverage from 56 percent in 1996 to 91 percent in 2013. The numbers of sewage pumping stations have also been increased from 18 in 1996 to 42 in 2013 with addition of another 18 likely to start by end of 2015. Before the extension of city limit, the six drainage zones in the city were named based on the location of sewage treatment plant in their respective drainage zones; namely Anjana, Bhesan, Bhatar, Karanj, Singanpore and Bamroli.

After extension of city limit, with the increase of the city limits in each of the above drainage zones and with additional requirement of sewage treatment facilities in some zones; the drainage zones were named on the basis of zone, wherein the sewage treatment plant is located. These are South-East Zone, West zone, South-West East Zone, North Zone and the South Zone drainage schemes respectively.

11.4.1 SEWERAGE GENERATION

At present, Surat has sewage generation of 744 MLD. As per the CPHEEO norms, the sewage generation taking into consideration the water supply for computing the water demand is 180 lpcd

in the water supply section, the quantity of waste water (sewage) generation for the city is computed considering per capita water supply @ 180 lpcd and sewage generation at 80% of water supply.

11.4.2 EXTENT OF COVERAGE

With the increase in the SMC limits from 112.274 sq.km. to 326.52 sq.km; the coverage of sewerage has gone down from 92% to 47%. but at the same time 81% population is being served by underground sewerage system.

Table 79: Sewerage System Indicators

Description	2014
Area of SMC (sq.km.)	326.515
SMC total population (Lakhs)	48.00
Actual population served (Lakhss)	43.68
Underground drainage (% population served)	91
Drainage network area (sq.km.)	154.00
% of habitable area covered	75 %
Total length of drainage network (km.) (On TP roads)	1615
Sewerage pumping stations installed	42

Source: Drainage Department , SMC, 2014

11.4.3 SEWERAGE NETWORK

The sewerage network in Surat is presently served by six drainage schemes inclusive of the sewerage network in walled city area, namely, South-East Zone, West zone, South-West East Zone, North Zone and the South Zone drainage schemes. The schemes serve a total population of 43.5 lakhs (As per Census 2011) through 42 sewerage pumping stations and 10 treatment plants.

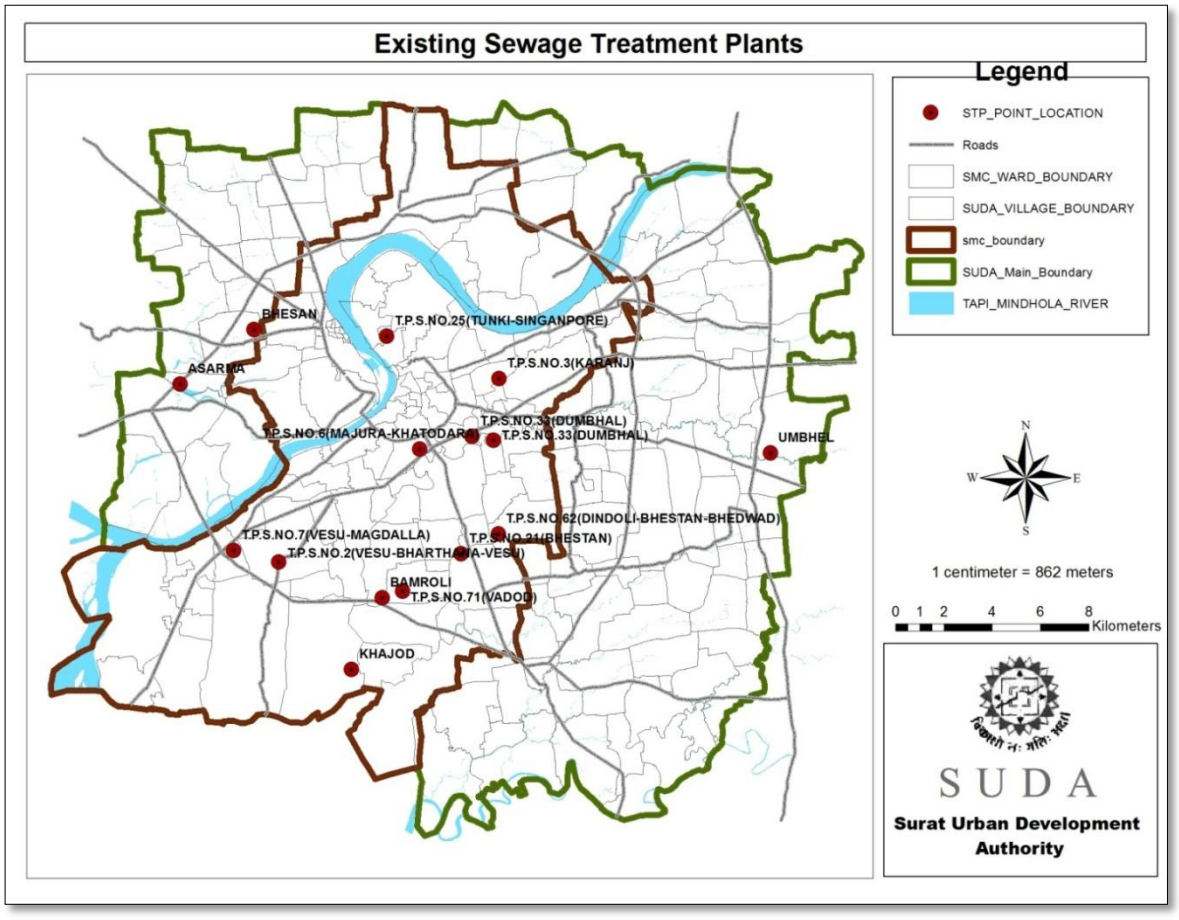
Table 80: Existing Sewerage Network (2014)

Sr. No	Sewerage Zone	Location	Year of Comm.	Capacity (MLD)			Process
				Design	Utilizing	Percentage Utilization	
1	**South-East**	Anjana	1995	82.5	82	99.39	Conventional Activated Sludge
		Dindoli	2013	66	25	37.88	Conventional Activated Sludge
2	**West**	Bhesan	1995	100	65	65.00	Conventional Activated Sludge
		Asharma	2009	15	8	53.33	Moving Bed Bio Reactor
3	**South-West**	Bhatar	2014	120	115	70.99	Conventional Activated Sludge + SBR

		Khajod	2009	25	10	40.00	Moving Bed Bio Reactor
4	**East**	Karanj	1999	100	98	98.00	Conventional Activated Sludge
5	**North**	Singanpore	2014	155	112	72.26	Conventional Activated Sludge+
		Variav	2012	84	45	53.57	UASB + Moving Bed Bio Reactor
6	**South**	Bamroli	2002	100	65	65.00	UASB + Extended Aeration
		Total		**847.5**	**625**	**73.74 %**	

Source: Drainage Department , SMC, 2014

Figure 46: Existing Water Treatment Plant location



For the villages outside SMC area, partial sewage network is available. These networks dispose the water into nearby creeks and water bodies available. In 54 villages closed network is available. There are about 30 villages with no network at all and 10 villages with open or mix network available. The details are as below.

Table 81: Sewerage Details Of SUDA Area

Sr.No.	Name of Taluka	Total Number of Villages	Disposal of Sewage		
			Number of Villages in which Network is Available	Mix or Open Network	No Network
1	Kamrej	17	10	2	5
2	Palsana	17	6	4	7
3	Olpad	17	9	4	4
4	Choryasi	44	29	0	14
	Total	**95**	**54**	**10**	**30**
			56.84%	**10.53%**	**31.58%**

Source: Primary Survey SUDA ,March 2014

Rest of the SUDA area disposes the sewage through soak pits and septic tanks. The sewage system in these areas have no sewage network laid, therefore the disposal and treatment shows that a significant deficit exists in this area. In order to meet the increasing demand for sewage system, treatment plants as well as sewage network lines should be implemented. The details of soak pits and septic tank are as below.

Table 82: Soakpit And Septic Tank Details of SUDA Area

Sr. No.	Name of Taluka	Total Number of Villages		
			Number of Soak Pits	Number of Septic Tanks
1	Kamrej	17	270	270
2	Palsana	17	11467	10967
3	Olpad	17	3990	3865
4	Choryasi	44	6564	5895
	Total	**95**	**22291**	**20997**

Source: Primary Survey SUDA ,March 2014

11.4.4 SEWAGE PUMPING STATIONS

Out of total 42 sewage-pumping stations, 36 are main stations and the remaining six are auxiliary stations, which are of a lesser capacity and installed in an isolated manner. The diameters of the raising mains of the main stations vary between 600 mm to 1600 mm and those of the auxiliary stations vary from 250 – 500 mm. The depths of the stations vary from 9 to 15 m for main stations and 4 to 9 metres for auxiliary stations.

11.4.5 SEWAGE TREATMENT FACILITIES

There are ten sewage treatment plants catering to the needs of all the six zones of the city and which have a total treatment capacity of 847.5 MLD of sewage. (One more sewerage treatment plant and augmentation of two STP are under construction stage.) The sewage collected by the drainage schemes is treated at the sewage treatment plants before being let out into river or Khadi. With the increased drainage network over the last three years and coming three years, the entire sewage generated in the city can be treated before disposal by the year 2016.

The total capacity of the ten treatment plants is 847.5 MLD. Ten treatment plants are located at Anjana, Bhesan, Asarma Bhatar, Khajod, Karanj, Dindoli, Bamroli-Vadod, Variav and Singanpore. (One more sewerage treatment plant at Gavier and augmentation of Karanj STP and Bhatar STP are under construction.) The operation and maintenance of all ten sewage treatment plants has been carried out by private agencies.

Treatment plant at Singanpore has been augmented from the Conventional Activated Sludge process facility to advance SBR technology. It has been augmented from 100 MLD capacities to 155 MLD capacities. Wherein treatment plant at Bhatar is being augmented from 120 MLD capacities to 162 MLD from Conventional Activated Sludge process facility to advance SBR technology. The treatment plant at Bamroli- Vadod is based on the Up flow Anaerobic Sludge Blanket process with extended aeration as polishing treatment and is one of the largest plants of its kind in the India. 40 MLD Tertiary Treatment Plant to treat secondary treated sewage and to generate Industrial Grade Water for supplying Industrial Grade water to pandesara industrial units is under commissioning stage. The sewage treatment plant at Asarma and Khajod are based on the Moving Bed Bio Reactor process and are first of its kind in India at Municipal Level. The sewage treatment plant at Variav is combination of UASB and Moving Bed Bio Reactor process. De-silting activity of manholes and drainage lines is privatized by SMC through contracts.

Table 83: Zone Wise Drainage Pumping Stations

Drainage Zone	Sewage Pumping Station		
	Name	Capacity (MLD)	Total Zone wise
West Zone (Rander)	1 Rander	30	**149.78**
	2 Adajan	15	
	3 Pal	15	
	4 Bhesan Jahangirabad	32.78	
	5 Pisad	26	
	6 Pal-Palanpore	31	
South West Zone (Athwa)	7 Nanpura	98	**325.5**
	8 Athwa	21	
	9 Umra (N)	18.5	
	10 Umra (s)	19.5	

Drainage Zone	Sewage Pumping Station		
	Name	Capacity (MLD)	Total Zone wise
	11 Althan	19	
	12 Piplod	9	
	13 Khatodara	50	
	14 Khatodara Old GIDC	18.5	
	15 Vesu Terminal	51	
	16 Vesu Intermediate (ONGC)	21	
North Zone (Katargam)	17 Paras	52	
	18 Singanpore	62	
	19 Kantareshwar	69	
	20 Katargam New GIDC	2	
	21 Shantiniketan	1	
	22 Kosad	83	
	23 Kosad Railway	57	
	24 Chhaprabhatha	25	
	25 Utran	37	
	26 Mota Varachha	11	
	27 Mota Varachha GEB	28	**427**
East Zone (Varachha)	28 Karanj	93	
	29 Navagam	55	
	30 Modi Mohollo	3	
	31 Patel Nagar	2	**153**
South East Zone (Limbayat)	32 Sarthana	9	
	33 Magob	56	
	34 Parvat	4.5	
	35 Godadara	27	
	36 Dindoli	30	
	37 Salabatpura	65	
	38 Limbayat	41	
	39 New Anjana	12	
	40 Umarwada	14.5	**259**

Drainage Zone	Sewage Pumping Station		
	Name	Capacity (MLD)	Total Zone wise
South Zone (Udhana)	41 Bamroli	180	320
	42 Pandesara GIDC	140	
Total		**1634.28**	**1634.28**

Source: Drainage Department , SMC, 2014

11.4.6 GREEN ENERGY GENERATION FROM SEWERAGE GAS: BEST PRACTICE

SMC was consuming the electrical power for Operation and maintenance of the Sewage Treatment Plants from the Power supplier, which was imposed an additional financial burden on SMC. As population has been increasing, the volume of sewage pumping and treatment is also increased which transitively increase the power requirement for sewage pumping and treatment as well.As an initiative towards Green Energy Generation from Sewerage; Sewage Gas Based Power Plant at Singanpore, Karanj, Bhatar, Anjana, has been setup. In very short duration of ten months, these projects have been commissioned in 2007-08 and are now operational and providing electricity to respective plant equipments. Following table indicates total kwh generation at different Sewage gas power plants. 0.6 MWe capacity Sewage gas based power plant at Variav, 0.75 MWe capacity Sewage gas based power plant at Dindoli and 0.5 MWe capacity Sewage gas based power plant at Bamroli will commissioned soon.

Table 84: Power generation till Sep- 2013 at various sewage gas based powerplant

Name	Installed Capacity of Power Plant	Year of Commissioning	Total Unit Generation up to September - 2013 in kwh	Total Energy Saving in Rs.
Anjana	0.5 MWe	Oct-09	16190092	71684203.89
Karanj	1.0 MWe	Mar-09	12499011	60618186.77
Bhatar	1.0 MWe	Aug-09	3956673	19100583.67
Singanpore	1.0 MWe	Mar-09	7338832	34761512.16
Variav	0.6 MWe	June -12	-	-
			39984608	186164486.5

Source: Drainage Department , SMC, 2014

Followings are the technological reforms and benefits of Sewage gas based power plant.

- The Production of electricity through purely on sewage gas based engine generator technology have much more advantages and cost benefits over the earlier technology of duel fuel engine generator set;
- Power generation and utilization of it in sewage treatment plant reduce the electricity consumption of grid power;

- Saving in electricity bill will reduce revenue expenditure of Sewage treatment plant, which reduces municipal taxes to the citizens;
- Reduction of emission of green house gases for the protection of environment.

11.4.7 CDM AND SEWAGE GAS BASED POWER GENERATION BY SMC

The sewage gas based power generation at STPs at Karanj, Singanpore and Bhatar are eligible for assistance under clean development mechanism for the following reasons. The STPs are designed to generate the sewage gas by treating the sludge generated from primary and secondary clarifier of sewage in an anaerobic processing system (Digester) so as to restrict the atmospheric emission of methane gas. At the same time, the methane gas is recovered without leak in the atmosphere

Confirming to the advantages as described in above case study, it can be concluded that the power generation through sewage gas should be adopted as an integral part of sewage treatment system.

11.4.8 SMC'S PROJECT OF TERTIARY SEWAGE TREATMENT PLANT (TTP)

Pandesara is a notified industrial estate which was established by GIDC and falls within SMC limits. It is spread over an area of about 2.8 sq.km. There are about 400 industrial units operating in Pandesara estate, of which 119 units are water based industries comprising largely textile processing units and chemical industries. The size of the estate in terms of its turnover is approx Rs 4000 crores. Current water demand at Pandesara is estimated at approximately 90 – 100 MLD, comprising about 80 – 85 MLD of process water requirement and 10-15 MLD of potable quality water demand. Of the total demand, nearly 55 MLD is met through SMC potable water supply. The remaining demand is met through private sources including borewells and water tankers.

The Pandesara Industrial Estate is just 5 km away from the Sewage Treatment Plant at Bamroli (100 MLD capacity). Hence, SMC decided to set up a 40 MLD capacity Tertiary Treatment Plant to treat secondary treated water from Bamroli Sewage Treatment Plant to supply Industrial Grade Water to Pandesara Industrial Estate through SMC. This would enable SMC to reduce pressure on ground water resources in the city and free up potable water supplied to Pandesara Industrial area at present, which could be further used to supply the drinking water to the newly merged area in the city. This would also minimize the breakage of roads since, the transportation of water tanker would be turn down in the area.

11.4.8.1 Present Status of the Project

SMC has awarded work for 40 MLD capacity Tertiary Sewage Treatment Plant on EPC basis. To ensure income through sale of water as well as to conserve water resources, SMC intends to increase tertiary treated industrial grade water up to 80 MLD in future.

11.4.8.2 Technology Used

The tertiary sewage treatment process will be used at Bamroli treatment plant to achieve the desired treated effluent parameters.

There are following types of tertiary treatments.

- Sand Filtration
- Ultra-filtration
- Membrane Filtration
- Reverse Osmosis (RO)

11.4.8.3 Major Benefits

- It reduces diversion of drinking water for non-potable purposes in the long term.
- It reduces dependence of Pandesara Industrial Units on bore-wells and private tanker operators.
- It facilitates recycling of wastewater, an environmentally sound and progressive practice.
- It protects the current revenues of SMC from sale of water for industrial purpose in the short term.
- It assures more stability in level of water supply to industrial units by providing supplementary source of water in addition to drinking water.

11.4.9 EMERGING ISSUES

- Outdated sewerage system in the walled city area, Athwa and Umra
- Mixing of sewage with storm water and solid waste in several areas
- Low number of sewer connections
- Low per-capita cost recovery
- Unavailability of comprehensive wastewater system in Industrial Areas

11.4.10 FUTURE REQUIREMENTS

SMC has prepared a master plan for comprehensive sewerage system (more than 1500 km of sewers and 10 sewage treatment works) to serve not only the domestic and commercial, but also the industrial developments for the year 2026. This shall be further projected for 2035. Wastewater generated from all this development is to be collected by a network of underground sewers and pumping stations and conveyed to sewage treatment works for physical and biological treatment to meet the parameters prescribed by the CPCB before discharge into the nearest watercourse.

11.4.10.1 Sewerage Network

Phase wise execution of the master plan will cover not only the present population of the city but also the population expected by the year 2035. Complete area coverage is expected to be achieved by 2016. This is apart from the revitalization of the entire sewerage network in the central zone, where the present system is outdated. Complete revitalization of the system in the central zone is to be completed by 2020.

11.4.10.2 Sewerage Pumping Stations

With the newly proposed sewerage pumping stations in North, South, South-East and East Drainage Zone, the sewerage pumping stations will total to 60. These are expected to cater to the needs of the population of the city till 2035. Few of the existing sewage pumping stations i.e. Umra, Anjana, Salabatpura shall be rehabilitated.

11.4.10.3 Green Energy Generation

After successful implementation of the Green Energy generation projects at Singanpore, Karanj, Bhatar, Anjana; various organizations, municipal corporations, private agencies and industries at national & international levels have visited the Anjana Sewage Treatment Plant. Presently, several municipal corporations in India, have implemented / taken up implementation of such kind of project at their sites.

Following the successful experience, SMC now incorporates bio gas based power plant along with construction of sewage treatment plant itself. So generation of electricity can start as construction work completed and receiving of raw sewage starts at treatment plant. Installation of bio gas power plant has been completed with construction of treatment plant at Bamroli, Variav & Dindoli. The Work contract specifies the minimum electricity that should be generated from power plant based on incoming sewage quality and quantity; failing which the short fall in guaranteed generation will have to be borne by contractor.

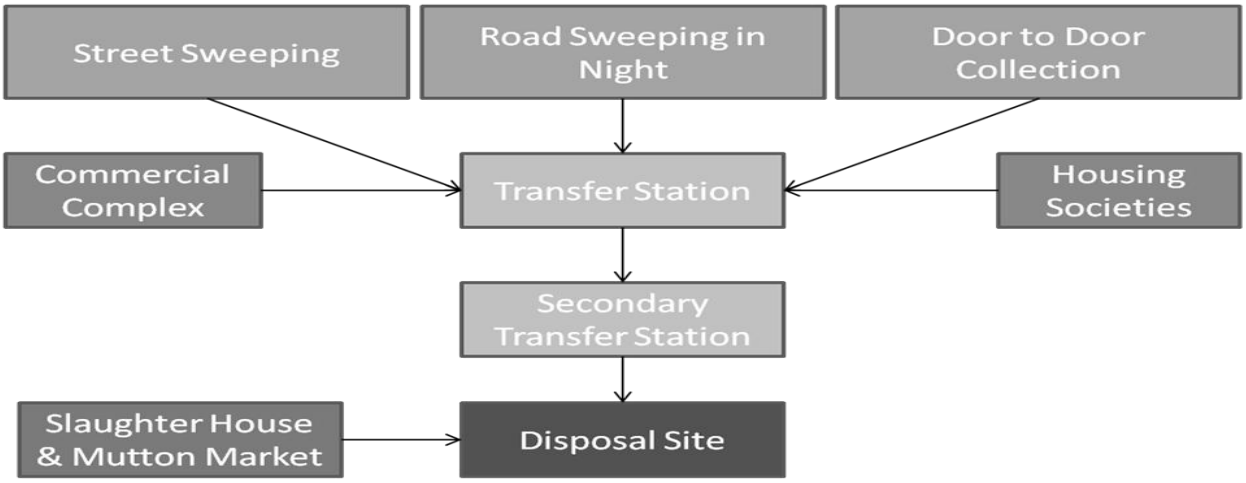
This will reduce the power need of STP and revenue expense of the urban local bodies besides providing environmental benefits to the cities.

11.5 SOLID WASTE MANAGEMENT

Efforts to improve solid waste management in the city of Surat were made by the health department after the havoc of the plague in 1994. The city is divided into 7 zones for efficient management and the waste generated is collected throughout the city and dumped at the Khajod disposal site (200 ha). At present in SUDA area, there is no scientific collection and disposal for solid waste available.

11.5.1 SOLID WASTE MANAGEMENT CURRENT SCENARIO

Figure 47: Process of Solid waste Collection to Final Disposal



Solid waste management is one of the core infrastructure facilities for the city. To make the city healthy and liveable, sound solid waste management system is required.

11.5.2 WASTE GENERATION AND COLLECTION

There are 314 cradle type doorstep bins placed on roadside designated spaces. The total number of waste collection bins is 1170. These are mainly 4.5 cu.m in size with a capacity of 1.5 tonnes (4.5 cu. m)/ dustbin and cover the entire population of the city. The spacing between waste storage depots is about 100 m and there are about 5000 wheel barrows for carrying waste.

For door-to-door collection of waste 3000 bins are installed by private agencies. The cradle type would be designed in such a way that revenue generation through advertisement is possible. There are also initiatives for segregation of waste at source including awareness generation through pamphlets. At present there are 5603 sweepers engaged in the collection of waste across the seven zones of the city. Of the total waste collected, the corporation manages 96 percent while the rest is collected by rag pickers.

Table 85: Solid Waste management – Existing situation

Sr. No.	Head	2014
1	Generation of Waste in MT	1680
2	Refuse garbage collection per day (MT)	1584
3	% garbage handled by D to D System	56%
4	% garbage handled by Other means	44%
5	Collection per person (gm/day)	330
6	Generation per person (gm/day)	350
7	% Efficiency (Collect/Generate)	88.57
8	Density of waste (kg/cu. m.)	200 to 250
9	% Moisture content of waste	55 to 60
10	No. of dustbins (2-3 cu. m. capacity)	139
11	No. of dustbins (4-5 cu. m. capacity)	1120
12	Total capacity of dustbins (cu. m.)	5400 cu. m.

Source: Solid Waste Department , SMC, 2014

Table 86: Waste Generation & Collection

1	**Generation**	
a.	Tons Per Day	1680 MT
b.	Gms/ capita/ day	350 gm
2	**Collection**	
a.	Corporation (TPD)	1494 MT

b.	Rag picker (TPD)	90 MT

Source: Solid Waste Department , SMC, 2014

In 2005 the solid waste generation per capita per day was 390 gm which has increased to 400 gm in 2007 and further decreased to 350 gm in 2014.

Table 87: Waste Generation through Different Sources

Source	Percentage (2014)
Households	55-58
Shops and Establishments	6-7
Vegetable/Fruit/ Meet/Fish market	12-15
Construction and demolition material	6-8
Hotel/Restaurant waste	7-8

Source: Solid Waste Department , SMC, 2014

Waste is majorly generated at household constituting 55% of the total. At household level there is partly segregation of bio-degradable and recyclable waste.

Table 88: Composition of Waste

Sr. No.	Type of waste	Percentage 2014
1	Combustible – Wood	20% to 21%
2	Recycle able	29% to 34%
A	Paper	8% to 9%
B	Plastic	9% to 10%
C	Metal	1% to 2%
D	Glass	2% to 3%
E	Brick Stone	9% to 10%
3	Food waste	15% to 17%
4	Vegetable	20% to 22%
5	Miscellaneous	8% to 9%
F	Cloth & Fabric	8% to 9%
G	Ash	20% to 22%
H	Ph	6 to 7
I	Moisture	55% to 60%

Source: Solid Waste Department , SMC, 2014

11.5.2.1 Door- to-door Collection

Handling of door-to-door Refuse / Garbage System is entirely carried out by SMC through its own budget. Hence there is no involvement of any partner in respect of financial collaboration / aid. However, initial investment on the procurement of vehicle is being made by the contractors/agency.

While inviting tenders due care was taken to include the clause for propaganda of door-to- door garbage collection system. This was the responsibility of agency to which the work of door-to- door garbage collection is entrusted. As the agency is paid for the work executed on per MT basis; it is always implementing innovative ideas for improvement in present practice of door-to-door garbage collection System. As part of innovative activities agencies are conducting survey at regular intervals and make changes in TPM schedule for maximum coverage.

Before the implementation of door-to-door garbage collection system it was normal practice to throw house hold waste in the street, from where it is collected by sweepers in handcart for its disposal in nearby containers. This resulted in overall filthy and dirty appearance in the street as well as around the container spot. On implementation of door-to-door garbage collection system; it has now become the practice of every citizen to store the huge household waste generated temporarily in dustbin till the time door-to-door garbage collection vehicle is arrived. This has improved the overall scenario and surrounding environment. On request form shop keepers this system is made operative in second shift from 5 pm to 11 pm to facilitate commercial units.

The door-to-door waste collection in Surat is one of the best practices to strengthen the Municipal Solid Waste (MSW) collection system in the area of urban local body *(As identified by 'Best Practices, Peer Experience and Reflective Learning- PEARL, NIUA, May 2009).*

The main aspect addressed by this best practice is compliance to MSW Rules-2000. This system has developed the garbage collection activity at doorstep of household there for it made householder to habituate themselves to store their garbage in a bin till vehicles of door-to-door Collection System Reaches To Them.

11.5.2.2 Strategy Used / Activities Implemented to Achieve the Desired Goals

- Selection of kind of vehicle based on width of road;
- Coverage of number of units in each route is between 1,000 and 3,000;
- Strengthening of the existing system of garbage collection;
- Creating public awareness on garbage management;
- Drivers and "Swachchhta Mitra" are provided with uniforms & identity cards;
- Concession period of this project is kept as Seven years keeping in mind the useful life of vehicle;
- All the garbage vehicles equipped with proper alarm system go to every door step regularly at scheduled time;
- Facility of second shift for collecting waste from commercial unit during 4.00 pm to 11.00 pm daily in each zone;
- First shift collection timing is 7.00 am to 1.00 pm daily for residential zone;

- This system operates for 365 days in a year;
- Creating Public Awareness through campaign is the part of contractor's scope of work;
- Centralized complaint management system at Head office at Mugalsarai & Contractor's office with modern communication facilities;
- Provision for segregated waste collection (Dry & Wet).

Before arriving at the present practice of making payment to the contractor on weight basis various options like lump sum base to cover city as a whole, to cover zone as a whole and payment on number of units covered were thought. The present practice of making payment on weight base is found appropriate.

The system of Door to Door garbage collection involves the huge cost of capital investment in procurement of vehicles for collection of garbage. It also involves the manpower component to run the system effectively and efficiently.

As such Municipal Corporation is paying to agency for the garbage collected from doorsteps of residential and commercial units on weight basis; it has become viable for agency to run the system effectively.

The major component in Solid Waste is Earth – Organic which consists of 42% of the total waste. The recyclable waste which majorly consists of plastic and paper constitute to 20%. The waste coming from vegetable market which is bio-degradable constitute to 22%.

Table 89: Existing fleet of Vehicles (2014)

Type of Transportation Vehicle	**Number**	**Capacity(T)**	**Trips per Day**
Dumper placer	71	1.0	08/Day/Vehicle
Mini Lorries/ Truck	19	07	1 to 2 / Day / Vehicle
Tractor Trailers	66	03	1 to 2 / Day / Vehicle
others, please specify **(Tata 407 & Equivalent)**	311	1.5 to 03	2.2/Day/Vehicle
Secondary Transportation			
Tipper Trucks	35	13-15	3 to 4 per day per Vehicle

Table 90: SWM Iindicators

Collection Performance (% Collected to Generated)	**92.26%**
Total vehicle capacity to total waste generated	137%
% of total waste treated through MSW treatment Plant	33%

Source: Solid Waste Department , SMC, 2014

Table 91: Zone wise Solid Waste Generation

Zone	Area (sq.km.)	Solid Waste Generation	
		2014	Generation per sq.km.
Central	8.97	122.2	13.62
North	34.35	230.4	6.71
East	35.42	356.7	10.07
West	52.62	279.2	5.31
South	53.12	410.2	7.72
South East	19.72	135.4	6.87
South West	117.48	146.4	1.25
Total	**326.515**	**1680.5**	5.15

Source: Solid Waste Department , SMC, 2014

The waste generation per sq.km. in central zone is highest due to high density whereas in south west zone the quantum of waste generated is very low.

Table 92: Taluka wise Solid Waste Collection

Sr. No.	Name of Taluka	Total Number of Villages	Solid Waste Management Collection	
			Number of Villages Having Door-to- door Collection (Contractual Basis)	Number of Villages Disposing Individually
1	Kamrej	17	3	14
2	Palsana	17	6	11
3	Olpad	17	3	14
4	Choryasi	44	5	39
	Total	**95**	**17**	**78**
	Percentage of villages		**17.89**	**76.84**

Source: Primary Survey SUDA ,March 2014

For SUDA area the solid waste management system is not in place. There are 17 villages where door to door collection for SWM is carried out on contractual basis. Remaining 73 villages there is no collection of waste. It is disposed individually by the people.

11.5.3 WASTE TRANSPORTATION AND DISPOSAL

Waste collected from all over the city is transported to the processing and disposal sites by 450 labourers and 104 drivers. The fleet of vehicles available for the purpose includes dumper placers, trucks, tractors, market vans and heavy machines which are 162 in total. 41 labourers are involved in processing and disposing waste at the Khajod disposal sites.

The transportation process is partly mechanized in the form of loaders, bulldozers and breakdown vehicles.

The private sector is partly involved in the transportation of waste in terms of manpower or a transportation of garbage and vehicles. They are mainly involved in transportation of municipal solid waste by dumper trucks and by containers through dumper placers.

11.5.3.1 Primary Transportations

Primary transportation is related to the transportation of municipal solid waste from containers and door-to-door garbage collection to the nearby transfer station. Primary transportation of MSW from various areas to nearby transfer station is done by

- Wheel burrows/Trolleys/Mini tempos
- Three wheeler tempos/ four wheeler tempos/Compactors of door-to-door
- Hydraulic dumper placers/Tractor with trailers/ Dumper trucks

MSW collected through various means reach to the nearby transfer station. The six transfer stations are working in the city in different six zones.

Table 93: SUDA area details of Solid Waste Disposal

Sr. No.	Name of Taluka	Total Number of Villages	Solid Waste Management Disposal			
			Number of Vilages where Waste is Disposed at Khajod	Number of Vilages where Waste is Disposed into Gauchar	Number of Vilages where Waste is Disposed into Creeks	Number of Vilages where Waste is Burnt
1	Kamrej	17	0	9	0	0
2	Palsana	17	0	3	4	1
3	Olpad	17	0	2	0	9
4	Choryasi	44	3	7	4	5
	Total		**3**	**21**	**8**	**15**

Source: Primary Survey SUDA ,March 2014

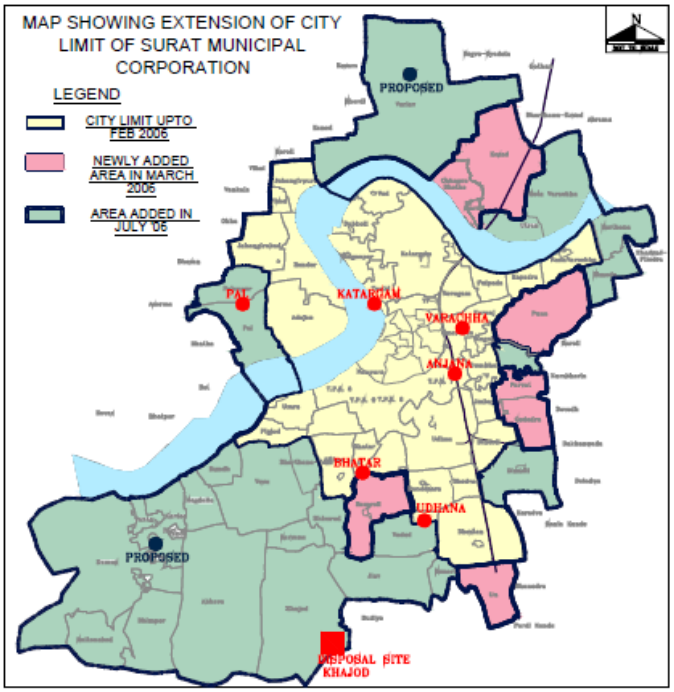
For SUDA area there are only 3 villages from where the waste is transported and disposed at the Khajod disposal. Most of the villages either dispose it into the gauchar land or into the creeks. About 15 villages are such where the waste is either burnt individually or is collected and disposed into the gauchar land and burnt.

Figure 48: Transportation Facilities for Waste Collection




11.5.3.2 Transfer Station - Processing And Disposal of Waste

Figure 49: Existing Location Of Transfer-Stations



Processing and disposal methods like incineration etc. are not used in Surat. Land available for treatment and disposal of waste, where the land filling is carried out, is about 10 km from the city. The life expectancy of land for the treatment and disposal of waste is 30 years at the Khajod final disposal site. There is sanitary landfill cell created and the cell is ready for its use for disposal of inert material obtained at the end of treatment process of MSW Treatment.

One Bio-Medical Waste Treatment Plant is working on a BOOT basis from 2003. The agency to which the work is granted is responsible for collection and treatment of Bio-Medical Waste. There are total 41 UHC, which are collection centers and Rs. 10 per kg is collected as charge.

11.5.3.3 Bio-Medical Waste Treatment: Best Practice

Centralized bio-medical Waste Treatment facility for treatment of bio medical waste generated from all medical institutes like clinics, hospitals, nursing homes, clinical laboratories, health centres, R&D centres and other generators of bio medical waste in Surat city has been installed on BOOT basis. This practice has been awarded best practice award (*As identified by 'Best Practices, Peer Experience and Reflective Learning- PEARL, NIUA, May 2009)*.

In the earlier days, when the impact of biomedical waste was not much recognized as infectious waste, deep burial method was under practice for the purpose of disposal. The only drawback with the system was likely reuse of medical kit without proper sterilization. This may lead to serious out spread of transmissible diseases. On realization of the impact of infectious diseases, Government of Gujarat framed one umbrella act in 1986 covering various activities that have detrimental effect on surrounding environment. In case of Biomedical waste management a Common Bio Medical Waste Treatment Facility (CBMWTF) is perhaps the only feasible solution for environment protection and effective legal compliance.

1. Most of the hospitals, clinics and other bio medical waste generators of the city have been registered under this scheme. List of the same and total waste collected have been given in the table below. Bio medical waste generated in all organization is collected and brought to Centralised Facility and provided treatment as per 'Biomedical Waste (Management & Handling) Rules, 1998.

Table 94: Total Member & Waste Report Year-Wise

Year	Waste (kg)	No. of Registered Members
2008-2009	244109	3067
2009-2010	280725	3089
2010-2011	308798	3125
2011-2012	339678	3215
2012-2013	351003	3168

Source: Solid Waste Department , SMC, 2014

This is the project which is first ever in the history of SMC that has been executed on BOOT base. Here the agency to whom the work is entrusted is allotted only a piece of land measuring 2400 sq.m. at the token rent of Re. 1 per sq.mt per annum and remaining all the other expenditures related to renovation and construction of housing facilities for treatment machines such as Incinerator, Autoclave and Shredder and their purchase is made by agency. The concession period of BOOT Contract is seven years which is expired on 31st December 2009 and it has been already extended further on mutually agreeable conditions.

Figure 50: Bio medical waste treatment plant run by Envision

Source: En-vision Enviro Engineers

11.5.3.4 Outcome of the Best Practice

As a matter of fact this project is the best example of symbiotic relationship between Municipal Corporation, agency and generators of Bio-medical waste. Municipal Corporation is benefited by the way of transferring burden of BMW treatment on to the shoulders of agency .To make the plant's operation and maintenance economically viable every occupier of the facility generating BMW is suppose to make the payment to agency for the quantity of BMW being treated. To make it further more viable agency is paid for minimum of 200 kg per day of BMW irrespective of the actual quantity of BMW generated by SMC run hospitals / maternity homes, laboratories and urban health care centres.

11.5.3.5 Emerging Issues

The havoc of plague in Surat helped to convert the city into one of the cleanliest cities of the country. This was made possible through a complete revamping of the entire solid waste management system. The system is working efficiently and effectively at present, wherein private sector is involved.

Bhatar waste disposal site which was used so far; is to be closed. Instead of that Khajod site is being used for disposal of solid waste. Moreover, the location of the site right within the city limits has exposed the entire process to the open air and life threatening parasites. Northern/ eastern part of the city also requires land of around 100 Ha for as land fill site.

Surat Municipal Corporation has been efficient in collecting the solid waste from all over the city and maintaining cleanliness. The need of the day is maintenance of the system in an efficient manner. For this purpose, it is required that the collection and disposal system be upgraded. To cater to the needs of the population 2035, when 3800 MT approximately of solid waste is expected to be generated everyday in the city, additional containers, collection and transportation vehicles, waste storage and transfer stations, and infrastructure at the new waste disposal site at Khajod are the immediate requirements.

Issues which can be identified associated to solid waste management; can be:

- Lack of effective technology for scientific disposal of solid,
- Segregation is not happening at source;
- Lack of public awareness;
- Lack of policy for use of bye-products generated from treatment of solid waste.

11.5.3.6 Strategies

Various strategies on policy and administrative levels need to be adopted for strengthening of Solid waste management in the city. Some of those can be:

- There should be planning for system strengthening, for example: up gradation of vehicles;
- All waste generated and collected has to be treated;
- Bhatar landfill site is to be closed (PPP initiative required)
- Separate collection and treatment system for plastic waste, organic waste, e waste etc are under planning stage.
- Separate Landfill site is required for disposal of dead animals. Three separate well developed land parcels need to be developed.

11.5.3.7 Future Requirements

Solid waste has increased and hence there is a need to plan for more compost plant, and workout techno economic feasibility for waste to energy systems. Also various models for reducing the waste need to be reviewed.

12 SOCIAL INFRASTRUCTURE

The term 'social infrastructure' covers a wide range of facilities and services that are provided by government to support and sustain the well being of communities. High quality social Infrastructure in cities provides good quality of life. The assessment of social infrastructure for Surat is largely based on secondary data and examines in particular the issue of municipal service provision in each sector.

Development of physical infrastructure cannot usher overall development at the desired level if the social infrastructure is not simultaneously developed. This chapter reviews the provision of social infrastructure facilities in Surat which include educational facilities like pre-primary, primary, secondary. higher education special institute. health facilities like public hospitals and health centres, recreational facilities like swimming pools, community hall, etc. and Fire and Emergency services. Hence this chapter focuses on identifying the gaps in provision of social infrastructure services in the city as to improve the scenario through various mechanisms.

12.1 EDUCATION

Education decides the development pattern of any city, it exhibits how urbanize a city is through its literacy level and exposure to different education facilities. Surat consist of educational facilities ranging from primary school to research level, which are provided by a host of agencies, ranging from the central government, state government and local government to the agencies aided by the state government as well as private institutions. The table below shows the number of Schools existing in Surat city by the year 2008, according to language medium of education.

Table 95: Number of primary school for different language mediums

Language Medium of Education	No. of primary schools
Gujarati	262
English	112
Hindi	69
Marathi	20
Telugu	7
Udiya	5
TOTAL	**475**

Source: Revised City Development Plan 2008-2013, SMC/SUDA

There 524 primary schools and 1,008 secondary and higher secondary schools for the year 2008, for different language medium in Surat district as per District Education Office.

Table 96: Area wise primary school

Area Name	No. of Primary Schools
Rander-adajan	53
Bhagan, katargam	97
Nanpura, bhatar, athwa lines	52
Udhana, pandesra, bamroli	161
Varacha, a.k. road, amroli	50
Puna, l.h. road, varacha	61
Total	**474**

Source: Revised City Development Plan 2008-2013, SMC/SUDA

Table 97: Schools in SUDA

Sr. No.	Name of Taluka	Total Number of Villages	Anganwadi	Primary
1	Kamrej	17	4	18
2	Palsana	17	19	24
3	Olpad	17	1	20
4	Choryasi	44	41	46
	Total	**95**	**65**	**108**

In the SUDA region within 95 villages, there are about 65 Anganwadis and in total there are 108 schools. There are 10 villages (10.52%) with no primary schools at all remaining 85 (89.48%) villages have at least one primary school.

In total, there are 632 primary schools within SUDA area including the SMC region.

Table 98: Number of teachers

Authority	No. of Teachers	No. of Secondary and Higher Secondary Schools
Central Government	184	15
State Government	78	11
Social Welfare Department	125	19
Municipality / Nagar Gram Panchayat	285	4
Private Granted	45	433
Private Non- granted	8534	526
Grand total	**9251**	**1008**

Source: Revised City Development Plan 2008-2013, SMC/SUDA

The total teachers for secondary and higher secondary are 9,251. There is 55% of total Secondary and Higher Secondary schools are being provided by mainly Private Sector itself.

Table 99: High Schools in SUDA region

Sr. No	Name of Taluka	Total Number of Villages	High School	Private Schools
1	Kamrej	17	11	8
2	Palsana	17	2	10
3	Olpad	17	2	0
4	Choryasi	44	9	10
	Total	**95**	24	28

Source: Primary Survey SUDA ,March 2014

There are 24 high schools out of which 11 are in Kamrej taluka. Besides high school there are 28 private schools which include primary as well as high schools.

Professional institutes located in the city are S.V. National Institute of Technology, Government Medical College and the SMC Medical College. The South Gujarat University is the local university and many colleges are affiliated with it. The Department of Business Administration under the university acts as a professional institute an offers a Masters in Business Economics. Centre for Social Studies (CSS) is an Indian Counsel for Social Science Research (ICSSR) institute specializing in the social science practices.

Table 100: Colleges in SUDA

Sr. No.	Name of Taluka	Total Number of Villages	Colleges of its Own
1	Kamrej	17	0
2	Palsana	17	10
3	Olpad	17	0
4	Choryasi	44	1
	Total	**95**	11

Source: Primary Survey SUDA ,March 2014

12.2 HEALTH

The city has emerged in recent years from decay to resurgence, as an example for other civic agencies to follow. Devastated by the plague in 1994, the city got increased and improved health facilities. A Civil hospital has come up along with a new medical college- SMIMER set up by SMC. Tapi river floods in Surat is the cause of many diseases like malaria, filaria, dengue, etc. This problem is

further compounded by the mosquitogenic condition of the city . A separate department is created by SMC to look after impacts by Vector borne diseases.

12.2.1 HEALTH FACILITIES

There were around 28 major hospitals registered under SMC in the year 2006-07, with capacity of all together 1119 beds, and staff capacity of total 2844 person consisting total 408 permanent doctors, 182 temporary doctors and 512 nurses. Also there are Major hospitals, like Smimer is 750 bedded hospital, with total staff of 1559 in the year 2006-07, consisting 254 permanent doctors and 312 nurses, and Maskati hospital, which is 120 bedded with total staff of 383, consisting 68 permanent doctors, 58 temporary doctors and 57 nurses. The ever-increasing population in the city is expected to put pressures on the existing health facilities. By the year 2009, around 305 medical facilities are registered with the SMC, of these as many as 92.59 percent hospitals are run by private organizations. The table below shows the number of Medical health facilities registered under SMC by the year 2009. According to Bio-vision Medical Waste collection centre in 2009, total 3250 Health related facilities are existing in Surat city, comprising of different range of health specialties, and treatment facilities. There are 4 blood banks, 158 dental clinics, 28 polyclinics, 2048 Clinics and dispensaries, 237 laboratories, 36 Urban Health centres which includes Smimer hospital (Surat Medical College) and Maskati hospital, and total 738 Hospitals ranging from capacity of 5 - 150 beds. The table below shows the list of Hospitals having capacity of more than 100 beds in SMC area in the year 2009.

Table 101: Hospitals with more than 100 beds in SMC

Name of Hospital	No. of beds
Smt.R.B.Shah Mahavir Super Specialty Hospital	100
Dhameliya Kidney Hospital & Lithotripsy Centre	100
Navjivan Children & General Hospital	100
Gupta Hospital	100
Harikrishna Group Of Hospital	109
Gastro Intestinal Endoscopy Centre	110
Anmol Eye Hospital	120
Vasundhara Maternity Hospital	130
Amar Hospital & Maternity Home	147
Chovatiya Surgical Hospital & Laproscopy Centre	150
Pinkal Hospital -Katargam	150
Shivam Hosptal (Dr. Nitin T. Puroit)	150
Nijanand Neuro Care & Electrophysiology Centre	201

Source: Revised City Development Plan 2008-2013 , SMC/SUDA

12.2.2 PRESENT HEALTH SERVICES

There are a total of 305 medical facilities are registered with the SMC by 2009, consisting with highest number of health facilities provided in Central zone, and minimum in South zone but overall it can be seen that number of medical facilities are increasing after 1994 plague and 2006 Floods to serve the city to combat all type health hazards affecting the city health.

Table 102: Number of medical health facilities registered under SMC

Zone	No. of Medical Health Facilities Registered Under SMC
Central Zone	89
North Zone	36
East Zone	54
South Zone	10
South East zone	50
South West Zone	16
West Zone	48
TOTAL	**305**

Source: Revised City Development Plan 2008-2013 , SMC/SUDA

Table 103: Hospitals in SUDA excluding SMC

Sr. No.	Name of Taluka	Total Number of Villages	Hospitals	Private Clinics	Others
1	Kamrej	17	9	24	5
2	Palsana	17	15	30	0
3	Olpad	17	0	6	0
4	Choryasi	44	12	30	61
	Total	**95**	36	90	66

Source: Primary Survey SUDA ,March 2014

In SUDA area the medical facilities are available in only 49 villages. There are 36 hospitals and 90 private clinics in these 49 villages. Few villages have other facilities like visiting doctor, CSC, Aryuvedic and other such facilities.

Table 104: Taluka wise villages having Hospitals

Sr. No.	Name of Taluka	Total Number of Villages	Number of Villages Having Hospitals
1	Kamrej	17	10
2	Palsana	17	8
3	Olpad	17	6
4	Choryasi	44	25
	Total	**95**	**49**

Source: Primary Survey SUDA ,March 2014

13 TRADE, INDUSTRIES AND COMMERCE

13.1 URBAN ECONOMY

Surat city has been an important hub for economic activities since ages. In early times, the city was well known as a 'Port town' and dealings for import and export were through Surat. Portuguese, British and other European countries had establishments in Surat. Today, Surat urban agglomeration accounts for 8% of the State's total population. Industrial development in Surat district is attributed to the presence of a large number of diamond processing, textiles and chemical and petrochemical industries. It processes 10 out of out of 12 varieties of diamonds in the world contributing to Rs. 45,000 crore, which is approximately 65% of the total diamond exports from India.

Surat is also known as '*Synthetic Capital of India',* hosts over 65,000 power looms and provides over seven lakhs jobs in the district. Surat has been very successful in attracting a sizable amount of Foreign Direct Investment in various sectors like energy, oil and petroleum. A significant investment of Rs. 3,000 crore (726 million USD) in Hazira terminal project is one of the largest Greenfield FDIs in India.

