

Gram Panchayat Spatial Development Plan

4th December

Draft Report Review

Tarapur, Gujarat

Structure of the Presentation

1. Introduction

- Background
- Tarapur GP Introduction
- Methodology
- Preparation of Base Map

2. Existing Situation Analysis

- ELU Map and other thematic maps
- Demography and Socio- Economic Profile
- Gap Analysis for Civic & Social Amenities
- Current status of physical infrastructure

3. Key Considerations for Planning Proposal

- Land suitability and potential analysis
- Growth estimation and area requirement
- Other parameters based on the existing situation analysis

4. Planning Proposals

- Proposed Road Network
- Proposed Land Use Zoning Map
- Other proposals and recommendations

Introduction

Background

- Rapid urbanization, increased migration from rural to urban areas- central themes for economic development in India until now
- COVID-19 pandemic and the resultant 'reverse migration' of lakhs of daily wage laborer, now pose a huge socio-economic problem and challenge to authorities
- **The Constitution Article 243G - empower Panchayats for the preparation of plans for economic growth**

Need for Spatial Development Plan

- Managing growth and change
- Providing for orderly and predictable development
- Protecting environmental resources
- Setting priorities for developing and maintaining infrastructure and public facilities
- Strengthening local identity
- Creating a framework for future policy decisions
- Promoting open, democratic planning
- Providing guidance to land-owners, developers, and Government authorities

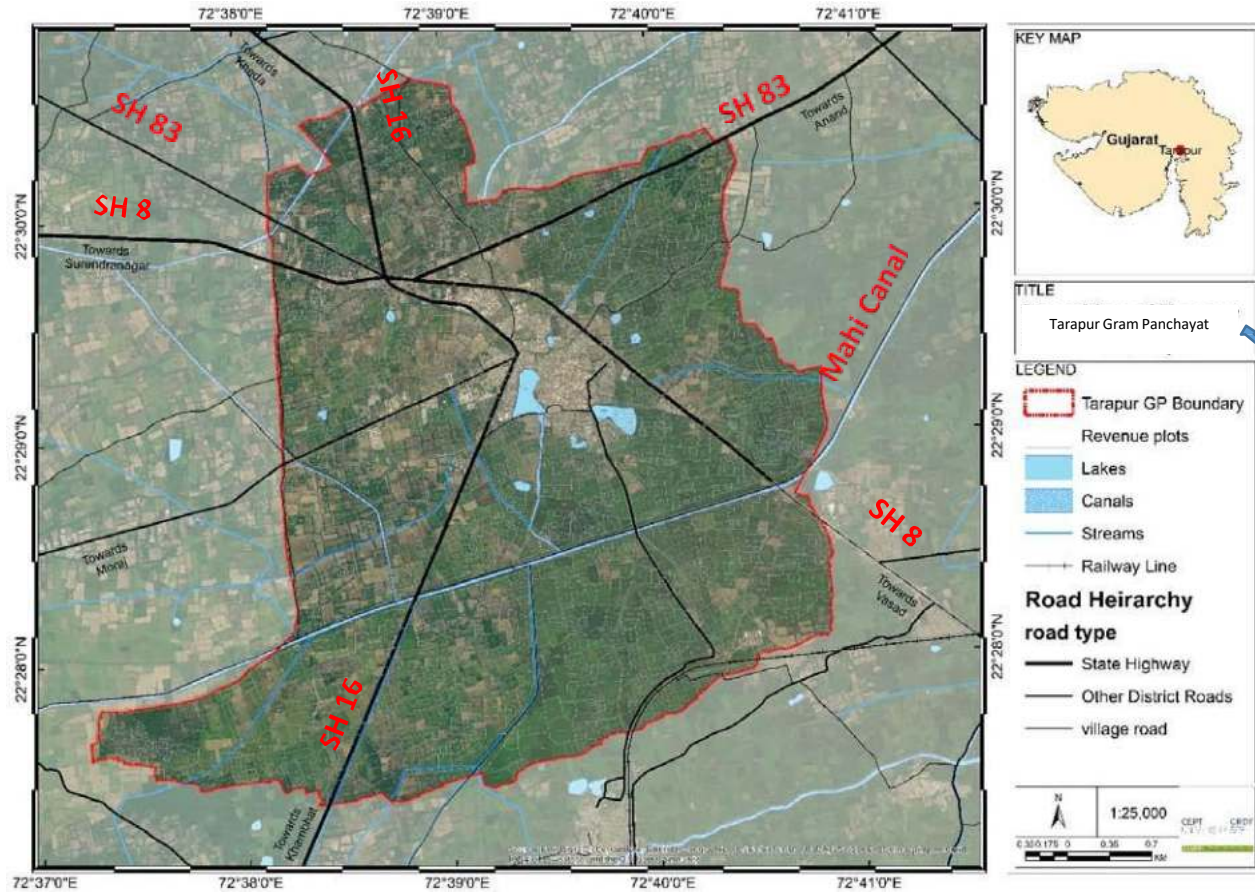
Spatial Development Plan for Gram Panchayat