There are over 41,300 small and medium industries functioning in the district. Some of the main industries are Textiles, Chemicals, Dying and Printing, Diamond Processing, Zari (silver) making, and; engineering and related activities (including manufacturing machines and equipment). Maximum number of (nearly 24,000 units) in small and medium enterprises is related to textile industry in the district followed by repairing and service industry with more than 11,000 units. Most of the small scale industries are located in Choryasi (Western Surat), Mangrol and Olpad (Northern Surat), Mandvi (Central Surat) and Palsana (Southern Surat) tehsils of the district.

Surat has a domestic airport which is well connected to different metros. It has daily flights to Delhi, Jaipur and Ahmedabad. Government of Gujarat has also undertaken an aviation master plan for the state which prioritizes development as well as upgradation of Surat airport. The other nearest airports are Mumbai, Vadodara and Ahmedabad. The upgraded Surat airport is envisaged to offer direct air connectivity to important destinations in India and abroad. This is expected to boost commercial activities in the city as well as in the district, leading to upsurge in the demand in hospitality sector, which is primarily driven by the corporate tourism.

Emergence of a petrochemical complex, gems and jewelry Park and the centrally promoted Surat SEZ are expected to further fuel the industrial and economic growth of the city. The expansion plans of Hazira port is envisaged in two phases. The first phase the development of port infrastructure to handle Liquefied Natural Gas (LNG) imports, and the second phase would offer port facilities for handling dry bulk and containerized cargo. The port facility would help in attracting sizeable investments in the coming future.

Magdalla and Hazira ports in Surat have good rail and road connectivity. Magdalla port is only 2 km away from the state highway and 15 km away from NH-8. Hazira port in Surat, has close proximity to the high speed dual carriageway which is under construction. The port is well connected with main Mumbai-Delhi Freight Corridor is expected to be a major driver for the industrial growth Hazira port.

Hazira is known as the '*Gateway Port*' to serve the hinterlands of North, West and Central India as it is situated in the midst of one of the most industrialized area in the country. It is deep water, all weather and direct berthing port in Surat. The existing industrial portfolio of Hazira includes industrial activities such as petrochemicals, fertilizers, heavy engineering, steel, energy and port related activities. More than 20 large and medium companies are located in Hazira, including Bharat Petroleum Corporation, Cairn Energy, Essar Power, Hindustan Petroleum and Larsen & Toubro, Reliance, NTPC among others. Shell has established an LNG Terminal at Hazira in 2004.

Magdalla port situated on the western coast of India in Southern Gujarat about 16 km upstream of Tapi river is a lighter age port. Magdalla port is only 2 km away from the state highway and 15 km away from NH-8. The nearby broad gauge railway line and Surat railway station are 15 and 16 km respectively away from the port. The port is well connected by road with Rajasthan, Madhya Pradesh, and North Maharashtra which are hinterland area to the port.

The urbanisation trends in India are a direct reflection of the structural changes that are taking place in the economy. The combined contribution of industry and services to GDP is significantly higher than that of agriculture. The urban areas are likely to play an increasingly important role with the continuing liberalisation of the economy. Much of the growth of the economy will come from economic activities that are likely to be concentrated in and around existing cities and towns, particularly large cities. Cities with transport and telecom linkages with global economy, are the preferred destinations for investments. However, there is inadequate recognition of the role that cities play in economic development. The cities need to be supported with improved planning and infrastructure to accommodate growth, better governance and management.

Surat ranked 9th in India with GDP of $40 billion in the Financial Year 2011-12, which was $14 billion in 2010. The per capita GDP which was $8000 in 2010. Surat is known for diamonds, textiles and recently for diamond-studded gold jewelry manufacturing. Surat registered GDP of 11.5% for seven fiscal years from 2001-2008 which was the fastest growing GDP in India. The City accounts for:

1. 90% of the world's total rough diamond cutting and polishing,
2. 99.99% of the nation's total rough diamond cutting and polishing,
3. 90% of the nation's total diamond exports,
4. 40% of the nation's total man made fabric production,
5. 28% of the nation's total man- made fibre production
6. 18% of the nation's total man- made fibre export, and
7. 12% of the nation's total fabric production.

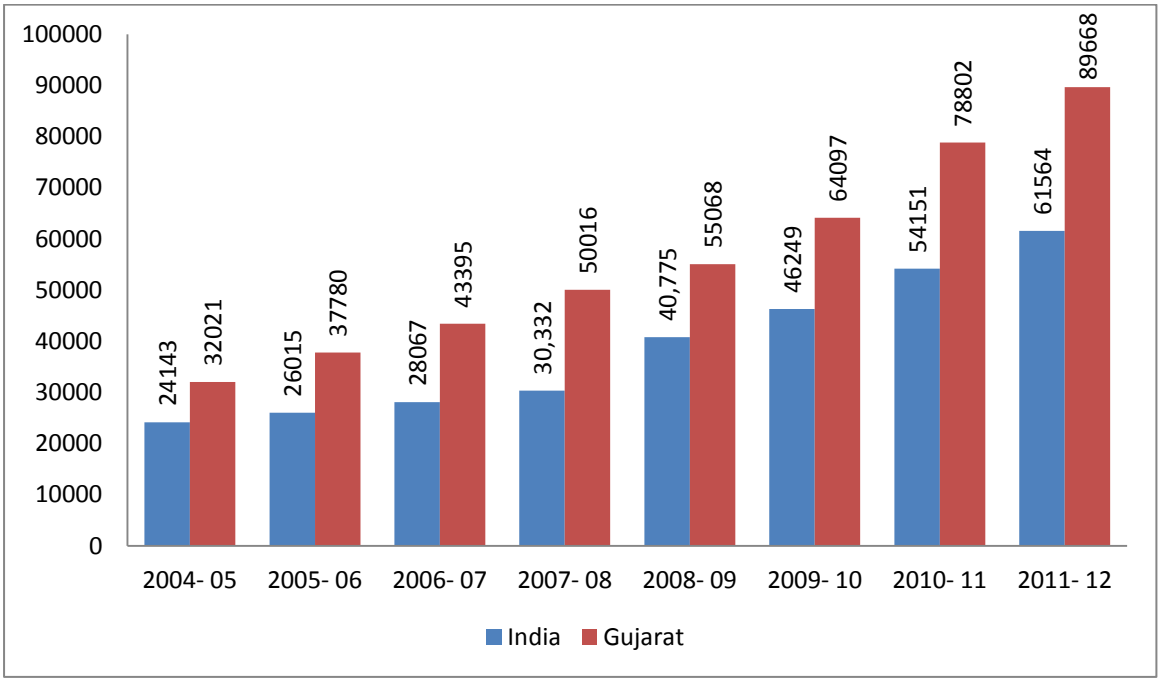
13.2 STATE GOVERNMENT INITIATIVES

The State Government of Gujarat published revised industrial policy to promote industrial activities in the state subsequently in 2003 and 2009. The basic aim was to create an atmosphere which should inspire investors to think of Gujarat as investment hub by availing information and facilitating investment friendly state through reincarnation of district industries centers and facilitation at state level. The state has had a proven track record of attracting high volumes of investment and as a result, becoming the most favored investment destination in India.

Industrial policy of 2003 was focused to provide infrastructure and empower the industrial estates, promoting better quality of life in urban areas, human resources development, labour reforms, environment zoning and mapping, Carbon Credit Exchange Program compensation, promoting agro processing industries, cluster development approach, assistance for technology upgradation, Technology Acquisition and Patent Tracking Fund, Quality Upgradation Scheme, investment for employment in sectors of textiles, apparel parks, Gems and Jewelry parks; market development and promotions, power sector reforms, tax reforms, rationalization in charges and duties with monitoring mechanism.

Later in 2009, the New Industrial Policy for the state of Gujarat took into account the context of the current global meltdown. Given the strong and accelerated growth and development exhibited by the state over the recent years, Gujarat is expected to be one of the key drivers for growth in the Indian economy. Gujarat has achieved tremendous growth in the industrial sector and as a result, has emerged as one of the leading industrialized states in India contributing nearly 16.1%3 to the country's industrial output. While Gujarat accounts for 4.99% of India's population, its share in the country's GDP for the year 2011-12 [at constant (2004-05) prices] is 7.61%. Gross State Domestic Product (GSDP) at factor cost at current prices in 2011-12 has been estimated at Rs. 6,11,767 crore registering a growth of 15.3% over the previous year. GSDP at factor cost at constant (2004-05) prices, in 2011-12 has been estimated at Rs. 3,98,884 crore showing an increase of 8.5% during the year. The share of primary, secondary and tertiary sectors is 21.8%, 36.1% and 42.1%respectively to the total GSDP in 2011-12. Gujarat has also registered an increase of 13.8% in the per capita income for 2011-12, which has been estimated at Rs. 89,668 as against Rs. 78,802 in 2010-11, at current prices.

Figure 51: Per Capita Income



The development, in the state has always been a policy-led inclusive development approach which has eventually attached a very high importance to the need for ensuring sustainable development. The new Industrial Policy would therefore capitalize on the inherent entrepreneurial characteristics

of the State. The new Industrial Policy in addition to addressing a wide range of areas of intervention, would also give adequate thrust to ensuring holistic development in the state.

The policy of 2009 mentions the Vision of GoG as "***Gujarat aspires to become a beacon of comprehensive social and economic development***". The primary policy objectives are as under: (1) Facilitate investments in the state, (2) Employment generation and Employability enhancement and (3) Adherence to high quality standards. The policy thereby indicates the necessary provisioning and the facilitation which would be made by the Government departments and through private entrepreneurs under Public Private Partnership (PPP) framework in the area of facilities like power, water, gas, road, railway, port connectivity, communications, quality human resources in adequate number etc. Since choice for investment is also directly governed by factors of overall physical and social quality of life in the State, adequate interventions have been planned and proposed therein for the purpose.

For the Twelfth Plan period, Gujarat's development vision will be guided by continued emphasis on human development and inclusive growth, while aiming at sustainable double digit growth which is environmentally sustainable with harmonious and balanced development in agriculture, manufacturing and services. Other objectives of the State are:

- Increased livelihood opportunities
- Empowerment of the youth and women
- Improved quality of life, especially of the poor - both in rural and urban areas
- Good governance and improved citizen centric services
- Improved effectiveness, efficiency and transparency in programs directly aimed at the poor
- Meeting the challenges of urbanization especially in terms of infrastructure, services and governance
- Decentralized Planning through ATVT (grass-root level planning and taluka-centric developmental governance), and
- Focused attention on balanced regional development through the State's three flagship programs

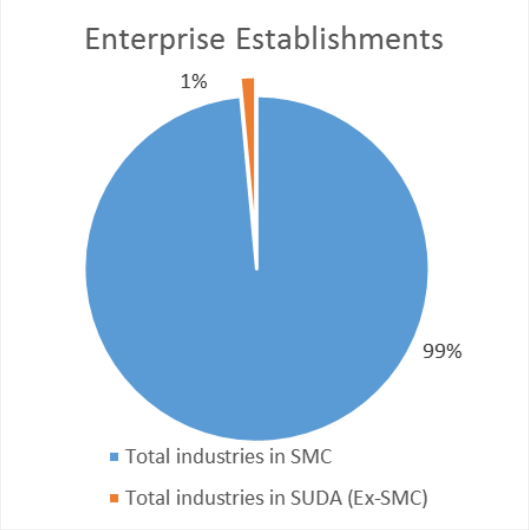
13.3 ECONOMIC ACTIVITIES IN SURAT URBAN AGGLOMERATION

Historically, Surat was a port town and in early days, it was the main hub of trading with the European nations. Over a period of time, Surat lost this identity however, the topography, linkages and atmosphere has attracted a number of investors, traders and industrialists. Later, the hand woven Zari works gained fame at global level followed by establishments of synthetic cloth, diamond cutting and polishing and allied industries. Increasing population has boosted the real estate market with its sub-sectors.

In the year 2000, it was reported by the Directorate of Economics and Statistics, Government of Gujarat based on The Fourth Economic Census, 1998 that Ahmedabad district accounted for nearly 12% in the State total enterprises, which is the highest among all the districts. The district-wise percentage share of enterprises in State total aggregate is varying between 5% to 10% for each of

the districts with Rajkot (6.09%), Mahesana (6.80%) Sabarkantha (6.49%), Kheda (6.59%), Anand (6.66%), Vadodara (5.52%) and ***Surat (9.56%)***. Interestingly, Surat is ranking Second position in sharing the enterprises established in the Gujarat state. Further, the quarterly review of Gujarat Economy, 2011 discusses the district-wise details of Micro, Small and Medium Enterprises. The document reveals that during the period of 01-07-2011 to 30-09-2011 Surat district registered with 5,914 Micro, 386 small and 17-Medium enterprise with subsequent employment to 32174, 7204 and 1286 workers respectively.

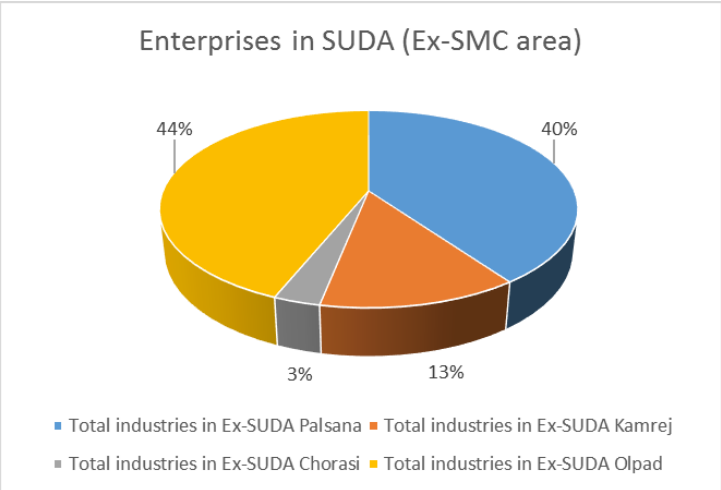
Figure 52: Enterprise Establishments in SUDA



Based on the records from the District Industries Commissioner (DIC) and the Gujarat Industrial Development Corporation (GIDC), an analysis was performed on the overall industrial/commercial units that has been established in Surat till year 2012. The analysis reveals that total Enterprises established in SUDA is 50,180 out of which within SMC limits are 49,437 and 743 in SUDA excluding SMC area. Further, this is distributed among four blocks namely Palsana, Kamrej, Chorasi and Olpad in which this enterprise establishments are 302, 98, 23 and 330 respectively.

Following figure shows the composition and share of enterprise establishments in SUDA and SMC area which suggests that there are 99% of enterprise establishments within SMC limits and the rest is in the SUDA (Excluding SMC).

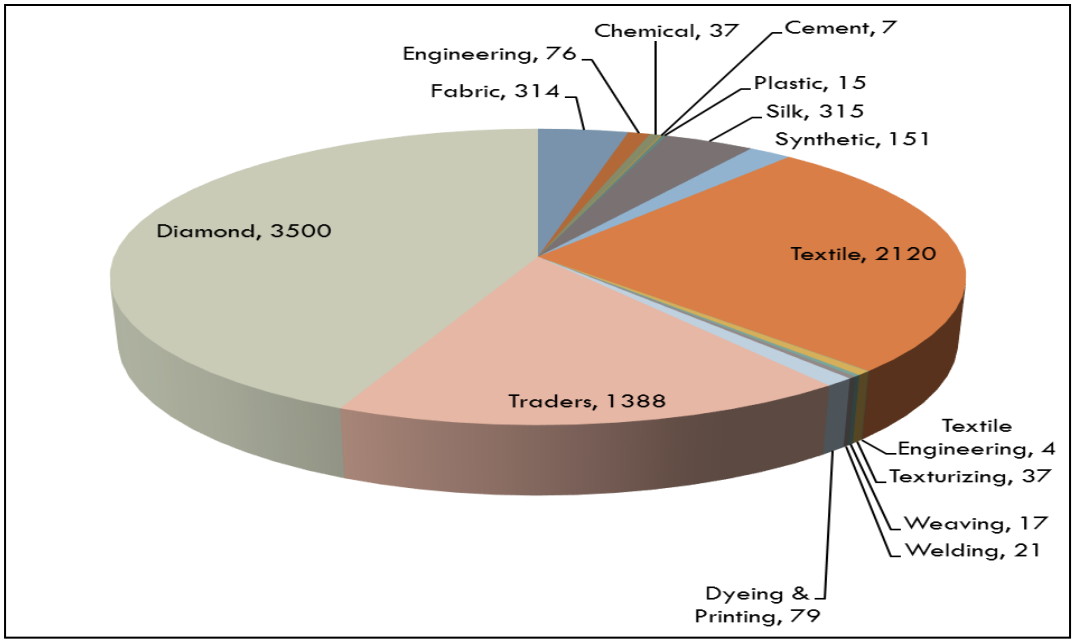
Figure 53: Enterprises in SUDA excluding SMC



Out of total enterprises established in SUDA (excluding SMC area) 40% are in Palsana, 13% in Kamrej, 3% in Chorasi and 44% in Olpad. Here, it is to be noted that the Olpad and Kamrej taluka are emerging enterprise centers whereas the Palsana has still a very good potential for development. Further, there are additionally, 753 enterprise establishments in the peri-SUDA area within these four taluka boundaries under the Surat District.

Surat urban agglomeration has a variety of trading, commercial and industrial establishments. Lowest sex ratio in the Gujarat state shows a significant presence of male workers in the urban area. In addition, the 39% of population in the city belongs to the main worker category of Census of India, 2011 for Surat urban agglomeration.

Figure 54: Established industries



Source: SGCCI , 2012-13

As shown in table below, the number exceeds 50,000 for economic establishments in the region with almost 18 lakhs of workers employed in different activities. Also, 14.98% of SUDA area has been marked with industrial land use followed by 3.15% of commercial land use.

Table 105: Enterprise establishments in Surat

Enterprise Establishments	Nos.
In SMC	49,437
In SUDA (Ex-SMC)	743
In Ex-SUDA Palsana	302
In Ex-SUDA Kamrej	98
In Ex-SUDA Chorasi	23
In Ex-SUDA Olpad	330
Total in SUDA (with SMC)	50,180
Total in peri-SUDA area	753

The Hazira Industrial area and port is located in the northern banks of Tapi river and is adjacent to the Surat urban area. It is home to several major processing facilities/ manufacturing centers for number of establishments. In general, Surat's industrial system is a complex blend of home-based, small scale and medium scale industries largely dependent on semi-skilled and unskilled labor. Some of the major establishments around the city are Reliance petrochemicals, Essar steel, Larsen & Toubro, ONGC, KRIBHCO, Shell, ABG Shipyard, HPCL, Indo Burma Petrolium Ltd, Cairn Energy, British Gas, Ambuja Cement, Welspun, Garden Vareli, NTPC and Torrent power.

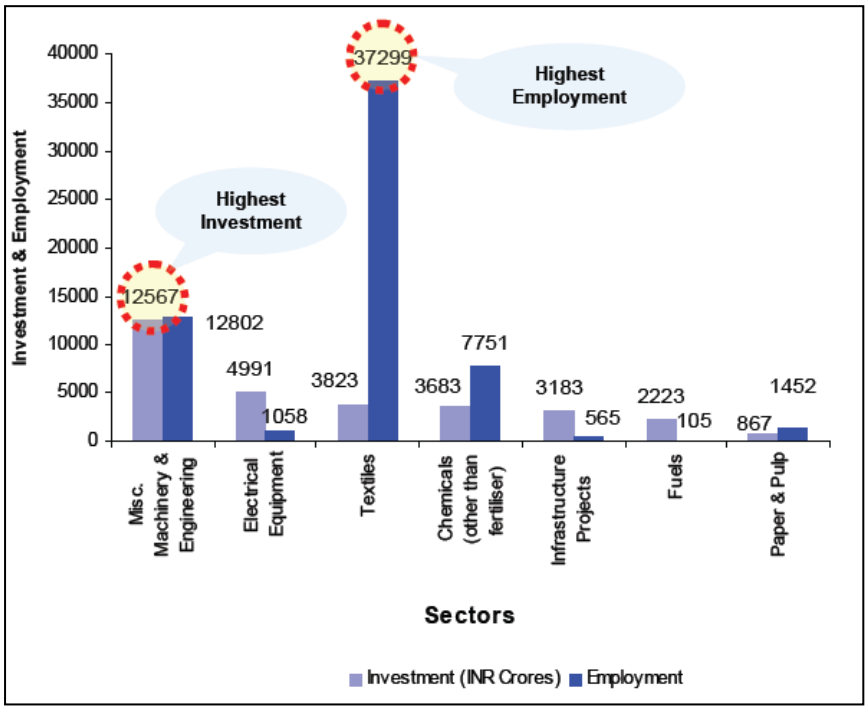
There are over 41,300 small scale industries (SSI) functioning in Surat district. Some of the main industries under SSIs in Surat are textiles, chemicals dying & printing, diamond processing, Zari

(Silver) making and engineering and related activities (manufacturing machineries & equipment). Maximum number of SSI units (24,000 Units) are related to textile industry in the district followed by repairing & service industry with more than 11,000 units.

Based on the Surat District Profile 2006-07, it was reported by the Industrial Entrepreneur Memoranda (IEMs) filed that the total investments during 1988-97 were Rs. 33,251 crore (USD 7.92 billion) and I Rs. 35,975 crore (USD 8.57 billion) during 1998-2007.Around 70% of the investments during 1998-07 have been contributed by engineering, electrical equipment, textiles, chemicals and petrochemicals sectors.

Total 866 units were introduced during 1988-97,however during 1998-07 a total of 1215 new units were introduced with textile sector units having taken a lion's share of 51% in terms of new units established in last one decade.

Figure 55: Sector wise investments in Surat



Source: Surat and Tapi District Profile, Industries Commissionerate, GoG

Given India's growing population and lifestyles, the Surat textile industry is poised to grow to meet the internal as well as exports demands. The technical advantages, vocational skill development and research facilities for textiles, within the city, provide a unique opportunity for the economic growth of Surat.

The diamond industry too, has similar advantages and thus, is slowly shifting from diamond cutting to the manufacturing of Jewellery.

SGCCI has already started focusing on expansion of textiles from 'Fiber to Fashion' and 'Diamond to Jewellery' through exhibitions, research, etc. It has also set up a convention and exhibition center and special economic zones for diamonds as well as garments are taken up.

On the western front of Surat is Hazira. Considering the unique mix of economy, considering the present conditions with niche products i.e. synthetic textiles/diamonds and due to the growing role of Hazira Industrial area, the economic growth of Surat is expected to sustain or increase over next two decades.

Following table shows details on the major sectors namely textile processing industries, diamond industries, weaving industries, chemical industries, engineering establishments, industries, embroidery and agro based industries. With Major industrial establishments in Hazira Notified Area, there are number of supporting and dependent establishments in Surat.

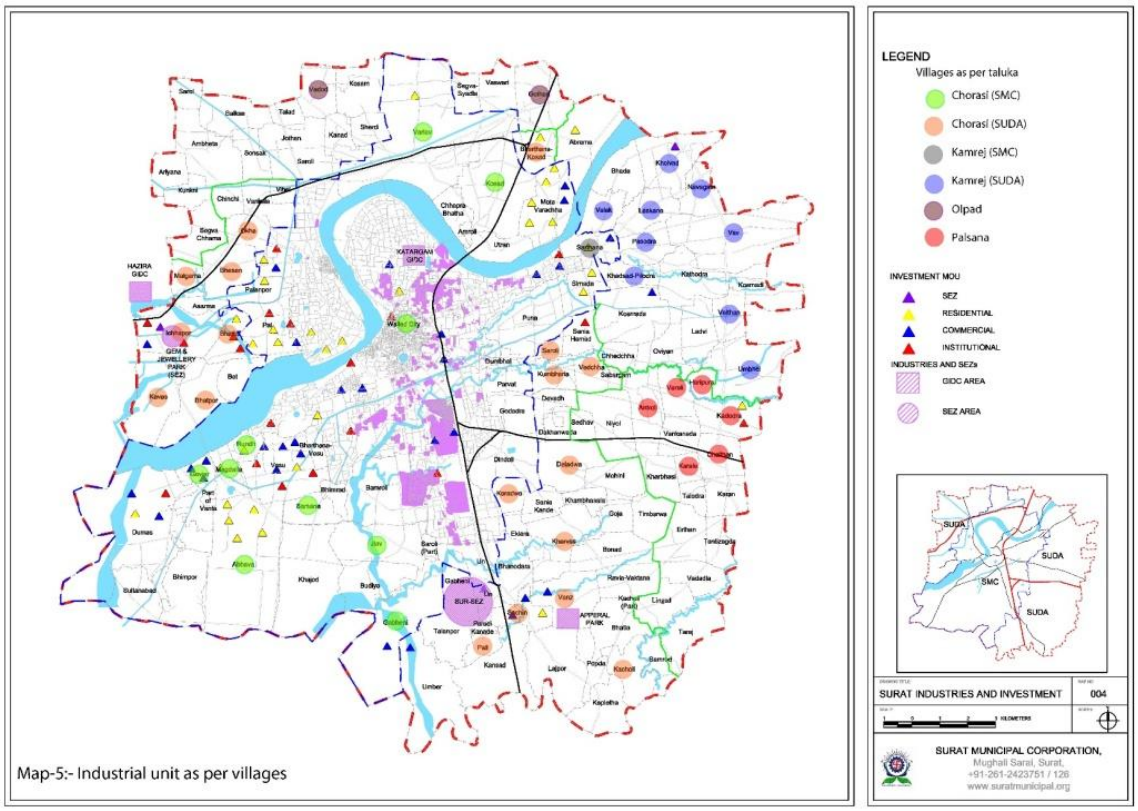
Table 106: Glimpses of ecoonomic establishments in Surat (Part-A)

Sr. No.	Particular	Textile processing	Diamond	Weaving	Chemicals
1	No. of Units	320	3500	25000	70
2	No. of People Employee	400000	Above 400000	125000	30000
3	Current Investment	Rs. 1000 Crore	Rs. 25000 Crore	Rs. 127500 Crore	Rs. 500 Crore
4	Current Annual Turnover	Rs. 2000 Crore	Rs. 200000 crores	Rs. 54000 Crore	RS. 6000 Crore
5	Current Area Sqr. Mtr	7.43 Lac Sq. Mt.	45 Sq. km	3 million Sq. Mt.	9 lac Sq. Mt.
6	Locations	Palsana, Pandesara, Sachin, Kadodara,	Varachha, Katargam, Mahidharpura, Puna	U. M. Rd, Sachin, Pandesara, Bamroli, Unn, Udhnaudyog Nagar, Bhestan, VastaDevdi, KapodraLaskana, Limbayat, ParvatPatia, Ved Road, KatargamGIDC, Salabatpura, Sagrampura, Khatodra, Sayan, Kim, Pipodra, Jolva	Pandesara, Sanchin, Palsana
7	Products	Dyeing & Printing	Diamond Polishing, Cutting, Gems & Jewellery	Art silk Cloth Mfg.	Dye Intermediates, Pharmaceutical chemicals manufacturing, Textile Chemical, Agro Chemicals manufacturing
8	Technology in future	Production	Jewellery Mfg.	Production of	Nano-

		of Colour Cotton	Casting	Colour Cotton, Water jet, Rapier	technology, Micro-reactor
9	Future Location	Sachin - Magdalla Road	Vesu, Piplod, Pal	Delad, Gothan	NA

Following map shows the industrial establishments in the SUDA area.

Figure 56: Locations of industrial establishments in SUDA



13.4 THE DFC- DMIC EFFECT

Government of India plans to develop a Dedicated Freight Corridor (DFC) linking Delhi, Mumbai, Kolkata, and Chennai. The proposed DFC passes through six states in India, of which, Gujarat accounts for 38% (564 Km) of total DFC length (1483 Km).The influenced area of 150 km on either sides of DFC is being developed as 'Delhi Mumbai Industrial Corridor' (DMIC).

Almost 62% of the total area of Gujarat (18 out of 26 districts) would be benefited by DMIC development.

The State government has identified 82 links in the DMIC Influenced area to upgrade them into two/four lane carriageway offering connectivity between ports, industrial estates, hinterlands, markets and points of agricultural produce.

13.5 RECOMMENDATIONS RECEIVED FROM SGCCI

13.5.1 OBNOXIOUS AND HAZARDOUS INDUSTRIAL ZONE

Present obnoxious and hazardous industrial zone, mainly in Udhna and on Udhna Magdalla Road, now has been converted into commercial and/ or residential zone. However, due to zoning, the industrial units, mainly consisting of SMSs are treated accordingly, which has deprived them taking benefit of various State Government and Central Government schemes. Such zones may be converted to either commercial or residential zone. Residential areas should be kept be away from such hazardous zone.

13.5.2 GENERAL INDUSTRIAL AND HAZARDOUS INDUSTRIAL ZONE

General Industrial and Hazardous Industrial Zone shall be provided in the new development plan. Budhiya, Gabheni, Talangpore near Sachin should be zoned as textile processing and /or chemical zone. Considering average area of around 15,000 sq.m. per unit total land area of around 20-25 lakhs sq.m. be reserved for around 175 units for such zone fornew industrial units or existing units which might need to shift. Paper and pulp mills also be identified in this zone.

Ichhchaapore, Kawas, Olpad, and Pinjrat and their surrounding area may be earmarked as General Industrial Zone. Many MSMEs, mainly engineering units will be in a position to establish them in this zone.

13.5.3 RESIDENTIAL ZONE

Residential Zone for people at large and industrial workers be earmarked towards South SUDA while industries may be located towards northern parts of SUDA.

13.5.4 DIAMOND INDUSTRY

Diamond Industry may be shifted near Mota Varachha (in northern parts) and bourse may be established in the same area.

13.5.5 F.S.I.

For all the industrial zone, present **F.S.I.** of 1 may be increased to keep pace with the future growth of industry and scarcity of land, keeping structural design constraints in mind, there may be common **F.S.I.** for residential, commercial and industrial zones.

13.5.6 INDUSTRIAL PARKS

Where the zone is earmarked for Industrial Zone, for workers' residence 15% to 20% and for commercial purpose 15% to 20% land may be allocated.

13.5.7 SEAPORT AND LOGISTICS

As in future, port will be fully functional at Hazira and will generate new business opportunities. Land area of around 50 lakhs sq.m. be reserved for this purpose, along with a 20% provision for residences in the same area. In and around Hazira or on Sachin Magdalla Road, logistic park may be provided to reduce burden on roads and other infrastructure of Surat.

13.5.8 COMMON FACILITIES

It is to be ensured that our industry grows as a cluster, which will require common facilities, to name a few, steam generation, effluent treatment plant, training center, laboratories etc. which may be developed in each Industrial Zone. As in SUDA area Industrial Solid Land Fill Waste Management facility is limited, currently it is being sent to site – at present being sent to Ankleshwar and other part of State and also outside Gujarat. Urgent need to set up such facility in SUDA area is much needed. Currently average daily 300 T is generated which is taken to various sites after paying Rs. 800 to Rs. 3000 per T towards transportation. Hazardous waste disposal site needs to be identified in or around SUDA.

13.5.9 COMMERCIAL ZONE

Khatodara-Sachin main road should be converted to carry out mainly commercial activities, which, if needed, be extended to periphery. Revision of F.S.I. is needed on this area. In Navagam – Varachha area as there exists no light industries, this area must be marked as residential and/or commercial area.

13.5.10 IT/ITES INDUSTRIES

Surat and surrounding area has been a major user of ITES. Diamond, Textiles and Hazira industries have used IT to its maximum benefits. Many IT companies, looking for anopportunity in II tier cities, will come to SUDA area if appropriate infrastructure andlocational advantage is provided to them 3 lakhs sq.m. may be reserved for 15-20 units near Vesu or Outer Ring Road.

13.5.11 AGRO INDUSTRIES

As South Gujarat, even though considered as a fruit bowl of Gujarat, has not been able to develop into Agro Industries Region, but in future it is bound be promoted as Agro Zone. Reservation for APMC for its cold storage, processing and other requirements should be kept near Abhva on outer ring road to support highly perishable items under dealing and need airport connectivity. Also, imported fruits are brought in from Mumbai. Government land for food processing zone may be identified with an area of around 100-125 hectares of area. APMC as well as private investors may initiate the such establishments in the vicinity of proposed cargo airport.

13.5.12 EXTENSION OF SUDA LIMITS

Existing SUDA limits may be extended covering Navsari, Kamrej, Olpad, Hansot, Dumas, Bardoli, Kim and Mandvi, which is also to be connected by Rapid and cheap Mass Transportation. It is noted that out of existing area of SUDA 50% area is under SMC's jurisdiction, resulting very little scope for industrial pocket planning. Local Railway facilities connecting various industrial pockets in surrounding the SUDA area will promote residentia land industrial inter-movement of work force. Transit facilities also should be increased for existing locations.

13.5.13 DMIC AND DFC

Industrial and commercial zoning must be done keeping in mind proposed DMIC and DFC planning. Logistics Park can be developed in the periphery of stations under this corridor. Area near Bhestan and Gothan must be earmarked for logistics and other ancillary purpose.

13.5.14 MISCELLANEOUS

Land prices need to be controlled, to increase warehouses, industrial parks and industries in specific industrial land pockets to promote shifting of industries to its appropriate location. Survey of existing zoning should be carried out to identify the actual number of industries established in that specific zone and accordingly new zoning to be done. Multiple nuclear zones pertaining to specific clusters should be promoted around SUDA periphery with building of minimum common infrastructure and transportation connectivity. Dahej Development model should be understood and followed. As in DP, the land is only to be reserved but actual development may be performed later on the basis of costs, taxes from people and grants. Possibility of setting up infrastructure must be considered on BOT basis.

Major road corridors may be identified connecting peripheral industrial pockets. If possible, concept of local trains, like Mumbai may be thought of with a longer horizon of planning period. Land prices are very high around proposed outer ring road, difficulty in shifting of existing industrial establishments from city. Any industrial unit constructing Green Building, based on standard practice, be given additional F.S.I.

14 HERITAGE AND CONSERVATION

Surat city has a fairly strong historical background and heritage sites. It played a pivotal role in the National Freedom Struggle of India. Public and private buildings in municipal areas have heritage value. These sites are beautiful proofs of town history and it generates revenue in the long run. Therefore it is very important to conserve the heritage sites which are located in different parts of Surat and also it is the duty of all local governments to initiate inner city revivals. This chapter focuses on the need for identification of the heritage structures in the city and the strategies to be adopted for its preservation.

Heritage means significant architectural monuments, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science. Heritage plays important role in the socioeconomic and cultural profile of the city. Urban heritage comprises archaeological sites, remains, ruins, and monuments protected by the Archaeological Survey of India (ASI)and their counterparts in the States, and also a large number of unprotected buildings, groups of buildings, neighborhoods, and public spaces including landscapes and natural features which provide character and distinctive identity to cities.

Surat has some good heritage resources which are spectator of city growth. Urban heritage is classified under two categories.

14.1 TANGIBLE HERITAGE

This includes buildings and physical elements of architectural and historical significance. The foremost heritage assets are the Indo-Islamic monuments of the 15th to 17th centuries, British and Dutch buildings. Categorization of Surat's Tangible Heritage has been in the following ways.

14.1.1 HERITAGE BUILDINGS

• Religious : Temples, Mosques , Churches, etc.

• Institutional: Colleges, Schools, Offices

• Historic : Fort, Dutch Post office and buildings with associative significance

14.1.2 GROUP OF HERITAGE BUILDINGS

This category includes areas/precincts which are of heritage significance due to a Contiguous Heritage character.

• **Heritage Wards** : Municipal Wards with high heritage content

•**Heritage Streetscapes**: Streets which have heritage significance due to cluster of heritage buildings

• **Riverine Heritage**: This includes areas and structures associated with the River and its Archaeological sites, immediate surroundings including banks.Many Monuments in Surat have been declared to be of national importance under the Ancient Monument and Archaeological Site and Remains Act, 1958.

- **Fortifications, Administrative Complexes:** Surat castle/fort, Surat Municipal Corporation Office.

- **Memorials, Tombs:** The Clock Tower, Gopi Talav, Kavi Narmad's home Saraswati Mandir, Khavaja Didar Dargah, Rander Islam Gymkhana.

Table 107: Buildings of national Importance

Sr. No.	Name of Property/Building	Location
1	The Mirjan Sami Mausoleum	Nr. Mughal Sarai
2	British Cemetry	Katargam Darwaja
3	The tomb of Gerald Aungier	Katargam Darwaja
4	Mausoleum of Oxenden Brothers	Katargam Darwaja
5	Mausoleum of Baron Adrian Van Reede	Dutch Cemetry , Nr. Katargam Darwaja
6	A jovial Dutch Man's Tomb	Dutch Cemetry , Nr. Katargam Darwaja
7	The American Cemetry	Nr. Katargam Darwaja

14.1.3 RELIGIOUS STRUCTURES

Parsi Fire Temple, Chintamani temple, CNI Christ Church, Ambikaa Niketan, Kantareshwar Mahadev Temple, Nausaiyid Mosque, Jumma Masjid, Hindu MilanMandir, Kshetrapal Mahadev Temple, Agam Temple, Saiyidd Idrus Mosque, Kuvvat -e-Islam Mosque, Zakaria Mosque, Agam Temple.

14.1.4 URBAN VILLAGES

Urbanised historic villages or traditional settlements incorporated within the urbanlimits like Rander, Katargam, Singanpore, Ved, Fulpada, Vesu from that Rander was the principal commercial centre, long before Surat came into prominence. It was ancient town where Arabs and Kafa came and settled in 11^{th}/12^{th} century. They over powered Jain population and became rulers. Trading with Malacca, China, Sumatra, etc., spices, silk, musk and porcelain were the major business. Living settlements such as the historic Walled City with its traditional

mohallas/sheri/wad and historic housing stock including havelis, gala type houses e.g. Zapa Bazar, Gopi Pura, and Salabatpura.

14.2 INTANGIBLE HERITAGE

This comprises movable artifacts, handicrafts, folklore, myths, legends, spirituality,traditional knowledge, rites and rituals, festive events, visual and performing arts, music,literature, language, dialects, traditional medicine, culinary traditions etc. which areintimately linked to the built heritage.In the recent initiative taken by the Surat Municipal Corporation towards Heritage.

Conservation has identified the Intangible Heritage in following categorizes.

14.2.1 ARTS AND CRAFTS

This category includes all traditional arts, crafts, plays, dances, music, literature, poetry, events and activities which are of any heritage significance. (E.g. Navsari weaving)

14.2.2 CULTURES AND TRADITIONS

This category includes significant and symbolic cultures and traditions of the communities of Surat which are of Heritage significance(E.g. Kite Flying, Ghees Festival, Navratri Celebration)

14.2.3 TRADITIONAL TRADE AND COMMERCE

This category includes all traditional trades/commerce of surat and the places, events, activities, traditional markets, associated with these traditional and commerce. (E.g. Zari trade, Power Looms, Diamond Industry)

14.2.4 MUSIC, PLAYS, POETRY AND LITERATURE

This category includes the literature and plays of Heritage significance. (E.g. Kavi Narmad's Granthawali, Parsi Natak)

14.2.5 TRADITIONAL COMMUNITIES

This category is associated with the communities present in Surat with historical significance. (e.g. Bhoras, Jains, Parsis)

14.2.6 HISTORY OF SURAT

• History related to associations with the events/persons like arrival of British

• Trade and Commerce related History

• Folklore Literature, documents related to the evolution of the city

14.3 BUILT HERITAGE AND SITES

According to the Ancient Monuments and Archaeological Sites and Remains Act, 1958 "Ancient Monument" means any structure, erection or monument, or any tumulus or place of interment, or any cave, rock sculpture, inscription or monolith which is of historical, archaeological or artistic interest and which has been in existence for not less than 100 years and includes:

- **Remains of an ancient monument;**
- **Site of an ancient monument;**

Such portion of land adjoining the site of an ancient monument as may be required for fencing or covering in or otherwise preserving such monument, and the means of access to, and convenient inspection of an ancient monument. However, for the purpose of documentation of Built Heritage under National Mission, the scope has been enhanced by defining any structure that belongs to pre independence period and 1950 has been considered as the cutoff date. Such built heritage will be considered for documentation that is architecturally, historically, archaeologically or aesthetically significant for reconstruction of regional history.

14.4 ISSUES

14.4.1 LACK OF INTEREST BY LOCAL GOVERNMENT IN PRESERVING THE STRUCTURES

Since historical times, Surat is developing as an industrial and business centre. And the city has few sites of tourist which might be one of the reasons for less interest by local government and people, towards maintaining and preserving the heritage structures in the city.

14.4.2 FAILURE OF HERITAGE WALK ATTEMPT

SMC's attempt to start a Heritage walk in Surat City has not succeeded so far. The reason sought for the failure is absence of awareness in the residents of Surat city as most of the residents are migrated from other states and are not aware of the existence of the buildings of Heritage and architectural significance. As most of the residents of Surat are in the city for economic needs, they lack the interest in heritage structures.

14.4.3 LACK OF FACILITIES AT THE HERITAGE SITES

Most of the heritage sites lack basic facilities like Parking, Drinking water, Sanitary blocks causing inconvenience and hence decrease in the number of potential tourists.

14.4.4 LACK OF AWARENESS IN PUBLIC

Due to lack of information & publication and awareness among people about importance of heritage sites, structures, from tourism as well as economic point of view people are not bothered about preserving such structures. Many of monuments have been spoiled by local public by various ways. (E.g. British and Dutch Cemeteries)

14.4.5 ABSENCE / ENACTMENT OF RULES AND REGULATIONS

In absence / enactment of area planning rules and regulation around the heritage sites, at many places the neighborhood surroundings of the heritage site are encroaching in to the site.(e.g. Gopi Taval, Mirja Shami no Rozo).

15 ENVIRONMENT

15.1 INTRODUCTION

Today, Surat is one of the major industrial city, contributing major shares of output, especially in textile manufacturing, trade, diamond cutting and polishing industries, intricate Zari works, chemical industries and the gas-based industries at Hazira, established by leading industry houses, such as ONGC, Reliance, ESSAR, Shell etc. Surat is a pivotal centre on the Ahmedabad – Mumbai 'Golden Corridor' as well as on the 225 km long industrial belt having direct linkages with the industrial urban centres of Vaodara, Ankleshwar and Vapi.

In Surat Urban Agglomeration, SMC is the centre of economical activities and Surat city forms the core of SUDA. The total area of SUDA is 715 sq.km. including 326.5 sq.km. of SMC area. SMC along with SUDA are trying to cope up with the urbanizing land and decreasing gap between demand-supply of urban basic services, with a right kind of governing system, which is concerned about public participation, urban poor and their requirements along with the overall quality of Environment in the region. People are exposed to a whole variety of factors that can either promote good health or be hazardous to health, including the physical living environment. SMC along with SUDA has improved health via their material, service-provision, cultural, and aesthetic attributes. They also offer opportunities for cost-effective interventions that can serve many people even if carried out on a small scale. Existing health-promoting infrastructure (e.g., drains; Water distribution networks; Solid waste management, etc.) can, in some situations, be upgraded to meet the local health demands. Health hazards and inequities remain, however, and new threats have emerged, but the knowledge and technologies for creating a healthy city are available.

Urban environment can be divided into two parts: Natural urban environment and Built Urban Environment. The natural urban environments include water bodies, eco sensitive areas and natural resources. The term built environment refers to the human-made surroundings that provide the setting for human activity, ranging in scale from personal shelter and buildings to neighbourhoods and cities that can often include their supporting infrastructure, such as water supply or energy networks. This chapter reviews the existing natural resources like water bodies, eco sensitive areas and natural reserves in SUDA region.

15.2 WATER BODIES IN THE CITY

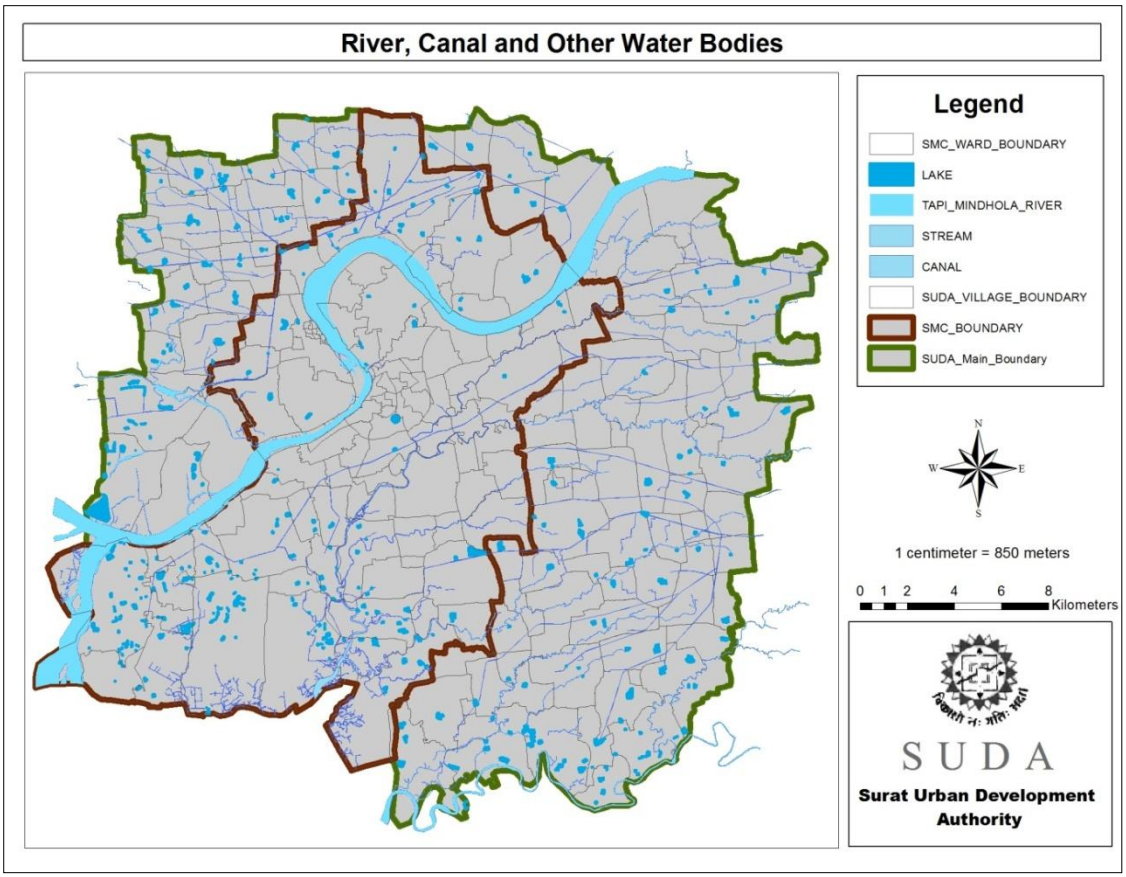
The Tapi River runs through the city of Surat, is one of the major rivers of peninsular India with a length of around 724 km. It is one of only three rivers in peninsular India that run from east to west. The river covers 3601 hectare of the total land under SUDA along with small portion of Mindhola estuary as well on southern part of SUDA area. SUDA region have about 898 no of small and large size lakes covering about 548ha of land area under lakes and pond.

Table 108: Details of Lakes in SUDA Region

Sr. No.	Authority	Name of Taluka / Zone	Total Number of Villages / Ward	Number of Ponds or Lake in The Taluka / Ward	Area of The Water Body Per Taluka / Ward (ha)	No. of Notified Lake / Pond
1	SUDA	Kamrej	17	53	26.020	
2		Palsana	17	56	33.658	
3		Olpad	17	117	71.444	
4		Choryasi	44	373	238.647	
5	SMC	North Zone	15	19	7.480	
6		Central Zone	16	01	7.539	
7		West Zone	22	39	24.098	
8		East Zone	19	13	4.280	
9		South West Zone	24	185	85.750	
10		South Zone	15	42	48.639	
11		South East Zone	14	00	0.0	
Total			220	898	547.555	

Source: SUDA Existing Land Use Map

Figure 57: River, lakes and water bodies in SUDA



SUDA and SMC have developed walk way on river front and some of the lakes and Sea – shore for recreational purpose. Notable examples include Gaviyar Lake, Lake at Subhash Garden, Dummas Beach, Sultanabad – Dummas, Umbher lake, GopiTalav, Out of total, 13 lakes have been interlinked as on today for managing storm water during the monsoon.

Figure 58: Area Developed for recreational purpose

15.3 ECO-SENSITIVE AREAS AND NATURAL PRESERVES

Songadh, Uchchhal and Vyara villages in Surat district are notified as Eco-sensitive zone. Nearest Eco-sensitive Zone Vyara is also 42 km away from the SUDA boundary.

Gaviyar Lake, Karuna Sagar Ovara, Umra Ovara, Umbhel Talav, Ugat Botenical Garden & Lake, Causway at Rander, Lake at Tena village etc. are sites where local and migratory birds can find season wise. Black headed Gulls can found in more numbers at Causeway from December to February. Sarus crane and many other birds species can be found at lake near Tena Village. Huge number of lesser Flamingos visit Surat city in month of June - July, most of them are found at Umra & Karuna Sagar Ovara. Botenical Garden and Umbhel Lake also have good bird's life of local species. Ecological sites need conservation to preserve flora and fauna. Some of them like Ugat, Umbhel, Gaviyar site already conserve as ecological site.

Figure 59: Bird life of Surat City

Source: Hitesh Topiwala, Member of Nature Club, Surat

15.4 FLORA AND FAUNA OF SUDA AREA

Many types of species of Flora and Fauna are used to be found within SUDA & SMC area, especially in such villages where Agricultural Land Use has covered more area comparatively. SUDA & SMC area has more number of lake/pond, two rivers the Tapi and Mindhola are passing through and Arabian Sea is adjacent to the SUDA area, where flora and fauna can found more in numbers. List of local and migratory flora, fauna, reptiles and butterflies are listed in Annexure. (Source: Nature Club, Surat)

15.5 IMPACT OF URBANIZATION ON ENVIRONMENT

Due to the industrialization a sudden population explosion in form of migration has taken place in the urban areas. The pace of urbanization has been very fast due to which it has not been possible to maintain and serve the population with required standard of living. The rapid urbanization has also given rise to a lot of pollution generation within the environment. Pollution is the introduction of contaminants into an environment that causes instability, disorder, harm or discomfort to the physical systems or living organisms. Pollution can take the form of chemical substances or energy such as noise, heat, or light energy Pollutants, the elements of pollution. The major forms of pollution considered during study, includes air pollution, water pollution, noise pollution and visual pollution.

- **Pollution Control Mechanisms**

  - **Institutional Framework**

The GPCB is the nodal agency that looks after the enforcement and implementation of environmental laws in the city. The environmental management of the city is looked after by several agencies. All these agencies are to act under the co-ordination of GPCB.

GPCB implements pollution control laws in the entire state and is guided by the Central Pollution Control Board. The SMC's role assumes significance as the provider and facilitator of any development in the city and SUDA area.

State Public Works Department is responsible for the maintenance of the major water bodies in the city. The State Highways Department and the National Highway Regulatory Authority are responsible for the maintenance of the highways in the city. The Regional Transport Office in Surat has responsibility to the Vehicular growth in the city and the Surat Traffic Police is responsible for the implementation of traffic management initiatives.

Local body has responsibility to implementation of MSW rules, 2000 and amended thereafter, along with plastic waste management and handling rules, 2011.

  - **Regulatory Framework**

GPCB is empowered to take legal action and punishable measures against law offenders under the EP Act. The Board can also monitor the industrial discharge and terminate the operations if an industry is found flouting the norms.

15.6 AIR

Air pollution is the human introduction of chemicals, particulate matter or biological materials into the air that cause harm or discomfort to humans or other living organisms, or damages the natural environment. Ambient air quality is being monitored by GPCB regularly at three locations in Surat. They are: Air India Building, SVR Engineering College and BRC Udhna (Industrial).

NOTE: Ambient Air Quality Standards (CPCB) for Rural and Residential areas are as under:

PM_{10} 100 µg/NM3
SO_2 80 µg/NM3
NO_x 80 µg/NM3

Table 109: Ambient air Monitoring statistics, 1996-97

Location of Monitoring Station	Parameters, 1996-97*		
	SPM	SO_2	NOx
Air-India Building, Kotsafil Road, Surat	355	62	21
S.V.R. Engg. College, Ichchhanath	170	40	15
B.R.C, Udhna	212	52	18

Table 110: Ambient air Monitoring statistics, 2009-10

Location of Monitoring Station	Parameters 2009-10*			
	RSPM	SPM	SO_2	NOx
Air-India Building, Kotsafil Road, Surat	85	171	17.80	26.53
S.V.R. Engg. College, Ichchhanath	77	156	15.70	24.36
B.R.C, Udhna	96	192	23.38	29.59

Table 111: Ambient air Monitoring statistics, 2013-14

Location of Monitoring Station	Parameters 2013-14*			
	PM2.5	PM10 RSPM)	SO_2	NOx
Air-India Building, Kotsafil Road, Surat	25.99	84.92	12.17	18.03
S.V.R. Engg. College, Ichchhanath	25.39	76.47	11.10	16.73
B.R.C, Udhna	29.91	102.08	15.31	19.78

Source: Annual report of GPCB

The NOx levels have always been below the CPCB prescribed standards. SO_2 levels, which were earlier above the prescribed limits have come down significantly and are now below the limits. Air quality has been monitored at 3 stations in Surat that indicate overall fall in SPM and RSPM.

Through the implementation of the Air Pollution Action Plan, it has been possible to bring down SPM (Suspended Particulate Matter) and RSPM (Respirable Suspended Particulate Matter) in the city of Surat significantly. In regard to SO_2 (Sulphur Dioxides) and NOx (Oxides of Nitrogen) which are the other relevant parameters in assessing the quality of air, in all stations, they remained within limits.

The Central Pollution Control Board (CPCB) in conjunction with IIT-Delhi recently surveyed 88 cities around the country in year 2009-10, as per survey Surat has been ranked 78th in the country and 6th in Gujarat state with respect to Air pollution with Air CEPI score of 46.00. While comparing it with

Ahmedabad with air CEPI score of 62.75 which ranked 2nd in country and 1st in Gujarat, it is very clear that Air pollution action plan has been implemented very effectively in Surat area.

Major milestones achieved in implementation of Surat Air Pollution Control Action Plan are as follows:

- SMC / BRTS have introduced 1851 passenger buses & 914 school buses on road. There are more than 28,726 rickshaws in Surat; out of which 95% are CNG auto rickshaws. (Source: RTO, Surat)
- Surat Municipal corporation has introduce mass public transport system such as BRTS and City bus service and also planning to start Metro rail project particularly for SUDA area on outer ring road
- Under Vehicle Inspection Program, many PUC Centers (as per revised system) are registered in Surat.
- Regarding industrial air pollution control, industries having major boilers are identified and in process of air pollution control measures in form of ESP [electro static precipitators], Bag Filters.
- The industrial units are categorized based on fuel consumption & performance of existing APCD (air pollution control devices).
- Many industrial units in pandesara and Sachin have switched over to Natural Gas or coal (instead of chindi waste) as fuel. Looking to the present situation and pace of urbanization, the urban air quality is expected to deteriorate faster in future. So, the long term strategies should be formulated and time bound targets should be set for achieving healthy and safe air environment.
- District level Air pollution control committee has been formed under the chairmanship of Surat District collector to implement the air pollution control plan and review it at every 3 months. The committee consists of officials from Surat RTO, GPCB, SUDA, SMC and members of Industrial associations.

15.7 WATER

15.7.1 SOURCE OF WATER

River Tapi is the perennial river flowing through Surat City. Tapi river is one of the major rivers in India. The total length of the Tapi river is approximately around 724 km. It flows in the central part of India. The river originates from the Betul district of Madhya Pradesh in the Satpura range at an elevation of 752 m above the sea level. The states through which the Tapi river flows include Maharashtra, Gujarat and Madhya Pradesh. Apart from the Narmada river, Tapi is the only river which flows in the westward direction and merges into the Arabian Sea. The Tapi basin extends to the total area of 65, 145 sq.km., which is approximately 2% of the total geographical area of India.

15.7.2 SOURCE AND WATER SUPPLY MANAGEMENT

River Tapi is the only source of Drinking Water for the citizens of Surat City. The entire water supply scheme executed till now and schemes which are being executed for the future generation is

keeping in mind the availability of quality water in river Tapti with adequate quantity. Presently, Urban Local Body (ULB)- SMC manages more than 950 MLD of to cater the water demand of Surat City. SMC has got riparian right of extracting water of 300 Cusec on daily basis from river Tapti. In order to manage water supply system based on river Tapti, SMC has constructed weir cum causeway near Rander. As a result, sweet water can be stored in the upstream of weir. Downstream of weir receives saline water from Arabian sea during high tide and in normal course too. Hence, because of weir cum causeway, intrusion till now and help managing water supply scheme for Surat City.

Table 112: Water Quality of River Tapi as monitored by CPCB

Sr. No.	Location	Water Quality Parameter (Mean value of Year)							
		pH	Temp. (Deg. C)	Conductivity	NO_3–N^+	D.O. (in ppm)	BOD (in ppm)	Fecal Coliform MPN/100 ml	Total Coliform MPN/100 ml
1	Ukai, Sherulla Bridge	7.7	27.5	352	0.10	7.0	1.5	2215	3170
2	Mandvi Bridge	8.0	27.7	359	0.22	7.8	1.9	677	1510
3	Upstream of Kathor	8.0	27.5	525	0.30	7.1	1.9	1058	2775
4	Near NH-8, Kathor Bridge	7.7	27.5	535	0.30	7.2	2.0	566	1908
5	Rander Bridge	7.9	27.0	659	0.27	7.0	1.9	1200	2150
6	ONGC Bridge	7.5	27.5	25418	0.20	4.4	4.9	2815	5850

Source: Basin-wise Complied Data – 2011, Central Pollution Control Board (CPCB), MoEF

Above data reveals that the quality of water gets deteriorated as it moves from upstream to downstream. ONGC bridge is the location where river receives saline water from Arabian sea. Also, in comparison to the classification of rivers of CPCB, river Tapi falls under 'C' class or below 'C' class river. Also, since quality of river Tapti is subject to the season variation, during monsoon season, when usually it received fresh water from upstream, it falls under 'B' class because of freshness of water and dilution of water.

15.8 NOISE

Noise pollution is displeasing human or machine created sound that disturbs the activity or balance of human and animal life. The unwanted sound is called noise. Loudness is measured in decibels

(dB). 20 db is whisper, 40 db the noise in a quiet office. 60 db is normal conversation, 80 db is the level at which sound becomes physically painful. Steady exposure to sounds higher than 80 dB can have negative long term effects on hearing. Redefining levels of noise pollution has become a crucial issue within densely populated urban areas.

Table 113: Noise Level standard limits

Area Code	Category of Area/ Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silence Zone	50	40

Source: National Ambiant Air Quality Standards (NAAQS)

Table 114: Existing noise levels in Surat

Sr. No.	Category of Area/ Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
1	Industrial area	70-80	65-72
2	Commercial area	63-69	60-64
3	Residential area	57-61	45-55
4	Silence Zone	45-50	40-45

Delhi is on the borderline with an average sound intensity of 80 dB. However, other metro cities have crossed this danger mark. Kolkata it is 87 dB, Mumbai 85 dB and Chennai 89 dB. Similarly in Surat city commercial areas reach up to 64-69 dB, and residential areas reach up to 57-61dB, which is higher than the limit suggested by GPCB. Vehicular noise is considered as the major contributor to noise pollution. That apart, uncontrolled use of loud speakers at social events also adds to the noise pollution. Broadly speaking, the noise pollution has two sources, i.e. industrial and non- industrial. Non- industrial source of noise includes the following categories: roads traffic, aircraft, railroads, construction, industry, noise in buildings, and consumer products. No honking zone has been identified for places like hospitals, educational institutions, religious places, etc.

15.9 VISUAL POLLUTION

In modern times, especially in cities, the hazards of visual pollution are many. Though there is no accurate definition currently available, for our convenience we can define visual pollution as follows:

Visual pollution is any unwanted sight that mentally or physically affects the community or creates any health hazard.

Visual pollution generally refers to those elements of the landscape that the community finds unattractive, including badly maintained buildings, advertisements (hoardings), business signs, telephone and utility poles, weeds, garbage dumps and litter. Solid waste management is one of the core infrastructure facilities for the city. To make the city healthy and livable, sound solid waste management system is required.

Efforts to improve solid waste management in the city of Surat were made by the health department after the havoc of the plague in 1994. It is the only city of its kind in Gujarat where private contracting and private participation in solid waste management was introduced first. The city is divided into 7 administrative zones for efficient management and the waste generated is collected throughout the city by door to door collection system and disposed at the Khajod disposal site (200 ha).

Apart from Domestic waste, industrial waste generated is also a big challenge for Surat area as of date there are no industrial waste treatment and disposal site present in Surat area resulting utilization of Mindhola River by industries to discharge toxic waste in absence of proper disposal facility present in Surat Area. More than 1000 industrial units generating 1,13,058.5 MTA industrial wastes has been identified as per GPCB survey report, 2007.

15.10 SOLID WASTE COLLECTION AND DISPOSAL

SMC have good door to door solid waste collection system for entire city area and have dumping site at Khajod. SMC also cover few villages of SUDA area adjacent to SMC boundary. In other villages of SUDA area, it has been found during primary survey that door to door collection provided by Grampanchayat or through village's private association. Collected solid wastes are used to dump on either Gouchar land or waste used to burn on open field. In most of the villages, Grampanchayat give door to door collection to houses inside village gamtal as well as construction outside the Gamtal, where in few villages societies out of Gamatal used to collect solid waste by their own at the end of the street together and waste used to burn in open air. Taluka wise present scenario of solid waste collection and disposal has given bellow for SUDA area using primary survey data provided by Sarpanch or Talati of each village.

Table 115: Solid Waste Collection and Disposal

Sr. No			Number of villages having Door-to-door Collection (Contractual basis)	Number of villages Disposing individually	Number of villages where waste is Disposed at Khajod	Number of villages where waste is Disposed into Gauchar	Number of villages where waste is Disposed into Creeks	Number of villages where waste is Burnt
1	Kamrej	17	3	14	0	9	0	0
2	Palsana	17	6	8	0	3	4	1
3	Olpad	17	3	14	0	2	0	9
4	Choryasi	44	5	37	3	7	4	5
	Total	**95**	**17**	**73**	**3**	**21**	**8**	**15**

Source: Primary Survey

15.11 URBAN HEAT ISLAND EFFECT AND ENVIRONMENTAL WARMING

An urban heat island (UHI) is a metropolitan area which is significantly warmer than its surrounding rural areas. As urban areas develop, changes occur in their landscape. Buildings, roads, and other infrastructure replace open land and vegetation. These changes cause urban regions to become warmer than their rural surroundings, forming an "island" of higher temperatures in the landscape.

The main cause of the urban heat island is modification of the land surface by urban development which uses materials which effectively retain heat. Waste heat generated by energy usage is a secondary contributor. As population centres grow they tend to modify a greater and greater area of land and have a corresponding increase in average temperature. UHIs have the potential to directly influence the health and welfare of urban residents. Elevated temperature from urban heat islands, particularly during the summer, can affect a community's environment and quality of life; some of the important issues are identified as follows:

- Increased energy consumption for high cooling demand.
- Elevated emissions of air pollutants and greenhouse gases
- Compromised human health and comfort
- Rapid temperature changes can be stressful to aquatic ecosystems

Glass facades and Aluminium composite panels Global warming is when the earth heats up (the temperature rises). It happens when greenhouse gases(carbon dioxide, water vapour, nitrous oxide, and methane)trap heat and light from the sun in the earth's atmosphere, which increases the temperature. This hurts people, animals, and plants.

Many cannot take the change, so they die. Some of the causes of global warming are listed below:

- Extensive use of electricity
- Extensive use of fuel for various purposes
- Burning of garbage on vast scale
- Cutting down the trees
- Increase in vehicles

15.12 FLOOD AND NATURAL HAZARD

Flood and Earthquake are the major Natural hazard found in Surat City.

In 2006, this was first time in the last 200 years that the city of Surat has seen floods of such a large magnitude. Due to incessant rains in Maharashtra, the flood gates of the Ukai Lake were opened releasing the excess waters into Gujarat. A major portion of Surat urban area under the municipal corporation got flooded on both sides of the river banks. It created a big havoc and unprecedented loss of property adding to the misery of the vulnerable population.

It is frequent in Surat to experience floods affecting various areas of the city. Beside the frequent floods in the Tapi river basin, the city has network of creeks, which is a subsystem of larger hydrological system. The Mithi khadi floods have been frequents in the last decade. Along the creek there are number of settlements of industrial and migratory workers and thus, the impacts of the swelling of the creeks are also crucial. SMC have made attempts of diverting the inflow of the creeks in the river in the recent years.

This region has high rainfall and less number of rainy days. This has caused sudden accumulation of water in Ukai dam which were released in the downstream of the river flowing through the city. The river when passes through the city has limited basin width and depth. The existing slope has reduced

flow of water. During high tide the back water from sea reduces further flow of water. It is estimated that there is certain rise in sea level. It becomes beyond the carrying capacity of the existing river basin which results in frequent flooding after release of water from Ukai dam located at the upstream. The following map shows the vulnerable areas under frequent flooding.

15.13 OBSERVATIONS AND ISSUES

15.13.1 AIR QUALITY

15.13.1.1 Observation

There is an improvement in air quality of the city.

15.13.1.2 Issue

Air pollution in the city and SUDA area is due to several internal and external factors of which the most important are:

All the air quality monitoring stations in the city and surrounding area have recorded dangerously high SPM levels during the past so many years. The high volume of dust suspension in the city is mainly due to the climatic conditions as well as the un-surfaced margins on almost all the roads in the city.

Rapid growth of vehicular population during the past decade is also a concern. Most of these vehicles are mostly not compliant with the BHARAT-II norms and release dangerous exhausts. The climatic conditions of the city generally cause these exhausts to remain suspended in the air. Inadequate traffic management measures have reduced the average speed of vehicles on the roads thereby increasing the travel time and hence the vehicular pollution. Chaotic movements at junctions have increased the dimension of the problem.

15.13.1.3 Strategy

- **Preparation of Inventory of Air Quality**

The inventory shall include a database on air quality indicators, identification of potential air pollution sources in the city and surrounding area, emission concentrations and identification of non-scheduled industrial and commercial locations with pollution potential. This programme shall involve the services of GPCB and the Traffic Police. The study shall form the basis for regular maintenance of data and can help to initiate education and awareness programmes on pollution mitigation and control measures. SMC has given grant of Rs. 60 lakhs to TIFAC Core towards procurement of Mobile Air Quality monitoring Van.

- **Integrated Transportation Planning**

Since a high concentration of pollutants is observed at junctions and in the form of SPM along roads, it is imperative to integrate air pollution mitigation measures with those of traffic improvement. Encourage the public to maximize utilization of mass transport system such as BRTS.

15.13.2 WATER QUALITY

15.13.2.1 Issue

Several reasons can be attributed to the pollution of the water bodies in the city and SUDA Area. The most important of them are:

The lack of comprehensive sewerage system in surrounding area of Surat city has led to large quantities of untreated wastewater being drained into the River Tapi and River Mindhola. This has led to degradation of ground water too.

The letting out of wastewaters by several small-scale industries in the east and south zones, either into the nearby drains or dub-bores has polluted the surface as well as ground waters.

There are no monitoring stations to estimate and assess the quantity and quality of wastewaters being generated in the city. The obvious results of all the above-mentioned reasons are health risks to the citizens of the city.

15.13.2.2 Strategies

Since there is no effective monitoring of the pollution levels of the city, the strategies shall address the same and help in maintaining an effective database of the environmental conditions of the city.

- **Establishment of Decentralised Waste Water Treatment Facilities**

Particularly, Outside Surat City Area where there is no drainage network exits; it shall be advisable that DEWATs units shall install and reuse such water for irrigation or gardening purpose.

- **Action Plan For Cleaning and De-silting of Important Water Bodies**

The action plan shall be formulated after consultations with the stakeholders, wherein all the water bodies in the city and surrounding region shall be studied to check the pollution levels and measures towards the maintenance and revitalisation shall be suggested. The plan shall also explore various options of maintenance; like developing recreational activities etc. based on the plan. All the water bodies that require attention with respect to pollution shall be cleaned and de-silted. The River Tapi shall also be part of the study. The study shall be taken up by consultants or experts.

After completion of the Mindhola River Rehabilitation project under NRCP; the quality of river Mindhola will significantly improve.

- **Effective Monitoring of Water Bodies and Quality Control**

The corporation shall initiate a dialogue between various agencies including GPCB, to collect and maintain data on important parameters of water bodies like BOD, COD, species present, extent of silt, sewerage outfalls, industrial discharges etc. on a regular basis. This forms an important aspect of monitoring the quality of water bodies.

SMC has prepared Master Planning to meet the future demand and envisaged the demand of more than 2300 MLD in 2041 Accordingly various water supply schemes are being executed. Followings are the challenges before SMC for meeting future water demand for Surat City.

1. **Quantity Issues**

- For meeting future demand, present riparian right of 300 cusec seems inadequate.
- Irrigation department which controls Ukai Dam which controls and regulate the flow of water in river Tapti based on the demand of irrigation. Demand for the drinking water for the Surat City assumes last priority.

2. **Quality Issues**

- Rapid urbanization along the bank of River Tapi and ever increasing domestic pollution is alarming now.
- All point and non-point sources falling under the jurisdictions of various stake holders and responsible for domestic river pollution needs to be plugged / diverted.
- Area beyond the jurisdiction of SMC has imposed great challenge. Such area falls under DDO or SUDA jurisdiction, hence, in lieu of proper river pollution abatement solutions for such area, domestic pollution will continue to deteriorate river water and ultimately drinking water quality remains in question.
- Imposition of new drinking water standard IS 10500 – 2012 and strict adherence to the various parameters will be difficult in present situation and ever increasing pollution.
- Moreover, Surat City has been declared as vulnerable city to the effect of Climate Change. Hence, extreme events like floods or droughts cannot be ignored. In case of drought like condition / the year in which monsoon fails, situation of water quality in river Tapti will be very bad because of non-availability of fresh water.

Therefore, in the larger interest of health of citizens Surat City and in order to meet the challenges of future water demand, above issues remains to be addressed jointly with other stake holders of river Tapi.

15.13.3 NOISE POLLUTION

15.13.3.1 Observation

The levels of noise have been constantly increasing due to the increase in the vehicles on the city roads.

15.13.3.2 Issue

Incompatible land uses, for example party plots located in residential areas cause noise pollution.

15.13.4 VISUAL POLLUTION

15.13.4.1 Observation

Presently at several locations in the city, the architectural character is being marred by large commercial hoardings, screens on the junctions and other visual pollution.

15.13.5 CONSERVATION ECO-SENSITIVE AREA

15.13.5.1 Observation

Human interference at Eco-sensitive site may create decrease in number of species and individual used to found within the area. Greenery/ plantation should increase. As mentioned, many migratory birds arrive at Surat in different season; at the same place local species are also found in good number. These sites should conserve, development should restricted in surround few area from the sites.

15.13.5.2 Issues

Species of flora and fauna are disappearing from city areas. Green cover area is very less in the city. Instead of Medicinal or edible plants, other low cost inedible plants to fauna are grown along the road. The vegetated clusters, at certain interval of area are not available which can absorb pollution and heat.

15.13.6 SOLID WASTE MANAGEMENT

15.13.6.1 Observation

Door-to-door Solid Waste collection is not available in some villages of SUDA Area. Villages which have door to door collection and villages which don't have door to door collection both don't have network and dumping site in SUDA area. Solid waste used to dump in open Gochar land or burnt at the end of individual society.

15.13.6.2 Issue

Due to solid waste used to burn in open air, air pollution increase. Due to dumping of solid waste on open land, it affects soil and ground water through leaching. It also spread bad odour in nearby area as well as it can cause disease.

Treatment facilities establish for solid waste treatment has been fails due to commercial and technical reasons, resulting in to increasing burden on landfilling.

15.13.6.3 Strategy

Centralized Eco waste recycling Park should be developed for all kind of waste i.e. plastic, E- waste, Organic waste, and Industrial waste generated around Surat Area. Such kind of Eco Park should be supported by central and state government so that comprehensive waste management around Surat area is possible and reduce the burden on landfilling and save natural resources and minimize greenhouses gases impact. Learning from past experience, it is strongly recommended that industrial waste management facility should be established on non- profit sharing basis in partnership with local authority and industrial associations.

16 STAKEHOLDERS CONSULTATION

16.1 INTRODUCTION

The public participation process and stakeholder consultation for DP 2035 SUDA has been conducted. The level of participation and involvement of different stake holders has been detailed in this chapter. Different discussions and various meeting were held to understand the view and opinion of stakeholders for revision of development plan.

The stakeholders' participation included experts' consultation, in which the stakeholders were involved through focus group discussions to review and assess the existing situation and needs for the future. These experts were invited to join various sub committees formed by SUDA. The consultation was more participatory and collaborative. As series of working group meetings were held and stakeholders were involved in making more specific suggestions for improving the existing conditions.

16.2 STAKEHOLDERS CONSULTATION PROCESS

The aim of conducting consultations is to articulate stakeholder expectations so as to be able to formulate a vision for the revised development plan, prioritize city development issues, strategy / action consensus and choice of strategy options. The methodology for consultation included following sequential tasks:

1. Identification of stakeholders
2. Conducting consultations
3. Documentation of consultations
4. Integrating consultation findings into project related decision-making

16.3 STAKEHOLDER GROUPS

Various stakeholder groups were identified during the consultation program to represent views of a wide cross-section of society. Two core groups of stakeholders were identified:

16.3.1 PRIMARY STAKEHOLDERS

Beneficiaries of a development intervention or those directly affected (positively or negatively) by it. The following stakeholder groups were included:

- Village Sarpanchs (95 villages)
- Institutes such as Chamber of Commerce, South Gujarat
- Institute of Architecture and Civil engineering etc.
- Non-Government Organizations
- Renowned Architects, Engineers and Town Planners
- Private Developers
- Subject Professors

➢ **Consultations with Village Sarpanch:** Meeting was held with the village Sarpanchs, of all 95 villages from 4 talukas included in area of SUDA. Their suggestions were invited for over

development of SUDA area. Particular requirement of Sarpanch was invited through written applications at the authority office and were considered during planning.

- **Consultations with Institutions:** Representatives of the following institutions were consulted to get their views on urban services and infrastructure situation, economic development, housing requirement, Transportation and other component of Development plan.

  - Chamber of Commerce
  - Indian Institute of Architects
  - Gujarat institute of Civil Engineering and Architecture
  - Members from GIDC estate.
  - SVNIT

16.3.2 SECONDARY STAKEHOLDERS

- **Consultations with Committees**

Following committees were formed that included internal as well as external members from all fields, to focus on key areas. Consultation meetings with the committees were held at regular intervals. Some of the committees were consulted and series of meetings were held to find out the issues and probable solutions for the same. The committees formed are listed below:

- **Core Committee**

  - **SC-1**: Basemap Preparation
  - **SC-2** : Demographical Projection and data collection
  - **SC-3** : Simplification of GDCR
  - **SC-4** : Affordable Housing and Socio economic studies
  - **SC-5** : Traffic and Transportation proposals
  - **SC-6** : Infrastructure Planning & ORR Implications
  - **SC-7** : Tapi River Alignment , CRZ Environmental Regulations
  - **SC-8** : Industry Trade & Commerce

Approximately 60 meetings were held in totality for over development plan preparation. The suggestions received from the stakeholders are listed below:

- **Consultation with MPs and MLAs**

All MP, MLA, Surat Zilla Panchayat President and Mayor (SMC) were invited on 22.04.2016 for detailed discussion on Development Plan 2035. Discussion on various issues were carried out and their suggestions on the same were invited.

Table 116: Electative Representatives' consultaion meeting's analysis

	Zoning	Road	Reservation	GDCR	SUDA Extension	Others	Total
Suggestions Received	42	39	23	16	7	9	136

16.4 STAKEHOLDERS SUGGESTIONS

16.4.1 SC4 : HOUSING AND SOCIO ECONOMIC STUDIES

- Katargam + Varachha and Udhna + Limbayat zones can be considered for proposing Affordable Housing
- Residential Housing for workers should be made compulsory for industrial development in GDCR
- The provision of affordable housing at present is based more on land availability. It should be well distributed in areas as per necessity rather than availability
- Need for Housing projects with public-private partnerships or Regulatory Policy. SMC can introduce various Housing Schemes with Private partnership so as to provide innovative options for all masses. This may include implementation of Policy measures such as to make mandatory for builders to provide 10 % of EWS houses in all housing schemes introduced into the city
- Encourage New Township development

16.4.2 SC5: TRAFFIC AND TRANSPORT

- Public Transport should be the main vision for development plan and land use should be proposed in accordance and integration along the public transport
- The following hierarchy was suggested
  - LRT/MRT along ORR
  - BRTS along radials
  - City Bus as feeders on through roads
  - Auto as feeders on through roads
- Metro should be proposed on the 66 km long Outer Ring Road but it should suffice to future expansion of authority area hence a radial should also be proposed along the NE-SW radial. Canal Road can be the radial along which metro can be proposed
- A multimodal transport hub to be proposed on outer ring road and Kadodara road intersection which will serve as a central place of connectivity where multiple forms of transit
- To develop a logistics park between expressway and national highway on the Palsana road
- Roads to be developed along all existing canals

16.4.3 SC 6: INFRASTRUCTURE & OUTER RING ROAD IMPLICATION

1. Water Supply

- There is an underprovision of water supply network in the part of the developing areas of Kamrej, Palsana, Vav , Navagam , Kholvad , Sachin, Talangpore, Vanz, Ichhapore, Bhatha etc. These areas to be divided into clusters and provision of infrastructure on priority basis for these area
- Due to high rainfall water should be compulsorily recharged
- 7% of the municipal corporation is yet to be provided with network for water supply. By 2015, 100% coverage in SMC area shall be done. Out of 95 only 25 villages are provided with GWSSB water remaining 70 villages do not have conventional water supply network. To increase network and supply to save ground water depletion

2. Storm Water Drain

Natural waterways need to be preserved. With development of area, ground percolation of water reduces thereby increases surface water flow. Therefore at one side water in the creeks increases and carrying capacity reduces in existing creeks/nallas. Hence natural slope should be maintained during planning process.

3. Sewerage

- Comprehensive waste water system unavailable in Industrial areas. Waste water treatment plant for industrial and hazardous waste should be provided in the industrial zone.
- Additional Sewerage pumping stations are proposed in North, South, South-East and East Drainage Zone which shall suffice to 2035 demand.
- After successful implementation of the Green Energy generation projects SMC now is proposing a bio gas based power plant along with construction of sewage treatment plant itself. So generation of electricity can start as construction work completed and receiving of raw sewage starts at treatment plan

4. Solid Waste Management

- Identify sites for solid waste disposal. No direct disposal to be allowed waste to be treated before disposal
- Separate Landfill site is required for disposal of dead animals. Three separate well developed land parcels need to be developed.
- Solid waste has increased and hence there is a need to plan for more compost plant, and area can be reserved for the same.

5. Social Infrastructure

- Fire Service reservations to be provided at TP Scheme level. Consider requirements for 70 meter height of building
- There are few streets where plantation has been carried out within the city but they do not form a green network. A green network is should be proposed
- Lake front development along with garden can be taken up to develop more spaces like the botanical garden which can used at city level for recreational purpose

16.4.4 SC 7 : TAPI RIVER FRONT , CRZ AND ENVIRONMENT

- Parallel road along with the Tapi River throughout the river both the side also perpendicular roads to maintain natural drain
- River Front Development
- Good Transportation Network
- Green Waste and Dry Waste bifurcation system for waste collection & promote reuse of Green waste
- Promote Zero energy and green buildings
- Eco-industrial Park Concepts
- Conservation of Eco- sensitive areas
- Conservation of Agricultural Lands
- Promote tree plantation along the road and nearby new constructions
- Promote Rain Water Harvesting within the construction and conservation of open land and Gardens
- Green barrier or green belt should provided around the industrial zone

16.4.5 SC 8 : INDUSTRY TRADE AND COMMERCE

1. **Obnoxious and Hazardous Industrial Zone**

- Present obnoxious and hazardous industrial zone, mainly in Udhna and on Udhna Magdalla Road, now has been converted into commercial and/or residential zone. However, due to zoning, the industrial units, mainly consisting of SMSs are treated accordingly, which has deprived them taking benefit of various State Government and Central Government schemes. Such zones may be converted to either commercial or residential zone. Residential areas should be kept be away from such hazardous zone.

2. **General Industrial and Hazardous Industrial Zone**

- Budhiya, Gabheni, Talangpore near Sachin should be zoned as textile processing and /or chemical zone. Total land area of around 20-25 lakhs sq.m. be reserved for around 175 units for such zone for new industrial units or existing units which might need to shift.
- Ichhchaapore, Kawas, Olpad, and Pinjrat and their surrounding area may be earmarked as General Industrial Zone.

3. **Residential Zone**

- Residential Zone for people at large and industrial workers be earmarked towards South SUDA while industries may be located towards northern parts of SUDA.

4. **Diamond Industry**

- Diamond Industry may be shifted to near Mota Varachha (in northern parts) may be relocated and bourse may be established in the same area.

5. F.S.I.

- For all the industrial zone, present F.S.I. of 1 may be increased to keep pace with the future growth of industry and scarcity of land, keeping structural design constraints in mind, There may be common FSI for residential, commercial and industrial zones.

6. Industrial Parks

- Where the zone is earmarked for Industrial Zone, for worker residents 15% to 20% and for commercial purpose 15% to 20% land may be allocated.

7. Sea Port and Logistics

- Land area of around 50 lakhs sq.m. be reserved for this purpose, along with a 20% provision for residences in the same area.
- In and around Hazira or on Sachin Magdalla Road, logistic park may be provided to reduce burden on roads and other infrastructure of Surat.

8. Common Facilities

- Hazardous waste disposal site needs to be identified in or around SUDA.

9. Commercial Zone

- Khatodara- Sachin main road should be converted to carry out mainly commercial activities, which, if needed, be extended to periphery. Revision of FSI is needed on this area. In Navagam – Varachha area as there exists no light industries, this area must be marked as residential and/or commercial area.

10. IT/ITES Industries

- Many IT companies, looking for an opportunity in II tier cities, will come to SUDA area if appropriate infrastructure and locational advantage is provided to them. 3.0 lac sq mt. may be reserved for 15-20 units near Vesu or Outer Ring Road.

11. Agro Industries

- Reservation for APMC for its cold storage, processing and other requirements should be kept near Abhva on outer ring road to support highly perishable items under dealing and need airport connectivity.
- Government land for food processing zone may be identified with an area of around 100-125 Hactres of area. APMC as well as private investors may initiate the such establishments in the vicinity of proposed cargo airport.

12. DMIC and DFC

- Industrial and commercial zoning must be done keeping in mind proposed DMIC and DFC planning. Logistics Park can be developed in the periphery of stations under this corridor. Area near Bhestan and Gothan must be earmarked for logistics and other ancillary purpose.

13. Miscellaneous

- Any industrial unit constructing Green Building, based on standard practice, be given additional FSI.

17 SPATIAL EXTENSION OF SUDA

To ensure the systematic and planned development of the Surat city and its surrounding areas, Surat Urban Development Authority(SUDA) was constituted on 30/01/1978 by Gujarat State Government under the provisions of the Gujarat Town Planning and Urban Development Act, 1976. Total area SUDA authority was 715 sq.km., including Surat Municipal Corporation and 148 surrounding villages. Between 1978 and 2015, the jurisdiction of SUDA was unchanged but the area of SUDA was increased to 1351 sq.km. by Gujarat State Government as per the notification **No.GH/V/330 of 2015/UDA-102012-5026(3)-L** dated 09/12/2015 and its corrigendum dated 18/12/2015. 100 more villages from 5 different talukas Olpad(40), Kamrej(37), Palsana(14), Choryasi(8) and Mangrol(1) have been made part of SUDA.

Kathor Grampanchayat was designated as area development authority under notification **No.GHB-20-UDA-1177-646(2)-Q** dated 30/01/1978. Also, an urban development authority was constituted for Hazira and surrounding areas under notification **No.GHV/121/UDA-1181-5100-V** dated 12/10/1985 which was later dissolved under notification **No.GHV/106/1097/M/86/K** dated 28/08/1997.

Under the notification **No.GH/V/330 of 2015/UDA-102012-5026(3)-L** dated 09/12/2015, both these areas were made part of SUDA and all the functions within these areas were transferred to SUDA. Development plans for these areas were prepared by respective authorities and are in force. However, after the inclusion of these areas within SUDA's jurisdiction, they will be considered as a part of SUDA's Development Plan for 2035.

7 (Hazira (C), Mora (C), Kamrej (K), Kathor (K), Olpad (O), Sayan (O) and Palsana (P)) of these 100 villages have population more than 10,000. Population wise summarisation is given below. There are 10 villages with population less than 500 and 6 of these are in Olpad taluka.

Table 117: villages with population more than 10,000 in newly added area

Sr. No.	Name of Taluka	Total no. of towns in Taluka	Number of Towns in SUDA Jurisdiction	Names
1	Kamrej	1	1	Amboli
2	Palsana	3	3	Chalthan, Kadodara, Vareli
3	Olpad	2	1	Sayan
4	Choryasi	10	8	Limla, Mora, Kansad, Sachin,Ichchhapor, Pardi Kanade, Bharthana
5	Mangrol	2	0	-
		18	13	

Table 118: demographic analyrsis for newly added villages

Taluka	Total no. of Villages	Total Population	No. of villages with population >10,000	No. of villages with population 5,001-10,000	No. of villages with population 1,001- 5,000	No. of villages with population less than 1,000
Kamrej	37	87,730	2	1	24	10
Palsana	14	36,974	1	1	8	4
Olpad	40	96,022	2	2	22	14
Choryasi	8	51,964	2	1	5	0
Mangrol	1	7,765	0	1	0	0
Total	**100**	**2,80,455**	**7**	**6**	**59**	**28**

Source: census 2011

Table 119: demographic analyrsis for old villages

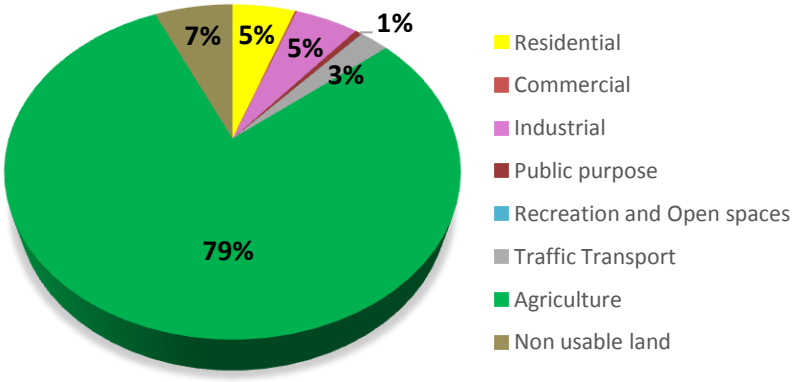
Taluka	Total no. of Villages	Total Population	No. of villages with population >10,000	No. of villages with population 5,001-10,000	No. of villages with population 1,001- 5,000	No. of villages with population less than 1,000
Kamrej	17	71,409	3	1	10	3
Palsana	17	77,185	2	1	9	5
Olpad	17	19,657	0	0	8	9
Choryasi	44	1,69,053	4	6	20	14
Total	**95**	**3,37,304**	**9**	**8**	**47**	**31**

Table 120: demographic analysis for all villages

Taluka	Total no. of Villages	Total Population	No. of villages with population >10,000	No. of villages with population 5,001-10,000	No. of villages with population 1,001-5,000	No. of villages with population less than 1,000
Kamrej	54	1,59,139	5	2	34	13
Palsana	31	1,14,159	3	2	17	9
Olpad	57	1,15,679	2	2	30	23
Choryasi	52	2,21,017	6	7	25	14
Mangrol	1	7,765	0	1	0	0
Total	**195**	**6,17,759**	**16**	**14**	**106**	**59**

17.1 EXISTING LAND-USE OF NEWLY ADDED VILLAGES

Figure 60: Existing Land-Use of Newly Added Villages in SUDA



The existing land-use of newly added villages shown in the pie chart. Almost 80% of the area is under agricultural use. Other major uses are residential and industrial. The recreational and open space are 1% of total area which is well below the required standard.

17.2 EXISTING INFRASTRUCTURE ANALYSIS

17.2.1 WATER SUPPLY

Out of newly added 100 villages in SUDA jurisdiction, only 11 villages receive supply from Tapi river. The rest of the villages depend on ground water. These villages draw water from ground through bores and supply it to households by pipelines or use of hand pumps. There are few villages which depend on both surface and ground water sources. 25 of these villages are supplied water by GWSSB and most of the other villages are catered by respective Gram Panchayats.

Table 121: Water infrastructure analysis for newly added villages supply

Sr. No.	Name of Taluka	Total Number of Villages	Water Supply		
			Source Tapi - Supply by Gwssb	Number of Villages Having Bores	Villages without Significant Data
1	Kamrej	37	4	28	**10**
2	Palsana	14	1	14	
3	Olpad	40	4	31	
4	Choryasi	8	2	6	
5	Mangrol	1	0	1	
	Total	**100**	**11**	**79**	

Source: Data obtained from Talatis

17.2.2 SOLID WASTE MANAGEMENT

There is no scientific collection and treatment of municipal solid waste in these villages. In 16 villages, waste is collected from households. In all other villages, the waste is either burnt or disposed in open grounds or creeks by respective households.

Table 122: Dor-to-door waste collection and disposal method analysis for newly added villages supply

Sr. No.	Name of Taluka	Total Number of Villages	Solid Waste Management Collection	
			Number of Villages Having Door-to-Door Collection	Number of Villages Disposing Individually
1	Kamrej	37	11	26
2	Palsana	14	1	13
3	Olpad	40	2	38
4	Choryasi	8	1	7
5	Mangrol	1	1	0
	Total	**100**	**16**	**84**

Source: Data obtained from Talatis

17.2.3 SEWERAGE SYSTEM

In extended SUDA region, few villages have sewerage. These networks dispose the water into nearby creeks and water bodies available. In 56 villages closed network is available. These villages have partial network catering to some portion of these villages. The details of availability of sewerage systems are given below.

Table 123: Sewage disposal infrastructure analysis for newly added villages supply

Sr. No.	Name of Taluka	Total Number of Villages	Disposal of Sewage	
			Number of Villages In which Network is Available	No Network
1	Kamrej	37	26	11
2	Palsana	14	8	6
3	Olpad	40	19	21
4	Choryasi	8	2	6
5	Mangrol	1	1	0
	Total	**100**	**56**	**44**

Source: Data obtained from Talatis

There are number of villages that depend on on-site sanitation facilities such as septic tank and soak pit for collection of sewage. The details are given below.

Table 124: On-site sanitation facilities analysis

Sr. No.	Name of Taluka	Total Number of Villages	Villages with On-site Sanitation Facilities
1	Kamrej	37	21
2	Palsana	14	9
3	Olpad	40	19
4	Choryasi	8	7
5	Mangrol	1	0
	Total	**100**	**56**

Source: Data obtained from Talatis

17.2.4 INTERNAL ROAD NETWORK

72 no. of villages have a part of their internal road network constructed of RCC. The other types of roads are bituminous roads and Kachha roads.

17.2.5 PARKS AND GARDENS

There are total of 28 gardens in 24 no. of newly villages in SUDA's jurisdiction. In rest of villages, there are no gardens which indicates the lack of recreational opportunities for the residents of these villages. Bagumara in Palsana taluka has 4 parks for population of about 3,500.

17.2.6 STORM WATER DRAINAGE

There are several villages where water is flows through natural gradients and gets disposed into creeks. In 39 villages, storm water drainage network has been laid out. However, most of these villages use drainage network for disposing storm water. Many of these villages dispose rain water into creeks by combination of natural and storm water drains.

Table 125: Strom water network analysis

Sr. No.	Name of Taluka	Total Number of Villages	Storm Water Drain	
			Number of Villages in Which Network is Available	Number of Villages in Which Water Runs off Naturally
1	Kamrej	37	16	21
2	Palsana	14	17	5
3	Olpad	40	4	20
4	Choryasi	8	2	4
5	Mangrol	1	0	1
	Total	**100**	**39**	**51**

Source: Data obtained from Talatis

17.2.7 EDUCATION

There are 101 no. of schools in newly added villages. 86 of these deliver primary level education while 15 no. of schools are high schools. In 5 villages there are no schools. The summary of educational infrastructure is given in the table below.

Table 126: Analysis for educational infrastructure

Sr. No.	Name of Taluka	Total Number of Villages	High Schools	Primary Schools
1	Kamrej	37	5	31
2	Palsana	14	1	11
3	Olpad	40	5	37
4	Choryasi	8	4	7
5	Mangrol	1	0	1
	Total	**100**	15	86

Source: Data obtained from Talatis

In terms of higher level education, 6 villages have colleges within their jurisdiction. Kudsad has 2 colleges.

17.2.8 HEALTH INFRASTRUCTURE

There are total of 26 hospitals in these villages. Olpad taluka has 14 hospitals in addition to small private clinics in the town. Palsana taluka has only 1 major hospital among 14 villages which is well below required standards. The detailed analysis of various medical facilities is given in the table below.

Table 127: analysis for health infrastructure

Sr. No.	Name of Taluka	Total Number of Villages	Hospitals
1	Kamrej	37	6
2	Palsana	14	1
3	Olpad	40	14
4	Choryasi	8	5
5	Mangrol	1	0
	Total	**100**	**26**

Source: Data obtained from Talatis

17.2.9 INDUSTRIES

There are various types of industries operational in this region varying from power looms to sugar factories and few others. There are around 300 such small industrial units.

18 POPULATION PROJECTION

In the process of urbanization, the trend of population growth is an important indicator for the assessment of development needs. In order to assess development needs, it is essential to forecast population of the area for the plan period. The population structure will enable to make projection for housing, employment, commercial, recreational and all types of socio-economic needs and therefore an assessment of the quantum of land required to accommodate this population is essential.

18.1 POPULATION GROWTH AND TRENDS

SUDA in its first development plan of 1986 estimated 16 lakhs population in SUDA area for 1991. According to census figure for 1991, total population within SUDA area was 17.8 lakhs. In the development plan the projection for 2001 was 27 lakhs and for 2011 was 42 lakhs. In comparison to these projections, the actual population as per census 2001 was 31.5 lakhs which increased to 48.05 lakhs by 2011. Thus Surat has experienced rapid growth of population than what it was envisaged in the development plan.

Table 128: Population Growth of Total SUDA area, 1961- 2011

Year	As Projected in DP 2005 (population in lakhs)	As per Census (population in lakhs)
1961	-	3.55
1971	-	5.58
1981	-	11.20
1991	-	17.80
2001	27.50	31.05
2011	42.00	48.05 (old SUDA area)
2011	-	50.85 (new SUDA area)

As per Census 2011, SUDA area has witnessed an increase in population from 31.05 lakhss to 48.05 lakhss for the old SUDA area comprising of SMC and 95 villages. After the extension of SUDA area by the State Government notification of 09.12.2015 and 18.12.2015, the ppulation of total SUDA area as per 2011 Census is 50.85 lakhss. The break- up of total pulation of SUDA area as per 2011 Census for SMC and surrounding 195 villages is shown in the table below:

Table 129: Break-up of total population of SUDA , 2011

Total Population of SUDA- 2011	
Population within SMC	44,67,797
Population outside SMC (including 195 villages)	6,17,759

About 88% of the total population resides in SMC area. The decadal population growth of SMC area is shown in the table below. The decadal growth rate during the last three decades is more than 62%, 76% and 55% respectively, which highest for any city in India.

Table 130: Decadal growth rate of population within SMC area

Year	Population (as per Census)	Decal Growth Rate
1981	9,99,373	
1991	16,24,135	62.52%
2001	28,68,603	76.62%
2011	44,67,797	55.75%

The population in the region outside SMC within SUDA boundary is hardly 12% out of the population. The decadal growth rate of the entire SUDA area is shown in the table below.

Table 131: Decadal growth rate of population within SUDA area

Year	Population (as per Census)	Decadal Growth Rate
1981	11,20,366	
1991	17,79,636	58.84%
2001	31,05,124	74.48%
2011	48,05,101	54.74%
2011	50,85,556 (newly extended area)	-

The growth rate increased also accounts to the higher migration due to trade and economy.

SMC population is increased at a very higher growth rate comparison with rest of SUDA. It indicates that SMC serves as a growth magnet which attracts the people for living.