- MoPR has initiated a pilot project of **Preparation of Gram Panchayat Spatial Development Plan**
- Selected 16 Instituted and 32 GPs
- For Gujarat State- 2 GPs (Tarapur and Nandasan)
- CUPP at CEPT University

Components of GP Spatial Development Plan

- Current state assessment and gap analysis
- Map preparation and spatial analysis
- Spatial indices
- Economy drivers for Panchayats
- Future forecasting
- Natural resource management plan
- Solid – liquid waste management plan
- Implementation plan

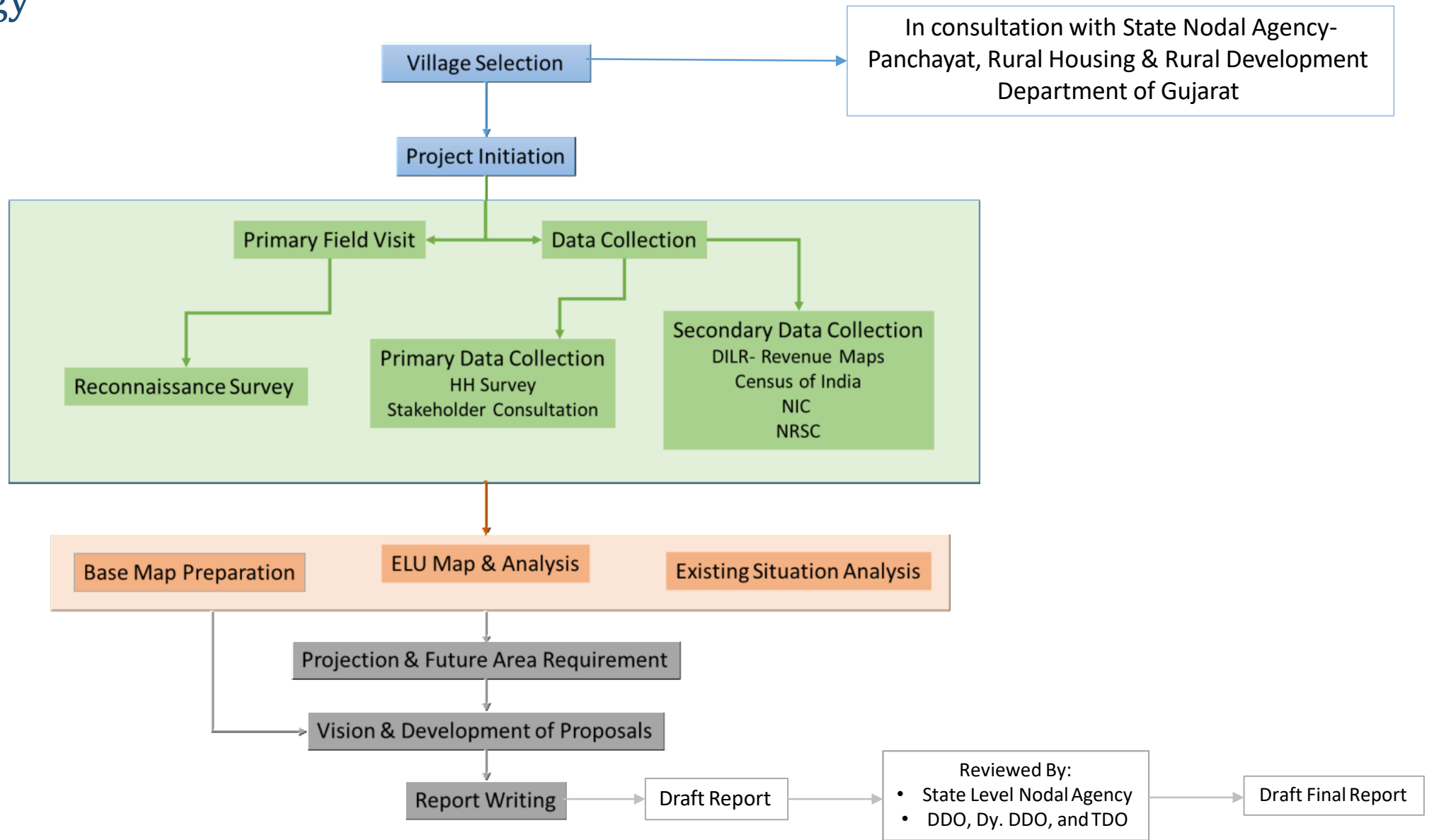
Tarapur Gram Panchayat- Location



-  22.40 Sq Km.
(as per the Base Map)
-  17,994
(as per census 2011)
-  Located at the junction of SH 16, SH 83, and SH 8

- A gateway between Saurashtra region and the southern regions of Gujarat due to which the GP has observed steady growth over the past few decades
- One of the important upcoming centers with increasing growth in trade, industrial and logistical activities.