The basic objective of the Development Plan is to achieve the balanced and sustainable growth of urban and rural centres within the development area. Planners are invariably most concerned with population projections which form the framework for setting targets expected to be achieved within a specified time- frame, be it for land use, services or facilities. The population has been worked out ased on different methods of projection, factual information and justified assumption. A committe was formed to assess the population projection of the SUDA area for te target year of 2035. The committe submitted the report as below:

18.2 POPULATION PROJECTION

The concepts of population estimates and population projections often are confused even though the distinction between the two is relatively simple and straightforward. Both concepts involve the generation of a number that is intended to indicate the size of the population of a given geographic area at a specific point in time. Both techniques make use of the basic demographic equation:

P2 = P1 + B - D + I - O

It indicates that the population at any given point in time (P2) is a function of the population at a previous point in time (P1) plus the amount of natural increase (births minus deaths) and the net migration (in-migration minus out-migration) during the interim. As per Census of India-GoI, basically there are two types of population projection methods:

1. Component and Non-component methods
2. Mathematical methods

Both methods have different characteristics so that they are used at large scale and small scale respectively. For projecting the population of Surat, different type of methods have been used, they are:

1. Arithmetical increase method (AIM)
2. Incremental increase method (IIM)
3. Geometrical increase method (GIM)
4. Geometric general method (GGM)
5. Ratio and correlation method (RCM)

All the above methods are applied to village-wise population for past five decades. Population totals are derived as per the administrative boundaries of SMC and SUDA as per existing status (year 2011) of administrative inclusion.

18.2.1 ARITHMETICAL INCREASE METHOD

Rate of population increase is constant and expression is

$$\frac{dp}{dt} = K_a$$

Where Ka is an arithmetic constant. The formula is, P_future = P_last + (K_a) (t_future - t_last) and,

$$K_a = \frac{\sum_{i=1}^{x} Kai}{x}$$

Where x = number of past records time intervals. This methods is more or less a straight line projection method where the projected values follow a uniform rate of growth, as obtained from past trends without consideration of any other effects.

18.2.2 INCREMENTAL INCREASE METHOD

In incremental increase method not only average increase but difference of increment is also add. So that method is focus on variation of increment.

Pn = P+ n.X + {n (n+1)/2}.Y

Where,

n = difference of future and present decade Pn = future population

P = Current population

X = average population increment Y = average of increment

18.2.3 GEOMETRICAL INCREASE METHOD

In this method the percentage increase in population from decade to decade is assumed to remain constant. The formula used is as,

$$P_n = P(1 + \frac{I_G}{100})^n$$

Where, I_G is the Geometric growth rate, *n* is the number of decade with *P* as present population. GIM method gives higher population projection results and for prevailing condition in Surat this type of growth is not suitable.

18.2.4 GEOMETRIC GENERAL METHOD

Given the case of Geometric General method here,

$dP/_{dt} = KgP$

Where, P = Present population, t = time, K_g is the arithmetic growth constant which altogether are used to find projections through Integrated population formula:

$dP/_{dt} = KgP$, cross multiply $dP/P = K_g dt$, integrate

$$\int_{P_1}^{P_2} \frac{dP}{P} = K_g \int_{t_1}^{t_2} dt \text{ with } \ln P_2 - \ln P_1 = K_a (t_2 - t_1), \text{ solving}$$

for K_a and, $K_g = \frac{\ln P_2 - \ln P_1}{t_2 - t_1}$, substituting

$\ln P_2 = \ln P_1 + K_g (t_2 - t_1)$

At any P and corresponding t

$\ln P = \ln P + K_g (t - t_1)$

$P = e^{\ln P + Kg (t - t1)}$

Using this method, it was observed that growth rate of projection are worked out as more than 70, 95 and 100 % for future three decades respectively considered under projection.

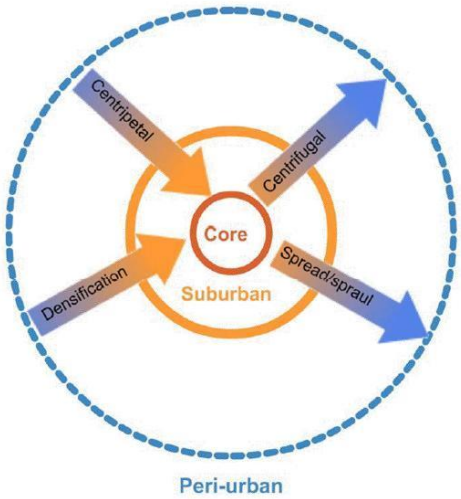
18.2.5 RATIO & CORRELATION METHOD

In this method, average Growth Rate was obtained for 6 decades for all 125 villages & Surat City within SUDA. The future growth of population was kept limited to 300 ppha density (considering future planned development through T. P. Schemes). This is an ideal limit for healthy atmosphere and infrastructure facilities provided and maintained properly. However, Puna, Godadara and Amroli units seems to be already congested in 2011, in these areas the population density is already more than 300 ppha hence, 2011 population was kept constant for these 3 areas while projecting future population leaving no scope for further development. The procedure followed in the method was as below:

- Calculate six decade growth rate for all villages and generate its average growth rate for individual.
- Classify (Categorization) all villages as per growth rate. A-1, A-2, A-3, A-4, B, C, D, E, F in different 9 categories.
- All villages arrange as per growth rate category and then take average as per particular group and that average growth rate use for population projection to every category individual.

Population projection in ratio & correlation method is under control and direct dependency of density. This method is more reliable because it takes care by giving attention to city physical characteristic and its capacity to accommodate population. The ***Table 132*** below shows the summary of village classified under each growth rate group.

Figure 61: Peri- Urban



In population projection, First decade 2011-21 growth rate is kept almost the same and then for 2021-31 and 2031-41 growth rate is reduced somewhat as many areas of the city achieved base line 300 ppha density and these areas are restricted for the population increase. Citizens will be shifting to other areas of the city and so pulling factor will be in effect towards maintaining the natural density limit.

Table 132: village classification as per growth rate

Village	Group								
	A-1	A-2	A-3	A-4	B	C	D	E	F
G.R.	Less than 0.25	0.25 to 0.50							
Choryasi	31	13	9	7	8	3	1	1	1
Kamrej	8	5	2	2	0	0	0	0	1
Olpad	13	4	0	0	0	0	0	0	0
Palsana	10	3	1	1	2	0	0	0	0
Total	62	25	12	10	10	3	1	1	2

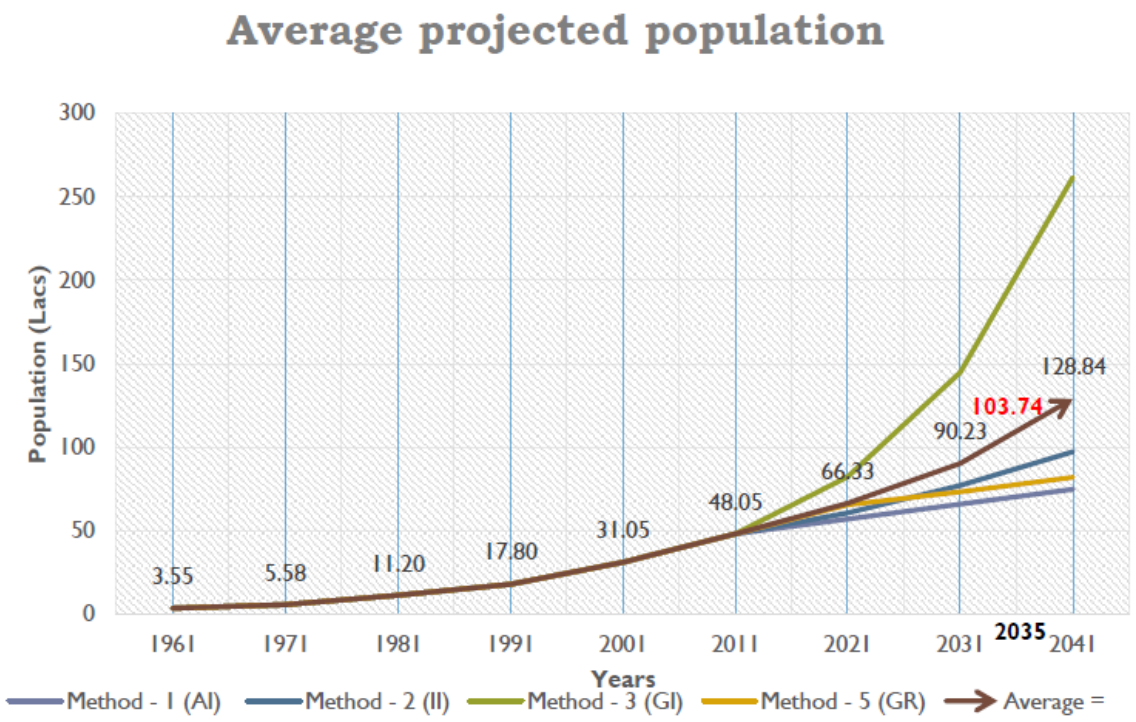
Table 7 shows the calculation summary for population projection using different methods. Detailed calculation for all the villages using all the methods are appended in the end of document in different appendix as mentioned earlier in the chapter.

Table 133: Population Projection for DP 2035

Projection Methods	**Year**								
	1961	**1971**	**1981**	**1991**	**2001**	**2011**	**2021**	**2031**	**2035**
Method-1 (AIM)	3.55	5.58	11.20	17.80	31.05	48.05	56.95	65.85	69.41
Method-2 (IIM)	3.55	5.58	11.20	17.80	31.05	48.05	60.69	77.07	84.67
Method-3(GIM)	3.55	5.58	11.20	17.80	31.05	48.05	82.31	144.86	182.88
Method-5(GRM)	3.55	5.58	11.20	17.80	31.05	48.05	65.37	73.13	78.01
Average=	**3.55**	**5.58**	**11.20**	**17.80**	**31.05**	**48.05**	**70.69**	**105.93**	**103.74**

In average population for the horizon year is approximate 3.5 times from today. It is due to the effect of GIM method that give boosted results. In mathematical model, the effect of physical and other demographic characteristics are not visible and its effect not count as required. Following is the average of projected population for Surat using four different methods. It is worked out that a population of 103.74 Lacs in the year 2035 will be used for framing of capital investment plan under the city development plan with 2035 as horizon year. Following graph shows output from various four methods along with average value of the results.

Figure 62: Population projection for DP 2035



If the current growth rate tend to continue, the total population of the SUDA area is expected to go up to 66.33 Lacs by 2021 and 90.23 Lacs by the year 2031. The growth will require additional infrastructure, services and facilities to cater the needs of future population and to facilitate high quality of life within the city.

After this report was submitted by the committe, the State Government extended the limit of SUDA by adding new 100 villages, having population of about 2.88 lakhss as per 2011 Census. The coommitte projected the population of about 104 lakhs by 2035. Considering the existing land- use of the newly added 100 villages and upcoming projects of national importance in the SUDA area, it will not be out f place to have an estimate of 110 lakhs population by the year 2035 in the whole SUDA area comprising of 1351 sq.km. Accordingly, SUDA adopted the estimated population of 110 lakhs by the year 2035 and accordingly the proposals have been framed. Considering the growth rate from 2011 to 2035 as recommended by the Committee and if the target population is 110 lakhs then the projected population for 2021 shall be 73 lakhss which will rise to 98 lakhs by 2031.

19 PROPSED LAND- USE (SUBMITTED UNDER SECTION 9)

19.1 INTRODUCTION

The Development Plan, 2035 is prepared considering the demand of projected population of next two decades for the entire area of 1351 sq.km. of Surat Urban Development Authority (SUDA). This total area consists of Surat Municipal Corporation (SMC) Area and 195 villages under SUDA. Surat ranks 4th fastest growing city in a global study of fastest developing cities conducted by The City Mayors Foundation, an international think tank on urban affairs. In fact, it is the fastest growing Indian city in terms of economic prosperity. However, as it continues to grow and expand at such high rate, the residents of the city are facing the issues such as traffic congestion , high cost of housing and real estate, parking issues, lack of public transport, increased demand for amenities, gardens, open spaces and much more. For Surat to grow as a sustainable city with inclusive development, an important industrial hub and commercial centre of the country; it must organize its land resources carefully. Following are some of the major considerations taken into account for deriving and formulating proposals of the Development Plan 2035.

19.2 PLAN OBJECTIVE

The first step in preparation of development plan is the identification of the land use characteristic and existing city structure situation. Detailed survey of existing situation has been made withal length in part one of the report. While formulating the proposals of development plan, the following broad principles have been kept in view.

- To have optimum utilization of urban land and to minimize the spread of urbanization in rich agricultural irrigated area
- To develop multi modular transportation considering high growth of city and upcoming national projects such as DFC, EW, Metro, Bullet train, DREAM City, etc. and creating transportation corridor by way of ring roads, DP Road and radial conduit roads
- To decongest the city by locating new development areas to ease the pressure on city Providing balanced development with environmental protection and adequate green spaces
- Diversification of economic activities

Thus, the main objectives of the development plan would be to achieve efficient functioning by restructuring the city, by means of conservation, new development and to serve as a policy framework with long term perspective to guide future developments. One of the important considerations while formulating the revised development plan proposals has been the need to protect the best of existing character of Surat to develop its structure and suggest appropriate measures to overcome remedies obstructing the healthy growth of city.

19.2.1 PLAN AREA

The present area of Surat Urban Development Authority is admeasured 1351 sq.km. This includes the 326 sq.km. area covered by Surat Municipal corporation and 195 village settlements.

19.3 METHODOLOGY ADOPTED

The methodology adopted for the formulation of development plan was to prepare a base map using GIS Techniques and develop GIS database. The data from various surveys and studies available with the SMC and other agencies was collected. Since comprehensive data for the entire plan area was not available, the information regarding existing land use, infrastructure facilities, housing, environment were collected from all 195 villages of SUDA area. For the preparation of the Development Plan, a number of study groups were formed for arriving at the proposals of the Development Plan. All this data was used to work out integrated proposal in the light of the present state of development, with the assessment of the existing conditions and accounting for the potential resources and constraints for future development and trends on the basis of known parameters.

19.4 PLAN PERIOD

The SUDA had proposed the first development plan in 1980, which was sanctioned by the Government on 31st January, 1986 and came into force from 3rd March, 1986. The first plan was prepared for the plan period up to 2001. The process of urbanization is a continuous phenomenon. Hence the development plan is revised every 10 years. The first revision of development plan was submitted in 1987 which came into force from 15th September, 2014. The plans visions were based on the existing situation prevailing at that time. However the process of planning depends upon a number of variables such as population growth, economic activities, development of counter magnets, and the nature of development. To deal with these factors, it requires to review the development process at moderate time intervals. SUDA has thus taken up the study of the preparing the second development plan to stream line the development to achieve the long term requirements. For preparation of development plan, plan period up to 2035 has been considered. This revised development plan also requires to be reviewed at an interval of 10 years with a view to accommodate and to review the programme of implementation and also to assess requirement and needs created by new technology and new development.

19.5 EXISTING CONDITIONS AND GOVERNMENT POLICIES

A detailed study and analysis of existing conditions was carried out. This included a land use study and analysis, studying the existing government policies applicable to the concepts considered. Analytical study of the zones and areas developed and requirements were carried out. Digital Elevation Models were prepared to as a part of land suitability analysis for future development to minimize the effects of floods.

19.6 SUGGESTIONS FROM STAKEHOLDERS

Extensive public consultations and stakeholder meetings were carried out which included experts from several Government and Semi Government institutes, Gram Panchayats, NGOs, educational, research and professional institutes such as SVNIT and eminent citizens of Surat. Eight working groups of experts from various fields were formed focusing on key areas including GDCR, housing and socio economic studies, Public transportation, Physical & Social infrastructure, Environment and Industries. The inputs from the consultations were studied and reviewed, detailed analysis of

existing situation was conducted and proposals for the Development Plan were formulated based on the inferences.

19.7 VISION AND THE PRINCIPLES OF GROWTH MANAGEMENT

The vision, objectives and the principles were identified after multiple discussions and deliberations played a crucial role in formulating the proposals of this Development Plan. The major principles that shaped the proposals include optimum utilization of urban land, multi modular public transport, creation of green network, encouraging sustainable and affordable development. The vision and principles are further detailed out in the following chapters.

19.8 PLANNING CONCEPT

19.8.1 VISION

In the revised development plan proposals, effort have been made to protect the best existing character of Surat. The vision envisaged for further development of Surat is as below.

An economically vibrant and sustainable Surat with diverse opportunities and rich culture; where all citizens enjoy a safe and liveable environment with good connectivity and infrastructure of Global standards.

19.8.2 AIM

Surat urban development authority is preparing the second revision of development plan for 2035. The aim of this development plan is to

Formulate an efficient, sustainable and inclusive development plan of the SUDA area so as to regulate and guide the planned and balanced urban growth in the region by 2035, resulting in better quality of life of people under the provisions of

Gujarat Town Planning & Urban Development Act, 1976 and

Gujarat Town Planning & Urban Development Rules, 1979

- To act as growth engine of South Gujarat region
- Efficient, safe, sustainable, affordable and multi-modular public transport
- Promotion of green city and environment friendly development
- Diversification of economic activities with hinterland integration
- To facilitate equitable supply of land and resources

19.8.3 PRINCIPLES

These principles are drafted to create and sustain the best character for Surat without losing the original cultural balance. A prosperous and secure future for the city is encapsulated in these principles.

19.8.3.1 Optimum utilization of urban land

The most important natural resource, so as to ensure sustainability and avoid adverse land use conflicts. There is a need to ensure high quality delivery of services of ecosystems that come from natural resource base and to cater to the needs of agricultural requirement.

19.8.3.2 Multi modular public transportation

- Enhance mobility options by proposing public transport like metro and integrating it with the existing BRTS routes
- Organizing feeder services to public transport
- Decongesting roads by promoting the use of public transport

19.8.3.3 Guided and balanced inclusive development

- To have a clear implementation strategy for development that guides development towards the final vision
- To support all scales of development so that holistic inclusive development for the benefit of population can take place

19.8.3.4 Facilitating diversification of economy

- To promote economic development beyond diamond, textile and Jari Industries for diversification into various fields like IT , medical, tourism, etc.
- Support economic activity of various scales at various levels of economic ladder
- Encourage industrial development to increase employment

19.8.3.5 Emphasis on green development

- Connect the gardens and open spaces and roads with a network of “Green Streets”
- Provide adequate gardens, parks and public open spaces
- Promote green development through GDCR

19.8.3.6 Preserving water channels/ water bodies/ natural drains

- To preserve the water bodies and natural drains by discouraging development around water bodies
- To promote agricultural activities surrounding water bodies

19.8.3.7 Improved safety and security environment

To create an environment where safety and security of the population shall be of utmost importance

19.8.2.8 Providing adequate space for recreational activities

- There is a lack of recreational activities in Surat. Adequate spaces shall be provided to promote and develop recreational activities in the area
- To have spaces for public interactions and informal gatherings for recreation

19.8.3.9 Providing balanced development with environmental protection and adequate green spaces

- Promote development that is based on principles and best practices of sustainability
- Protect and enhance environmental assets to create development that is environment friendly

19.8.3.10 Shifting of existing industries outside residential area

Shifting of various polluting industries from existing residential zones, negatively affecting the health standards, environment and overall liveability

19.9 LOCATIONAL CHALLENGES

The City of Surat has its locational challenges in terms of water bodies. City has develped along 37 km of Tapi river which is prone to frequent floods. About 60 km of Khadi (creeks) of various width is passing through the Surat city. There is a huge network of Canals. Surat being close to the Arabian sea is prone to Cyclone. In future, even Tsunami can not be totally ruled out. These challenges have to be given due thought while making land use proposals for 2035.

19.10 OTHER MAJOR CONSIDERATIONS

In regional context, there are other urban development authorities present in South Gujarat. SUDA, Navasari Urban Development Authority, Bardoli Urban Development Authority and Bharuch Urban Development Authority cover almost entire region between Navsari and Bharuch excluding only few villages. In this sense, the entire region could be considered as a big metropolitan area and therefore, the Development Plan 2035 of SUDA should be prepared considering infrastructural needs o this metropolitan region.

Based o the Existing land use, upccoming DREAM City project and inclusion of Hazira Industrial Area in the development area of SUDA, major 9 growth nodes could be easily identified. These 9 nodes must be considered while framing the land use proposals for the requirement of 110 lakhs population by 2035. The nine nodes identified are Olpad, Kathor, Kamrej, Kadodara, Palsana, Sahin ,DREAM City, Hazira and Tena.

It is pertinent to note that in the Development Plan of 2004, out of total area of 715 sq.km., about 52% of land, i.e. 373 sq.km. was proposed to be urbanized land for the purpose of development. The remaining 48% was put under non- urbanized land use. Considering the additional 100 villages in

the SUDA area after December, 2015; the existing land use indicates that out of 1351 sq.km. of the total SUDA area, only 289 sq.km. is under urbanized land use which is about 21% of the tota SUDA area. Considering the additional 60 lakhs population to be acomodated in the SUDA area and important projects like DREAM City, Expressway, DFC, Bullet train, Metro, Premiere institutions in Surat, it is proposed to increase the percentage of urbanized area within the SUDA boundary. Approximately, 787 sq.km. out of 1351 sq.km. area has been proposed as urbanized area and the rest 564 sq.km. (42%) has been proposed under non- urbanized land use for year 2035.

19.11 ZONING

To control the development in the newly extended area of SUDA comprising of villages which are not part of the Kathor Development Plan and Hazira Development Plan where urbanizable land use has not been proposed, has been put under Agriculture zone. Since many NA permission might have been obtained by the land owners in this newly extended area where Agriculture zone is proposed, the land owner is allowed to develop the land as per the NA permission irrespective of the Agriculture zone. The layout shall be revised only for the purpose for which the NA order has been obtained.

The proposed urbanized area of SUDA is broadly classified in the following zones:

- Residential
- Industrial
- Commercial
- Institutional/ Educational
- Recreational
- Logistics
- Surat Industrial Growth Region

The detailed proposal for each zone is described below:

19.11.1 RESIDENTIAL ZONE

In DP 2004, 204 sq.km. of area including residential zone adjacent to 90 m Outer Ring Road(ORR) was proposed as residential zone. As per the existing land use, about 102 sq.km. residential zone has been consumed, while remaining 102 sq.km. residential zone as per DP 2004 is still left which can be used to cater future demand.

According to census 2011 data, total population within SUDA boundary was around 50 lakhs. The population projected for 2035 is 110 lakhs. This means that there is requirement of planning for additional 60 lakhs population which is going to reside in SUDA by 2035. As per the UDPFI Guidelines, the population density for the residential use shall be 250 Per Hectare (PPH). If we want Gross Residential Density of 250 PPH for additional 60 lakhs population, we require 240 sq.km. of residential area. It means we have to propose residential zone to the tune of 342 sq.km. of total area.

While planning for the residential areas, the major factor considered is locating residential zones outside the 'flood-prone' areas. The special attention is given considering the history of frequent

floods within SUDA, especially SMC boundaries. For this, a Digital Elevation Model (DEM) of entire SUDA area was prepared. Such model gives details about the area susceptible to inundation under various flood conditions. Once the DEM was ready, it was overlaid on the existing land-use map of SUDA and then location for the new residential areas to be proposed were decided accordingly.

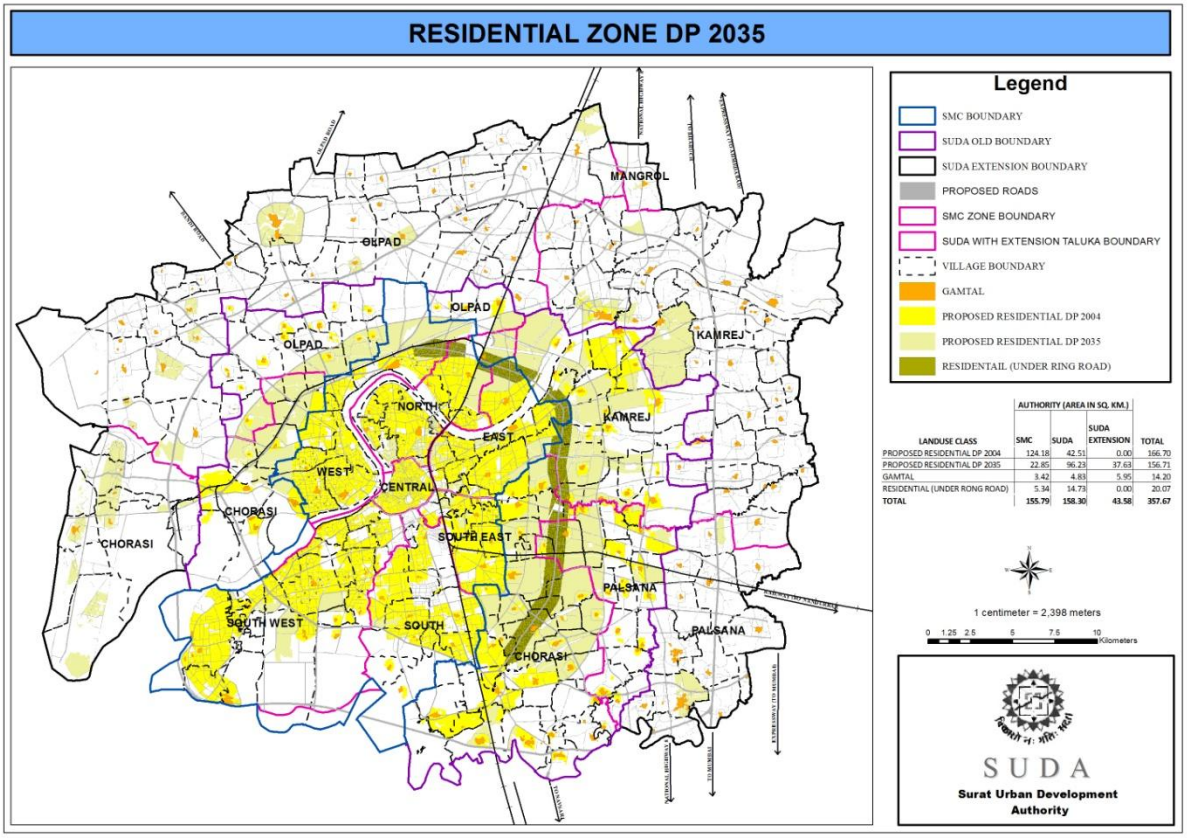
The new residential zone to accomodate the additional population has been proposed considering the DEM. It is proposed to cover the area within SMC boundary for residential zone. After inclusion of land having potential for residential development within SMC area, the proposal for new residential zone has been made within the 90 m ORR. The rest f the residential area has been proposed on the outer side of the 90 m ORR, bounded by 60 m Ring Road. As mentioned earlier, Olpad and Kamrej growth nodes require control by zoning and therefore, these two nodes have been provided with residential zoning. Gamtals as proposed in 2004 DP have been kept intact and continued to be Gamtals. For the natural growth of the villages, the Village Extension Zone has been proposed up to 200 m and 300 m from the boundary of the existing Gamatls depending upon the population of the villages as per Census 2011. If the population is less than 5000, the Village Extension Zone should be 200 m from the boundary of the Gamtal, otherwise it should be 300 from existing Gamtal boundary. The Village Extension Zone shall not be applicable in case of deemed Gamtal.

The existing polluting industries within Surat city area are proposed to be shifted to another area. This area has been proposed for residential zone as per Development Plan, 2035. This residential zone shall be available for residential use only after the closure of the existing industries. Also, about 8.58 sq.km. of land has been proposed for reservation for different acquiring bodies like SMC, SUDA, GHB, PWD, etc. for the purpose of developing these lands for housing. The land under these reservations has been listed in the list of reservations. This area of reservation is not included in the proposed area under residential zone.

The Government of Gujarat has issued guidelines for construction of affordable housing within the development authority area. It is proposed to allow the affordable housing project as per the Government guidelines in any of the urbanized land use. The beneficiaries shall be as per the guidelines of the Government.

Total area proposed under Residential zone (including DP 2004 proposal) is 358 sq.km., which is 45.45% of the total urbanised area proposed in DP 2035.

Figure 63: Residential Zone Proposals- DP 2035



19.11.2 INDUSTRIAL ZONE

Surat is one of the industrial hubs of the nation, attracting large labour forces from across the nation for employment. This is one of the reasons of large share of migrants' population in the city over the decades. Hazira is one of the biggest industrial centres in the country, housing variety of industries in terms of scale and nature. Hazira is now made a part of SUDA jurisdiction after extension of SUDA in December, 2015 under the State Government's resolution. Other than this, there are other pockets of textile, diamond and Zari industries across the city.

The level of industrial growth over last couple of decades has been tremendous. All the areas proposed as industrial zones in DP 2004 have been occupied by different types of industries and moreover, the areas outside SUDA jurisdiction have experienced high level of industrial development due to the unavailability of industrial zones for development within SUDA. The major industrial zones proposed in DP 2004 and later on developed as industrial pockets are Pandesara GIDC, Udhna GIDC and Katargam GIDC. However, Navagam did not develop to its potential even though it is located in proximity of National highway.

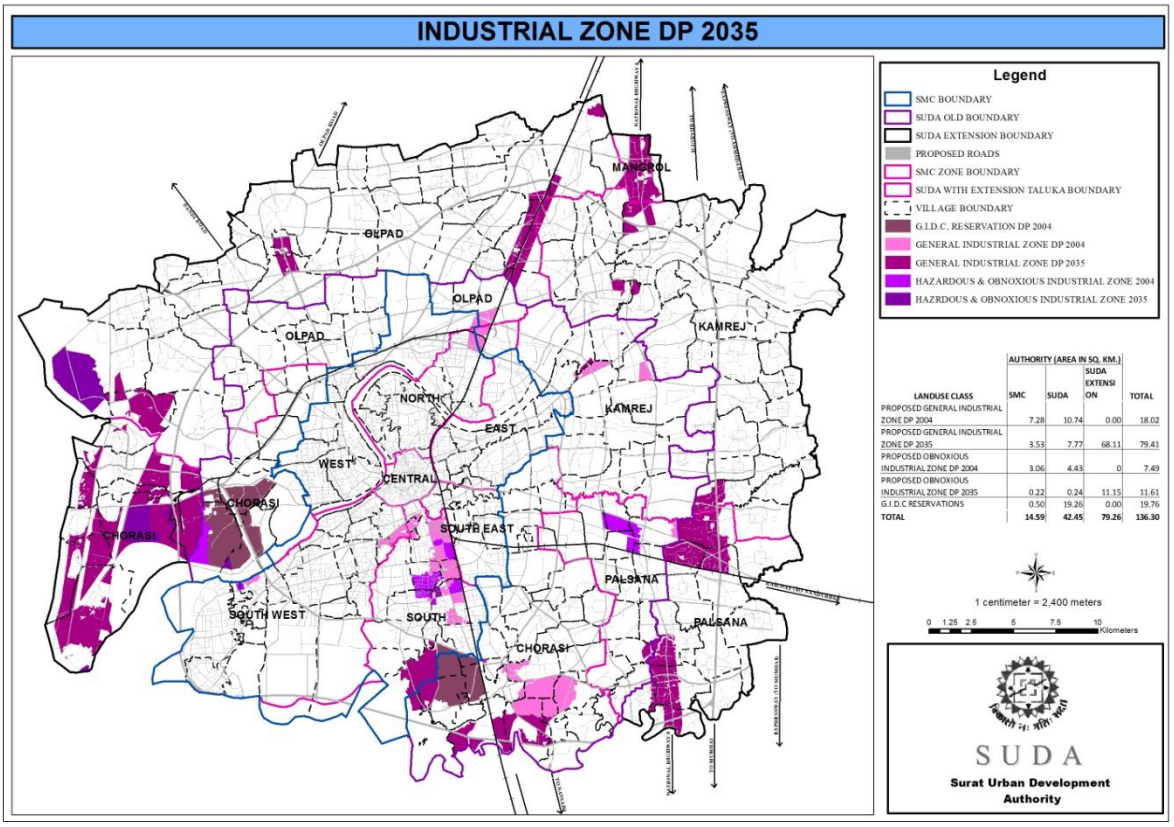
At present, there is hardly any scope of industrial development due to consumption of industrial zone. There are also various polluting industries located within residential zones, negatively affecting the health standards, environment and overall liveability. The existing polluting industries within the residential area proposed to be shifted admeasures about 4.3 sq.km. (1075 acres). For such industries to be shifted outside and to cater the potential of development, 136 sq.km. of area is proposed as industrial zone in the Development Plan- 2035, which includes about 9 sq.km. (2200

acres) of Obnoxious and Hazardous Industrial Zone in the newly added Pinjarat village. The location is on the north of existing Hazira area, under huge Government vacant land with access to water bodies. The site is in vicinity of 120 Regional Ring Road, 90 m ORR and the Utility Corridor. Only 22 acres of the land is under the private ownership while rest is the Government land. Kadodara, Palsana, Sachin and Tena growth nodes are proposed for the industrial zone considering the existing land use and the access to the existing National Highway and proposed Ring Roads. The Industrial Zone and Obnoxious and Hazardous Industrial Zone existing in DP 2004 have been continued including the Hazira Industrial Zone as per the erstwhile Hazira Area Development Authority's development plan. Industrial Corridor along broad gauge railway line near Gothan- Kosad has been proposed.

Since the acquisition proceedings by OGNC, KRIBHCO and GSPCL is over in the Kavas- Bhatpore area, the portion which was not acquired has been proposed as Obnoxious and Hazardous Industrial Zone.

Total area proposed under Industrial zone (including DP 2004 proposal) is 136 sq.km., which is 17.32% of the total urbanised area proposed in DP 2035.

Figure 64: Industrial Zone Proposals- DP 2035



19.11.3 SURAT INDUSTRIAL GROWTH REGION (SIGR) ZONE

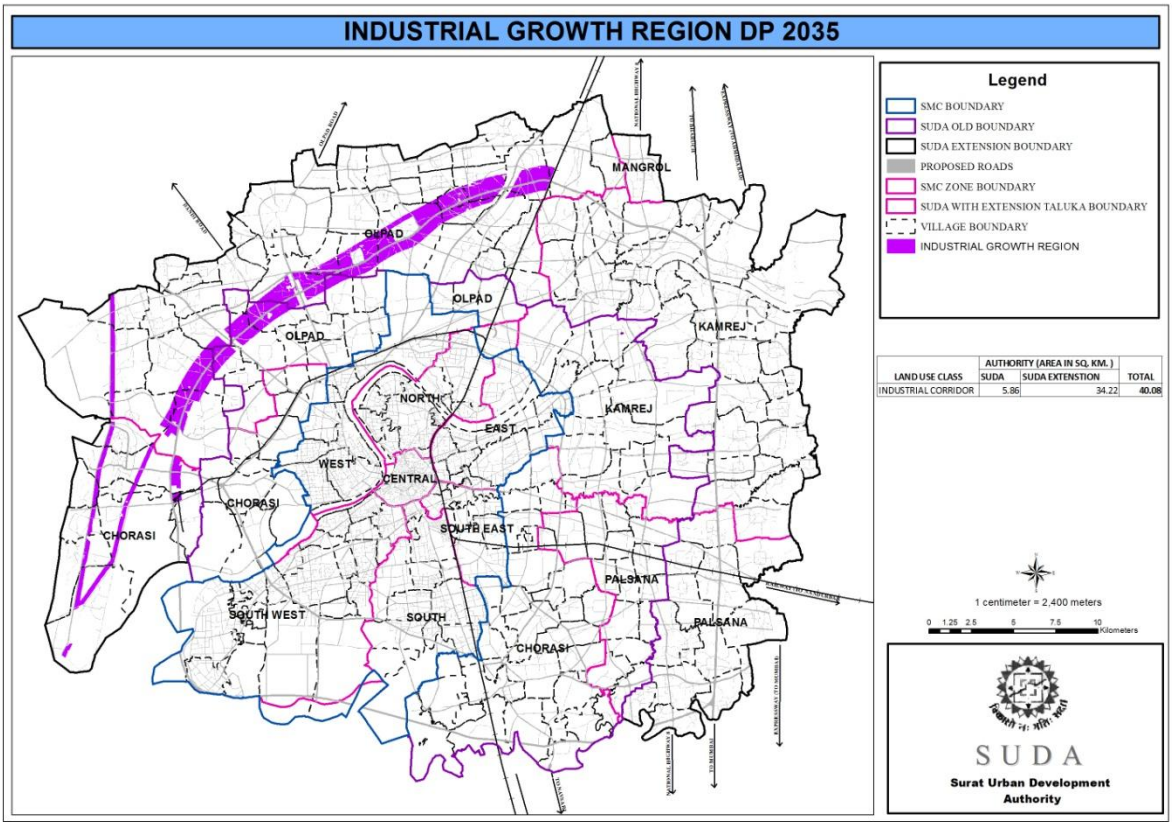
Hazira is one of the key industrial areas in the state of Gujarat and is now included in the development area under the jurisdiction of SUDA. There are critical infrastructure facilities of Reliance, ESSAR, Shell, L&T. Adani, KRIBHCO, etc. Hazira port has been developed on BOOT basis and is operational since 2012. As per GMB estimate, the Hazira Port is going to handle about 84 million

MT of cargo by the year 2030. In order to ensure that Hazira port is connected to the rest of the country, it is essential to have a strong dedicated network for transportation and communication. The evacuation of this huge volume of cargo is contingent only upon Hazira Port is connected to the network of Indian railway and the DFC project under implementation otherwise it will choke the roads around Surat city. SUDA has conceived a plan to develop industrial growth region of about 30 km long, having 1.445 km width from Hazira to the existing BG Delhi Mumbai railway line near Gothan admeasuring about 40 sq.km.

On the request of the Gujarat Maritime Board and considering the demand of the Hazira Industrial Association, this industrial growth region has been proposed in the Development Plan - 2035 of SUDA in which following cross-section is suggested subject to the recommendation by the experts who may be engaged by the SPV to be formed exclusively for this game changer project.

It is proposed to develop this region SIGR, by mechanism of Town Planning Scheme under the provisions of Gujarat Town Planning and Urban Development Act, 1976. For expedient implementation of this project, it is proposed to form a SPV which can act as Development Authority under the provisions of the Gujarat Town Planning and Urban Development Act, 1976 and can prepare the TP Scheme and allot the Final Plots for the specific purpose of residential, commercial, Logistics and Industries. Roads and Railway network can be proposed for the balanced development of this region as well as the surrounding areas. Hazira rail and road project is being developed by Govt. of Gujarat through GMB and GIDC's equity participation under non Government railway model in Hazira Infrastructure Private Limited (HIPL).

Figure 65: Industrial Growth Region- DP 2035



The typical cross-section of this Industrial Growth Region could be as shown in the tablebelow:

Table 134: cross-section of this Industrial Growth Region

Sr. No.	Proposed Land-use	Width
1	Utility Corridor	250 m
2	Railway Land	30 m
3	Industrial Zone	500 m
4	Part of Regional Ring Road	120 m
5	Logistics Zone	200 m
6	Road	45 m
7	Proposed Residential Zone	300 m
	Total Width of the Corridor	1445 m

The development permission shall be given in this zone once the TP scheme is framed under the provisions of the Gujarat Town Planning and Urban Development Act, 1976.

Total area proposed under Industrial Growth Region zone is 40 sq.km., which is 5.09% of the total urbanised area proposed in DP 2035.

19.11.4 COMMERCIAL ZONE

Surat being the second largest city of Gujarat after Ahmedabad and having proximity to the Metro city of mumbai, lot of trade and commerce activities are happening in the Surat city. Considering the vision of preparing this Development Plan for SUDA to be growth engine of South Gujarat region, dedicated commercial zone shall help in increasing the commercial activity in Surat. About 8 sq.km. of commercial zone was proposed in the DP 2004. New commercial zone has been proposed in Chaltan village near the National Highway-8, which has potential to develop as a commercial centre for APMC. Commercial zone has also been proposed in the Surat Industrial Growth Region near the junction of 120 m Regional Ring and 90 m Radial Roads in Kareli, Masma and Narthan and their adjacent villages. The commercial zone proposed in the Kathor Development Plan which is now included in the SUDA area, is proposed to be continued as commercial zone since it is in vicinity to the National Highway- 8.

Total area proposed under Commercial zone(including DP 2004 proposal) is 12 sq.km., which is 1.50% of the total urbanised area proposed in DP 2035.

19.11.5 PUBLIC PURPOSE

As per provisions of section 12(2) of the Act, the draft development plan shall provide for all or any of the following public purposes:

a) proposals for the reservation of land for public purposes, such as schools, colleges, and other educational institutions, medical and public health institutions, markets, social welfare and cultural institutions, theatres and places for public entertainment, public assembly, museums, art galleries, religious buildings, play-grounds, stadium, open spaces, dairies;

b) transport and communications, such as roads, highways, railways, and airport, including their extension and development;

c) proposals for water supply, drainage, sewage disposal, other public utility amenities and services including supply of electricity and gas;

d) reservation of land for community facilities and services;

e) proposals for designation of sites for service industries, industrial estates and any other industrial development on an extensive scale;

f) proposals for flood control and prevention of river pollution;

g) proposals for the reservation of land for the purpose of Union, any State, local authority or any other authority or body established by or under any law for the time being in force.

It is necessary for the performance of statutory functions to take private as well as Government land for public use as the claim of the whole community is always superior and public necessity is greater than private interest and claim of an individual.

It is the duty vested in the Area Development Authority and it is the duty vested in the State Government to envisage all the future need of the society and of proper and systematic development of the area. If colleges or residential units are allowed to be constructed on the land upon which sewage treatment plant is necessary today, it cannot be removed in future, when there will be actual need for sewage treatment plant. All the necessary provisions ought to be made in advance for the subjects referred to in Section 12 of the Act so that whenever actual development is to be carried out either for constructing schools, colleges, gardens, medical and public health institutions, markets, places for public entertainment or construction for water supply, drainage or sewage treatment plant etc., it may not lead to a situation that no such development can ever be carried out. Therefore, there is need for reservation of the land for the public purpose as contemplated in the Act.

In the last 3 decades, the population in SMC area has recorded a decadal growth rate of more than 62%, 76% and 55% during 1981-91, 1991-2001 and 2001-2011 respectively. Development Plan of 2004 has anticipated the population of only 42 lakhss by 2011 for SUDA area. The actual population of SUDA area as per the last census 2011 is more than 49 lakhss much beyond the population projected in the 2004 Development Plan. Public facilities are necessary to be provided for the increasing population.

It is also pertinent to note that the State Government has extended the development area of SUDA from about 715 km^2 to about 1351 km^2 by adding another 100 villages having population of about 2.80 lakhss as per 2011 census by the notification of 9.12.2015 and 18.12.2015. Based on the past trend of population growth rate and the required planning intervention of the urban areas the

population of SUDA area for the target year of 2035 has been projected to be 110 lakhss. It means additional 60 lakhs people shall be living in SUDA area. Projects like, Expressway from Ahmadabad to Mumbai, DFC, High Speed Train, Bullet Train, Metro, DREAM City project, setting up of premier institutions / Universities, etc. is going to influence the Surat in a big way during the plan period of 2015-2035.

Moreover, the highly developed industrial pocket of Hazira Notified Area is also included in the new SUDA limits for which the Development Plan has now to be prepared. Hazira is one of the major ports of India. Development of Hazira having concentration of various large scale industries, has lot of implications on the planning proposals of the SUDA area. The existing industrial portfolio of Hazira includes industrial activities such as petrochemicals, fertilizers, heavy engineering, steel, energy and port related activities. More than 20 large and medium companies are located in Hazira, including KRIBHCO, ONGC, IOC, IPCL, BPCL, CAIRN ENERGY, NTPC, SHELL, GPCL, RELIANCE INDUSTRIES, L & T, ADANI Infrastructure, ESSAR, etc. Large industrial units are functioning in the Hazira area for which necessary infrastructure and planning inputs are required along with the comprehensive disaster management plan. Large scale movement of hazardous goods is also taking place to and fro from Hazira to different states through newly extended SUDA area. Moreover, Kathor development area, Sachin (Census Town), Kansad, Kadodara, Olpad, Sayan (Census Town), Amboli (Census Town), Kamrej, etc. are acting as magnet for the economic activities.

The need has arisen for reserving the land in the DP of SUDA for the various public purposes mentioned under section 12(2) of the Act for catering to the additional population and to satisfy the planning requirement.

SVNIT, being the technical institute of repute in Surat, SUDA took the expertise of SVNIT in analyzing the public purposes plots proposed in the Development Plan of 2004 and suggesting public purpose plots location to be reserved in this Development Plan - 2035 looking to the population growth rate and development happened and going to happen within the target year of 2035 in terms of its use, spatial extent and its location. Unique culture of the urban area as well as regional developments and national development policies were kept in mind for proposals.

SVNIT submitted the report in April 2016 and accordingly, the public purpose land are reserved in the SMC, Old SUDA and New SUDA area as per the provisions of section 12(2) of the Act, for various public purposes for acquiring agencies like SMC, SUDA, GHB, Custom department, R&B, GSRTC, Airport Authority, P & T, etc.

Under the provisions of the Act, the reserved land has to be acquired by consent, agreement or under the provisions of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

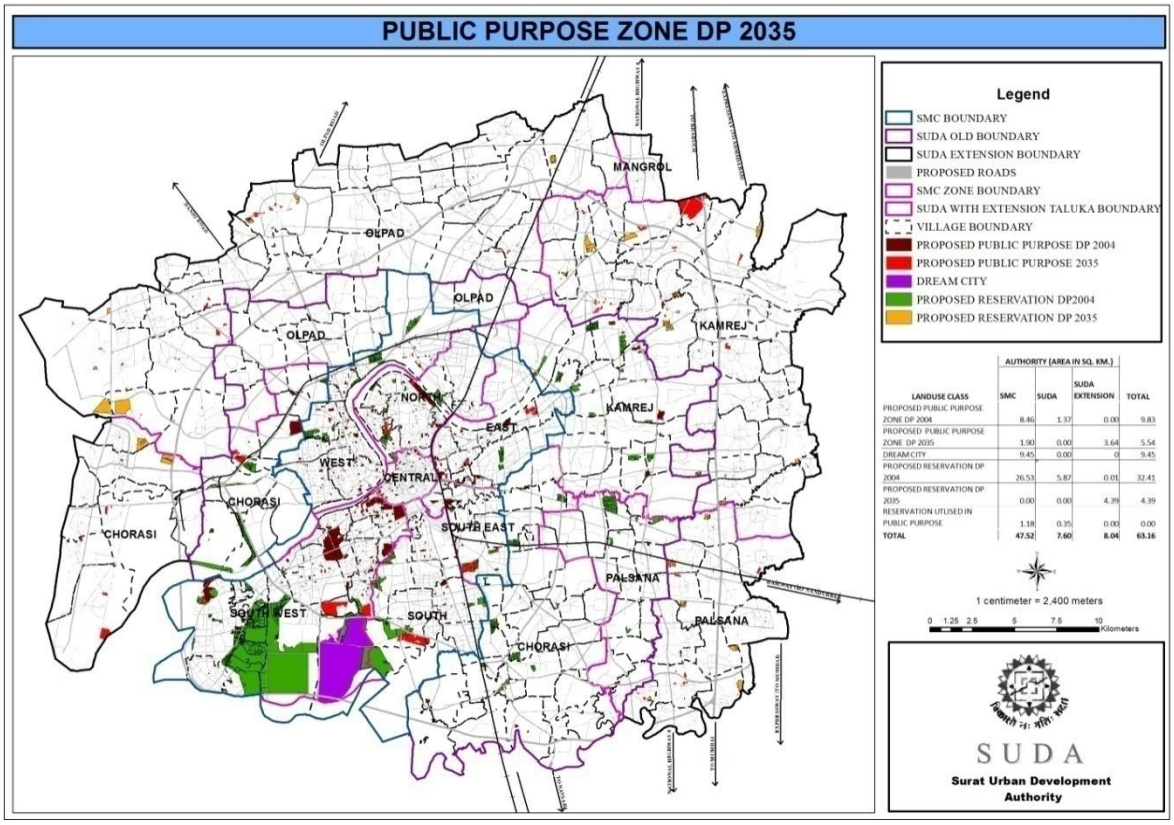
The Public Purpose zone proposed in DP 2004 has been continued in DP 2035.

Historical monuments, Government Buildings, etc. have been included in the Public Purpose zone.

About 36.54 sq.km. of the urbanized land has been proposed under reservation in the DP 2035. The list of reservation proposed in DP 2035 is given in ~~**Annexure- 7** of this report.~~ (removed)

Total area proposed under Public Purpose zone(including DP 2004 proposal) is 63 sq.km., which is 8% of the total urbanised area proposed in DP 2035.

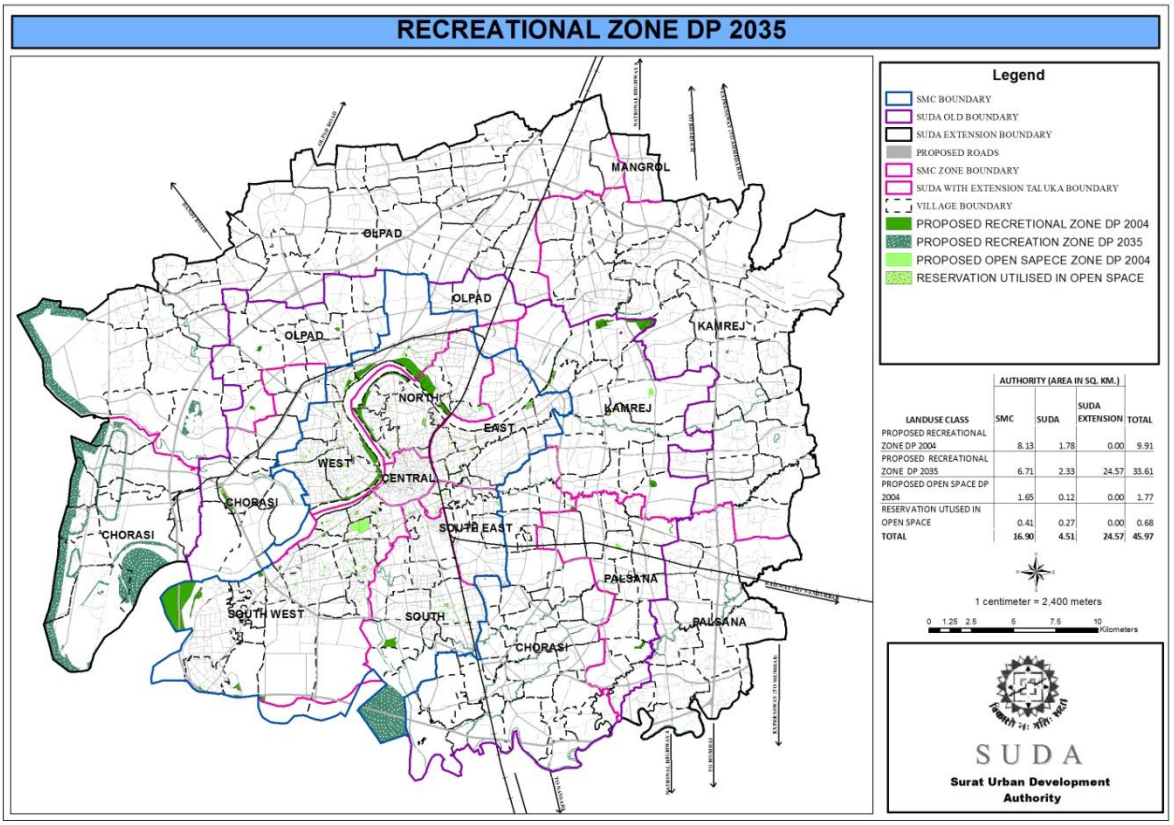
Figure 66: Public Purpose Zone Proposals- DP 2035



19.11.6 RECREATIONAL ZONE

Recreational spaces are indispensable part of any urban area. The most liveable places to live are those where there are equal opportunities to live, work and play. Open spaces, Parks and Gardens play a very significant role in the landscape of the city. They are important input for generating quality of life that people value and enjoy in the city. The land around existing Talavs are proposed for Gardens and Recreational uses. Garden and open spaces at the neighbourhood level can be obtained in the TP schemes. Considering the large area and future population of SUDA region, total 46 sq.km. of recreational spaces are proposed in DP 2035 as compared to 12 sq.km. proposed in DP 2004. The major portion of recreational spaces are proposed on southern part of SUDA in the Gabheni village on the Government Land.

Figure 67: Recreational Zone Proposals- DP 2035



AUTHORITY (AREA IN SQ. KM.)

LANDUSE CLASS	SMC	SUDA	SUDA EXTENSION	TOTAL
PROPOSED RECREATIONAL ZONE DP 2004	8.13	1.78	0.00	9.91
PROPOSED RECREATIONAL ZONE DP 2035	6.71	2.33	24.57	33.61
PROPOSED OPEN SPACE DP 2004	1.65	0.12	0.00	1.77
RESERVATION UTLISED IN OPEN SPACE	0.41	0.27	0.00	0.68
TOTAL	16.90	4.51	24.57	45.97

19.11.7 TRAFFIC AND TRANSPORTATION ZONE

In the light of the present traffic and transportation issues and in view of the transportation needs of this rapidly growing Surat city and the adjoining other developed areas, there is a pressing need to devise suitable transportation plan for the whole SUDA area which should have the integration with the other development areas outside the SUDA boundary. The transportation system for the city needs to be planned in a comprehensive manner, both for the passenger and goods traffic. The recommendations of the Comprehensive Mobility Plan made for SMC area as part of City Development Plan has been given due consideration for framing the proposals.

Lack of efficient public transportation system, parking issues, etc. have been taken care of while framing the proposals. Hierarchy of road system has been properly established for the efficient, safe, sustainable, affordable and multi- modal public transportation system.

A high quality, well connected and integrated transportation network is essential to ensure healthy growth, thriving economy and high liveability standard for a city. To avoid traffic congestion problems in future and allow easy movement of goods and people, a comprehensive road network comprising of Rings and Radials has been proposed in the Development Plan 2035.

A 90 m wide Outer Ring Road around the existing city boundary has already been proposed. New Regional Ring Road of 120 m width and 116 km length is proposed in the SUDA area. This Ring will act as a gateway for traffic towards Mumbai and Ahmedabad. Some part of this 120 m wide road has also been proposed parallel to the National Highway-8 and the proposed Expressway. This 120 m

road can be projected towards Bhruch-Ankleshwar Urban Development Authority in the north and towards Navsari Urban Development Authority in the south, which can extend up to Mumbai in future. Another 60 m wide Ring is proposed between 90 m and 120 m wide Ring Roads so as to accommodate the proposed residential zone. The part of this 60 m road is also proposed parallel to the national Highway 8 so that in case of emergency, this can act as an alternative path for going towards Bharuch, Ankleshwar in North and Navsari, Valsad, Mumbai in South.

All three ring roads are connected to the growth nodes and other major city centres through a network of major Radials of 90 m, 60 m and 45 m width. A combination of Rings and Radials is planned in such a way that everyone will have an access to one of these major roads from anywhere in the region at proximity of 3-4 km. 7 radials of 90 m width have been proposed in the SUDA area so as to have easy access from the adjoining area. 13 radial roads of 60 m width have been proposed. Similarly, 5 radial roads of 45 m width have been proposed.

Total length of 120 m road proposed in SUDA area is 116 km, 90 m wide roads are of 140 km. 60 m wide roads have total length of 360 km, whereas 45 m wide roads have length of about 301 km. Thus the total major roads proposed in DP 2035, have cumulative length of 917 km. This road network will provide for smooth movement for public and goods traffic. Total road length proposed in the DP 2035 is more than 2200 km.

18 m wide road has been proposed parallel to the 90 m ORR on the periphery of 500 m residential zone. Wherever possible considering the existing land use and the embankment, the roads have been proposed along the Tapi river. Roads of appropriate width have also been proposed along the Khadis so that the Khadis can be protected and it can properly serviced as and when required.

It is proposed to provide ring road around each and every village, and these rings have been inter-connected by network of 18 m roads. This will improve the movement of goods and traffic within the non- urban areas and help improve their economy.

DREAM CITY PROJECT is proposed in Khajod area having access from 90 m ORR. The activities proposed in the DREAM city will generate huge traffic volume. Moreover, the construction of Ubharat bridge in future will also add to the traffic volume on the 90 m ORR. Hazira now being included in the SUDA area- having huge volume of goods movement, there is a need to increase road width between the Khajod and Ichchapor junctions. The design of these two junction needs to be prepared by the traffic and transportation experts. Accordingly, the part of 90 m ORRT between these two junctions has been widened to 120 m width.

Vadodara- Mumbai Expressway is proposed to be passing through the newly extended area of SUDA. Since the exact alignment of this proposed Expressway is yet to be made available, it is proposed to have corridor of 500 m width along the roughly proposed alignment of the Expressway. This corridor will help in implementation of the Expressway of sufficient Right of Way(RoW). No development permission shall be given in this corridor till the RoW of the proposed Expressway is final decided by the concerned authority. Once the RoW is finalised, the rest of the land proposed in this corridor shall be used for purposes specified in the Agriculture zone.

The alignment of Dedicated Freight Corridor from Tapi river towards Dindoli has been marked in the Development Plan 2035 as per the alignment obtained from the concerned agency. The alignment

from Tapi towards Gothan was not available, hence tentative alignment from Tapi towards Gothan has been proposed in the land use plan. This will be corrected if made available by the concerned department before the submission of Draft DP 2035 under section 16 of the Act.

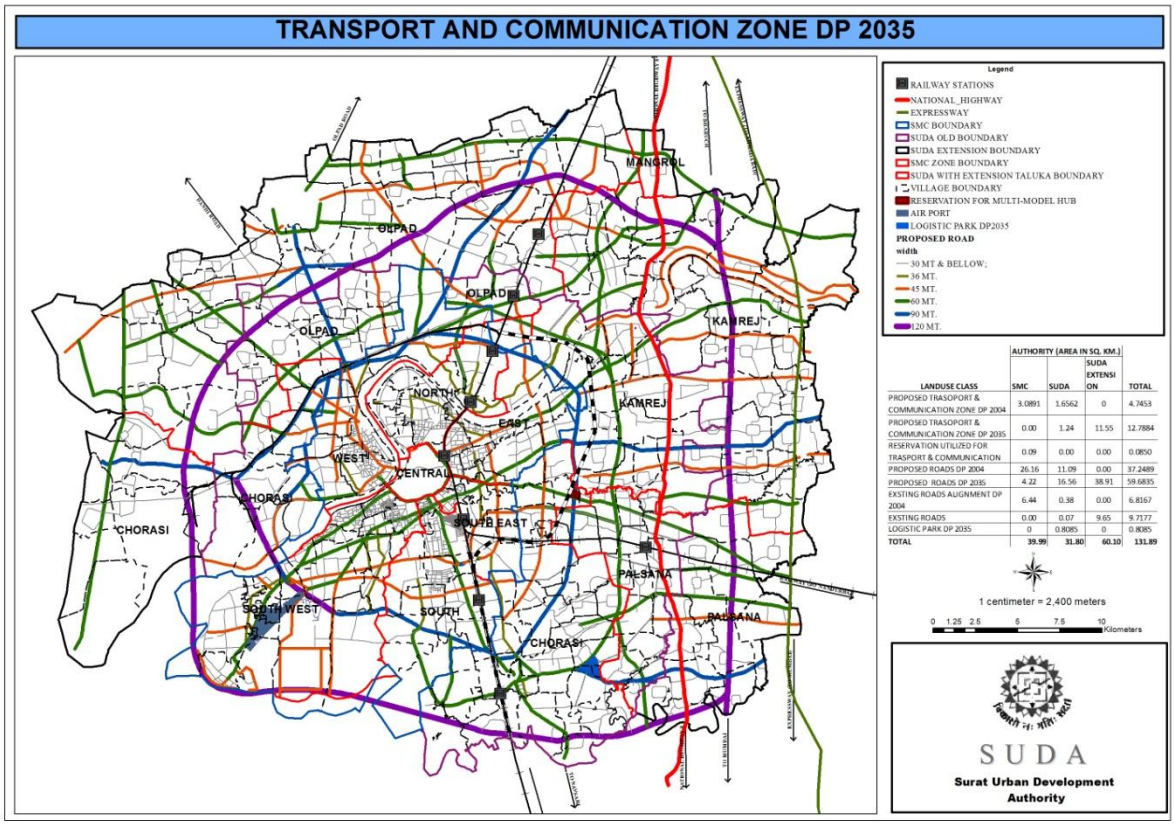
Micro level road network shall be prepared by virtue of Town Planning schemes. New railway network from Hazira to Gothan can be part of the SIGR. New bridges across Tapi river as suggested in the Comprehensive Mobility Plan(CMP) can be undertaken by SMC as and when the need arises during the plan period subject to the alignment suggested by the expert group. The list of proposed bridge in CMP is given below:

Table 135: New bridges proposed across Tapi river the Comrehensive Mobility Plan

Sr. No.	Description	Carriageway width (m)	lanes	Length (m)
1	Utran-kapodara	15	6	1091
2	Third ring road(Nr. Varachha)	22	6	825
3	Ved-variyav	22	6	760
4	Dabholi-Jahangirpura	15	4	1059
5	Dhastipura- Jilani complex	15	4	1132
6	Athwa-adajan	15	4	1233
7	Pal-Umra	22	6	1780
8	Piplod-Bhata	7.5	2	600

Railway Station zone proposed in DP 2004 is continued in DP 2035.

Figure 68: Traffic and Transport Zone- DP 2035



19.11.8 INSTITUTIONAL ZONE

DREAM City project is being developed in the Khajod area. To supplement this project, it is proposed to have institutional zone in Sarsana, Jiav and Sonari villages in the SMC area near to the DREAM City project and having access from the 90 m ORR.

Total area proposed under Institutional zone is 6.1 sq.km.

19.11.9 LOGISTICS ZONE

Logistics which deal which the movement and storage of materials, is a significant part of economy. The logistics parks have the facilities for container depots, warehouses, terminals and ancillary commercial development. Warehouses are important for distribution of commodities to final consumer within the city. Provision of truck terminals and truck parking space within the logistics zone will help in reducing congestions on the roads. The logistics park can also provide facilities for packaging, parking, mechanized handling, inter- modal transfers, sorting of consumer goods including cold chain centres. The key benefits of the logistics park are cost saving through economies of scale, reduced transit and processing time, optimal use of various modes of transport and reduction in inventory and damages. Considering the huge requirement of space for textile manufacturing and trading, consumer goods for 110 lakhs population and the future requirement of Hazira Industrial Area, the Logistics zone has been proposed in the SUDA DP 2035.

About 8,00,000 sq.m. of area adjacent to the Sachin Udhyognagar in the village of Bhatia, Kachholi and Ravla- Vaktna having wide direct access from the National Highway- 8 to Palsana and proposed

90 m roads have been proposed for Logistics zone. The proposed location is easily accessible from Delhi- Mumbai National Highway- 8, National Highway to Palsana, 90 m ORR and the outlet from the proposed Expressway. Moreover, 200 m wide Logistics zone has been proposed along the SIGR, having approach from the 120 m Regional Ring Road.

19.12 MULTIMODAL TRANSPORT HUB

Indian Railway Board through RLDA (Rail Land Development Authority) has entrusted to IRSDC (Indian Railway Station Development Corporation) the work of preparation of Master Plan and Feasibility Report for *the* ***Development of the Multimodal Transport Hub*** at ***Surat Railway Station*** to international standards and integrating the surrounding developments. The project is to be developed on Design, Build, Finance, Operation and Transfer (DBFOT) basis.

The project aims to develop/redevelop the existing Suart Railway Station area to Multimodal Transport Hub with World Class Standards thereby resulting in better standards and amenities to the passengers involving complete designing, construction, financing, maintenance, generation and collection of revenues through identified passenger amenities, commercial spaces and activities in order to achieve a financially viable model where the redevelopment, operations and maintenance can be self-financed.

The objective is also to undertake a harmonious integration with the development of the surrounding area of Surat Railway Station. The study will integrate with the future transportation and infrastructure near railway station by:

- Proposed Surat Railway Station (WR) on east and west side by SPV
- Master planning for integration with development of infrastructure around Surat Railway Station by Surat Municipal Corporation (SMC);
- Proposed Gujarat State Road Transport Corporation (GSRTC) Bus depot on east side and Bus Station on west side;
- Proposed BRTS corridor; and
- Proposed METRO station

The Special Purpose Vehicle (SPV) has been formed to execute the project on DBFOT on basis. The Indian Railways (Western Railway), Gujarat State Road Transport Corporation (G.S.R.T.C.), Gujarat Industrial Development Board (G.I.D.B.) and Surat Municipal Corporation (S.M.C.) are principal partners in Special Purpose Vehicle.
The Special features of this project are:

- Preparation of Comprehensive Master plan for Multimodal Transport Hub at Surat Railway Station for next 50 years which integrate various modes of transport under one roof
- First of its Kind of unique project in this category in all over India.
- One of Iconic project of Public sector in India
- Provide various mode traffic solutions to acute problems of traffic issues at Surat Railway station surrounding areas & connectivity with highway, future metro

railway station, Mass transport system – BRTS & City Bus which will help in reducing loss of man-hour, fuel, economy & environment

- Gives Multi-modal transport facility under one roof
- Western Railway
- GSRTC
- BRTS
- Metro
- Gujarat's First ever ***60 Storied*** exclusive commercial structure which change the Sky Line of Surat city as well as Gujarat State
- 1st ever multi height railway station platform all over in India
- Generation of ***Solar Power***, which feed the whole railway station requirement
- Proposed Vertical Commercial Development which raise the value of Surat railway station area and resolve the shortage of land problem in this area
- Earn handsome revenues to SPV holders i.e. WR ,GSRTC & SMC
- Highly investment return project for Developer

Special development control regulations to be prepared later on for the development in this area based on demand and recommendation of the technical report of SPV. If required, unlimited height and FSI may be permitted by the State Government for the successful implementation of this project.

Table 136: Salient Features of The MMTH

Description	Existing Railway Station	Proposed MMTH
Number Of Platform	4 Nos.	6 Nos.
Platform Length	300 m	600 m
Passenger Handling Capacity / Day		
Railway	1.75 Lakhs	6 - 8 Lakhs
GSRTC	0.70 Lakhs	2.0 - 3.0 Lakhs
Parking Facility	2 Wheeler - 3000 nos.	2 Wheeler - 7260 nos.
	4 Wheeler - 30 nos.	4 Wheeler - 5793 nos.
		3 Wheeler - 1080 nos.
		Bus Parking- ❖ BRTS: 78 nos. ❖ GSRTC : 97 nos.
Composition of Multi-Modal Transport Facility	Not Available	Railway+ GSRTC+ BRTS+ Metro Rail
Public Amenities	Restaurant @ Platform 1	Food Court, 3 Star Hotels, 5 Star Hotels, Budget Hotel, Cinema, Shopping Mall
Vertical Movement @ Station	Foot Over Bridge, 1 elevator	4 transit conduit - with separate entry and exit 68 nos. of escalator
Solar Power Generation	Not Available	1,63,750 sq.m. Area is available for installing

		Solar Panel	
Land Pocket Used		GSRTC TP 8 - FP 4:	88,340 m^2
		WR @ EAST SIDE TP 4 - FP 268:	61,776 m^2
		WR @ RAILWAY YARD WARD NO. 7:	70,416 m^2
		SMC TP 4, FP T-10:	6,685 m^2
		Total Area :	**2,27,217 m^2**

Another multimodal transport hub admeasuring 4.2 Hectares has been proposed on the 90 m ORR in village Vedchha. it will serve as will serve as a central place of connectivity where multiple forms of transit come together seamlessly.

The interface will merge efficient transport like -

- LRT /Metro (which shall provide connectivity to railway station) ,
- BRTS
- Central bus station can be shifted there from core city
- Private bus operators can operate from the hub

19.13 DREAM(DIAMOND RESEARCH AND MERCANTILE) CITY

The Gujarat State Government is in the process of planning to develop a DREAM City with State-of-the-Art utilities along with social and physical infrastructure facilities.

More than 90% diamonds are manufactured/ processed in the form of cutting, polishing at Surat along with Navasari, Bhavnagar and Amreli. Therefore the establishment of DREAM City at Surat would provide a global trading platform to the Surat Diamond traders as well as the international trading community. The DREAM City will be developed as a smart city which would help in developing skills in the diamond sector and the city may be developed as an International Diamond Manufacturing and Trading Hub in an integrated manner. The vast expertise in the sector is already latent in Surat which the State Government needs to take advantage of.

Hence, setting up of an International Diamond Trading Hub at Surat would be a win- win situation for the State as well as the Nation, since Surat has a locational expertise of cutting, polishing as well as trading.

Thus the purpose of DREAM City project is to **"Develop International Trading, Research and Service Hub with a focus on Diamond Bourse, to allow non polluting activities and to extend supply value chain for high end trading."**

The major objectives of DREAM City Project are:

1. To set up a Diamond Research and Mercantile Smart City (DREAM Smart City) at Surat;
2. To provide a common platform for the Diamond Traders of Surat in the form of Diamond Bourse (exchange) at Surat;
3. To provide one-stop solution to the Diamond Traders by providing Custom House, banks and other service providers who cater to the gem and jewellery trade;
4. To provide offices for the diamond traders, walk-in vaults, safe deposit boxes, trading floor, strong rooms, lockers, customs clearance facilities with all the modern facilities required to carry their day-to-day business;
5. To provide ancillary services required for the Project along with the driving forces for the Project;
6. To provide world class design and standards for sustainable development with low carbon policy and Zero waste discharge policy to attract Foreign Direct Investments;
7. To provide world class safety and security standards to the diamond traders;
8. To act as a DREAM City and Diamond Export Centre of Gujarat;

The State Government has formed SPV by the name of Diamond Research and Mercantile City Ltd. under the Company's Act, 2013.

The DREAM City zone is proposed in part of Khajod village as shown in the proposed land use map. The DREAM City project shall be implemented by the DREAM City Ltd. Government Company under the provisions of Gujarat Town Planning and Urban Development Act, 1976 as decided by the State Government. The development permission in DREAM City zone shall be regulated as may be decided by the State Government. Till then no development permission shall be given.

19.14 LAND USE TABLE

Table 137: Table showing comparison of proposed land use in DP 2004 and Draft DP 2035

Land Use								
	DP 2004			DP 2035				
	SMC+SUDA	SMC	SUDA	SMC+ OLD SUDA	SMC	SUDA OLD	SUDA EXTENDED	TOTAL
Residential	204.00	140.84	63.16	314.09	155.79	158.30	43.58	357.67
Commercial	7.65	4.71	2.94	8.98	5.09	3.89	2.84	11.82
Industrial	42.93	15.25	27.68	57.04	14.59	42.45	79.26	136.30
Public Purpose	64.21	47.04	17.17	55.12	47.52	7.60	8.04	63.16
Recreational	12.36	10.63	1.73	21.41	16.90	4.51	24.57	45.97
Traffic and Transportation	40.75	27.43	13.32	71.79	39.99	31.80	60.10	131.89
Industrial Growth Region	-	-	-	5.85	0	5.86	34.22	40.09
Urbanized Area	371.90	245.90	126.00	534.29	279.89	254.40	252.61	786.90
Agriculture	284.94	45.32	239.62	124.76	12.37	112.39	347.82	472.58
Other Non-	58.47	35.89	22.58	56.43	34.85	21.55	35.62	92.05

Urbanized Area								
Total Non-Urbanized Area	343.41	81.21	262.20	181.19	47.25	133.94	383.44	564.63
Total	715.31	327.11	388.20	715.48	327.11	388.34	636.05	1351.53

Table 138 DP 2035 Proposed Land- use with break-up of different uses in each zone

Landuse		**Existing- 2015**		**Proposed - 2035**	
		Area in sq.km.	**%age of Urbanized Land**	**Area in sq.km.**	**%age of Urbanized Land**
1 Residential Zone		136.94	47	357.67	45.45
	Residential Zone DP -2004			166.54	-
	Proposed Residential Zone DP- 2035			150.80	-
	Residential Zone 90 m ORR			20.06	-
	Gamtal			14.20	-
	Industrial Shift Zone			4.35	-
2 Commercial Zone		5.71	2	11.82	1.50
3 Industrial Zone		74.61	26	136.30	17.32
	General Industrial Zone			117.19	-
	Obnoxious and Hazardous Industrial Zone			19.11	-
4 Public Purpose Zone		17.52	6	63.16	8.03
	Public Purpose Zone			11.07	-
	Educational Zone			6.10	-
	Reservations			36.54	-
	DREAM City Zone			9.45	-
6 Recreational Zone		2.46	1	45.97	5.84

7 Traffic and Transportation Zone		51.48	18	131.89	16.76
	Transportation Zone			131.09	-
	Logistics Park			0.80	-
8 Industrial Growth Region		-	-	40.09	5.09
Total Urbanized Land		288.72	100	786.90	100
Agriculture		1062.81	-	472.58	-
Water Bodies, Forest and Other Non-Urbnized Area				92.05	-
Total		**1351.53**	**-**	**1351.53**	-

20 COST ESTIMATES

20.1 INFRASTRUCTURE ESTIMATES FOR 2035

20.1.1 WATER SUPPLY COST ESTIMATES FOR 2035

Water demand for urban area under SUDA authority is estimated under different heads using CPHEEO norms.

Table 139 Water Demand Projection

Category	Water Demand (per day)	Demand for 2025 (MLD)	Demand for 2035 (MLD)
Household	150 per capita	1140	1445
Health Institutions	400/per bed	14	14
Government offices	45 per capita	1.1	1.1
Industrial demand		145	145
Railway station	70 per capita	28	35
Colleges	45 per capita	6.1	8.1
Schools	45 per capita	73.7	95.1
Total Demand		**~1410**	**~1750**

Source: CPHEEO manual

Total capital cost of additional water supply infrastructure during these two phases (2016-2025 and 2026-2035) are given below.

Table 140 water supply cost estimates

Category	Unit Cost	2016-2025 (Cr. INR)	2026-2035 (Cr. INR)	Total Cost (Cr. INR)
Augmentation of Intake Wells	0.1 Cr/MLD	15	27.9	42.9
Additional treatment capacity with SCADA system	0.3 Cr/MLD	52.8	209.4	262.2
Network costs	12 Cr/sq.km.	2324	3844	6168
Cost of water meters	2000/ unit	356.7	171	527.7
Total		**2748.5**	**4251.9**	**~7001**
		Average inflation rate of 5% per year is considered		

Source: Surat Municipal Corporation records

It would be difficult to estimate the infrastructural requirements for each and every village of the area. Therefore, the villages are divided in 5 categories according their populations for ease in estimating the requirements. Estimates for these population classes are given in the table below. The towns having estimated population higher than 20,000 have already been considered as a part of estimates made for city area.

Table 141 waster supply estimates for villages

Capital work	Cap. Ex. for population upto 2,000	Cap. Ex. for population upto 5,000	Cap. Ex. for population upto 10,000	Cap. Ex. for population upto 15,000	Cap. Ex. for population upto 20,000
Unit Estimated Cost	12,15,000	50,00,000	90,00,000	1,50,00,000	2,00,00,000

Source: Cost functions for predicting capital expenditure of small town water systems

Table 142 water supply estimates for villages- cost estimates

Sr. No.	Category	Total number of villages	Total Cost
1	Population up to 2,000	52	6,31,80,000
2	Population up to 5,000	82	41,00,00,000
3	Population up to 10,000	27	24,30,00,000
4	Population up to 15,000	10	15,00,00,000
5	Population up to 20,000	5	10,00,00,000
	Total	**176**	**96,61,80,000**
	Total Inflated Value		**1,17,19,76,340**
Considering 5% inflation every year and 70% of investment in first 10 years			

20.1.2 SEWERAGE ESTIMATES FOR 2035

Based on the population projections and city expansion within SUDA area, the total infrastructural requirements in terms of sewerage is estimated below. This is done considering the current gaps in service delivery and future needs. The estimates are made in two phases, 2025 and 2035. Four major components of any drainage system are Sewage Treatment Plant, Sewage Pumping Stations, Underground Network including Rising Mains. To estimate the future cost requirements, cost for unit area for each of these four components is considered. The unit costs for these components are provided in table given below.

Table 143 Sewerage estimates

Sr. No.	Component	Unit Cost (Cr. INR/ km^2)
1	Sewage Treatment Plant	2.84
2	Pumping Stations	2.78
3	Network	3.79
4	Rising Mains	1.32

Source: Surat Municipal Corporation records

Considering this as unit cost of development per hectare area and projecting it for two invest phases of year 2025 and 2035, following results were found. Total urbanised area in 2014 was around 197 sq.km. The total drainage network in the city during the same year was in area of 154 sq.km. This mean that 43 sq.km. of the urban area was still without drainage system. The priority would be to lay down sewerage in this area in addition to the expansion of the city area which is estimated to be around 163 sq.km. The total area to be covered with sewerage by 2025 comes out to be 206 sq.km. Phase- wise estimates for this period are given in the table below.

Table 144 Sewerage cost estimates

Investment Year	Area to be Covered	Investment at present value (Cr. INR)	Investment at inflated value
2016	82.4	884	884
2019	61.8	663	809
2022	61.8	663	935
Total by 2025	**206**	**2210**	**2628**
			Average inflation rate of 5% per year is considered

For further development, area of 163 sq.km. will have to be covered at estimates given below.

Table 145Cost estimates for sewerage

Investment Year	Area to be Covered	Investment at present value (Cr. INR)	Investment at inflated value
Total by 2025	206	2210	2628
2026	65.2	700	1197
2029	48.9	525	1040
2032	48.9	525	1202
Total by 2035	**163**	**1750**	**6067**
			Average inflation rate of 5% per year is considered

20.1.3 SOLID WASTE MANAGEMENT ESTIMATES FOR 2035

Municipal solid waste within Surat city is collected by Surat Municipal Corporation. Door-to-door collection of waste is done from households, commercial users. Collected waste is then taken to transfer stations, from where it is transported to the dumping site.

For more efficient solid waste management system, the 'segregation of waste at source' is essential. Collection of segregated (dry and wet) will be done for the amount projected in the table below.

Table 146 SWM estmation

Category	2025	2035
Projected population within city	76 lakhss	96 lakhss
Per capita of waste generation estimated	450 gm	450 gm
Total waste generation estimated	3420 TPD	4325 TPD
Dry component of total waste generated	~1200 TPD	~1515 TPD
Wet component of total waste generated	~2250 TPD	~2815 TPD

The collected waste will be processed at decentralised facilities spread all across the cities. Decentralised processing is recommended for saving fuel costs and avoiding unnecessary transportation of waste over long distances. Overall processing cost of waste is around 400 Rs. / per capita/ year for large cities. The investment estimates are given in the table below.

Table 147 SWM Cost estimates

Category	Unit cost (Present value)	2016-2025(Cr. INR)	2026-2035(Cr. INR)	Total by 2035 (Cr. INR)
Door-to-door collection of waste and transportation of waste	-	Outsourcing	Outsourcing	
Processing of dry+wet waste and treatment	INR 1000/ capita/ 2-3 years	3276	7074	10,350
Cost of secondary collection bins	-	-	-	-
Cost of engineered landfill	INR 176.5/ tonne	43	91	134
Total		**3319**	**7165**	**10,484**
Average inflation rate of 5% per year is considered				

- **Cost estimation for solid waste management for 2035 for area outside Surat city**

Total waste generation is estimated for projected populations for year 2025 and 2035. Average per capita per person per day waste generation is taken as 250 gm.

Table 148: SWM Village estimation

Category	2025	2035
Average per capita waste generation	250 gm/ person/ day	
Total amount of waste generated	249 TPD	349 TPD
Capacity to be built (30% extra of total generated)	325 TPD	455 TPD
Amount of Wet Waste	195 TPD	273 TPD
Amount of Dry Waste	130 TPD	182 TPD

Total investment for wet waste treatment is around 53 Cr. INR with average inflation rate of 5% per year.

Table 149 Total infrastructure estimates

Sector	Total Investment Requirements For 2035 (Cr. INR)		
	SUDA area within city	SUDA area outside city	Total
Water Supply	~7,001	~118	7,119
Sewerage	6,067	-	6,067
Solid Waste Management	10,484	53	10,537
Total	**23,552**	**171**	**23,723**
These values are found considering average inflation of 5% every year			

20.2 COST ESTIMATES FOR ROADS

The details of various major roads proposed in DP 2035 is as given below:

Table 150 DP 2035 proposed roads

Sr. No.	Road Width (m)	Road Length (km)		Total
		Ring	Radial	
1	120	116.00	0	**116.00**
2	90	56.35	83.01	**139.36**
3	60	67.18	293.56	**360.74**
4	45	0	301.38	**301.38**
	Total	**239.53**	**677.95**	**917.48**

The cost estimate for construction of proposed roads is given below.

Table 151 DP 2035 road cost estimates

Sr. No.	Road Width (m)	Unit Cost of Road Development (Rs. in crore/ km)	Road Length (km)	Total Cost (crore)
1	120	3.00	116.00	348
2	90	2.00	139.36	278.72
3	60	1.50	360.74	541.11
4	45	1.00	301.38	301.38
	Total		**917.48**	**1469.21**

Thus, total cost for development of road will be around **Rs. 1470 crore**.

20.3 COST OF LAND ACQUISITION OF RESERVATION LAND

The total cost of land acquisition at Jantri rate is estimated to be Rs. 17,000 crore, out of which only about 30% of the land is private land and hence the final cost of land acquisition for reservation land is estimated to be **Rs. 5,100 crore.**

Table 152 Total cost estimates

Sr.No	Category	Total cost (Rs. crore)
1	Infrastructural Cost (considering inflation)	23,723
2	Road Development	1,470
3	Land Acquisition of Reservation Land	5,100
	Total	**30,293**

20.4 PHASING

It is expected that the development projects envisaged in the development plan shall commence after the development plan gets sanctioned. Therefore it is anticipated that the plan implementation programs can be worked out by 2016. The phasing of all individual proposals included and proposed in this report will be spread over 20 years with some buffer period for time over runs. The authority has considered advance actions in the direction to undertake specific projects which of primary importance to achieve the objectives of the development plan, which includes for the town planning schemes and other development projects, however it is hoped that the implementation of the development plan shall gather momentum with the progress of the time and shall continue to accelerate further.

20.5 FINANCE & RESOURCE MOBILISATION

The implementation of the development plan calls for long term fiscal planning. In the development plan standard urban facilities and services are proposed. It is proposed to stimulate a rapid rate of economic growth, improvement of the areas presently undergoing development, better utilization of the existing facilities, with preparation of special town planning schemes to achieve planned development and create the land resource which may generate finance.

It is realized that the development plan proposals remain on paper in the absence of proper resource mobilization. Properly structured sources of funds for the authority are limited, which includes, the contribution of local authorities with urban development area (under section 24 of the act), development charges for the development of lands and buildings (under section 99 and 100), various fees, contribution, user charges for services such as roads, drainage water supply etc.(under section 23 of the act). As a matter of fact it is necessary to augment the present funding mechanisms with innovative means. As brought out in the development plan proposals the primary tool to implement the plan shall be through the town planning schemes and accordingly the entire developable area shall be covered in the town planning scheme area. The lands available in the town planning scheme through the plots allotted to the authority shall be the primary base of resource for funding the projects.

The direct sources of funds available through the various charges, contributions are inadequate for the major projects envisaged in the development plan. For funding the various schemes, the authority will have to seek and rely on loans, grants from the government and other financial institutions as buffer. However, the authority shall have to mobilize financial resources and utilize land as resource to gear up various development activities. For the purpose of rising of the resources for the development, a concept of charging the fees for the services and amenities is proposed in the development control regulations. It is proposed to implement the Development Plan by means of

Town Planning schemes. The lands available to the authrity by means of vesting as part of TP schmes mechanism, if used efficiently and in a proper time frame can yield sufficient financial resources for providing the infrastructure facilities. It is proposed that SMC as well as SUDAshould engage the services of estate management consultant for guiding the authorities to get the maximum revenue out of the lands available by means of TP scheme mechanism to appropriate authority.

It is also proposed to finance the infrastructure projects by imposing additional infrastructure charges for consuming additional F.S.I. than the base F.S.I. In commercial projects for more floor height, the developer has to pay additional infrastructure charges. Similarly for building height above 40 m, the develper has to pay additional infrastructure charges. To get the substantial amount of finance for infrastructure projects, it is proposed that in the new residential zone, the base F.S.I. shall be 0.6 and additional F.S.I. has to be purchased.

The amount available from the sale of F.S.I. in new proposed residential zone admeasuring 150.80 sq.km. assuming ground coverage of on an average 45% and assuming 50% of the total built- up area available is used as maximum paid F.S.I., then as per the rate of paid F.S.I. proposed to be 40% of Jantri rate- about 16 sq.km. **X** Jantri rate shall be the amount generated from the sale of F.S.I. Compared to that, since the area under reservation is proposed to be 36.54 sq.km. out of which only 30% is private land, only 11 sq.km. land has to be purchased at the Jantri rate. So the land acquisition for public purpose can be made by means of paid F.S.I.

It is expected that the government shall also help the authority in the accelerating the rate of development in the urban areas by readily responding to the needs of the authority by way of grants and loans. Given the initial capital, the authority shall prioritize and can takeup some short term and a few long term projects keeping in mind the development needs of the different areas and the revenue generations. In the initial some remunerative projects shall be required to create buoyancy in the financial strength of the authority.

Revenue realized from the different commercial projects can be dovetailed in the revolving fund which can be recycled to meet the cost of the schemes in the subsequent stages. Commercial projects will assist to generate funds for extending the areas of operation of the development authority. The authority will have to fund for priority sector programs viz infrastructure development and weaker section housing.

Overall, the major resurces will be generated through Sale of Plots, Incremental Contribution, Other Fees and Grants from the Government.

Apart from State and Central Government financial assistance, the Authority has to explore the potential f getting finance from institutions like HUDCO, World Bank, ADB, etc. Even private sector can be involved in the management, implementation and financing of infrastructure projects through joint ventures or by way of public private partnership.

21 PROPSED LAND- USE (SUBMITTED UNDER SECTION 16)

SUDA prepared and submitted the Draft Development Plan - 2035 under section 9 to the State Government on 9th May, 2016 for the area admeasuring 1351 Km^2. As per the statutory requirement the same was published in the Official Gazette the on 10th May 2016 under section 13 for inviting public opinion. The notice was also issued in the prescribed manner in the Gujarati daily on 11th May, 2016 inviting suggestions and objections from the general public within the statutory time limits of two months.

As per the provisions of section 14 of the amended Act, 1976, SUDA has to submit the Draft Development Plan - 2035 to the State Government along with opinion on such objections and suggestions. As section 15 of the Gujarat Town Planning and Urban Development Act, 1976 was deleted by the Gujarat Act No. 11 of 2014 which came into force from 21.01.2015, SUDA is now required to submit the Draft Development Plan -2035 along with the Draft GDCR under section 16 of the Act, 1976 for the State Government's approval.

21.1 EXCLUSION OF VILLAGES

In the meantime, Government of Gujarat, in exercise of the powers conferred by sub-section (2A) of section 22 of the Gujarat Town Planning and Urban Development Act, 1976 sub divided the area of Surat Urban Development Authority and constituted Khajod Urban Development Authority under sub section (4) of section 22 of the said Act by notification No. GH/V/144 of 2016/ DVP-142015-2441-L dated 19.07.2016. Thus, Khajod village of Chorayasi Taluks was deleted from the jurisdiction of SUDA.

Later on, before the Draft DP - 2305 could be submitted under section 16, Government of Gujarat, in exercise of the powers conferred by the sub-section (2A) of section 22, under notification No. GH/V/199 of 2016/UDA-102014-5026(3)-L dated 24.10.2016, excluded 54 villages (50 wholly and 4 partly) out of newly added 100 villages from SUDA jurisdiction. In the said notification, Asnabad village of Olpad taluka which is on the north side of National Highway is shown as excluded from the SUDA jurisdiction, but in fact, there is no National Highway running east west in the said Asnabad village. Thus, total Asnabad village is continued to be part of SUDA jurisdiction. Thus, by the said notification, effectively 53 villages (50 wholly and 3 partly) were excluded from SUDA's jurisdiction.

Few days later, by another notification No. GH/V/200 of 2016/UDA-102014-5026(3)-L dated 03.11.2016, 7 more villages were excluded from SUDA jurisdiction by Government of Gujarat.

Thus, the new development area of SUDA includes,

Table 153 area and population

Sr. No.	Jurisdiction of	Area (Km^2)	Population (census 2011)
1	Surat Municipal Corporation (except Moje: Khajod)	309.45	44,66,060
2	Kanakpur- Kansad Nagar Palika (Taluka : Choryasi)	6.99	28,327
3	Sachin Nagar Palika (Taluka : Choryasi)	5.71	28,102
4	Kadodara Nagar Palilka (Taluka : Palsana)	4.19	27,336
5	Neighbouring 135 Rural settlements (including 3 part villages viz., Moje - Velanja, Taluka : Kamrej Moje - Sandhiyer, Taluka : Olpad Moje - Paria, Taluka : Olpad)	658.82	4,11,269
	Total	**985.16**	**49,61,094**

Note : Out of 3 villages which are partly included Gamtal of Moje –Paria falls within the jurisdiction of SUDA development area while Gamtal of Moje - Velanja and Sandhiyer fall outside the jurisdiction of SUDA development area. Hence population of Moje - Paria is considered for the total population of SUDA area.

Sine the development area of SUDA was modified and reduced from 1351 Km^2 to 985 Km^2 during the period intervening between section 13 and section 16, hence, this chapter has been added as a part of this report.

Urban Development and Urban Housing Department of the Government of Gujarat by the letter dt. 21.11.2016 informed SUDA to submit the Draft Development Plan - 2035 after deleting the villages from the development area of SUDA along with the suggestions and objections received for the proposals on the Draft Development plan - 2035 published u/s 13 in the area remaining in the jurisdiction of SUDA after the notification of 24.10.2016 and 3.11.2016. As per this direction of the State Government, the proposed Land use table gets modified and is discussed below. Since the population of villages which are excluded by the notification of 24.10.2016 and 3.11.2016 amounts merely 1.22 lakhs (as per 2011 census), the population projection for the SUDA area for the target year 2035 has been kept as projected earlier to be 110 lakhs.

21.2 PROPOSED LAND USE - 2035

Here it is pertinent to note that the existing polluting industries within Surat city area was proposed to be shifted to village Pinjarat in the huge Government Land in the Draft Development Plan - 2035 published u/s 13 of the Act, on 10.05.2016 and it is proposed that once the polluting industries are shifted than the area so released from the polluting industries may be used for residential development as per the regulations of existing residential zone. However, the village Pinjarat where these industries were planned to be shifted, has now been excluded from SUDA's jurisdiction after Government of Gujarat's notification of 24.10.2016. The industrial shifting zone is continued as proposed in the published Draft Development Plan – 2035. The State Government shall develop the area earmarked earlier for industrial zone in the village Pinjarat by forming a SPV or by any other mode for accommodating the industries shifted out of the industrial shifting zone.

Moreover, SUDA has conceived the plan to develop industrial growth region having 1.445 km width from Hazira to the existing BG Delhi Mumbai railway line near Gothan admeasuring. But this SIGR (Surat industrial Growth Region) proposed through Sandhiyer, Khalipor, Madhar, Kareli and Bharundi villages, which are excluded from SUDA's jurisdiction after Government of Gujarat's notification dated **24.10.2016** is now affected.

The zoning proposal in the new development area after exclusion of villages is shown in the Figures below.