Methodology



Stakeholder Meetings

Dates	Stakeholders	Purpose of the Meeting
2 July 2020	State Nodal Agency at Gandhinagar Office	Selection of villages for GPSDP
11 August 2020	TDO, ATDO, Sarpanch, TCM, Town Engineer and villagers	Tarapur GP field visit
10 September 2020	MoPR- VC	Work status review
2 November 2020	State Nodal Agency at Gandhinagar Office	Discussed the submitted draft report
10 November 2020	Anand DDO & Dy. DDO at District Office	Discussed the submitted draft report
3 December 2020	State Nodal Agency at Gandhinagar Office	Presentation of updated draft report
Tele communication with Sarpanch and ATDO during months of August, September and October		

Methodology

Primary Field Visit

- **Meeting with Gram Panchayat officials (Sarpanch, TDO, Talati, etc)**
 - Ms Sharaddha Patel – TDO, Tarapur
 - Mr HG Rana – ATDO, Tarapur
 - Ms Hinaben – Sarpanch, Tarapur
 - Mr Vala Bhai Vistran – TCM, Tarapur
 - Mr G D Gohil – TCM, Tarapur
 - Mr Ankan Patel – Engineer, Tarapur
- **Focused group discussions regarding;**
 - Strength and weakness of the Gram Panchayat
 - Existing key concerns by the people
- **Primary data collection**
 - HH survey
 - Village profile
 - Government land records
 - Development under various schemes
 - Sarpanch perspective for the Gram Panchayat
 - Details of existing infrastructure amenities (water supply, sanitation, solid waste etc)



Methodology

Household Survey

- Total No. of HH Survey- 320
- Was done with help of sarpanch, talati and villagers
- Handed over the survey from to the CUPP team
- Transfer the data into digital format

Sample of HH Survey Form in Regional Language

કાઉસહોલ્ડ સર્વે		No.												
પ્રતિસાહ આપનારનું નામ:		નિવાસનો સમયાવાનો: સ્થાન:												
ધર્મ:	જાતિ:	માલિકી: આર:	બીપીએલ કાર્ડ: રેશન કાર્ડ:											
મૂળભૂત માહિતી														
સભ્ય	ઉંમર	સેક્સ	વૈવાહિક સ્થિતિ	વાયકાન	શિક્ષણ અથવા કૌશલ્ય	વ્યવસાય	જોબ નું સ્થાન	વાહન માલિકીનું					સ્વંયતંત્રતા	ડિજિટલ સાક્ષરતા
								2	3	4	5	કેન		
વ્યવસાયમાં પરિવર્તન જો કોઈ હોય તો: સ્થાને અને કારણ:														
મોબાઇલ વપરાશ / નેટવર્ક														
સભ્ય	કોન્ટ્રીવિટી		ઇન્ટરનેટનો ઉપયોગ		વાઇફાઇ / બ્રોબંડ		ઉપયોગનો હેતુ							
	સાકે	અરીબ	હા	ના	હા	ના	ફેમિલી કનેક્ટ	કામ	અન્ય	બીજા	ઇન્ટરનેટ	ઇન્ટરનેટ		

Sample of Sarpanch Questionnaire

1) Background Information			
1.	Name		
2.	Address		
3.	Caste		Age:
4.	Education		No. Of family members:
5.	Main Occupation		Secondary occupation:
6.	Contact No		Income:
2) House hold information			
1.	Use of electronic gadgets	Smart phones	Computer
2.	Internet usage	Yes	No
3.	No of skilled family members		
4.	Type of skill sets possessed		
3) House's physical condition and amenities:			
1.	Type of house	Kutcha	Semi kutcha
2.	No of rooms		
3.	Toilet availability?		
4.	Bathroom ??		
5.	Electricity?		
6.	Drainage connection?		
7.	Cattle shed?		