Figure 69 Map showing all Residential zone

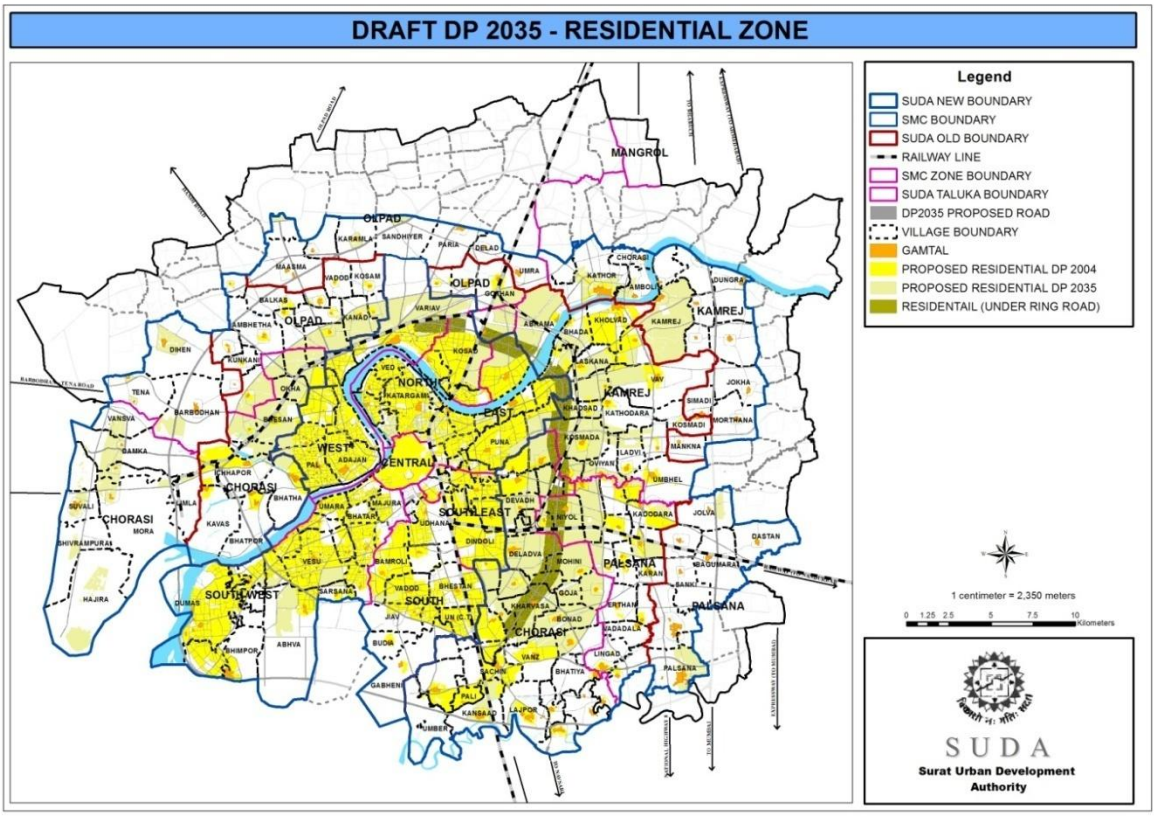


Figure 70 Map showing all Industrial growth region

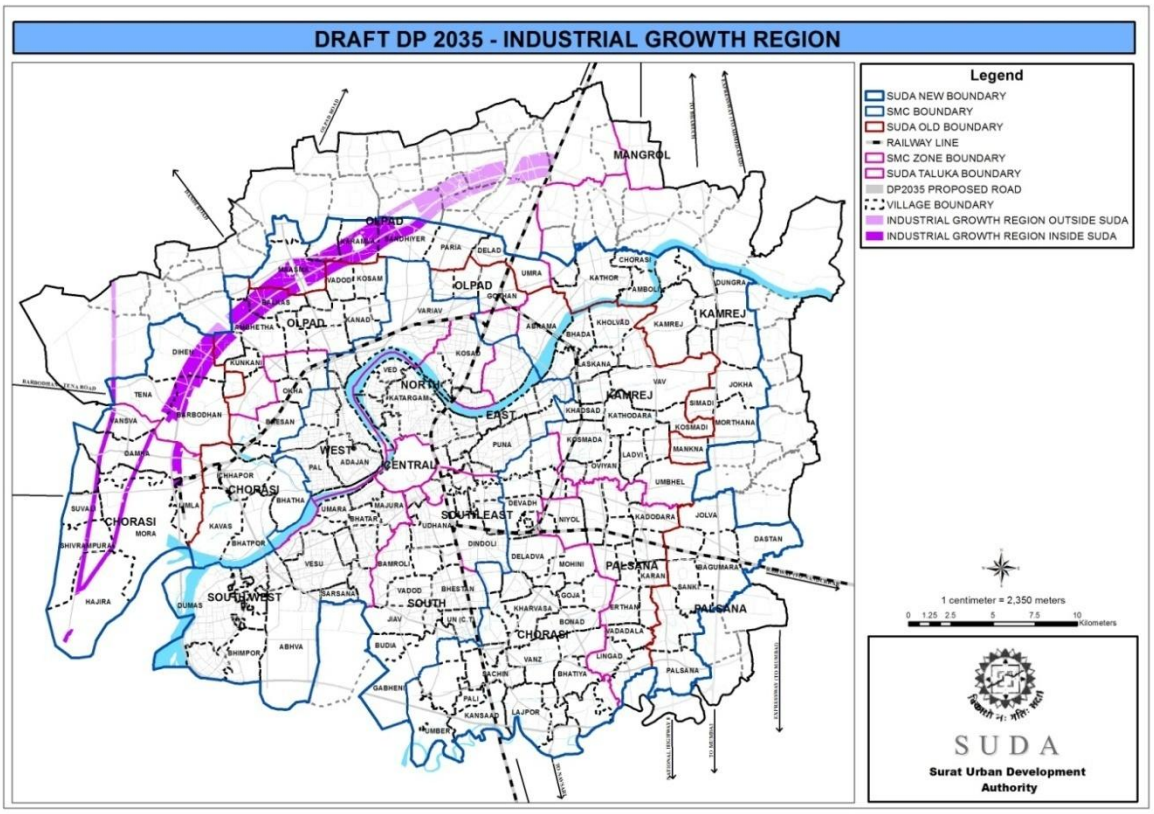


Figure 71 map showing industrial zone

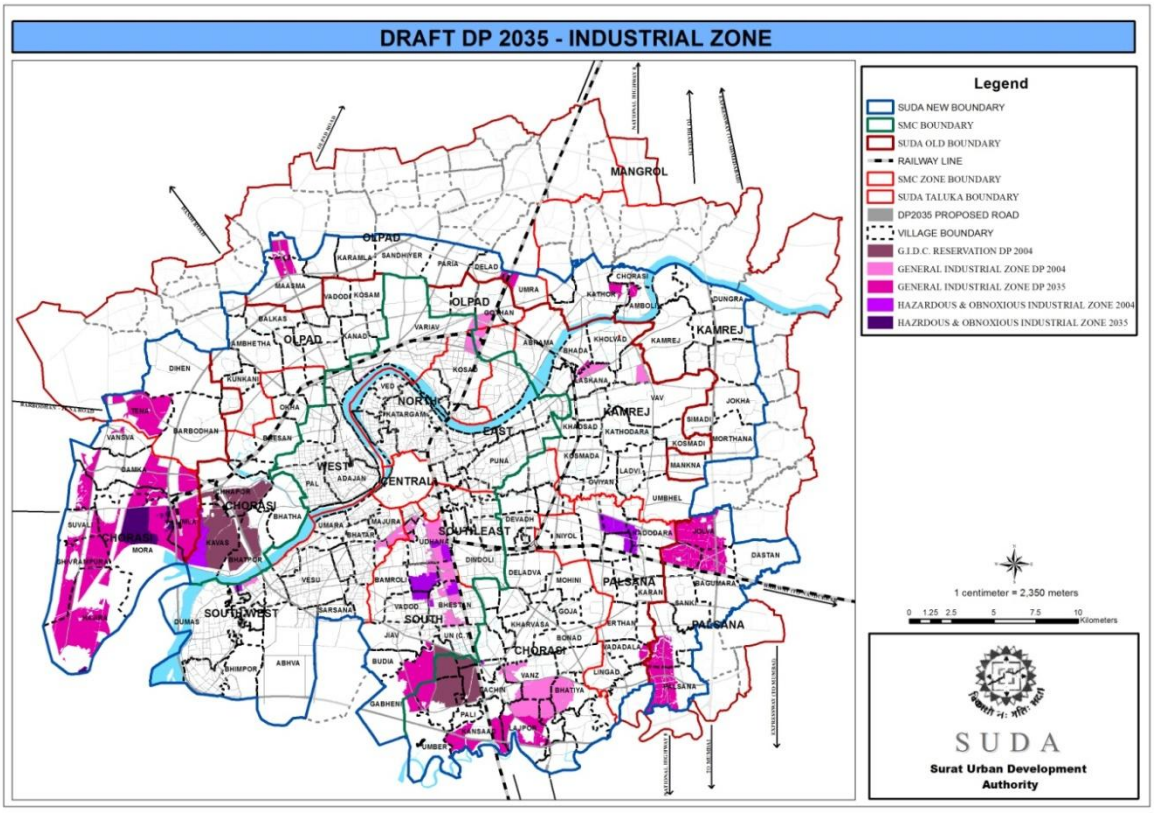


Figure 72: Public Purpose Zone Proposals- DP 2035

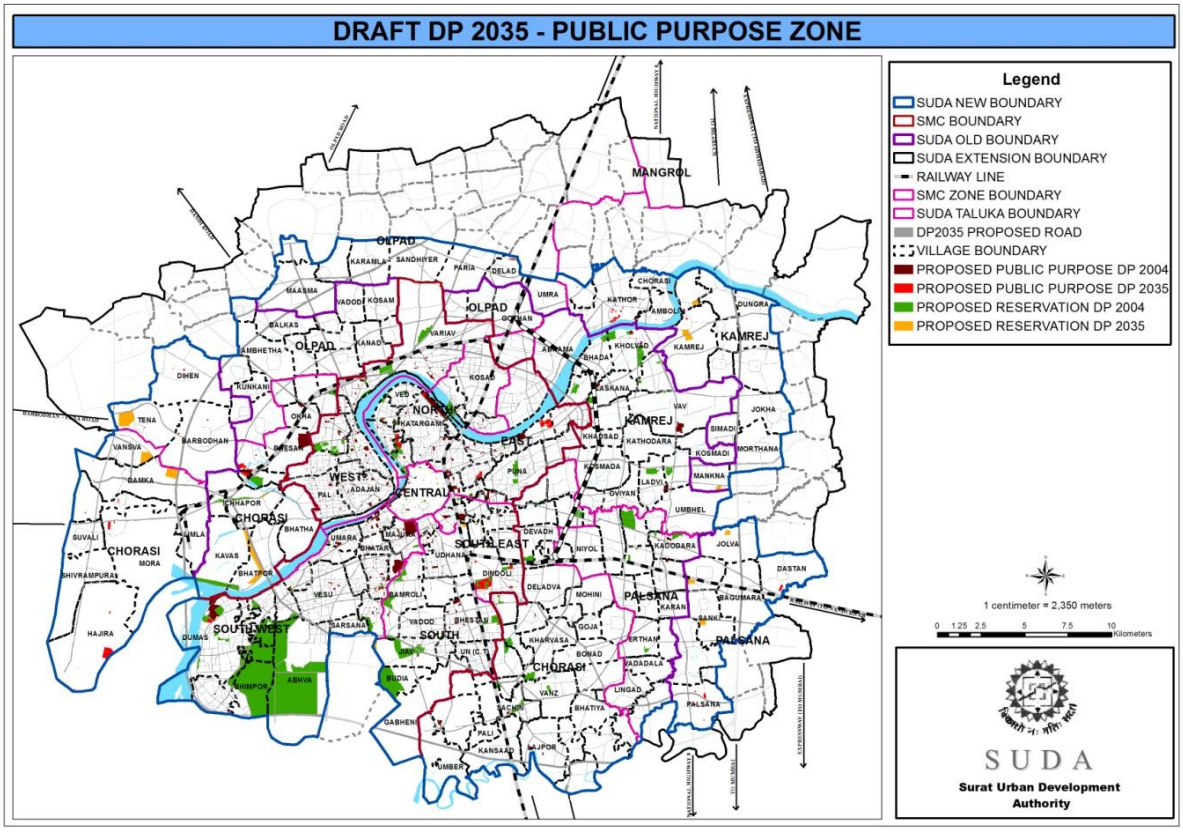


Figure 73 Recreational Zone Proposals- DP 2035

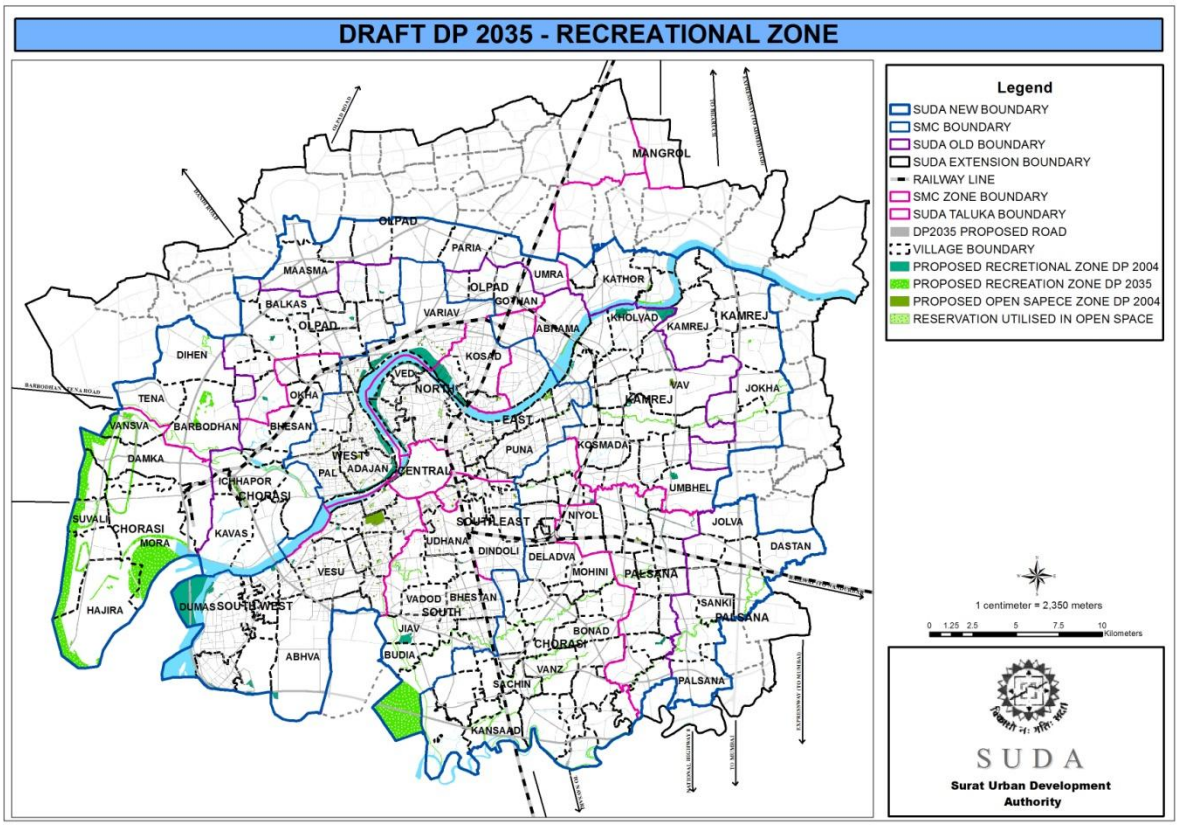
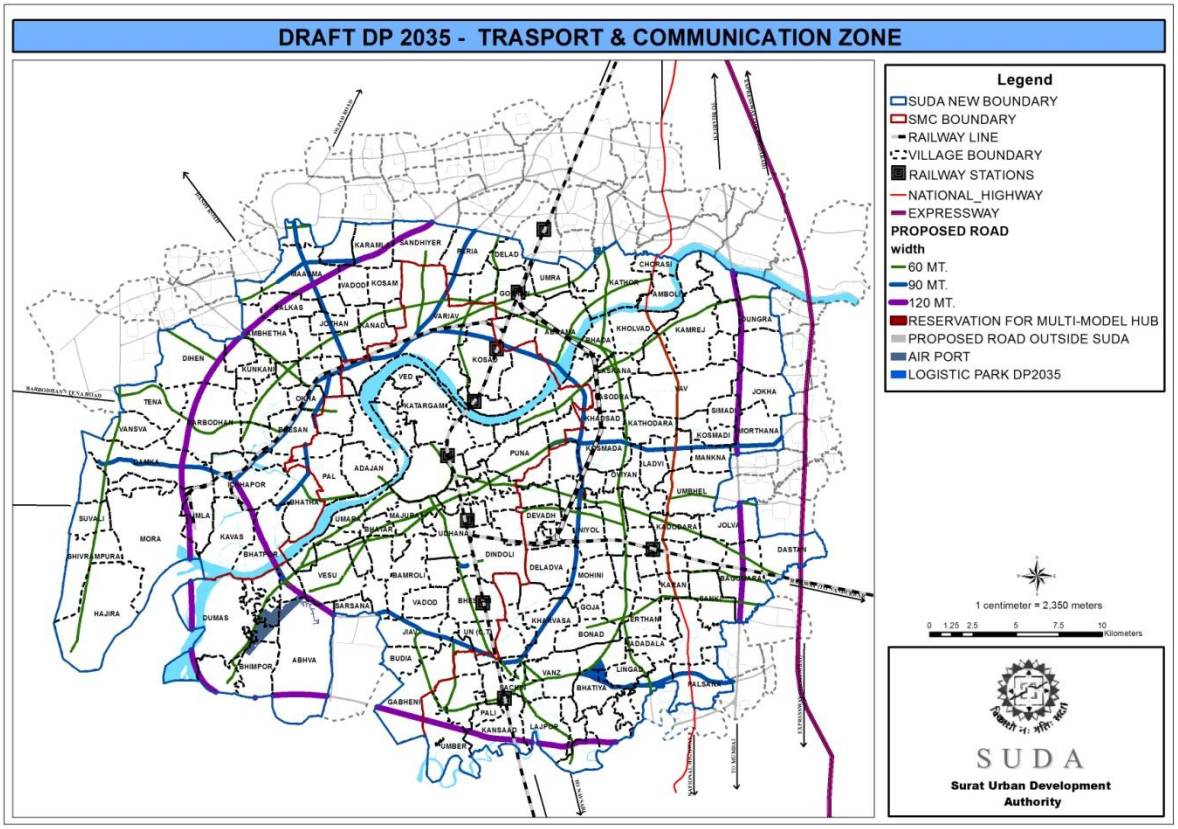


Figure 74 map showing all transportation link and communication zone



The proposed land use of the SUDA area in the 985.16 Km^2 for the target year of 2035 after exclusion of villages now remains is shown in the table below. The existing landuse and landuse proposed at the time of publication u/s 13 is also mentioned in the said table.

Table 154 Proposed Land use - 2035

Landuse		Existing - 2015		Proposed - 2035 (u/s 16)		Proposed – 2035 (u/s 9)	
		Area Km^2	%age of Urbanized Land	Area Km^2	%age of Urbanized Land	Area Km^2	%age of Urbanized Land
1 Residential		**123**	**48**	**346.73**	**50.93**	**357.67**	**45.45**
	Residential Zone DP - 2004			166.54		166.54	
	Proposed Residential Zone DP- 2035			144.63		150.80	
	Residential Zone 90 m ORR			20.06		20.06	
	Gamtal			11.15		14.20	
	Industrial Shift Zone			4.35		4.35	
2 Commercial		**5**	**2**	**10.48**	**1.53**	**11.82**	**1.50**
3 Industrial		**67**	**26**	**112.96**	**16.59**	**136.30**	**17.32**
	General Industrial Zone			100.89		117.19	
	Obnoxious and Hazardous Industrial Zone			12.07		19.11	
4 Public Purpose		**14**	**6**	**47.87**	**7.02**	**63.16**	**8.03**
	Public Purpose Zone			10.41		11.07	
	Educational Zone			5.57		6.10	
	Reservations			31.89		36.54	
	DREAM City Zone			-		9.45	
6 Recreational		**2**	**1**	**39.48**	**5.80**	**45.97**	**5.84**
7 Traffic and Transportation		**44**	**17**	**95.26**	**13.99**	**131.89**	**16.76**
	Transportation Zone			94.46		131.09	
	Logistics Park			0.80		0.80	
8 Surat Industrial Growth Region		**-**	**-**	**28.14**	**4.13**	**40.09**	**5.09**

Urbanized area		**255**	**100**	**680.92**	**100**	**786.90**	**100**
Agriculture		730		235.45		472.58	
Water Bodies and Other Non-Urbanized Area				68.79		92.05	
Total SUDA		**985**		**985.16**		**1351.53**	

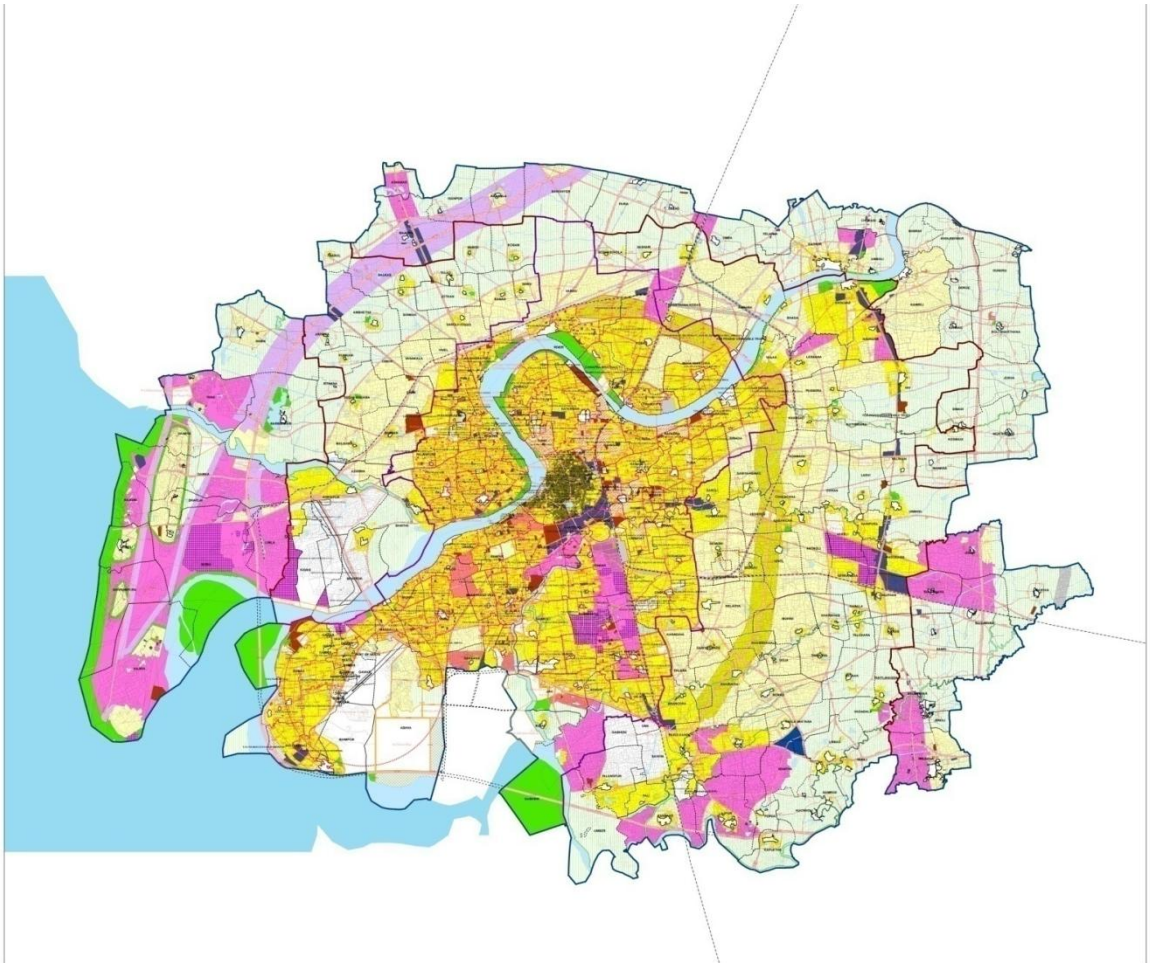
As per the proposed landuse table, the composition of urbanised and non-urbanised area is shown in the Table below.

Table 155 comparison of composition of SUDA area

	Proposed in 2004 DP for 2011		**Existing - 2015**		**Proposed – 2035 (u/s 16)**		**Proposed – 2035 (u/s 13)**	
	Area ($Km^{2)}$	**%age**	**Area ($Km^{2)}$**	**%age**	**Area ($Km^{2)}$**	**%age**	**Area ($Km^{2)}$**	**%age**
Urbanised	312.51	44	255	26	680.92	69	786.90	58
Non- urbanised	409.49	56	730	74	304.24	31	564.63	42
Total SUDA	**722.00**	**100**	**985**	**100**	**985.16**	**100**	**1351.53**	**100**

The urbanised area has increased from 58% to 69% as the rural settlements excluded from the SUDA boundary mainly comprises of non-urbanised proposed agricultural zone.

Figure 75: Draft DP 2035 submitted u/s 16



21.3 RESERVATIONS

After the exclusion of villages from the development area of SUDA, now about 31.89 Km^2 of land has been proposed for reservation for different acquiring bodies like SMC, SUDA, GHB, Civil Aviation Dept., PWD, etc. for the public purposes. The list of reservations is shown in the table below.

Table 156: List of reservations

Sr. No.	Reference No.	Reference No. (DP2004)	Purpose	Agency	Land Detail	Area (sq.m.)
1	C-1	C7	Vegetable Market	S.M.C.	WARD NO. 4 / C.S.NO. 1587, 1588, 1589, 1590, 1591, 1592, 1592, 1593, 1594,1595 TO 1597/A/P, 1597/B/P, 1599, 1600, 1601, 1602,1603	7,689
2	C-2	C11	Whole Sale Market	S.M.C.	WARD NO. 7 / C.S.NO. 4452/P, 4537, 4536/P, 4538	5,263
3	C-3	C16	District Centre	S.M.C.	RANDER / (T.P.S.NO.29| RANDER) F.P. NO. 96, 136, 101	5,442
4	C-4	C18	Commercial	S.M.C.	VED / T.P.S.NO.. 52(VED)SR.NO. 58/P, 59/P, 85/1 TO 85/6(P), 89/A/1+89/B/1 TO 89/B/15(P)	38,828
5	C-5	C31	Parking	S.M.C.	BHATAR / T.P.S.NO.27(BHATAR-MAJURA) 88/P, 46/P/1	3,202
6	C-6	C34	District Centre	S.M.C.	DUMAS / (T.P.S.NO.78(DUMAS-BHIMPOR-GAVIAR) 334, 356/P/2,353/P/2,356/P/2, 356/P/3B 358, 362, 368/P/2,369, 370, 371, 372/P/4,376/P/1, 381, 382/2, 382/1 BHIMPOR / (T.P.S.NO.78(DUMAS-BHIMPOR-GAVIAR) 41, 39/P/3, 39/P/4, 44/P/1, 40, 42, 39/P/1, 39/P/2, 43,44/P/2 GAVIYAR (T.P.S.NO.78(DUMAS-BHIMPOR-GAVIAR) 243/P	1,89,013
7	C-7	C45	Office Building & Quarters	Custom Dept.	(TPS NO.59) SACHIN / 382/P, 383, 384, 401 PARDI-KANDE / 46/P, 50/P, 51/P,	73,475

					52/P	
8	C-9	H5	District Centre	S.M.C.	WARD NO. 11 / 2321, 232, 2337/G, 2338, 2339, 2340, 2341/A, 2341/B, 2342/A, 2342/B, 2343, 2347, 2348, 2349,2350, 2351, 2352/G, 2353/G, 2354/G, 2355/G, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2374/G, 2375, 2376, 2377/G, 2378, 2379, 2380/G, 2381, 2383, 2384, 2389, 2390/G, 2391, 2392, 2393/G, 2394, 2395, 2396, 2397, 2398, 2399,2400, 2401, 2402, 2403	5,511
9	C-10	P106	Commercial Hub	S.M.C.	(T.P.S.NO. 17 PUNA) PUNA / 49/1/P, 57/1/P, 58/P, 59/P, 67/P, 71/P, 72/2/P	67,984
*A	C-11	C-14	Shopping Centre	S.M.C.	RANDER/ C.S.NO.339,266/B	515
10	H-1	H3	Site & Service	S.M.C.	WARD NO. 2 / 2043/G, 2044, 2045, 2046/A, 2046/B, 2047/A, 2047/B/1,2047/B/2	1,326
11	H-2	H6	Housing	S.M.C.	UMARWADA / T.P.S.NO.8(UMARWADA) FP NO. 80/P	17,157
12	H-4	H9	Housing	S.M.C.	ALTHAN / (TPS NO.37 ALTHAN-SOUTH) 78/P	10,773
13	H-5	H21	Town Ship	S.U.D.A.	AABHAVA / 506/P	63,76,510
14	H-6	H27	Site & Service	G.H.B.	JAHAGIRABAD / 30/1, 31/2, 32, 33, 34, 36, 37, 38, 39, 40, 41 /P, 43, 45 /P, 47 /P, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 76//P, 77 /P	3,23,969
15	H-7	H32	Site & Service	G.H.B.	PUNA / T.P.S.NO.20(PUNA) 388/P, 389/P, 390 /P, 391 /P, 392/P, 395/P, 417 /P, 418 /P, 422 /P, 423 /P, 424 /P, 427, 428, 429 /P, 430, 431 /P, 432 /P, 438	1,88,801
16	H-8	H33	Site & Service	G.H.B.	VARELI / 75/P, 76/P, 77/P, 78/P, 79/P,	7,03,043

					80/P, 81, 82/P, 82/P, 83/P, 84, 85/P, 86/P, 87/P, 88/P, 90/P,90/P, 91, 92/P, 93/P, 94/P, 95, 96, 97, 98/P, 99, 100/P, 101/P, 102/P, 103/P, 104/P, 105/P, 108/P, 109/P, 110/P, 111/P, 114/P ANTROLI/ 19/P	
17	H-9	H34	Site & Service	G.H.B.	KHOLVAD / 60/P, 62/P,62/P, 63, 64/P, 65/P, 66, 67/P, 406/P, 407/P, 408/P, 411/P, 412/P, 413/P, 415, 416, 417/P	3,38,683
18	H-10	H47	Site & Service	P.W.D.(GoG)	RANDER / TPS 29(Rander) FP No. 20	5,507
19	H-11	H48	Public Housing	P.W.D.(GoG)	(T.P.S.No.31 GAVIYAR-MAGDALLA)GAVIYAR / 59/1/P/5/P(P)	13,786
20	H-12	H49	Staff Quarter	Choryasi Taluka Panchayat	MAJURA / (TPS NO.9) F.P.NO. 7/P	1,399
21	H-13	H50	Hostel For S/C, S/T	DPO social welfare (GoG)	EARTHAN / 142/P	49,714
22	H-14	C20	EWS Housing	S.M.C.	SINGANPOR / TPS NO. 26(SINGANPOR)F.P No. 73/1, 73/2, 74, 75, 76, 77, 78	47,213
23	H-15	P99	Public Housing	S.U.D.A.	VANZ / 399/P, 405/P, 407/P	59,652
24	H-16	P109	Public Housing	S.U.D.A.	VANKANEDA / 29/P	11,529
25	H-17	P111	PWD Rest House	S.U.D.A.	VAV / 667/P	11,332
26	H-18	P112	Housing	S.U.D.A.	NAVAGAM / T.P.S. NO. 45(NAVAGAM-VAV) SURVEY NO. 56/P, 57/P, 58/P	28,818
27	H-19	P115	Public Housing	S.U.D.A.	KHOLVAD / 120, 121, 122, 123, 124	27,715
28	H-20	P142	EWS Housing	S.M.C.	MAJURA / 61	34,715
29	O-1	O4	Garden	S.M.C.	WARD NO.1 / 1965	400
30	O-2	O13	Garden	S.M.C.	WARD NO.5 / 1855/P, 1856/A, 1859	389
31	O-3	O29	Recreation	S.M.C.	RANDER / CS NO.208/A-B	375
32	O-4	O33	Recreation	S.M.C.	RANDER / T.P.S.NO.30(RANDER) FP-NO. 109, 110, 111, 112, 113, 130	4,066

33	O-5	OM56	Open Space & Garden	S.M.C.	DINDOLI / T.P.S.NO.41(DINDOLI) BLOCK NO. 359	3,019
34	O-6	O57	Recreation	S.M.C.	(T.P.S.No.76 DUMAS-VANTA-GAVIYAR) DUMAS / 937/P,901/P,902/P	1,84,481
35	O-7	O58	Recreation	S.M.C.	(T.P.S.No.81 DUMAS) DUMAS / 82/P	56,282
36	O-8	O59	Eco Park	S.M.C.	(T.P.S.No 77 DUMAS-BHIMPORE-GAVIYAR) DUMAS / 640/B, 641/B, 642/P, 644/P, 645/P, 646, 647, 655/P, 656/P, 712/P	65,497
37	O-9	O60	Eco Tourism	S.M.C.	(T.P.S.No. 77 DUMAS-BHIMPORE-GAVIYAR) (T.P.S.No. 78 DUMAS-BHIMPORE-GAVIYAR) BHIMPOR / 48/P/1,48/P/2 DUMAS / 409, 410/P, 411/P,412/P, 413/P, 414/P, 414/2(P), 415/P, 416/P, 417/P,418/P, 420/P, 421, 422, 424/2, 432, 433,434, 435/P,436/P	73,036
38	O-10	O65	Recreation	S.M.C.	JIAV / 244/P , 289, 290, 291, 292, 293, 294, 295, 296/P, 297/P, 309/P	5,23,798
39	O-11	O66	Recreation	S.M.C.	JIAV / 244/P	71,406
40	O-12	O68	Recreation	S.U.D.A.	KARADAVA / 17, 18, 20/P , 21/A/P, 22/P, 23, 103/P, 104, 110, 111, 112, 114, 130	58,008
41	O-13	O69	Lake Development	S.M.C.	DINDOLI / T.P.S.NO.69(GODADARA-DINDOLI) 12/P, 13/P, 15/P, 16/P	68,603
42	O-14	O79	Open Space	KRIBHCO	KAVAS / 202/P	2,36,216
43	O-16	H8	Sports Complex	S.M.C.	JAHANGIRABAD /31/1, 190, 191, 192/P, 201/P, 209, 210, 211 TO 214, 216, 217/P	1,33,966
44	O-17	H11	Recreation	S.M.C.	BAMROLI / T.P.S.NO.72(BAMROLI) 70/P, 86/P, 90/P, 91/P, 92/P, 93, 94/P, 95/P, 96/P, 97/P, 98/P, 99/P, 100/P, 101/P, 102/P	3,06,258
45	O-18	P34	Play Ground	S.M.C.	WARD NO.12 / (2033/B)P	369
46	O-19	P110	Garden	S.U.D.A.	VANKANEDA/ 82/P, 153/P, 159/1/P, 184/P	81,542

47	O-20	P124	Sports Complex	S.M.C.	PALANPOR / TPS NO. 8(Palanpor) FP. NO. 91, 92, 93, 94, 95, 96	29,561
48	O-21	C24	Sports Complex	S.M.C.	BHESTAN / T.P.S.NO.54(BHESTAN) 272, 273, 292, 293, 294/P	48,873
49	O-22	T11	Garden	S.M.C.	TPS NO.9 (MAJURA) / F.P. NO. 5/1	2,919
50	O-23	T29	Open Space & Garden	S.U.D.A.	ICHHCHAPOR / 544/P, 545, 546/P, 547/P, 548/P,683/P,684/A,685/P,688/P, 687/P, 691/P,702/P,703/P,704/P, 705/P, 706/P, 707/P,708/P, 709/P,710/P	72,337
51	O-26	-	Open Space & Garden	S.U.D.A.	BHERAV / 184/P, 185/P, 186, 187	1,22,234
*B	O-28	-	Open Space	S.M.C.	ANTROLI/ SURVEY NO. 120, 178	1,97,396
*C	O-29	-	Nature Park	S.M.C.	NIYOL/ SURVEY NO. 233,243/P,244/P	1,62,304
*D	O-30	O-34	Open Space & Garden	S.M.C.	T.P.S. NO. 29 (RANDER) F.P. NO. 120	908
*E	O-31	O-80	Open Space & Garden	S.U.D.A.	KAVAS/ SURVEY NO. 202/P BHATPOR/ SURVEY NO. 250/P, 251/P, 252/P, 253/P	2,70,777
*F	O-32	-	Garden		KATHOR/ SURVEY NO. 19	7,702
52	P-1	P6	School and Play Ground	S.M.C.	WARD NO.2 / 1425, 1425/B, 1446/A/1, 1446/A/2	2,501
53	P-2	P7	Parking	S.M.C.	WARD NO.2 / 2196, 2203/A, 2203/C	1,859
54	P-3	P9	Parking	S.M.C.	WARD NO.2 / 1385/A, 1385/B-G , 1386, 1405, 1406, 1407	744
55	P-4	P10	Solid Waste Disposal	S.M.C.	WARD NO.2 / CS NO.3	1,595
56	P-5	P11	School and Play Ground	S.M.C.	WARD NO.2 / 657	118
57	P-6	P12	Public Utility Centre	S.M.C.	WARD NO.3 / CS NO.1445	2,055
58	P-7	P13	Public Utility & Parking	S.M.C.	WARD NO.4 / CS NO. 2190/A/1/A/1	919
59	P-8	P14	Public Utility & Parking	S.M.C.	WARD NO.4 / 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448,	3,234

					1449, 1453, 1523, 1524	
60	P-9	P19	Public Utility Centre	S.M.C.	WARD NO.6 / 2383, 2384, 2385, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2432, 2433, 2434, 2435, 2469/B/1, 2469/B/2, 2483/B/1, 2483/B/2, 2483/B/3, 2686, 2687/A, 2688, 2689/B/1, 2689/3 TO 6, 2689/7, 2689/8, 2689/9, 2689/10, 2689/11, 2689/12, 2689/13, 2689/14, 2689/15	4,653
61	P-10	P20	Parking	S.M.C.	WARD NO.7 / 4800, 4801, 4810, 4811,4814	418
62	P-11	P22	Parking	S.M.C.	WARD NO.7/ 1703, 1704, 1742, 1743/G, 1744, 1745/G, 1746, 1747, 1748, 1749/G, 1753, 1754, 1755, 1756, 1757, 1758, 1759	965
63	P-12	P23	Parking	S.M.C.	WARD NO.7 / 1612/G, 1616/G ,1617/G	698
64	P-13	P25	Public Utility Centre	S.M.C.	WARD NO.8 / 1186	1,183
65	P-14	P26	Parking	S.M.C.	WARD NO.9 / 853, 854 ,& 884	292
66	P-15	P30	Parking	S.M.C.	WARD NO.11 / 1591/G, 1599, 1600, 1601, 1602, 1602/C, 1602/B , 1603, 1604, 1605, 1606, 1608, 1633, 1634, 1635, 1636, 1637	447
67	P-16	P31	Parking	S.M.C.	WARD NO.11 / 1417	104
68	P-17	P33	School & Play Ground	S.M.C.	WARD NO.12 / 858, 857	479
69	P-18	P42	Parking	S.M.C.	RANDER / TPS NO.29, FP NO. 93	5,027
70	P-19	P44	Public Utility Centre	S.M.C.	RANDER / TPS NO.29, FP NO. 34 , 35	4,787
71	P-20	P45	Water Distribution Centre	S.M.C.	KATARGAM / 259 ,260	14,868
72	P-21	P48	Water Works	S.M.C.	DABHOLI / 126/P, 129/P & (135/1 + 135/2)P	16,327
73	P-22	P49	Water Treatment Plant	S.M.C.	(T.P.NO.51 DABHOLI) DABHOLI / 31, 32/P, 33, 34/1/P, 34/2/1, 34/2, 34/3/1, 118 (T.P.S.NO. 52 VED) VED / 135/P, 135/P,	88,042

					136	
74	P-23	P50	Public Purpose	S.M.C.	T.P.S.-25(TUNKI- SINGANPORE) FP. NO. 9, 10, 11, 13, 19, 72, 73, 84,85,86,87,91,93	97,716
75	P-24	P50	Public Purpose	S.M.C.	T.P.S.-25(TUNKI- SINGANPORE) FP-8,88,89,90 T.P.S.-24(TUNKI) FP- 51/P, 52/P, 54, 55, 59, 84, 85, 86, 87, 89, 90, 91, 92, 93, 94, 95, 96, 97	1,78,086
76	P-25	P51	Public Utility Centre	S.M.C.	UMARA / TPS NO.5(Umra North) FP NO. 186	21,061
77	P-26	P53	Water Works	S.M.C.	ALTHAN / TPS28(Althan Bhatar)FP 10, 11, 12 TPS37(Althan South) FP- 62, 63, 65	16,589
78	P-27	P55	Public Purpose	S.M.C.	TPS NO. 37 (Althan South) FP NO.-78/P	12,053
79	P-28	P57	Solid Waste Disposal	S.M.C.	(T.P.S.56 BAMROLI & T.P.S.No.58 BAMROLI) BAMROLI / 122/P, 123/P, 129/P, 130/P, 131/P, 176/P, 177/P, 179/P, 193, 194/P	2,07,358
80	P-29	P63	Water Works	S.M.C.	BHESTAN / T.P.S.NO.54(BHESTAN)SR. NO. 232/P , 233/P, 234	20,498
81	P-30	P66	Public Purpose	S.M.C.	(T.P.S> No. 62 Dindoli,Bhestan, Bhedvad) DINDOLI / 82, 274/P, 278/P, 279/P, 281, 293/P, 295/P, 296/P, 298/P, 299/P, 301, 302, 310, 313 BHEDVAD / 23/5/B/P , 24/1/P/1(P), & 24/2+24/3(P)	1,78,727
82	P-31	P67	Public Purpose	S.M.C.	(T.P.S.No.40 LIMBAYAT-DINDOLI) DINDOLI / 438/P	10,571
83	P-32	P68	Community Centre	S.M.C.	(T.P.S.No 41 DINDOLI) DINDOLI / 383	1,700
84	P-33	P69	Municipal Office	S.M.C.	(T.P.S.No.39 UDHNA-LIMBAYAT) LIMBAYAT / 17/P	12,697
85	P-34	P76	Sewage Treatment Plant	S.M.C.	JANHAGIRPURA / 137, 141, 142/P, 143, 144, 145 & 146	91,335
86	P-35	P83	Public Purpose	S.M.C.	SACHIN / 64/P, 65/P, 66/P, 67/P	17,033

87	P-36	P84	Public Purpose	S.M.C.	PARVAT / T.P.S.NO.61(PARVAT-GODADARA) 14/P	14,765
88	P-37	P87	Sewage Treatment Plant	S.M.C.	VARIYAV / 36/P, 37/P & 38/P,39+55(P)	47,580
89	P-38	P88	Water Distribution Centre	S.M.C.	VARIYAV / 128, 129/1, 129/2, 131/1, 131/2, 132/1, 132/2, 133/1, 133/2, 134/1, 134/2, 135, 136, 137, 138, 139, 140, 141, 142, 143/2/P,147/2/P, 148/P, 149, 150, 151, 152/1, 152/2/P, 153, 154/P, 155/P, 156, 157/1/P, 160/P, 169/P, 170/P, 171, 172/1/P	3,18,019
90	P-39	P90	Water Treatment Plant	S.M.C.	DUMAS / T.P.S.NO.82(DUMAS) 628/1, 628/2/B/P , 629, 630+636, 631, 632, 633	38,827
91	P-40	P91	Sewage Treatment Plant	S.M.C.	(T.P.S.No. 82 DUMAS) DUMAS / 937/P, 937/1(P),937/2/1(P), 937/2/2(P), 937/4(P), 937/5(P),937/6(P), 937/7(P)	1,18,302
92	P-41	P92	Water Works	S.M.C.	(T.P.S.No. 78 DUMAS-BHIMPORE-GAVIYAR) DUMAS / 332 & 442/P BHIMPOR / 45/P/2 & 45/P/1/P	28,158
93	P-42	P94	Public Purpose	S.M.C.	GAVIYAR / T.P.S.NO.32(GAVIAR-VANTA-DUMAS) 287	26,839
94	P-43	P95	Sewage Treatment Plant	S.M.C.	(T.P.S.No. 67 JIAV-SONARI-GABHENI) JIAV / 244/P	57,251
95	P-44	P96	Public Purpose	S.M.C.	BUDIA / 305/P, 379/P, 380/P, 381, 382/P, 383,384, 385, 386, 387	15,09,735
96	P-45	P97	Slaughter House	S.M.C.	BAMROLI / 52/P	59,425
97	P-46	P100	Water Distribution Centre	S.U.D.A.	BHANODARA / 192/P, 193/P, 194, 196, 197, 216/P, 217/P	66,744
98	P-47	P100	Water Treatment Plant	S.U.D.A.	BHANODARA / 180/P, 181/P, 184/P, 185/P, 186, 187, 188, 189/P, 195 EKLERA / 96/P, 97/P, 98/P, 99/P, 100/P, 101/P, 102/P, 103, 104, 105, 106, 107, 108/P	2,21,700
99	P-48	P103	Water Distribution Centre	S.U.D.A.	DEVADH / 54/P, 57, 58, 59, 60, 61, 62, 63/P, 64/P, 65/P, 76/P, 78/P, 79/P	1,99,497
100	P-49	P107	Parking	S.U.D.A.	KADODARA / 218/A/P , 218/B , 219/P	23,884

101	P-50	P108	Sewage Treatment Plant	S.M.C.	KADODARA / 13/P & 22/P	1,65,334
102	P-51	P116	Public Purpose	S.U.D.A.	KHOLVAD / 195/P, 197, 198, 199/P, 200, 201/P, 202/P ,203/P, 204, 205, 206, 207/P, 208, 209,210, 211, 212, 213, 214, 215, 216/P BHADA / 15/P,18/P, 19/P, 20/P, 21/P, 22, 23, 24, 25/P, 26, 27, 28, 29/P	3,03,918
103	P-52	P118	Public Purpose	S.U.D.A.	(T.P.S.No. 70 CHHAPARABHATHA-AMROLI-KOSAD-UTRAN) CHHAPARA BHATHA/ 203/P, 204/P, 205/P, 206/P, 207/P	1,11,499
104	P-53	P119	Water Distribution Centre	S.M.C.	(T.P.S.No. 70 CHHAPARABHATHA-AMROLI-KOSAD-UTRAN) CHHAPARA BHATHA/ 208/P, 209/P, 210/P, 211/P, 212/P, 213/P	1,51,863
105	P-54	P120	Solid Waste Disposal	S.M.C.	VARIYAV / 735/P, 736/P, 737, 738/P, 739, 740/P, 741/P, 742/P, 744, 745/P, 746/P, 747/P, 748/P, 749, 750, 751, 752/P, 753/P, 754/P	2,88,394
106	P-55	P122	Water Works	S.M.C.	VARIYAV / 863/1, 864/P, 867/3/P, 869/2/P KOSAD / 530	26,049
107	P-56	P123	Water Works	S.M.C.	VARIYAV / 35/P	18,765
108	P-57	P126	Solid Waste Disposal	S.M.C.	ASARAMA / 1/P, 9/B/P, 10/P, 11/P, 12, 13, 14, 15, 16, 17, 18, 19,20, 64/P	3,12,811
109	P-58	P131	Public Purpose	Telephone Dept.	T.P.S.NO.25(TUNKI-SINGANPORE) FP-40	3,621
110	P-59	P136	Public Purpose (Govt. Rest House)	G.E.B.	VESU / T.P.S.NO.29(RUNDH-VESU-MAGDALLA) 400/3/P, 402/P , 403, 404	15,727
111	P-60	P140	Public Purpose (Sub-Station)	P.W.D.(GoG)	(T.P.S.No. 40 NAVAGAM) NAVAGAM / 2, 3/P, 179/P	20,227
112	P-61	P141	Educational Complex	Gujarat Maritime Board	GAVIYAR / T.P.S.NO.76(DUMAS-VANTA-GAVIAR) 13, 14, 15, 16, 17/P, 22, 28/P, 33/P, 34/P, 35/P, 36/P, 37/P, 43/P, 44/P, 45	1,41,688

113	P-62	P144	Public Purpose	S.M.C.	JIAV / 244/P	1,10,251
114	P-64	PN3	Public Purpose	G.E.B.	PAL T.P.S 74/396/P	18,882
115	P-67	C2	Parking	S.M.C.	WARD NO.1/ 2913, 2914, 2915, 2916/C, 2917, 2918, 2920, 2921, 2922, 2923	10,858
116	P-68	C5	Community Centre	S.M.C.	WARD NO.2/ 3091/P, 3092/G, 3094/P, 4893/P, 5001/P	13,150
117	P-69	C8	Parking	S.M.C.	WARD NO.4/ 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732/P	929
118	P-70	C9	Parking	S.M.C.	WARD NO. 3/ 436	137
119	P-71	C12	Parking	S.M.C.	WARD NO. 7 / 4181, 4182, 4183, 4184, 4186, 4194/B, 4194/A/3, 4230	938
120	P-72	C28	Water Distribution Centre	S.M.C.	JANHAGIRABAD / 227/P, 228/P, 229, 230/P, 231, 232, 233, 254/P, 255/P	36,451
121	P-73	C41	Parking	S.U.D.A.	SACHIN / 166	8,032
122	P-75	H1	Parking	S.M.C.	WARD NO. 1 / 1808/G, 1809/G, 1810/G, 1811/G, 1812/G/P, 1813/G/P, 1814/G, 1815/G, 1816/G, 1833/G/P	1,166
123	P-76	H2	Parking	S.M.C.	WARD NO. 1 / 1582/P, 1629/G/P, 1630/G/P, 1631/G, 1632, 1633/G, 1634, 1695, 1695/A , 1696/B, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706/A, 1706/B, 1707	4,569
124	P-77	H4	Parking	S.M.C.	WARD NO. 7 / 1, 2, 3, 4, 5, 6, 7, 8, 9,10, 11,12,13,14, 15, 16, 17, 18, 19, 20, 1773/G, 1774, 1175, 1176, 1777, 1780/A, 1780/B, 1781, 1782, 1783/G, 1784, 1784/B/1, (1784/A/1)P, (1784/A/3)P, (1917/1+1991)P, 1917/2, 1917/3, 1917/4, 1917/5, 1917/6, 1917/7, 1918/G, 1919/G,	10,306

					1920/G, 1921/G, 1922/G, 1980, 1981, 1982, 1983/B/3, 1983, 1984, 1985, 1989, 1990/A/G, 1992, 1993, 1994/A, 1994/B, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2001-A/2, 2001/A-1-C/3, 2001A/1/C/4, 2001/A-1-C/1, 2001/A-1-C/2, 2001/B, 2001/A/1/C/G, 2002, 2065/A-G	
125	P-78	H15	Community Centre	S.M.C.	(T.P.S.No.54 BHESTAN) BHESTAN / 232/P, 235, 236, 237, 238/P,267/P	1,53,231
126	P-79	H17	Parking	S.M.C.	BHIMRAD / 22/P, 201/P,202/P SARSANA / 125,126/P	2,96,926
127	P-82	O1	Parking	S.M.C.	WARD NO.1 / 3652, 3653, 3654, 3655, 3656, 3657	310
128	P-83	O2	Parking	S.M.C.	WARD NO.1 / 2529, 2530, 2531	349
129	P-84	O3	Parking	S.M.C.	WARD NO.1 / 3607/A, 3607/B, 3608, 3639/A, 3701, 3702, 3703, 3704/G	763
130	P-85	O5	Parking	S.M.C.	WARD NO.1 / 3212, 3213, 3214/P, 3215	1,203
131	P-86	O6	Public Purpose	S.M.C.	WARD NO.1 / 480, 481, 483, 484/G, 488, 489, 491, 492/P,493/P, 499/P, 500/P, 501, 502 , 504, 505	6,411
132	P-87	O8	Parking	S.M.C.	WARD NO.4 / CS NO.1652,CS NO. 1653	1,115
133	P-88	O12	Parking	S.M.C.	WARD NO.5 / 1688A/3,1688/2/B,(1688A/4)P	1,370
134	P-89	O14	Parking	S.M.C.	WARD NO.6 / 1307/P	625
135	P-90	O16	Parking	S.M.C.	WARD NO.7 / 1024/P	2,144
136	P-91	O23	Public Purpose	S.M.C.	TPS 3(KATARGAM) FP- 428/A/P,428/B/P	80,514
137	P-92	O25	Parking	S.M.C.	RANDER / CS No.172,181-A,181-B,184/P	1,292
138	P-93	O26	Parking	S.M.C.	RANDER / CS NO.325/B, 326, 327, 328/A-B-C-E/P	498
139	P-94	O28	Parking	S.M.C.	RANDER / CS NO. 288,291,298	802

140	P-95	O30	Parking	S.M.C.	RANDER / CS NO.109-A	659
141	P-96	O35	Water Distribution Centre	S.M.C.	TPS30(RANDER) FP-101,102,103,104,105,107,108	14,238
142	P-97	O46	Auditorium(SMC)	S.M.C.	(T.P.S.No.41 DINDOLI) DINDOLI / 345/P	18,115
143	P-98	O62	Public Purpose	S.U.D.A.	ABHVA / 506/P	5,00,487
144	P-99	O76	Water Distribution Centre	S.U.D.A.	(T.P.S.No.49 KHOLVAD-NAVAGAM) KHOLVAD / 453/P, 454, 455/P	19,069
145	P-100	T2	Urban Renewal (Parking)	S.M.C.	WARD NO.4 / 3055, 3057/A/1-G, 3057/B, 3058	426
146	P-101	T6	Urban Renewal (Parking)	S.M.C.	WARD NO.10 / 2593, 2594, 2595/A, 2595/B, 2596, 2597, 2598, 2599, 2601	204
147	P-102	T7	Urban Renewal (Parking)	S.M.C.	WARD NO.12 / 2764G, 2765	285
148	P-103	T25	Educational Purpose	S.U.D.A.	LADVI / 48/P, 90, 91, 92, 93, 94/P, 95/P	1,98,695
149	P-104	T30	Public Purpose	S.U.D.A.	ICHHCHAPOR / 379/P, 413/P, 414/P, 415/P, 418/P, 450, 517/P, 518/P, 537, 538/P, 539/P	77,969
150	P-105	-	Disaster Management Center	S.U.D.A.	DAMKA / 507/P, 508/P, 509/A/P	1,53,575
151	P-106	-	Hospital	S.U.D.A.	DAMKA / 506/P,507/P,508/P,509/A/P	1,58,099
152	P-107	-	Sewage Treatment Plant	S.U.D.A.	VANSVA / 128/P,129/P, 130, 131, 132/P	3,49,298
153	P-116	-	Sewage Treatment Plant	S.U.D.A.	KAMREJ / 506/P, 507/P, 508/P, 510/P, 586/P, 587/P, 598/P	1,02,067
154	P-117	-	Public Purpose	S.U.D.A.	KAMREJ / 584, 585/P, 588/P, 598/P	1,16,849
155	P-118	-	Water Distribution Centre	S.U.D.A.	MANKNA / 128, 129/P	81,968
156	P-120	-	Water Treatment Plant	S.U.D.A.	JOLVA / 301/P, 302, 323/P	80,955
157	P-121	-	Sewage Treatment Plant	S.U.D.A.	TATITHAYA / 20/P, 276/P, 277/P, 283, 284, 285, 286/P	1,64,119

158	P-122	-	Water Treatment Plant	S.U.D.A.	SANKI / 300/P, 303, 305, 306, 308, 312/P, 313/P	1,08,123
159	P-124	-	Hazardous Waste Disposal Site	S.U.D.A.	TENA / 591/P	8,232
160	P-125	-	Solid Waste Disposal Site	S.U.D.A.	TENA 591	6,29,632
*G	P-127	P-41	Slaughter House	S.M.C.	RANDER TIKA NO. 9 C.S. NO. 103/C/9/A/P	2,904
*H	P-128	-	Recreation for S.M.C.	S.M.C.	RUNDH T.P.NO.4(RUNDH-MAGDALLA) F.P. NO. 18	3,369
*I	P-129	-	Public Purpose for S.M.C.	S.M.C.	RUNDH T.P.NO.4(RUNDH-MAGDALLA) F.P. NO. 18	6,800
*J	P-130	P59	Cemetery/ Burial Ground	S.M.C.	UDHNA BLCK. NO. 69/P,70/P,71,72,73	70341
*K	P-131	P81	Solid Waste Disposal	S.M.C.	JIAV 246/P	102296
*L	P-132		Nagarpanchayat Staff quaters & offices	Kathor	KATHOR 1	11731
161	T-1	T12	Transport Node	S.M.C.	VIHEL / 13/P,18/P, 19/P, 20/P T.P.S.NO.45(JAHANGIRPURA-PISAD)FP NO- 66, 67, 68, 69 VANAKALA / 93/P, 94/P, 95/P,96/P, 97/P	1,17,629
162	T-3	TM64	Transport Node	S.M.C.	(T.P.S.No.67 JIAV-SONARI-GABHENI) JIAV / 470/P, 473/P, 474/P, 476/P, 477/P, 478/P	34,297
163	T-4	T19	Transport (Parking)	S.M.C.	KAPADARA / T.P.S.NO.16(KAPADRA) FP NO. 9	8,795
164	T-5	T23	Transport Node	G.S.R.T.C.	SACHIN / 170/A	54,506
165	T-6	T24	Logistic Park	S.U.D.A.	VALTHAN / 28/1, 28/2, 28/3, 31/P & 47/P	1,31,981
166	T-7	T26	Multi Model Transport Hub	S.U.D.A.	VEDCHHA / 12,51/P, 52/P, 53, 54/P, 111/P, 112/P, 113/P, 116/P, 117/P, 118/P, 119/P, 120/P, 121	1,63,789
167	T-8	T28	Aerodrome Complex	Civil Aviation Dept.	Area within shape formed by connecting points A-B-C-D-E-F-G-H-I-J-K-L-M-N-O	1,09,09,884

					on DP map	
168	T-9	T13	Logistic Park	S.M.C.	MAGOB / T.P.S.NO.34(MAGOB-DUMBHAL) FP NO. 20 & 21	29,827
169	T-10	O45	Transport (Parking)	S.M.C.	MAJURA/ T.P.S.NO.1(UDHANA-MAJURA) FP NO.82	4,154
170	T-11	O52	Logistic Park	S.M.C.	(T.P.S.No.58 VALAK) VALAK / 12/P, 13/P, 15, 16/P, 17/P, 18/P, 20/P, 21/P, 23, 25/P, 157, 158/P, 167/P, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179/P, 180/P	1,52,962
171	T-12	O53	Transport (Parking)	S.M.C.	(T.P.S.NO.67 JIAV-SONARI-GABHENI) JIAV / 244/P	47,044
172	T-13	O67	Logistic Park	S.U.D.A.	SACHIN / 61/P, 62/P, 63/P, 170/A/P	36,666
173	T-14	OM53	BRTS Terminal	S.M.C.	(T.P.S.No.35 KUMBHARIA-SAROLI-SANIYAHEMAD-DEVADH) SAROLI / 20/P	54,747
174	T-15	P2	Bus Stand	S.M.C.	WARD NO.1 / 2821, 2822, 2823, 2824, 2825, 2826, 2827, 2828, 2829, 2830, 2831, 2832, 2833, 2834, 2835, 2836, 2837, 2838, 2839, 2840, 2841, 2842, 2843, 2844	2,229
175	T-16	P36	BRTS Hub	S.M.C.	TUNKI/ T.P.S.NO.3(KATARGAM) FP NO. (428/B)P	39,596
176	T-17	P37	BRTS Hub	S.M.C.	KATODARA/ T.P.S.NO.6(MAJURA-KHATODARA) FP NO.366,367	6,255
177	T-18	P64	BRTS Terminal (Work Shop)	S.M.C.	(T.P.S.No. 55 BHESTAN) BHESTAN / 232/P	32,645
178	T-19	P77	Transport Node	S.M.C.	JAHANGIRPURA / 95	22,466
179	T-20	P101	Logistic Park	S.U.D.A.	KHARVASA / 222, 223/P, 224/P, 225/P, 226,227/P, 228/P, 229/P, 233, 234	2,36,850
180	T-21	P138	BRTS Node	S.M.C.	RUNDH/ T.P.S.NO.4(RUNDH-MAGDALLA)/ FP NO. 30,31	16,052
181	T-22	P143	Transport Node	S.U.D.A.	LASKANA / 5/A/1/P, 5/P	1,51,466

*M	T-24	-	Multimodal Transit Terminal (Govt.)	S.M.C.	HARIPURA/ 41/B/P,41/A/P	2,52,148
*N	T-25	1	S.T.Stand	G.S.R.T.C.	KATHOR 507	15557
						3,18,99,171
			Total (of 181 remaining reservations of published DDP after deleting 60 villages)			**3,18,99,171**
			****Total (added 14 reservations after reviewing objections/suggestions)**			**11,04,748**

NOTE:

The spatial extent of the reservation shall be as demarcated in the map of Draft Development Plan- 2035 and the final area shall be as per Revenue Records for the complete City Survey numbers, Revenue Survey numbers or Block Numbers. In case of part land, the area shall be as obtained from the computer system. In case of any dispute in this regard, decision of the Chief Executive Authority of SUDA shall be final and binding.

*Reservations assigned with alphabetical letters- following * sign in the table above have been added to the list of the reservations of the Draft Development Plan- 2035 after its publication u/s 13 of the Act. Such reservations have been added at the recommendation of Surat Municipal Corporation; in other cases, these reservations were not highlighted in the published Draft DP- 2035 and hence these have been added in this report.

21.4 COST ESTIMATES

Detailed cost estimates for Draft Development Plan- 2035 were documented in Chapter- 20 of this report when the Draft DP - 2035 was published u/s 13 of the Act. This includes estimates for infrastructure, road development work and cost for acquisition of land reserved for various purposes under this Draft Development Plan. The cost estimates projected then are enumerated in the table below:

Table 157 Cost Estimates in Draft DP - 2035 published u/s 13

Sr. No.	Category	Total cost (Rs. crore)
1	Infrastructural Cost (considering inflation)	23,723
2	Road Development	1,470
3	Land Acquisition of Reservation Land	5,100
	Total	**30,293**

However, after publication of Draft Development Plan- 2035 u/s 13 of the Act, the State Government modified the development area of SUDA by excluding villages from its jurisdiction by notifications of 24.10.2016 and 03.11.2016. After exclusion of these villages from SUDA, the cost estimates have been revised. Since most of the infrastructural cost is estimated for the urbanised area, this has less impact in the 61 villages excluded as most of it was proposed in then agricultural zone. So, infrastructure cost estimated in u/s 13 Report is kept as it is. After exclusion of 61 villages from SUDA's jurisdiction, the proposed road network is affected. For example, the original length of 120 m wide Ring Road was 116 km but after exclusion of these villages, only 79 km of this proposed ring road would fall under SUDA's jurisdiction. The summary of the proposed road network for Draft Development Plan- 2035 to be submitted u/s 16 of the Act, is given in the table below:

Table 158 Draft DP 2035 Proposed Roads u/s 16

Sr. No.	Road Width (m)	Road Length (Km)		Total (Km)
		Ring	Radial	
1	120	73.82	0	**73.82**
2	90	49.90	125.21	**175.11**
3	60	62.62	202.84	**265.46**
4	45	0	216.87	**216.87**
	Total	**186.34**	**544.92**	**731.26**

The cost of development of proposed road network submitted u/s 16 based on the rough estimates assuming unit cost of road is given in the table below:

Table 159 Draft DP 2035 Road Cost Estimates

Sr. No.	Road Width (m)	Unit Cost of Road Development (Rs. in crore/ km)	Road Length (km)	Total Cost (crore)
1	120	3.00	73.82	221.46
2	90	2.00	175.11	350.22
3	60	1.50	265.46	398.19
4	45	1.00	216.87	216.87
	Total		**731.26**	**1186.74**

After the exclusion of 61 villages from the development area of SUDA, set of reservations for public purposes in those excluded villages also now not part of SUDA area and hence the acquisition cost of these land reserved has to be excluded. When the draft DP was published u/s 13, at that time the total area under reservation was proposed to be 36.54 Km^2 and for which acquisition cost was estimated to be Rs. 5100 crores. With this estimate, for 31.89 Km^2 reserved area which is left after exclusion of villages, the cost of acquisition shall now be Rs. 4450 crores. The cost estimate for the Draft Development Plan- 2035 submitted u/s 16 of the Act shall now be as shown in the table below.

Table 160: Cost Estimates for Draft DP - 2035 submitted u/s 16

Sr. No.	Category	Total cost (Rs. crore)
1	Infrastructural Cost (considering inflation)	23,723
2	Road Development	1,187
3	Land Acquisition of Reservation Land	4,450
	Total	**29,360**

The implementation, phasing, etc. shall be as mentioned in the Chapter 20.

22 ANNEXURE

Annexure 1: Demographic details of SUDA area(effective from 03.11.2016)

Sr. No.	Municipal Corporation/ Village/ Nagarpalika	Taluka	Population	Area(Ha)
A	**Surat Municipal Corporation**	**Chorasi**	**44,66,060**	**309.45 sq.km.**
B	**Kanakpur- Kansad Nagarpalika**	**Chorasi**	**28,327**	**6.99 sq.km.**
C	**Sachin Nagarpalika**	**Chorasi**	**28,102**	**5.72 sq.km.**
D	**Kadodara Nagarpalika**	**Palsana**	**27,336**	**4.20 sq.km.**
E	**Old SUDA villages**	**Chorasi/ Kamrej/ Olpad/ Palsana**	**2,53,539**	**365.04 sq.km.**
1	Asarma*	Chorasi	-	163.44
2	Bhanodra	Chorasi	1,138	285.01
3	Bharthana Kosad	Chorasi	5,679	431.42
4	Bhatha	Chorasi	5,122	882.96
5	Bhatia	Chorasi	963	453.34
6	Bhatpor	Chorasi	3,449	824.20
7	Bhesan	Chorasi	2,195	557.85
8	Bonand	Chorasi	1,218	512.07
9	Chichi*	Chorasi	-	187.41
10	Dakhkhanvada	Chorasi	183	139.64
11	Deladva	Chorasi	1,374	647.23
12	Devadh	Chorasi	1,168	375.10
13	Eklera	Chorasi	839	202.09
14	Goja	Chorasi	357	192.70
15	Ichchhapor	Chorasi	12,097	912.61
16	Kachholi	Chorasi	2,149	485.81
17	Kapletha	Chorasi	3,312	345.49
18	Karadva	Chorasi	1,437	226.51
19	Kavas	Chorasi	6,500	72.11

Sr. No.	Municipal Corporation/ Village/ Nagarpalika	Taluka	Population	Area(Ha)
20	Khambhasla	Chorasi	452	157.34
21	Kharvasa	Chorasi	1,346	661.73
22	Kumbharia	Chorasi	5,824	285.17
23	Lajpor	Chorasi	7,920	720.43
24	Malgama	Chorasi	960	284.90
25	Mohni	Chorasi	1,424	875.00
26	Okha	Chorasi	63	290.79
27	Pali	Chorasi	7,325	167.15
28	Pardi Kanade	Chorasi	9,167	129.53
29	Popda	Chorasi	1,017	260.91
30	Ravla Alias Vaktana	Chorasi	1,090	399.56
31	Sabargam	Chorasi	262	62.59
32	Samrod	Chorasi	1,056	194.49
33	Saniya Hemad	Chorasi	3,964	324.09
34	Saniya Kanade	Chorasi	1,555	261.08
35	Saroli	Chorasi	3,063	198.91
36	Talangpor	Chorasi	11,417	427.10
37	Timbarva	Chorasi	600	341.50
38	Umber	Chorasi	1,704	885.45
39	Vanakala	Chorasi	277	346.41
40	Vanz	Chorasi	2,444	616.24
41	Vedchha	Chorasi	514	256.36
42	Vihel*	Chorasi	-	116.01
43	Abrama	Kamrej	2,682	1032.28
44	Bhada	Kamrej	1,770	458.51
45	Chhedchha	Kamrej	357	176.84
46	Kathodara	Kamrej	2,625	544.66
47	Khadsad	Kamrej	1,044	280.77

Sr. No.	Municipal Corporation/ Village/ Nagarpalika	Taluka	Population	Area(Ha)
48	Kholvad	Kamrej	15,535	763.62
49	Kosamadi	Kamrej	1,082	408.67
50	Kosmada	Kamrej	1,650	752.70
51	Ladvi	Kamrej	1,310	401.07
52	Laskana	Kamrej	15,318	388.31
53	Navagam	Kamrej	10,945	374.60
54	Oviyan	Kamrej	566	368.68
55	Pasodara	Kamrej	860	338.85
56	Umbhel	Kamrej	4,853	833.74
57	Valak	Kamrej	2,153	331.39
58	Valthan	Kamrej	1,606	306.21
59	Vav	Kamrej	7,053	1350.84
60	Ambheta	Olpad	1,713	697.58
61	Ariyana	Olpad	1,419	284.54
62	Balkas	Olpad	846	463.11
63	Gothan	Olpad	3,035	635.27
64	Jothan	Olpad	728	334.40
65	Kanad	Olpad	524	403.86
66	Kosam	Olpad	1,412	403.78
67	Kunkni	Olpad	856	237.00
68	Sarol	Olpad	416	178.05
69	Saroli	Olpad	1,946	374.51
70	Segwachhama	Olpad	1,346	511.18
71	Segwasyadla	Olpad	805	234.40
72	Sonsak	Olpad	1,128	290.72
73	Sherdi	Olpad	1,309	165.89
74	Talad	Olpad	719	151.09
75	Vadod	Olpad	506	364.33

Sr. No.	Municipal Corporation/ Village/ Nagarpalika	Taluka	Population	Area(Ha)
76	Vaswari	Olpad	949	299.55
77	Antroli	Palsana	2,114	492.56
78	Chalthan	Palsana	21,795	830.37
79	Erthan	Palsana	845	421.80
80	Haripura	Palsana	1,593	135.06
81	Karala	Palsana	1,607	134.05
82	Karan	Palsana	1,381	257.92
83	Kharbhasi	Palsana	849	270.05
84	Lingad	Palsana	1,779	377.64
85	Niyol	Palsana	1,626	552.26
86	Sedhav	Palsana	596	129.49
87	Talodara	Palsana	418	165.45
88	Tantizaghda	Palsana	847	217.57
89	Taraj	Palsana	1,626	347.20
90	Vadadala	Palsana	995	316.89
91	Vankaneda	Palsana	2,745	273.41
92	Vareli	Palsana	9,033	281.80
F	**SUDA new Villages**	**Chorasi/ Kamrej/ Olpad/ Palsana**	**1,57,730**	**267.68 sq.km.**
1	Asnabad	Olpad	870	214.36
2	Barbodhan	Olpad	3,358	1,421.60
3	Delad	Olpad	4,028	290.19
4	Dihen	Olpad	2,636	1,282.05
5	Isanpor	Olpad	1,271	347.36
6	Karamla	Olpad	957	578.40
7	Masma	Olpad	2,811	997.19
8	Paria**	Olpad	2,506	668.70
9	Sandhiyer**	Olpad	0	780.77
10	Sithana	Olpad	191	166.22
11	Umra	Olpad	2,233	423.58

Sr. No.	Municipal Corporation/ Village/ Nagarpalika	Taluka	Population	Area(Ha)
12	Tena	Olpad	1,976	756.82
13	Bagumara	Palsana	3,403	958.88
14	Baleshvar	Palsana	6,962	764.72
15	Dastan	Palsana	1,967	735.89
16	Isroli	Palsana	969	72.43
17	Jolva	Palsana	1,754	643.56
18	Palsana	Palsana	10,945	713.32
19	Sanki	Palsana	1,008	604.35
20	Tantithaiya	Palsana	2,910	404.22
21	Amboli CT	Kamrej	6,137	375.00
22	Bhairav	Kamrej	961	410.17
23	Choryasi	Kamrej	1,153	226.00
24	Delad	Kamrej	1,507	248.30
25	Dungra	Kamrej	2,884	693.70
26	Jokha	Kamrej	2,085	666.84
27	Kamrej	Kamrej	16,078	1,065.91
28	Kathor	Kamrej	13,783	1,107.00
29	Kholeshwar	Kamrej	1,300	446.97
30	Koli Bharthana	Kamrej	1,989	660.20
31	Mankna	Kamrej	1,408	370.39
32	Morthana	Kamrej	1,448	675.63
33	Nansad	Kamrej	1,404	237.02
34	Simadi	Kamrej	874	310.28
35	Velanja**	Kamrej	0	270.18
36	Bhatlai	Chorasi	4,066	193.14
37	Damka	Chorasi	5,604	1,050.90
38	Hajira	Chorasi	16,724	2,012.50
39	Limla CT	Chorasi	3,683	25.00
40	Mora CT	Chorasi	13,924	745.00
41	Rajgari	Chorasi	1,300	350.83
42	Sunvali	Chorasi	4,165	1,305.22
43	Vansva	Chorasi	2,498	497.39

Sr. No.	Municipal Corporation/ Village/ Nagarpalika	Taluka	Population	Area(Ha)
G	**River/ Other**	**-**	**-**	**26.07 sq.km.**
	Total (A+B+C+D+E+F +G)		**49,61,094**	**985.15 sq.km.**

Note: * Vihel, Chichi and Asarma are census villages with record population as null.

**Out of 3 villages which are partly included Gamtal of Moje –Paria falls within the jurisdiction of SUDA development area while Gamtal of Moje - Velanja and Sandhiyer fall outside the jurisdiction of SUDA development area. Hence population of Moje - Paria is considered for the total population of SUDA area

Annexure 1(B): Demographic details of newly added villages in SUDA's jurisdiction (dt. 09.12.2015)

Sr. No.	Taluka	Village	Population	Area(Ha)
1	Olpad	Achharan	1,025	420.78
2	Olpad	Andhi	623	469.89
3	Olpad	Asnabad	870	214.36
4	Olpad	Atodra	1,755	692.60
5	Olpad	Barbodhan	3,358	1,421.60
6	Olpad	Bhandut	1,242	590.44
7	Olpad	Bharundi	1,031	550.41
8	Olpad	Delad	4,028	290.19
9	Olpad	Dihen	2,636	1,282.05
10	Olpad	Gola	832	427.74
11	Olpad	Isanpor	1,271	347.36
12	Olpad	Jafrabad	420	249.14
13	Olpad	Kachhol	552	287.01
14	Olpad	Kanthraj	681	261.86
15	Olpad	Kanyasi	1,387	424.62
16	Olpad	Karamla	957	578.40
17	Olpad	Kareli	1,152	801.11
18	Olpad	Kasala Khurd	476	150.51
19	Olpad	Kasla Bujrang	443	188.36
20	Olpad	Khalipor	421	174.77
21	Olpad	Kudsad	9,407	1,687.70
22	Olpad	Madhar	607	296.25
23	Olpad	Masma	2,811	997.19
24	Olpad	Morthan	948	592.64
25	Olpad	Narthan	1,237	577.59
26	Olpad	Obhla	430	391.44
27	Olpad	Olpad	15,898	1,501.00
28	Olpad	Orma	1,147	623.91
29	Olpad	Paria	2,506	917.22
30	Olpad	Pinjrat	5,799	3,382.61
31	Olpad	Sandhiyer	3,207	1,352.09
32	Olpad	Sayan CT	15,324	702.00
33	Olpad	Selut	1,077	408.70
34	Olpad	Sithan	1,144	313.00
35	Olpad	Sithana	191	166.22
36	Olpad	Siwan	2,134	562.07
37	Olpad	Syadla	1,415	505.24
38	Olpad	Umra	2,233	423.58
39	Olpad	Tena	1,976	756.82

40	Olpad	Veluk	1,371	478.70
41	Palsana	Bagumara	3,403	958.88
42	Palsana	Baleshvar	6,962	764.72
43	Palsana	Bhutpor	591	608.36
44	Palsana	Dastan	1,967	735.89
45	Palsana	Ghaluda	440	173.17
46	Palsana	Italva	1,260	292.71
47	Palsana	Isroli	969	72.43
48	Palsana	Jolva	1,754	643.56
49	Palsana	Kanav	1,609	511.81
50	Palsana	Makhinga	874	451.85
51	Palsana	Palsana	10,945	713.32
52	Palsana	Sanki	1,008	604.35
53	Palsana	Tantithaiya	2,910	404.22
54	Palsana	Tundi	2,282	814.72
55	Kamrej	Akhakhol	590	305.50
56	Kamrej	Alura	645	265.61
57	Kamrej	Amboli CT	6,137	375.00
58	Kamrej	Antroli	1,068	416.12
59	Kamrej	Asta	1,375	385.63
60	Kamrej	Bhairav	961	410.17
61	Kamrej	Choryasi	1,153	226.00
62	Kamrej	Delad	1,507	248.30
63	Kamrej	Dharutha	490	211.82
64	Kamrej	Dhatva	1,069	386.88
65	Kamrej	Dhoran Paradi	1,939	1,052.53
66	Kamrej	Dungra	2,884	693.70
67	Kamrej	Ghala	4,550	2,148.45
68	Kamrej	Ghaludi	877	395.92
69	Kamrej	Haldharu	3,002	707.90
70	Kamrej	Jat Bharthana	562	142.75
71	Kamrej	Jior	219	196.99
72	Kamrej	Jokha	2,085	666.84
73	Kamrej	Kamrej	16,078	1,065.91
74	Kamrej	Karjan	2,602	1,228.86
75	Kamrej	Kathor	13,783	1,107.00
76	Kamrej	Kholeshwar	1,300	446.97
77	Kamrej	Koli Bharthana	1,989	660.20
78	Kamrej	Mankna	1,408	370.39
79	Kamrej	Morthana	1,448	675.63
80	Kamrej	Nansad	1,404	237.02
81	Kamrej	Navi Paradi	4,474	815.69

82	Kamrej	Netrang	1,228	374.06
83	Kamrej	Pali	1,325	425.98
84	Kamrej	Parab	1,627	509.56
85	Kamrej	Segva	1,149	667.97
86	Kamrej	Shekhpur	1,432	568.16
87	Kamrej	Simadi	874	310.28
88	Kamrej	Tharoli	194	299.79
89	Kamrej	Valan	1,091	358.55
90	Kamrej	Vansdarundhi	661	125.79
91	Kamrej	Velanja	2,550	621.60
92	Mangrol	Pipodara	7,765	834.39
93	Chorasi	Bhatlai	4,066	193.14
94	Chorasi	Damka	5,604	1,050.90
95	Chorasi	Hazira	16,724	2,012.50
96	Chorasi	Limla CT	3,683	25.00
97	Chorasi	Mora CT	13,924	745.00
98	Chorasi	Rajgari	1,300	350.83
99	Chorasi	Sunvali	4,165	1,305.22
100	Chorasi	Vansva	2,498	497.39
		Total	**2,80,455**	**61,329**

Annexure 2: Old SUDA village wise population growth rate

Sr. No.	Village	Taluka	Category	Area	Population						Growth Rate				
					1961	1971	1981	1991	2001	2011	1961-71	1971-81	1981-91	1991-01	2001-11
1	Abhva	Chorasi	SMC	2195.76	1234	1541	2040	2505	2881	3249	24.88%	32.38%	22.79%	15.01%	12.77%
2	Amroli	Chorasi	SMC	42.00	2451	2183	5755	13078	17138	28501	-10.93%	163.63 %	127.25%	31.04%	66.30%
3	Bamroli	Chorasi	SMC	556.82	739	1017	1348	8889	45354	105130	37.62%	32.55%	559.42%	410.23%	131.80%
4	Dindoli	Chorasi	SMC	520.34	1830	3875	9143	20539	84898	151508	111.75%	135.95 %	124.64%	313.35%	78.46%
5	Magdalla	Chorasi	SMC	248.66	885	1110	1432	2021	5257	6104	25.42%	29.01%	41.13%	160.12%	16.11%
6	Sarsana	Chorasi	SMC	201.46	373	494	612	745	849	979	32.44%	23.89%	21.73%	13.96%	15.31%
7	Bharthana – Vesu	Chorasi	SMC	219.44	785	841	957	1219	1920	5414	7.13%	13.79%	27.38%	57.51%	181.98%
8	Bhimpor	Chorasi	SMC	638.87	4001	4991	6318	7239	7553	7862	24.74%	26.59%	14.58%	4.34%	4.09%
9	Bhimrad	Chorasi	SMC	240.22	594	796	962	1115	1257	2415	34.01%	20.85%	15.90%	12.74%	92.12%
10	Budia	Chorasi	SMC	363.83	1201	1328	1673	2047	2349	2438	10.57%	25.98%	22.36%	14.75%	3.79%
11	Gabheni	Chorasi	SMC	1325.94	1487	1847	2273	3433	6321	17140	24.21%	23.06%	51.03%	84.12%	171.16%
12	Gaviyar	Chorasi	SMC	406.12	274	418	1020	1413	2449	2585	52.55%	144.02 %	38.53%	73.32%	5.55%
13	Godadara	Chorasi	SMC	296.89	434	610	800	3028	23234	111628	40.55%	31.15%	278.50%	667.31%	380.45%
14	Jiav	Chorasi	SMC	573.43	682	935	1316	1143	1550	6003	37.10%	40.75%	-13.15%	35.61%	287.29%
15	Khajod	Chorasi	SMC	1639.24	588	831	1040	1214	1434	1737	41.33%	25.15%	16.73%	18.12%	21.13%
16	Kosad	Chorasi	SMC	953.26	2827	3786	5226	8004	28663	88224	33.92%	38.03%	53.16%	258.11%	207.80%
17	Magob	Chorasi	SMC	151.64	642	721	960	2160	21961	58275	12.31%	33.15%	125.00%	916.71%	165.36%
18	Mota Varachha	Chorasi	SMC	903.52	3453	4479	5950	7055	7704	32640	29.71%	32.84%	18.57%	9.20%	323.68%
19	Pal	Chorasi	SMC	604.50	1931	2520	3584	4459	11165	36107	30.50%	42.22%	24.41%	150.39%	223.39%
20	Palanpor	Chorasi	SMC	300.81	531	775	920	1712	11496	23514	45.95%	18.71%	86.09%	571.50%	104.54%
21	Puna	Chorasi	SMC	733.14	3069	4330	5096	8557	119092	346598	41.09%	17.69%	67.92%	1291.75 %	191.03%
22	Rundh	Chorasi	SMC	365.29	865	1108	1416	1639	2155	4355	28.09%	27.80%	15.75%	31.48%	102.09%
23	Simada	Chorasi	SMC	260.25	325	434	564	1101	3345	23527	33.54%	29.95%	95.21%	203.81%	603.35%

Sr. No.	Village	Taluka	Category	Area	Population						Growth Rate				
					1961	1971	1981	1991	2001	2011	1961-71	1971-81	1981-91	1991-01	2001-11
24	Sonari	Chorasi	SMC	129.41	80	113	151	186	498	5057	41.25%	33.63%	23.18%	167.74%	915.46%
25	Sultanabad	Chorasi	SMC	449.12	1171	1523	2174	2641	3263	3661	30.06%	42.74%	21.48%	23.55%	12.20%
26	Vadod	Chorasi	SMC	364.33	321	435	606	499	235	89	35.51%	39.31%	-17.66%	-52.91%	-62.13%
27	Vanta	Chorasi	SMC	152.96	290	364	434	472	661	244	25.52%	19.23%	8.76%	40.04%	-63.09%
28	Variav	Chorasi	SMC	2259.62	2865	4165	5883	8495	14003	19728	45.38%	41.25%	44.40%	64.84%	40.88%
29	Vesu	Chorasi	SMC	898.90	975	1177	1771	3298	6251	26471	20.72%	50.47%	86.22%	89.54%	323.47%
30	SuratTown	Chorasi	SMC	14604.23	250792	422779	927774	1504057	2433430	3326254	68.58%	119.45%	62.11%	61.79%	36.69%
31	Asarma*	Chorasi	SUDA	163.44	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
32	Bhanodra	Chorasi	SUDA	285.01	268	317	388	532	774	1138	18.28%	22.40%	37.11%	45.49%	47.03%
33	Bharthana Kosad	Chorasi	SUDA	431.42	525	714	925	2755	4743	5679	36.00%	29.55%	197.84%	72.16%	19.73%
34	Bhatha	Chorasi	SUDA	882.96	3947	3424	4777	5128	5164	5122	-13.25%	39.52%	7.35%	0.70%	-0.81%
35	Bhatia	Chorasi	SUDA	453.34	510	622	798	807	882	963	21.96%	28.30%	1.13%	9.29%	9.18%
36	Bhatpor	Chorasi	SUDA	824.20	1200	1800	2072	2327	3379	3449	50.00%	15.11%	12.31%	45.21%	2.07%
37	Bhesan	Chorasi	SUDA	557.85	878	1145	1571	1669	2011	2195	30.41%	37.21%	6.24%	20.49%	9.15%
38	Bonand	Chorasi	SUDA	512.07	762	762	998	1022	1287	1218	0.00%	30.97%	2.40%	25.93%	-5.36%
39	Chichi*	Chorasi	SUDA	187.41	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
40	Dakhkhanvada	Chorasi	SUDA	139.64	141	126	357	190	227	183	-10.64%	183.33%	-46.78%	19.47%	-19.38%
41	Deladva	Chorasi	SUDA	647.23	721	894	1181	1368	1412	1374	23.99%	32.10%	15.83%	3.22%	-2.69%
42	Devadh	Chorasi	SUDA	375.10	250	400	579	813	1158	1168	60.00%	44.75%	40.41%	42.44%	0.86%
43	Eklera	Chorasi	SUDA	202.09	475	587	690	846	789	839	23.58%	17.55%	22.61%	-6.74%	6.34%
44	Goja	Chorasi	SUDA	192.70	142	202	385	351	425	357	42.25%	90.59%	-8.83%	21.08%	-16.00%
45	Ichchhapor	Chorasi	SUDA	912.61	2003	2607	3487	5144	8292	12097	30.15%	33.76%	47.52%	61.20%	45.89%
46	Kachholi	Chorasi	SUDA	485.81	873	1139	1135	1195	1650	2149	30.47%	-0.35%	5.29%	38.08%	30.24%
47	Kanakpur-Kansad	Chorasi	SUDA	698.28	1751	2072	2849	4866	17384	28327	18.33%	37.50%	70.80%	257.25%	62.95%
48	Kapletha	Chorasi	SUDA	345.49	1221	1397	1851	2226	2408	3312	14.41%	32.50%	20.26%	8.18%	37.54%
49	Karadva	Chorasi	SUDA	226.51	74	84	116	161	164	1437	13.51%	38.10%	38.79%	1.86%	776.22%
50	Kavas	Chorasi	SUDA	72.11	770	1083	1469	2215	2366	6500	40.65%	35.64%	50.78%	6.82%	174.73%

Sr. No.	Village	Taluka	Category	Area	Population						Growth Rate				
					1961	1971	1981	1991	2001	2011	1961-71	1971-81	1981-91	1991-01	2001-11
51	Khambhasla	Chorasi	SUDA	157.34	267	259	359	397	448	452	-3.00%	38.61%	10.58%	12.85%	0.89%
52	Kharvasa	Chorasi	SUDA	661.73	751	835	1289	1374	1708	1346	11.19%	54.37%	6.59%	24.31%	-21.19%
53	Kumbharia	Chorasi	SUDA	285.17	1697	2151	2798	3112	4136	5824	26.75%	30.08%	11.22%	32.90%	40.81%
54	Lajpor	Chorasi	SUDA	720.43	2948	3797	4973	5856	6257	7920	28.80%	30.97%	17.76%	6.85%	26.58%
55	Malgama	Chorasi	SUDA	284.90	424	543	702	782	915	960	28.07%	29.28%	11.40%	17.01%	4.92%
56	Mohni	Chorasi	SUDA	875.00	794	850	1062	1201	1290	1424	7.05%	24.94%	13.09%	7.41%	10.39%
57	Okha	Chorasi	SUDA	290.79	143	1	1	30	63	63	-99.30%	0.00%	2900.00 %	110.00%	0.00%
58	Pali	Chorasi	SUDA	167.15	268	348	401	642	2358	1325	29.85%	15.23%	60.10%	267.29%	-43.81%
59	Pardi Kanade	Chorasi	SUDA	129.53	231	356	740	1310	4422	9167	54.11%	107.87 %	77.03%	237.56%	107.30%
60	Popda	Chorasi	SUDA	260.91	489	524	653	931	1070	1017	7.16%	24.62%	42.57%	14.93%	-4.95%
61	Ravla Alias Vaktana	Chorasi	SUDA	399.56	674	703	1015	955	1141	1090	4.30%	44.38%	-5.91%	19.48%	-4.47%
62	Sabargam	Chorasi	SUDA	62.59	2	36	62	51	132	262	1700.00 %	72.22%	-17.74%	158.82%	98.48%
63	Sachin	Chorasi	SUDA	570.95	1559	2409	3142	5252	11877	28102	54.52%	30.43%	67.15%	126.14%	136.61%
64	Samrod	Chorasi	SUDA	194.49	574	700	809	758	947	1056	21.95%	15.57%	-6.30%	24.93%	11.51%
65	Saniya Hemad	Chorasi	SUDA	324.09	1355	1971	2445	2379	2954	3964	45.46%	24.05%	-2.70%	24.17%	34.19%
66	Saniya Kanade	Chorasi	SUDA	261.08	581	742	1036	1532	1984	1555	27.71%	39.62%	47.88%	29.50%	-21.62%
67	Saroli	Chorasi	SUDA	198.91	924	1109	1157	1389	1896	3063	20.02%	4.33%	20.05%	36.50%	61.55%
68	Talangpor	Chorasi	SUDA	427.10	1253	1442	1595	1956	3802	11417	15.08%	10.61%	22.63%	94.38%	200.29%
69	Timbarva	Chorasi	SUDA	341.50	412	457	522	567	583	600	10.92%	14.22%	8.62%	2.82%	2.92%
70	Umber	Chorasi	SUDA	885.45	951	1230	1403	1508	1539	1704	29.34%	14.07%	7.48%	2.06%	10.72%
71	Vanakala*	Chorasi	SUDA	346.41	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
72	Vanz	Chorasi	SUDA	616.24	1174	1491	1903	2064	2480	2444	27.00%	27.63%	8.46%	20.16%	-1.45%
73	Vedchha	Chorasi	SUDA	256.36	89	476	335	417	457	514	434.83%	-29.62%	24.48%	9.59%	12.47%
74	Vihel*	Chorasi	SUDA	116.01	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
75	Sarthana	Kamrej	SMC	330.90	131	130	175	172	237	25706	-0.76%	34.62%	-1.71%	37.79%	10746.41 %
76	Abrama	Kamrej	SUDA	1032.28	1020	1346	1616	1951	3041	2682	31.96%	20.06%	20.73%	55.87%	-11.81%

Sr. No.	Village	Taluka	Category	Area	Population						Growth Rate				
					1961	1971	1981	1991	2001	2011	1961-71	1971-81	1981-91	1991-01	2001-11
77	Bhada	Kamrej	SUDA	458.51	791	984	1114	1498	1842	1770	24.40%	13.21%	34.47%	22.96%	-3.91%
78	Chhedchha	Kamrej	SUDA	176.84	53	155	190	320	367	357	192.45%	22.58%	68.42%	14.69%	-2.72%
79	Kathodara	Kamrej	SUDA	544.66	987	1287	1898	1836	2411	2625	30.40%	47.47%	-3.27%	31.32%	8.88%
80	Khadsad	Kamrej	SUDA	280.77	137	160	277	427	351	1044	16.79%	73.13%	54.15%	-17.80%	197.44%
81	Kholvad	Kamrej	SUDA	763.62	2924	4118	4986	7526	10687	15535	40.83%	21.08%	50.94%	42.00%	45.36%
82	Kosamadi	Kamrej	SUDA	408.67	586	669	1342	1148	1275	1082	14.16%	100.60 %	-14.46%	11.06%	-15.14%
83	Kosmada	Kamrej	SUDA	752.70	840	1274	2375	2331	2127	1650	51.67%	86.42%	-1.85%	-8.75%	-22.43%
84	Ladvi	Kamrej	SUDA	401.07	539	695	1079	1381	1546	1310	28.94%	55.25%	27.99%	11.95%	-15.27%
85	Laskana	Kamrej	SUDA	388.31	629	864	1448	4590	8452	15318	37.36%	67.59%	216.99%	84.14%	81.24%
86	Navagam	Kamrej	SUDA	374.60	772	1140	2275	3165	8612	10945	47.67%	99.56%	39.12%	172.10%	27.09%
87	Oviyan	Kamrej	SUDA	368.68	325	307	436	611	766	566	-5.54%	42.02%	40.14%	25.37%	-26.11%
88	Pasodara	Kamrej	SUDA	338.85	296	459	767	826	829	860	55.07%	67.10%	7.69%	0.36%	3.74%
89	Umbhel	Kamrej	SUDA	833.74	1932	2689	3568	4287	5117	4853	39.18%	32.69%	20.15%	19.36%	-5.16%
90	Valak	Kamrej	SUDA	331.39	401	520	620	1075	1644	2153	29.68%	19.23%	73.39%	52.93%	30.96%
91	Valthan	Kamrej	SUDA	306.21	341	518	708	925	1132	1606	51.91%	36.68%	30.65%	22.38%	41.87%
92	Vav	Kamrej	SUDA	1350.84	1855	2395	3863	6023	6649	7053	29.11%	61.29%	55.92%	10.39%	6.08%
93	Ambheta	Olpad	SUDA	697.58	980	1126	1470	1522	1611	1713	14.90%	30.55%	3.54%	5.85%	6.33%
94	Ariyana	Olpad	SUDA	284.54	405	589	993	926	1010	1419	45.43%	68.59%	-6.75%	9.07%	40.50%
94	Balkas	Olpad	SUDA	463.11	433	505	549	713	794	846	16.63%	8.71%	29.87%	11.36%	6.55%
95	Gothan	Olpad	SUDA	635.27	1217	1747	2650	3208	3193	3035	43.55%	51.69%	21.06%	-0.47%	-4.95%
96	Jothan	Olpad	SUDA	334.40	243	334	432	763	968	728	37.45%	29.34%	76.62%	26.87%	-24.79%
97	Kanad	Olpad	SUDA	403.86	219	335	660	671	846	524	52.97%	97.01%	1.67%	26.08%	-38.06%
98	Kosam	Olpad	SUDA	403.78	515	678	910	1097	1762	1412	31.65%	34.22%	20.55%	60.62%	-19.86%
99	Kunkni	Olpad	SUDA	237.00	383	507	697	650	741	856	32.38%	37.48%	-6.74%	14.00%	15.52%
100	Sarol	Olpad	SUDA	178.05	161	209	311	368	394	416	29.81%	48.80%	18.33%	7.07%	5.58%
101	Saroli	Olpad	SUDA	374.51	798	1027	1472	1460	1752	1946	28.70%	43.33%	-0.82%	20.00%	11.07%
102	Segwachhama	Olpad	SUDA	511.18	563	766	999	1090	1240	1346	36.06%	30.42%	9.11%	13.76%	8.55%
103	Segwasyadla	Olpad	SUDA	234.40	381	394	556	626	593	805	3.41%	41.12%	12.59%	-5.27%	35.75%
104	Sonsak	Olpad	SUDA	290.72	873	968	1288	1098	1764	1128	10.88%	33.06%	-14.75%	60.66%	-36.05%
105	Sherdi	Olpad	SUDA	165.89	578	902	1385	1437	1387	1309	56.06%	53.55%	3.75%	-3.48%	-5.62%

Sr. No.	Village	Taluka	Category	Area	Population						Growth Rate				
					1961	1971	1981	1991	2001	2011	1961-71	1971-81	1981-91	1991-01	2001-11
106	Talad	Olpad	SUDA	151.09	427	476	690	619	1089	719	11.48%	44.96%	-10.29%	75.93%	-33.98%
107	Vadod	Olpad	SUDA	364.33	310	368	478	821	668	506	18.71%	29.89%	71.76%	-18.64%	-24.25%
108	Vaswari	Olpad	SUDA	299.55	344	508	633	730	820	949	47.67%	24.61%	15.32%	12.33%	15.73%
109	Antroli	Palsana	SUDA	492.56	805	1153	1441	1818	2376	2114	43.23%	24.98%	26.16%	30.69%	-11.03%
110	Chalthan	Palsana	SUDA	830.37	1099	2100	4243	6664	12774	21795	91.08%	102.05 %	57.06%	91.69%	70.62%
111	Erthan	Palsana	SUDA	421.80	592	655	1213	1597	1396	1436	10.64%	85.19%	31.66%	-12.59%	2.87%
112	Haripura	Palsana	SUDA	135.06	565	772	1062	1357	1511	1714	36.64%	37.56%	27.78%	11.35%	13.43%
113	Karala	Palsana	SUDA	134.05	193	299	426	1052	1365	1607	54.92%	42.47%	146.95%	29.75%	17.73%
114	Karan	Palsana	SUDA	257.92	581	733	1468	1344	1430	1381	26.16%	100.27 %	-8.45%	6.40%	-3.43%
115	Kharbhasi	Palsana	SUDA	270.05	321	435	542	794	800	849	35.51%	24.60%	46.49%	0.76%	6.13%
116	Kadodara	Palsana	SUDA	418.74	914	1336	2700	4976	14819	27336	46.17%	102.10 %	84.30%	197.81%	84.47%
117	Lingad	Palsana	SUDA	377.64	968	1173	1626	1678	1994	1779	21.18%	38.62%	3.20%	18.83%	-10.78%
118	Niyol	Palsana	SUDA	552.26	900	1207	1491	1412	1650	1626	34.11%	23.53%	-5.30%	16.86%	-1.45%
119	Sedhav	Palsana	SUDA	129.49	178	346	376	546	551	596	94.38%	8.67%	45.21%	0.92%	8.17%
120	Talodara	Palsana	SUDA	165.45	259	295	554	418	450	418	13.90%	87.80%	-24.55%	7.66%	-7.11%
121	Tantizaghda	Palsana	SUDA	217.57	423	544	776	727	800	847	28.61%	42.65%	-6.31%	10.04%	5.88%
122	Taraj	Palsana	SUDA	347.20	650	850	1018	1388	1875	1626	30.77%	19.76%	36.35%	35.09%	-13.28%
123	Vadadala	Palsana	SUDA	316.89	525	623	720	833	897	995	18.67%	15.57%	15.69%	7.68%	10.93%
124	Vankaneda	Palsana	SUDA	273.41	655	982	2133	2150	2743	2745	49.92%	117.21 %	0.80%	27.58%	0.07%
125	Vareli	Palsana	SUDA	281.80	170	225	439	950	4636	9033	32.35%	95.11%	116.40%	388.00%	94.84%
Total					**354953**	**558208**	**1120366**	**1779636**	**3105124**	**4804882**					

Source: Census of India, 2011

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Annexure 3: Old SUDA village area

Sr.	Village	Taluka	SMC/SUDA	Area	1991		2001		2011	
				In Ha.	Pop.	Density	Pop.	Density	Pop.	Density
1	Abhva	Chorasi	SMC	2195.76	2505	1.141	2881	1.312	3249	1.480
2	Amroli	Chorasi	SMC	42.00	13078	311.381	17138	408.048	28501	678.595
3	Bamroli	Chorasi	SMC	556.82	8889	15.964	45354	81.452	105130	188.804
4	Dindoli	Chorasi	SMC	520.34	20539	39.472	84898	163.159	151508	291.171
5	Magdalla	Chorasi	SMC	248.66	2021	8.128	5257	21.141	6104	24.548
6	Sarsana	Chorasi	SMC	201.46	745	3.698	849	4.214	979	4.860
7	Bharthana -Vesu	Chorasi	SMC	219.44	1219	5.555	1920	8.750	5414	24.672
8	Bhimpor	Chorasi	SMC	638.87	7239	11.331	7553	11.822	7862	12.306
9	Bhimrad	Chorasi	SMC	240.22	1115	4.642	1257	5.233	2415	10.053
10	Budia	Chorasi	SMC	363.83	2047	5.626	2349	6.456	2438	6.701
11	Gabheni	Chorasi	SMC	1325.94	3433	2.589	6321	4.767	17140	12.927
12	Gaviyar	Chorasi	SMC	406.12	1413	3.479	2449	6.030	2585	6.365
13	Godadara	Chorasi	SMC	296.89	3028	10.199	23234	78.258	111628	375.991
14	Jiav	Chorasi	SMC	573.43	1143	1.993	1550	2.703	6003	10.469
15	Khajod	Chorasi	SMC	1639.24	1214	0.741	1434	0.875	1737	1.060
16	Kosad	Chorasi	SMC	953.26	8004	8.396	28663	30.068	88224	92.550
17	Magob	Chorasi	SMC	151.64	2160	14.244	21961	144.823	58275	384.298

Sr.	Village	Taluka	SMC/SUDA	Area	1991		2001		2011	
				In Ha.	Pop.	Density	Pop.	Density	Pop.	Density
18	Mota Varachha	Chorasi	SMC	903.52	7055	7.808	7704	8.527	32640	36.125
19	Pal	Chorasi	SMC	604.50	4459	7.376	11165	18.470	36107	59.730
20	Palanpor	Chorasi	SMC	300.81	1712	5.691	11496	38.217	23514	78.169
21	Puna	Chorasi	SMC	733.14	8557	11.672	119092	162.441	346598	472.758
22	Rundh	Chorasi	SMC	365.29	1639	4.487	2155	5.899	4355	11.922
23	Simada	Chorasi	SMC	260.25	1101	4.231	3345	12.853	23527	90.402
24	Sonari	Chorasi	SMC	129.41	186	1.437	498	3.848	5057	39.077
25	Sultanabad	Chorasi	SMC	449.12	2641	5.880	3263	7.265	3661	8.151
26	Vadod	Chorasi	SMC	364.33	499	1.370	235	0.645	89	0.244
27	Vanta	Chorasi	SMC	152.96	472	3.086	661	4.321	244	1.595
28	Variav	Chorasi	SMC	2259.62	8495	3.759	14003	6.197	19728	8.731
29	Vesu	Chorasi	SMC	898.90	3298	3.669	6251	6.954	26471	29.448
30	Surat Town	Chorasi	SMC	14604.23	1504057	102.988	2433430	166.625	3326254	227.760
31	Asarma	Chorasi	SUDA	163.44	0	0.000	0	0.000	0	0.000
32	Bhanodra	Chorasi	SUDA	285.01	532	1.867	774	2.716	1138	3.993
33	Bharthana Kosad	Chorasi	SUDA	431.42	2755	6.386	4743	10.994	5679	13.164
34	Bhatha	Chorasi	SUDA	882.96	5128	5.808	5164	5.849	5122	5.801
35	Bhatia	Chorasi	SUDA	453.34	807	1.780	882	1.946	963	2.124

Sr.	Village	Taluka	SMC/SUDA	Area	1991		2001		2011	
				In Ha.	Pop.	Density	Pop.	Density	Pop.	Density
36	Bhatpor	Chorasi	SUDA	824.20	2327	2.823	3379	4.100	3449	4.185
37	Bhesan	Chorasi	SUDA	557.85	1669	2.992	2011	3.605	2195	3.935
38	Bonand	Chorasi	SUDA	512.07	1022	1.996	1287	2.513	1218	2.379
39	Chichi	Chorasi	SUDA	187.41	0	0.000	0	0.000	0	0.000
40	Dakhkhanvada	Chorasi	SUDA	139.64	190	1.361	227	1.626	183	1.311
41	Deladva	Chorasi	SUDA	647.23	1368	2.114	1412	2.182	1374	2.123
42	Devadh	Chorasi	SUDA	375.10	813	2.167	1158	3.087	1168	3.114
43	Eklera	Chorasi	SUDA	202.09	846	4.186	789	3.904	839	4.152
44	Goja	Chorasi	SUDA	192.70	351	1.821	425	2.206	357	1.853
45	Ichchhapor	Chorasi	SUDA	912.61	5144	5.637	8292	9.086	12097	13.255
46	Kachholi	Chorasi	SUDA	485.81	1195	2.460	1650	3.396	2149	4.424
47	Kanakpur-Kansad	Chorasi	SUDA	698.28	4866	6.969	17384	24.895	28327	40.567
48	Kapletha	Chorasi	SUDA	345.49	2226	6.443	2408	6.970	3312	9.586
49	Karadva	Chorasi	SUDA	226.51	161	0.711	164	0.724	1437	6.344
50	Kavas	Chorasi	SUDA	72.11	2215	30.717	2366	32.811	6500	90.140
51	Khambhasla	Chorasi	SUDA	157.34	397	2.523	448	2.847	452	2.873
52	Kharvasa	Chorasi	SUDA	661.73	1374	2.076	1708	2.581	1346	2.034
53	Kumbharia	Chorasi	SUDA	285.17	3112	10.913	4136	14.504	5824	20.423

Sr.	Village	Taluka	SMC/SUDA	Area	1991		2001		2011	
				In Ha.	Pop.	Density	Pop.	Density	Pop.	Density
54	Lajpor	Chorasi	SUDA	720.43	5856	8.128	6257	8.685	7920	10.993
55	Malgama	Chorasi	SUDA	284.90	782	2.745	915	3.212	960	3.370
56	Mohni	Chorasi	SUDA	875.00	1201	1.373	1290	1.474	1424	1.627
57	Okha	Chorasi	SUDA	290.79	30	0.103	63	0.217	63	0.217
58	Pali	Chorasi	SUDA	167.15	642	3.841	2358	14.107	1325	7.927
59	Pardi Kanade	Chorasi	SUDA	129.53	1310	10.113	4422	34.139	9167	70.771
60	Popda	Chorasi	SUDA	260.91	931	3.568	1070	4.101	1017	3.898
61	Ravla Alias Vaktana	Chorasi	SUDA	399.56	955	2.390	1141	2.856	1090	2.728
62	Sabargam	Chorasi	SUDA	62.59	51	0.815	132	2.109	262	4.186
63	Sachin	Chorasi	SUDA	570.95	5252	9.199	11877	20.802	28102	49.220
64	Samrod	Chorasi	SUDA	194.49	758	3.897	947	4.869	1056	5.430
65	Saniya Hemad	Chorasi	SUDA	324.09	2379	7.341	2954	9.115	3964	12.231
66	Saniya Kanade	Chorasi	SUDA	261.08	1532	5.868	1984	7.599	1555	5.956
67	Saroli	Chorasi	SUDA	198.91	1389	6.983	1896	9.532	3063	15.399
68	Talangpor	Chorasi	SUDA	427.10	1956	4.580	3802	8.902	11417	26.731
69	Timbarva	Chorasi	SUDA	341.50	567	1.660	583	1.707	600	1.757
70	Umber	Chorasi	SUDA	885.45	1508	1.703	1539	1.738	1704	1.924
71	Vanakala	Chorasi	SUDA	346.41	0	0.000	0	0.000	0	0.000

Sr.	Village	Taluka	SMC/SUDA	Area	1991		2001		2011	
				In Ha.	Pop.	Density	Pop.	Density	Pop.	Density
72	Vanz	Chorasi	SUDA	616.24	2064	3.349	2480	4.024	2444	3.966
73	Vedchha	Chorasi	SUDA	256.36	417	1.627	457	1.783	514	2.005
74	Vihel	Chorasi	SUDA	116.01	0	0.000	0	0.000	0	0.000
75	Sarthana	Kamrej	SMC	330.90	172	0.520	237	0.716	25706	77.685
76	Abrama	Kamrej	SUDA	1032.28	1951	1.890	3041	2.946	2682	2.598
77	Bhada	Kamrej	SUDA	458.51	1498	3.267	1842	4.017	1770	3.860
78	Chhedchha	Kamrej	SUDA	176.84	320	1.810	367	2.075	357	2.019
79	Kathodara	Kamrej	SUDA	544.66	1836	3.371	2411	4.427	2625	4.820
80	Khadsad	Kamrej	SUDA	280.77	427	1.521	351	1.250	1044	3.718
81	Kholvad	Kamrej	SUDA	763.62	7526	9.856	10687	13.995	15535	20.344
82	Kosamadi	Kamrej	SUDA	408.67	1148	2.809	1275	3.120	1082	2.648
83	Kosmada	Kamrej	SUDA	752.70	2331	3.097	2127	2.826	1650	2.192
84	Ladvi	Kamrej	SUDA	401.07	1381	3.443	1546	3.855	1310	3.266
85	Laskana	Kamrej	SUDA	388.31	4590	11.820	8452	21.766	15318	39.448
86	Navagam	Kamrej	SUDA	374.60	3165	8.449	8612	22.990	10945	29.218
87	Oviyan	Kamrej	SUDA	368.68	611	1.657	766	2.078	566	1.535
88	Pasodara	Kamrej	SUDA	338.85	826	2.438	829	2.447	860	2.538
89	Umbhel	Kamrej	SUDA	833.74	4287	5.142	5117	6.137	4853	5.821

Sr.	Village	Taluka	SMC/SUDA	Area	1991		2001		2011	
				In Ha.	Pop.	Density	Pop.	Density	Pop.	Density
90	Valak	Kamrej	SUDA	331.39	1075	3.244	1644	4.961	2153	6.497
91	Valthan	Kamrej	SUDA	306.21	925	3.021	1132	3.697	1606	5.245
92	Vav	Kamrej	SUDA	1350.84	6023	4.459	6649	4.922	7053	5.221
93	Ambheta	Olpad	SUDA	697.58	1522	2.182	1611	2.309	1713	2.456
94	Ariyana	Olpad	SUDA	284.54	926	3.254	1010	3.550	1419	4.987
94	Balkas	Olpad	SUDA	463.11	713	1.540	794	1.714	846	1.827
95	Gothan	Olpad	SUDA	635.27	3208	5.050	3193	5.026	3035	4.777
96	Jothan	Olpad	SUDA	334.40	763	2.282	968	2.895	728	2.177
97	Kanad	Olpad	SUDA	403.86	671	1.661	846	2.095	524	1.297
98	Kosam	Olpad	SUDA	403.78	1097	2.717	1762	4.364	1412	3.497
99	Kunkni	Olpad	SUDA	237.00	650	2.743	741	3.127	856	3.612
100	Sarol	Olpad	SUDA	178.05	368	2.067	394	2.213	416	2.336
101	Saroli	Olpad	SUDA	374.51	1460	3.898	1752	4.678	1946	5.196
102	Segwachhama	Olpad	SUDA	511.18	1090	2.132	1240	2.426	1346	2.633
103	Segwasyadla	Olpad	SUDA	234.40	626	2.671	593	2.530	805	3.434
104	Sonsak	Olpad	SUDA	290.72	1098	3.777	1764	6.068	1128	3.880
105	Sherdi	Olpad	SUDA	165.89	1437	8.662	1387	8.361	1309	7.891
106	Talad	Olpad	SUDA	151.09	619	4.097	1089	7.208	719	4.759

Sr.	Village	Taluka	SMC/SUDA	Area	1991		2001		2011	
				In Ha.	Pop.	Density	Pop.	Density	Pop.	Density
107	Vadod	Olpad	SUDA	364.33	821	2.253	668	1.834	506	1.389
108	Vaswari	Olpad	SUDA	299.55	730	2.437	820	2.737	949	3.168
109	Antroli	Palsana	SUDA	492.56	1818	3.691	2376	4.824	2114	4.292
110	Chalthan	Palsana	SUDA	830.37	6664	8.025	12774	15.384	21795	26.247
111	Erthan	Palsana	SUDA	421.80	1597	3.786	1396	3.310	1436	3.404
112	Haripura	Palsana	SUDA	135.06	1357	10.047	1511	11.188	1714	12.691
113	Karala	Palsana	SUDA	134.05	1052	7.848	1365	10.183	1607	11.988
114	Karan	Palsana	SUDA	257.92	1344	5.211	1430	5.544	1381	5.354
115	Kharbhasi	Palsana	SUDA	270.05	794	2.940	800	2.962	849	3.144
116	Kadodara	Palsana	SUDA	418.74	4976	11.883	14819	35.390	27336	65.282
117	Lingad	Palsana	SUDA	377.64	1678	4.443	1994	5.280	1779	4.711
118	Niyol	Palsana	SUDA	552.26	1412	2.557	1650	2.988	1626	2.944
119	Sedhav	Palsana	SUDA	129.49	546	4.217	551	4.255	596	4.603
120	Talodara	Palsana	SUDA	165.45	418	2.526	450	2.720	418	2.526
121	Tantizaghda	Palsana	SUDA	217.57	727	3.341	800	3.677	847	3.893
122	Taraj	Palsana	SUDA	347.20	1388	3.998	1875	5.400	1626	4.683
123	Vadadala	Palsana	SUDA	316.89	833	2.629	897	2.831	995	3.140
124	Vankaneda	Palsana	SUDA	273.41	2150	7.864	2743	10.033	2745	10.040

Sr.	Village	Taluka	SMC/SUDA	Area	1991		2001		2011	
				In Ha.	Pop.	Density	Pop.	Density	Pop.	Density
125	Vareli	Palsana	SUDA	281.80	950	3.371	4636	16.451	9033	32.055

Annexure 4: Details of auto ridership in Surat

Sr. No.	Route		Per Day	
	From	To	Auto Trips	Estimated Passengers @ 5/Trip
1	Ved Road	Piplod	4000	20000
2	Lalita Chokdi	Piplod	3825	19125
3	Ghod Dod Road	Piplod	3675	18375
4	Mahidharpura	Station	3600	18000
5	Station	Lalita Chokdi	3222	16111
6	Bhagal	Ved Road	3106	15531
7	Delhi Gate	Udhana Gate	3040	15200
8	Aamroli	peoples	3000	15000
9	Lal Darwaja	Udhana 3-Road	3000	15000
10	Palanpur Patia	Hanipark Road	2800	14000
11	Ashram	Peoples	2450	12250
12	Bhagal	Lal Gate	2400	12000
13	Dabholi	Station	2400	12000
14	Dabholi	Katargam	2400	12000
15	Garnala	Lal Darwaja	2400	12000
16	Station	Ved Road	2383	11917
17	Station	Aamroli	2300	11500
18	Chowk	Nanpura	2200	11000
19	Bhagal	Chowk	2160	10800
20	Peoples	Katargam	2125	10625
21	Bhagal	parle Point	2100	10500
22	Mahidharpura	Adajan	2100	10500
23	Varachha	Kapodra	2100	10500
24	Station	Chowk	2053	10267
25	Station	Bhavani-vad	1943	9717
26	Ashram	Station	1750	8750
27	Puna	Varachha	1742	8711
28	Station	Udhana	1733	8667
29	Adajan	Chowk	1714	8571
30	Variavi Bazar	Bhagal	1600	8000
	TOTAL	30 Routes	75323	376617
	Total	All Routes	153849	769244

Annexure 5: Detailed list of commercial establishment in SUDA

Sr. No.	Village	Taluka	Administration Under	2011 Population	Total Enterprise Established
1	Abhva	Chorasi	SMC	3249	4
2	Amroli	Chorasi	SMC	28501	0
3	Bamroli	Chorasi	SMC	105130	0
4	Dindoli	Chorasi	SMC	151508	0
5	Magdalla	Chorasi	SMC	6104	6
6	Sarsana	Chorasi	SMC	979	1
7	Bharthana -Vesu	Chorasi	SMC	5414	0
8	Bhimpor	Chorasi	SMC	7862	0
9	Bhimrad	Chorasi	SMC	2415	0
10	Budia	Chorasi	SMC	2438	0
11	Gabheni	Chorasi	SMC	17140	1
12	Gaviyar	Chorasi	SMC	2585	2
13	Godadara	Chorasi	SMC	111628	0
14	Jiav	Chorasi	SMC	6003	3
15	Khajod	Chorasi	SMC	1737	0
16	Kosad	Chorasi	SMC	88224	2
17	Magob	Chorasi	SMC	58275	0
18	MotaVarachha	Chorasi	SMC	32640	0
19	Pal	Chorasi	SMC	36107	0
20	Palanpor	Chorasi	SMC	23514	0
21	Puna	Chorasi	SMC	346598	0
22	Rundh	Chorasi	SMC	4355	1
23	Simada	Chorasi	SMC	23527	0
24	Sonari	Chorasi	SMC	5057	0
25	Sultanabad	Chorasi	SMC	3661	0
26	Vadod	Chorasi	SMC	89	0
27	Vanta	Chorasi	SMC	244	0
28	Variav	Chorasi	SMC	19728	4
29	Vesu	Chorasi	SMC	26471	0
30	Surat Town	Chorasi	SMC	3326254	49401
31	Asarma	Chorasi	SUDA	0	0
32	Bhanodra	Chorasi	SUDA	1138	0
33	BharthanaKosad	Chorasi	SUDA	5679	6
34	Bhatha	Chorasi	SUDA	5122	2
35	Bhatia	Chorasi	SUDA	963	0
36	Bhatpor	Chorasi	SUDA	3449	6
37	Bhesan	Chorasi	SUDA	2195	7
38	Bonand	Chorasi	SUDA	1218	0
39	Chichi	Chorasi	SUDA	0	0
40	Dakhkhanvada	Chorasi	SUDA	183	0
41	Deladva	Chorasi	SUDA	1374	2

Sr. No.	Village	Taluka	Administration Under	2011 Population	Total Enterprise Established
42	Devadh	Chorasi	SUDA	1168	0
43	Eklera	Chorasi	SUDA	839	0
44	Goja	Chorasi	SUDA	357	0
45	Ichchhapor	Chorasi	SUDA	12097	6
46	Kachholi	Chorasi	SUDA	2149	1
47	Kansad	Chorasi	SUDA	28327	0
48	Kapletha	Chorasi	SUDA	3312	0
49	Karadva	Chorasi	SUDA	1437	1
50	Kavas	Chorasi	SUDA	6500	6
51	Khambhasla	Chorasi	SUDA	452	0
52	Kharvasa	Chorasi	SUDA	1346	1
53	Kumbharia	Chorasi	SUDA	5824	8
54	Lajpor	Chorasi	SUDA	7920	0
55	Malgama	Chorasi	SUDA	960	1
56	Mahoni	Chorasi	SUDA	1424	0
57	Okha	Chorasi	SUDA	63	2
58	Pali	Chorasi	SUDA	1325	1
59	PardiKanade	Chorasi	SUDA	9167	0
60	Popda	Chorasi	SUDA	1017	0
61	Ravla Alias Vaktana	Chorasi	SUDA	1090	0
62	Sabargam	Chorasi	SUDA	262	0
63	Sachin	Chorasi	SUDA	28102	44
64	Samrod	Chorasi	SUDA	1056	0
65	Saniya Hemad	Chorasi	SUDA	3964	0
66	Saniya Kanade	Chorasi	SUDA	1555	0
67	Saroli	Chorasi	SUDA	3063	3
68	Talangpor	Chorasi	SUDA	11417	0
69	Timbarva	Chorasi	SUDA	600	0
70	Umber	Chorasi	SUDA	1704	0
71	Vanakala	Chorasi	SUDA	0	0
72	Vanz	Chorasi	SUDA	2444	4
73	Vedchha	Chorasi	SUDA	514	3
74	Vihel	Chorasi	SUDA	0	0
75	Sarthana	Kamrej	SMC	25706	12
76	Abrama	Kamrej	SUDA	2682	0
77	Bhada	Kamrej	SUDA	1770	0
78	Chhedchha	Kamrej	SUDA	357	0
79	Kathodara	Kamrej	SUDA	2625	0
80	Khadsad	Kamrej	SUDA	1044	1
81	Kholvad	Kamrej	SUDA	15535	58
82	Kosamadi	Kamrej	SUDA	1082	0
83	Kosmada	Kamrej	SUDA	1650	0

Sr. No.	Village	Taluka	Administration Under	2011 Population	Total Enterprise Established
84	Ladvi	Kamrej	SUDA	1310	0
85	Laskana	Kamrej	SUDA	15318	418
86	Navagam	Kamrej	SUDA	10945	13
87	Oviyan	Kamrej	SUDA	566	0
88	Pasodara	Kamrej	SUDA	860	2
89	Umbhel	Kamrej	SUDA	4853	4
90	Valak	Kamrej	SUDA	2153	3
91	Valthan	Kamrej	SUDA	1606	2
92	Vav	Kamrej	SUDA	7053	1
93	Ambheta	Olpad	SUDA	1713	0
94	Ariyana	Olpad	SUDA	1419	0
95	Balkas	Olpad	SUDA	846	0
96	Gothan	Olpad	SUDA	3035	72
97	Jothan	Olpad	SUDA	728	0
98	Kanad	Olpad	SUDA	524	0
99	Kosam	Olpad	SUDA	1412	0
100	Kunkni	Olpad	SUDA	856	0
101	Sarol	Olpad	SUDA	416	0
102	Saroli	Olpad	SUDA	1946	0
103	Segwachhama	Olpad	SUDA	1346	0
104	Segwasyadla	Olpad	SUDA	805	0
105	Sonsak	Olpad	SUDA	1128	0
106	Sherdi	Olpad	SUDA	1309	0
107	Talad	Olpad	SUDA	719	0
108	Vadod	Olpad	SUDA	506	3
109	Vaswari	Olpad	SUDA	949	0
110	Antroli	Palsana	SUDA	2114	1
111	Chalthan	Palsana	SUDA	21795	5
112	Erthan	Palsana	SUDA	1436	0
113	Haripura	Palsana	SUDA	1714	17
114	Karala	Palsana	SUDA	1607	1
115	Karan	Palsana	SUDA	1381	0
116	Kharbhasi	Palsana	SUDA	849	0
117	Kadodara	Palsana	SUDA	27336	28
118	Lingad	Palsana	SUDA	1779	0
119	Niyol	Palsana	SUDA	1626	0
120	Sedhav	Palsana	SUDA	596	0
121	Talodara	Palsana	SUDA	418	0
122	Tantizaghda	Palsana	SUDA	847	0
123	Taraj	Palsana	SUDA	1626	0
124	Vadadala	Palsana	SUDA	995	0
125	Vankaneda	Palsana	SUDA	2745	0

Sr. No.	Village	Taluka	Administration Under	2011 Population	Total Enterprise Established
126	Vareli	Palsana	SUDA	9033	10
127	Bhatlai	Chorasi	Ex SUDA	----------	3
128	Mora	Chorasi	Ex SUDA	----------	4
129	Sunvali	Chorasi	Ex SUDA	----------	2
130	Vansva	Chorasi	Ex SUDA	----------	14
131	Amboli	Kamrej	Ex SUDA	----------	1
132	Delad	Kamrej	Ex SUDA	----------	1
133	Dhoran	Kamrej	Ex SUDA	----------	1
134	Ghala	Kamrej	Ex SUDA	----------	1
135	Kamrej	Kamrej	Ex SUDA	----------	65
136	Karjan	Kamrej	Ex SUDA	----------	2
137	Kathor	Kamrej	Ex SUDA	----------	7
138	KoliBharthana	Kamrej	Ex SUDA	----------	1
139	Mankna	Kamrej	Ex SUDA	----------	5
140	Netrang	Kamrej	Ex SUDA	----------	1
141	Orna	Kamrej	Ex SUDA	----------	1
142	Parab	Kamrej	Ex SUDA	----------	1
143	Pardi	Kamrej	Ex SUDA	----------	2
144	Simadi	Kamrej	Ex SUDA	----------	4
145	Velanja	Kamrej	Ex SUDA	----------	5
146	Atodra	Olpad	Ex SUDA	----------	7
147	Bolav	Olpad	Ex SUDA	----------	7
148	Delad	Olpad	Ex SUDA	----------	79
149	Kanyasi	Olpad	Ex SUDA	----------	1
150	Karanj	Olpad	Ex SUDA	----------	7
151	Kareli	Olpad	Ex SUDA	----------	7
152	Kasad	Olpad	Ex SUDA	----------	2
153	Kim	Olpad	Ex SUDA	----------	13
154	Kudsad	Olpad	Ex SUDA	----------	12
155	Masma	Olpad	Ex SUDA	----------	31
156	Narthan	Olpad	Ex SUDA	----------	1
157	Nesh	Olpad	Ex SUDA	----------	1
158	Olpad	Olpad	Ex SUDA	----------	25
159	Orma	Olpad	Ex SUDA	----------	1
160	Paria	Olpad	Ex SUDA	----------	7
161	Sayan	Olpad	Ex SUDA	----------	119
162	Sandhiyer	Olpad	Ex SUDA	----------	1
163	Siwan	Olpad	Ex SUDA	----------	1
164	Tena	Olpad	Ex SUDA	----------	3
165	Thothab	Olpad	Ex SUDA	----------	1
166	Umra	Olpad	Ex SUDA	----------	1
167	Umrachhi	Olpad	Ex SUDA	----------	1

Sr. No.	Village	Taluka	Administration Under	2011 Population	Total Enterprise Established
168	Vadoli	Olpad	Ex SUDA	----------	2
169	Bagumara	Palsana	Ex SUDA	----------	3
170	Baleshvar	Palsana	Ex SUDA	----------	27
171	Dastan	Palsana	Ex SUDA	----------	4
172	Ghaluda	Palsana	Ex SUDA	----------	1
173	Jolva	Palsana	Ex SUDA	----------	136
174	Kareli	Palsana	Ex SUDA	----------	17
175	Makhinga	Palsana	Ex SUDA	----------	1
176	Palsana	Palsana	Ex SUDA	----------	56
177	Tantithaiya	Palsana	Ex SUDA	----------	57

Source: DIC, Surat, 2014

Annexure 6: Scanned copies of Government Notifications

1. Government Notification dt. 09.12.2015 for inclusion of 100 villages in SUDA

GOVERNMENT OF GUJARAT
URBAN DEVELOPMENT AND URBAN HOUSIGN DEPARTMENT
SACHIVALAYA, GANDHINAGAR

NOTIFICATION

Dated. 09/12/2015

THE GUJARAT TOWN PLANNING AND URBAN DEVELOPMENT ACT, 1976.

No.GH/V/330 of 2015/ UDA-102014-5026(3)-L: WHEREAS, the Government of Gujarat is of opinion that it is necessary in the public interest that the objective of proper development or redevelopment of the areas within the jurisdiction of the villages specified in Column (4) of the scheduled appended hereto will be best served by including it with the development area of Surat Urban Development Authority.

AND WHEREAS, the areas specified in the schedule requires plan development.

AND WHEREAS, Kathor Grampanchayat was designated as area development authority vide Government notification No.GHB-20-UDA-1177-646(2)-Q Dated.30.01.1978.

AND WHEREAS, Hajira and surrounding area was declared as development area and for which Urban Development Authority was constituted vide Government notification No.GHV/121/UDA-1181-5100-V Dated.12.10.1985.

AND WHEREAS, dissolves the Hajira Area Development Authority with effect from the 28th August 1997 vide notification No.GHV/106/ 1997/ UDA/ 1097/ M/86/K dated.28.08.1997.

AND WHEREAS, directs that all the functions to be performed on dissolution of Hajira Area Development Authority by the State shall be performed by the District Collector Surat district, Surat who shall be assisted by Assistant Town Planner of Town Planning Department of the State vide Government notification No.GHV/107 of 1997/UDA/1097/M-86/K dated.28th August 1997.

AND WHEREAS, Surat and surrounding area was declared as development area and for which Urban Development Authority was constituted vide Government notification No.GHB-20-UDA-1177-646(2)-Q Dated.30.01.1978.

NOW THEREFORE, in exercise of the powers conferred by sub-section (2A) of Section-22 of the Gujarat Town Planning and Urban Development Act, 1976 (President's Act No.27 of 1976) the Government of Gujarat hereby:-

SCHEDULE

No.	Name of the District	Taluka	Villages
1	2	3	4
1	Surat	Chorasi	Damka, Bhatlai, Vasuva, Rajagari, Mora, Limla, Suvali, Hajira
		Olpad	Tena, Barbodhan, Dihen, Bhadut, Selut, Narthan, Veluk, Kasala Khurd, Kasla Bujrang, Kachhol, Orma, Jafrabad, Mauma, Asnabad, Isanpor, Olpad, Karamla, Atodra, Andhi, Gola, Morthan, Achharan, Sandhiyer, Paria, Madhar, Khalipor, Sithan, Kanthraj, Obhla, Bharundi, Siwan, Sayan (CT), Kudsad, Syadla, Kareli, Kanyasi, Pinjrat, Delod, Ariyana
		Palasana	Jolva, Dastan, Bagumara, Sanki, Tundi, Baleshvar, Bhutpor, Ghaluda, Isroli, Palsana, Kanav, Jat Bharthana, Makhinga, Intalva
		Mangrol	Pipodara
		Kamrej	Nansad, Koli Bharthana, Shekhpur, Velanja, Ghaludi, Antroli, Tharoli, Choryasi, Bhairav, Amboli (CT), Kathor, Dhoran Paradi, Akhakhol, Karjan, Kholeswar, Kamrej, Delod, Dungra, Chala, Jior, Dhatva, Netrang, Dharutha, Jokha, Asta, Segva, Morthana, Simadi, Mankna, Valan, Alura, Vansdarundhi, Pali, Parab, Haldharu

By order and in the name of the Governor of Gujarat,

(Neela Munshi)
Officer on Special Duty & Ex. Officio Joint Secretary
to the Government of Gujarat
Urban Development and Urban Housing Department

2. Government Notification dt. 18.12.2015 (corrigendum of notification dt. 09.12.2015)

GOVERNMENT OF GUJARAT
URBAN DEVELOPMENT AND URBAN HOUSING DEPARTMENT
SACHIVALAYA, GANDHINAGAR.

CORRIGENDUM

Dated. 18/12/2015

THE GUJARAT TOWN PLANNING AND URBAN DEVELOPMENT ACT, 1976

No.GH/V/ 336 **of 2015/**UDA-102014-5026(3)-L WHEREAS, under Government Notification of Urban Development and Urban Housing Department No.GH/V/330 of 2015/UDA-102014-5026(3)-L, dtd.09.12.2015 regarding include and amalgamate area in the Surat Urban Development Authority, under sub-section (2A) of section-22 of the Gujarat Town Planning and Urban Development Act, 1976 (President's Act No. 27 of 1976) in the said notification dated.09.12.2015 the following is amended.

1. In the notification the following member is added after sr.no.5 "

Municipal Commissioner, Surat Municipal Corporation	Ex-Officio Member

2. In the schedule the village "Ariyana" of Taluka Olpad is deleted.
3. In the schedule, the village "Jat Bharthana" shown in "Palsana" Taluka is deleted and added in "Kamrej" Taluka.
4. In the schedule, the village "Sithana" and "Umara" are added in the Olpad Taluka, the village "Tatithaya" is added in the Palasana Taluka and the village "Navi Pardi" is added in the Kamrej Taluka.

By order and in the name of the Governor of Gujarat,

(Neela Munshi)
Officer on Special Duty & Ex-Officio Joint Secretary
to the Government of Gujarat
Urban Development and Urban Housing Department

3. Government Gazette dt. 10.05.2016 (Publication of Draft DP- 2035 u/s 13 of the Act)

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PART-II EXTRAORDINARY

FORM – A

(See rule - 5)

NOTICE

Surat Urban Development Authority, Surat

Gujarat Town Planning & Urban Development Act-1976

No. SUDA/Technical /Dated : 10/05/2016

Whereas Surat Urban Development Authority, Surat has prepared and submitted draft Development Plan-2035 described in schedule annexed hereto, for the area shown in "ANNEXURE – A" to the State Government under section-9 of the Gujarat Town Planning and Urban Development Act-1976 (Herein after referred to as "the said Act").

And whereas draft Development Plan-2035 alongwith particulars specified in Schedule appended herewith is to be published in accordance with sub section – 1 of section 13 of the said Act.

Now, therefore in pursuance of sub section (2) of section – 13 of the said Act, the Authority hereby gives notice that any suggestions and objections which may be received from any person in writing with respect to the draft Development Plan-2035 within a period of two months from the date of its publication in the official Gazette shall be considered by the Authority. Applicants should submit three copies of their suggestion / objections.

The draft development plan and particulars specified in Schedule is kept open for public inspection in the office of Authority on all working days during office hours.

OFFICE :
Surat Urban Development Authority,
SUDA Bhavan, Nanpura, Surat.

Sd/- Illegible
Chief Executive Authority
Surat Urban Development Authority,
Surat

(Rjt.) II-Ext.-1 62

SCHEDULE

THE GUJARAT TOWN PLANNING AND URBAN DEVELOPMENT ACT-1976, SECTION 13(2)

(a) A statement indicating broadly the uses to which lands in the area covered by the plan are proposed to be put and any survey carried out for the preparation of the draft development plan.

(b) Maps, charts and statements explaining the provisions of the draft Development Plan-2035.

(c) The draft regulations for enforcing the provisions of the draft Development Plan-2035.

(d) Procedure explaining the manner in which permission for developing any land may be obtained from the Urban Development Authority.

(e) A Statement of the stage of development by which it is proposed to meet any obligation imposed on the Urban Development Authority by the draft Development Plan-2035.

(f) An approximate estimate of the cost involved in acquisition of land reserved for public purposes.

Sd/- Illegible
Chief Executive Authortiy
Surat Urban Development Authority,
Surat.

ANNEXURE -A

DISTRICT : SURAT

Name of Town & Villages.	SURAT MUNICIPAL CORPORATION AREA
(1) TALUKA : CHORYASI	ASARMA, BHANODRA, BHARTHANA KOSAD, BHATHA, BHATIA, BHATPORE, BHESAN, BONAD, CHINCHI, DANKHANWADA, DELADWA, EKLERA, GOJA, ICCHAPORE, KACHOLI, KANSAD, KAPLETHA, KARADVA, KAVAS, KHAMBHASLA, KHARVASA, KUMBHARIYA, LAJPORE, MALGAMA, MOHINI, OKHA, PALI, PARDI KANDE, POPDA, RAVLA VAKTANA, SABARGAM, SACHIN, SAMROD, SANIYA HEMAD, SANIYA KANDE, SAROLI, TALANGPORE, TARAJ, TIMBARVA, UMBER, VANAKLA, VANZ, VEDCHHA, VIHAL, BHATLAI, DAMKA, LIMLA, MORA, RAJGIRI, SUVALI, VANSVA, HAJIRA. (53 REVENUE VILLAGES)
(2) TALUKA : KAMREJ	ABRAMA, ARIYANA, BHADA, CHEDCHA, KATHODRA, KHADSAD, KHOLVAD, KOSMADA, KOSMADI, LADVI, LASKANA, NAVAGAM, OVIYAN, PASODRA, UMBHEL, VAV, VALAK, VALTHAN, KAMREJ, KARJAN, KATHOR, KOLI BHARTHANA, KHOLESHAR, DHORANPARDI, DHATVA, DHARUTHA, GHALA, GHULIDI, DEROD, NANSAD, NETRANG, JIOR, JAAT BHARTHANA, JOKHA, SEGVA, SIMADI, SHEKHPUR, ASTA, AKHAKHOL, ALURA, ANTROLI, AMBOLI, CHORASI, DUNGRA, VELANJA, VANSDA RUNDHI, VALAN, MORTHANA, MANKNA, THAROLI, BHERAV, PALI, PARAB, HALDHARU, NAVIPARDI. (54 REVENUE VILLAGES)

(3) TALUKA : OLPAD	AMBHETA, ANTROLI, BALKAS, GOTHAN, JOTHAN, KANAD, KOSAM, KUNKNI, SAROL, SEGWASYADLA, SEGWACHHAMA, SAROLI, SHERDI, SONSAK, TALAD, VADOD, VASWARI, ACCHARAN, ANDHI, ASNABAD, ATODRA, BARBODHAN, BHANDUT, BHARUNDI, DELAD, DIHEN, GOLA, ISANPOR, ZAFRABAD, KASLABUJARANG, KACHOL, KANTHRAJ, KANYASI, KARMLA, KARELI, KASLA KHURD, KUDSAD, KHALIPOR, MASMA, MADHAR, MORTHAN, NARTHAN, OBHLA, OLPAD, ORMA, PARIYA, PINJARAT, SANDHIYER, SAYAN, SHELUT, SIVAN, SITHAN, SAYDLA, TENA, VELUK, SITHANA, UMARA. (57 REVENUE VILLAGES)
(4) TALUKA : PALSANA	CHALTHAN, DEVADH, ERTHAN, HARIPURA, KADODRA, KARALA, KARAN, KHARBHASI, LINGAD, NIYOL, SEDHAV, TALODRA, TANTIZAGDA, VADADLA, VANKANEDA, VARELI, BAGUMRA, BALESHWAR, BHUTPOR, DASTAN, GHALUDA, ITALVA, ISROLI, JOLVA, KANAV, MAKHINGA, PALSANA, SANKI, TUNDI, TANTITHAIYA. (30 REVENUE VILLAGES)
(5) TALUKA : MANGROL	PIPODARA. (1 REVENUE VILLAGE)

Surat, 10th, May, 2015.

Sd/- Illegible
Chief Executive Authority
Surat Urban Development Authority,
Surat.

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4. Government Notification dt. 19.07.2016 (Declaration of Khajod Urban Development Authority)

GOVERNMENT OF GUJARAT
URBAN DEVELOPMENT AND URBAN HOUSING DEPARTMENT
SACHIVALAYA, GANDHINAGAR.

NOTIFICATION
Dated. 19-07-2016

THE GUJARAT TOWN PLANNING AND URBAN DEVELOPMENT ACT, 1976

No.GH/V/ 144 of 2016/DVP-142015-2441-L: WHEREAS, under Government Notification, Urban Development and Urban Housing Department No.GHB/23/UDA/1177/646 (5)-QZ dated.30th January 1978, under sub-section (1), (2) and (4) of section 22 of the Gujarat Town Planning & Urban Development Act, 1976 (President's Act No.27 of 1976) (hereinafter referred as "the said Act") declares the development area and constitutes the Surat Urban Development Authority for that area.

NOW THEREFORE, in exercise of the powers conferred by sub-section (2A) of section 22, of the said Act, the Government of Gujarat hereby:, sub divide the area of Surat Urban Development Authority and constitute Khajod Urban Development Authority under sub section (4) of section 22 as mentioned in schedule- 1 for the sub divided area as specified in schedule - 2

SCHEDULE - 1

1	Chairman	To be appointed by the State Government
2	Joint Secretary/Deputy Secretary Urban Development & Urban Housing Department Sachivalaya , Gandhinagar	Ex-Officio Member
3	Managing Director, DREAM CITY CO. LTD.	Member
4	Chief Town Planner or his representative not below the rank of Senior Town Planner	Ex-officio Member
5	Managing Director, GIDB	Member (Invitee)
6	Collector, Surat	Member
7	President, Surat District Panchyat, Surat	Member
8	Chief Executive Authority	Member Secretary To be appointed by State Government
9	Commissioner, SMC	Member (Invitee)
10	Chairman, SUDA	Member (Invitee)

SURAT SUDA Inward No.:- 29 JUL 20 Date:- Branch:-

SCHEDULE - 2

Sr.No.	Name of the District	Taluka	Name of the Village
1	2	3	4
1	Surat	Chorasi	Khajod

By order and in the name of the Governor of Gujarat,

(Neela Munshi)
Officer on Special Duty & Ex-Officio Deputy Secretary
to the Government of Gujarat
Urban Development and Urban Housing Department

જા. સંકલન નં. 725
તા. 27 JUL 2016

GOVERNMENT OF GUJARAT
URBAN DEVELOPMENT AND URBAN HOUSING DEPARTMENT
SACHIVALAYA, GANDHINAGAR.

NOTIFICATION

Dated.19.07.2016

THE GUJARAT TOWN PLANNING AND URBAN DEVELOPMENT ACT, 1976.

No.GH/V/145 of 2016/DVP-142015-2441-L: WHEREAS, under Government notification, Urban Development and Urban Housing Department No.GH/V/144 of 2016/DVP-142015-2441-L: Dated.19.07.2016 Constitute the Khajod Urban Development Authority.

NOW THEREFORE, in exercise of the powers conferred by section 23A, of the said Act, the Government of Gujarat hereby:, entrust all the powers and functions of the Khajod Urban Development Authority to the Diamond Research and Mercantile City Company Limited (Dream City Co. Ltd.)

By order and in the name of the Governor of Gujarat,

(Neela Munshi)
Officer on Special Duty & Ex-Officio Deputy Secretary
to the Government of Gujarat
Urban Development and Urban Housing Department

SUDA Inward No. 29 Branch

Copy forwarded with compliments to :

- Secretary to H.E. the Governor of Gujarat, Rajbhavan, Gandhinagar (by letter)
- The P. S. to Hon'ble Chief Minister, Swarnim Sankul-1, Sachivalaya, Gandhinagar.
- Chief Town Planner, Gandhinagar.
- Commissioner, Surat Municipal Corporation, Surat.
- Chief Executive Authority, Surat Urban Development Authority, Surat.
- Collector, Surat
- District Development Officer, Surat District Panchayat, Dist. Surat.
- Managing Director, DREAM CITY CO. LTD., Surat.
- Managing Director, GIDB, Gandhinagar.
- The Manager, Government Central Press, Gandhinagar - with a request to publish the aforesaid notification in part IV-B, central section, in the Government Extra Ordinary Gazette **Dated.19.07.2016** and forward 10 printed copies of the same to this Department. The Gujarati version of this Notification will be forwarded shortly to you by the Legislative and Parliamentary Affairs Department, Sachivalaya, Gandhinagar.
- The Director of Information, Gandhinagar- with request to issue a suitable press notes.
- The Legislative and parliamentary Affairs Department, Sachivalaya, Gandhinagar - with a request to send Gujarati version of the said Notification directly to the Manager, Government Central Press, Gandhinagar for its publication in the official gazette urgently.
- The Revenue Department, Sachivalaya, Gandhinagar.
- System Manager, Urban Development and Urban Housing Department, Gandhinagar- with request to publish in the department web site.
- The Select file of ' L ' Branch, U.D. & U.H.Deptt. (2016)
- The personal file of Dy. Section Officer, U.D. & U.H. Deptt. (2016)

5. Government Notification dt. 24.10.2016 (Deletion of 54 villages from SUDA's jurisdiction)

Extra No. 598

વાર્ષિક લવાજમનો દર રૂ. ૩૫૦૦/-

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The Gujarat Government Gazette

EXTRAORDINARY

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Separate paging is given to this Part in order that it may be filed as a Separate Compilation.

PART IV-B

Rules and Orders (Other than those published in Parts I, I-A, and I-L) made by the Government of Gujarat under the Gujarat Acts

URBAN DEVELOPMENT AND URBAN HOUSING DEPARTMENT

NOTIFICATION

Sachivalaya, Gandhinagar, 24th October, 2016.

GUJARAT TOWN PLANNING AND URBAN DEVELOPMENT ACT, 1976

No.GH/V/189 of 2016/UDA-102014-5026(3)-L: WHEREAS, under Government Notification, Urban Development and Urban Housing Department No.GH/V/330 of 2015/UDA-102014-5026(3)-L dated.09.12.2015 and corrigendum No.GH/V/336 of 2015/UDA-102014-5026(3)-L dated.18.12.2015 , under sub-section (1), (2-A) of section 22 of the Gujarat Town Planning & Urban Development Act, 1976 (President's Act No.27 of 1976) (hereinafter referred as "the said Act") declares the urban development area. amalgamates the areas of Surat Urban Development Authority and surrounding villages (hereinafter reffered as "the said Authority").

NOW THEREFORE, in exercise of the powers conferred by sub-section (2A) of section 22 read with, clause (a) of sub-section (2) of section 4 of the said Act, the Government of Gujarat hereby declares that, the area mentioned in the schedule shall be exclude from the Surat Urban Development Authority and relevant provision of the said Act shall cease to apply to the said area.

SCHEDULE

No.	Name of the District	Taluka	Villages
1	2	3	4
	Surat	Olpad	Bhadut, Pinjrat, Selut, Veluk, Kasala Khurd, Kasla Bujrang, Kachhol, Orma, Olpad, Andhi, Gola, Morthan, Achharan, Atodra, Madhar, Khalipor, Kanthraj, Obhla, Bharundi, Siwan, Sayan (CT), Kudsad, Syadla, Kareli, Kanyasi, Asnabad (Northern part of State Highway).

No.	Name of the District	Taluka	Villages
1	2	3	4
			Sandhiyer (Northern part of State Highway), Paria(Northern part of State Highway), Jafrabad, Narthan.
		Mangrol	Pipodara
		Kamrej	Haldharu, Pali, Alura, Vansdarundhi, Segva, Asta, Jat Bharathan, Dharutha, Netrang, Dhatva, Jior, Chala, Karjan, Dhoran Paradi, Akhakhol, Tharoli, Antroli, Ghaludi. Shekhpur, navi Paradi, Velanja(Northern part of State Highway), Parab, Valan.

By order and in the name of the Governor of Gujarat,

Neela Munshi,
Officer on Special Duty & Ex-Officio Joint Secretary
to the Government of Gujarat
Urban Development and Urban Housing Department.

6. Government Notification dt. 03.11.2016 (Deletion of 7 villages from SUDA's jurisdiction)

GOVERNMENT OF GUJARAT
URBAN DEVELOPMENT AND URBAN HOUSING DEPARTMENT
BLOCK NO.14, 9th FLOOR, SACHIVALAYA
GANDHINAGAR.

Urban Development & Urban Housing Deptt. Govt. of Gujarat Gandhinagar

NOTIFICATION

Dated:03.11.2016

GUJARAT TOWN PLANNING & URBAN DEVELOPMENT ACT, 1976

No.GH/V/ 200 of 2016/UDA-102014-5026(3)-L: WHEREAS, under Government Notification, Urban Development and Urban Housing Department No.GH/V/330 of 2015/UDA-102014-5026(3)-L dated.09.12.2015 and corrigendum No.GH/V/336 of 2015/UDA-102014-5026(3)-L dated.18.12.2015 , under sub-section (1), (2-A) of section 22 of the Gujarat Town Planning & Urban Development Act, 1976 (President's Act No.27 of 1976) (hereinafter referred as "the said Act") declares the urban development area, amalgamates the areas of Surat Urban Development Authority and surrounding villages (hereinafter reffered as "the said Authority").

NOW THEREFORE, in exercise of the powers conferred by sub-section (2A) of section 22 read with, clause (a) of sub-section (2) of section 4 of the said Act, the Government of Gujarat hereby declares that, the area mentioned in the schedule shall be exclude from the Surat Urban Development Authority and relevant provision of the said Act shall cease to apply to the said area.

SCHEDULE

No.	Name of the District	Taluka	Villages
1	2	3	4
	Surat	Palsana	Tundi, Bhutpor, Ghaluda, Kanav, Makhinga, Italava.
		Olpad	Sithan

By order and in the name of the Governor of Gujarat,

(Neela Munshi) 3.11
Officer on Special Duty & Ex-Officio Joint Secretary
to the Government of Gujarat
Urban Development and Urban Housing Department

2016

Annexure 7: Heritage structures in SMC

No.	Name of Property /Building	Location	Age (years)	Condition	
Excellent Working Condition					
1	Parsi Fire Temple	Nr. Mughal Sarai	184	Excellent	Working
2	Chintamani temple	Nr. Mughal Sarai	363	Excellent	Working
3	Amba Niketan	Parle Point	40	Excellent	Working
4	Swaminarayan Temple	Haripura main Road	139	Excellent	Working
Good Working Condition					
5	Surat Municipal Corporation Office	Govardhandas Chokhawala Road,	363	Good	Working
6	Sorabaji J.J. Training College	Chowk	136	Good	Working
7	CNI Christ Church	Chowk	188	Good	Working
8	The Clock Tower	Rajmarg, Bhagol	137	Good	Vacant
9	Nayatwada Badi Jumma Masjid	Rander-Hajira Road, Rander	93	Good	Working
10	Khavaja Dana Saheb Dargah	Bade kha Chakla	380	Good	Working
11	Hindu Milan Mandir	Gopipura, Nr Agam Temple	80	Good	Working
12	Kshetrapal Mahadev Temple	Rudharpura	90	Good	Working
Fair Working Condition					
13	Saiyidd Idrus Mausoleum	Saiyad pura	370	Fair	Working
14	Rander Islam Gymkhana	Rander	100	Fair	Working
15	The Mirjan Sami Mausoleum	Nr. Mughal Sarai	460	Fair	Working
16	Naginchand Hall & Andrews Library	Chowk	101	Fair	Working (Parlty)
17	Ambaji Temple	Wadi falia from Bhagol	225	Fair	Working

No.	Name of Property /Building	Location	Age (years)	Condition	
18	Gandhi Bagh	Chowk	138	Fair	Working
19	Kantareshwar Mahadev Temple	Katargam (Gamtal)	150	Fair	Working
20	Zakaria Mosque	Rander	100	Fair	Working
21	Agam Temple	Gopipura	62	Fair	Working
22	Kavi Narmad's home Saraswati Mandir	Amaliran, Gopipura	143	Fair	Vacant
23	Khavaja Didar Dargah	Rampura, Form Bhagol	475	Fair	Vacant
24	Nausaiyid Mosque	West bank of the Gopi Talav	250	Fair	Vacant
Showing Signs of Deterioration					
25	Kuvvat -e-Islam Mosque	Rander	214	Showing Signs of Deterioration	Working
26	British Cemetery	Katargam Darwaja	350	Showing Signs of Deterioration	Vacant
27	The Tomb of Gerald Aungier	Katargam Darwaja	300	Showing Signs of Deterioration	Vacant
28	Mausoleum of Oxenden Brothers	Katargam Darwaja	349	Showing Signs of Deterioration	Vacant
29	Dutch Cemetery-Mausoleum of Baron Adrian Van Reede	Katargam Darwaja	316	Showing Signs of Deterioration	Vacant
30	The Armenian Cemetery	Katargam Darwaja	325	Showing Signs of Deterioration	Vacant
31	Parsi Boy's Orphanage	Shahpore	150	Showing Signs of Deterioration	Working
32	Surat Castle	Chowk	468	Showing Signs of Deterioration (part) and Danger of Disappearance	Working (Parity)
Danger of Disappearance					
33	Hope Bridge	Chowk-Adajan Patia	131	Danger of Disappearance	Vacant
34	Dutch Cemetery-A Jovial Dutch-Man's Tomb	Katargam Darwaja	341	Danger of Disappearance	Vacant
35	Gopi Talav	Navsari Bzar Teen	500	Danger of	Vacant

No.	Name of Property /Building	Location	Age (years)	Condition	
		Rasta		Disappearance	
Note:					
Excellent		Maintain Regularly			
Good		Not found any threats			
Fair		Defect in finishing and plaster creaks			
Showing Signs of Deterioration		Structural defects-creaks in column/ beam			
Danger of Disappearance		Serious structural and masonry defects.			

Source: SMC, 2009