Base Map Preparation

Data Source:

- Cadastral Maps/ Revenue maps- DILR (Anand, Govt. of Gujarat)
 - Village/survey boundaries, panchayat boundary, plot boundary along with survey numbers
- Roads and water bodies- NRSC
 - Water bodies, canals, road network, railway line
- Satellite Images- NRSC
 - For verification

Methodology

- **Cadastral Maps:** Received scanned images of revenue maps, in two parts
- **Geo-referencing of Revenue Maps:** All images were converted to Tiff for geo-referencing and GCPs were identified on Satellite image and revenue maps.
- **Digitization of Revenue Plots and Survey Nos.:** All lines of plots, roads and rivers, canals and other water bodies were digitized after that and a unique no. was assigned to each polygon.
- **Edge Matching:** The GIS team cleaned up all edges of village after matching to make the single boundary between adjacent and plots.
- **Quality Check and Cleaning & Editing of Maps:** All maps were thoroughly checked for the digitization of all features and appropriate no. of the plot.

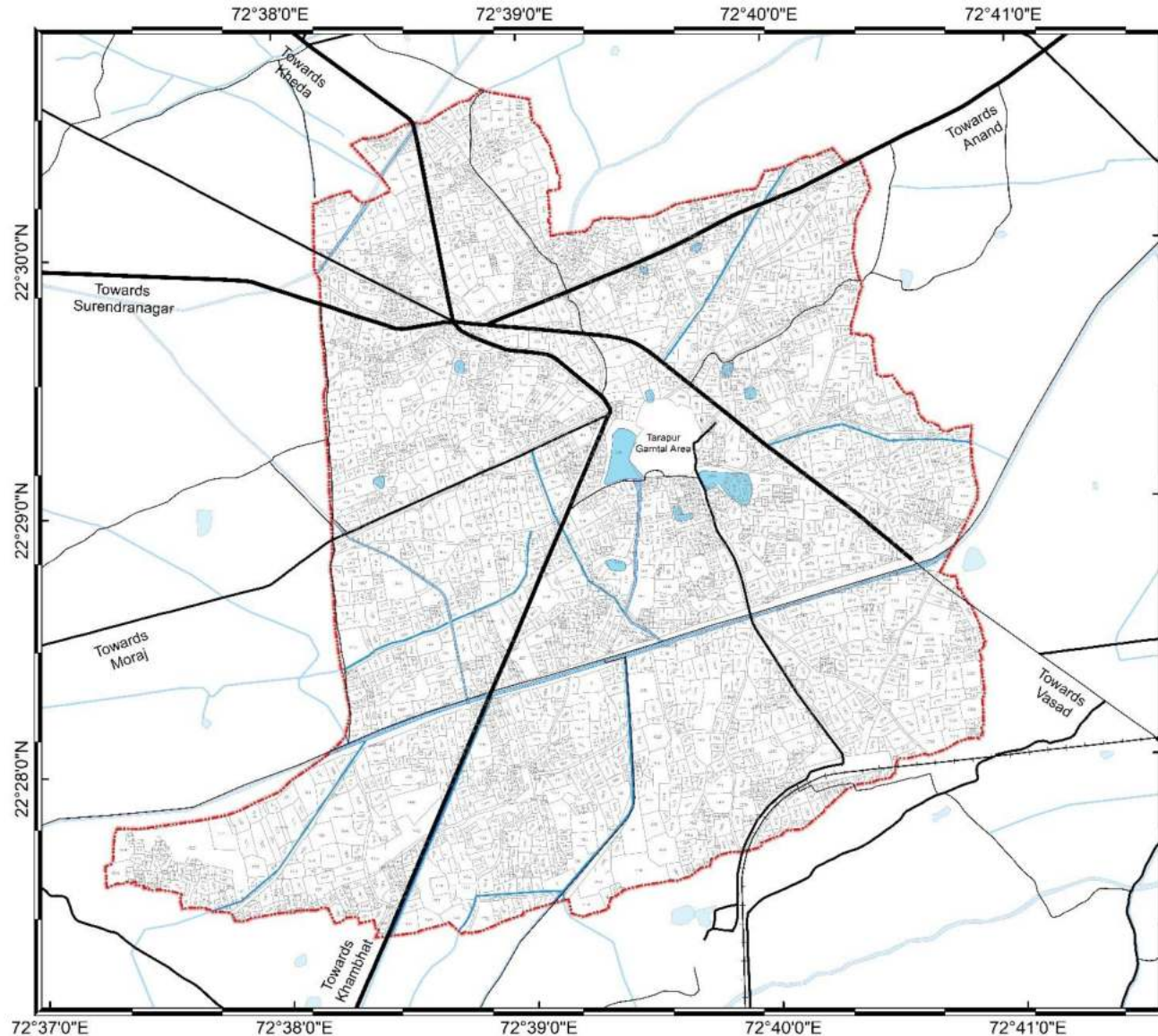
Cadastral Maps



Digitization of Revenue Plots

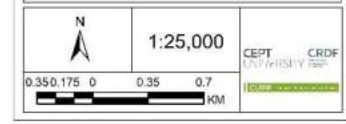


Base Map Preparation



TITLE
Base Map of Tarapur Gram Panchayat

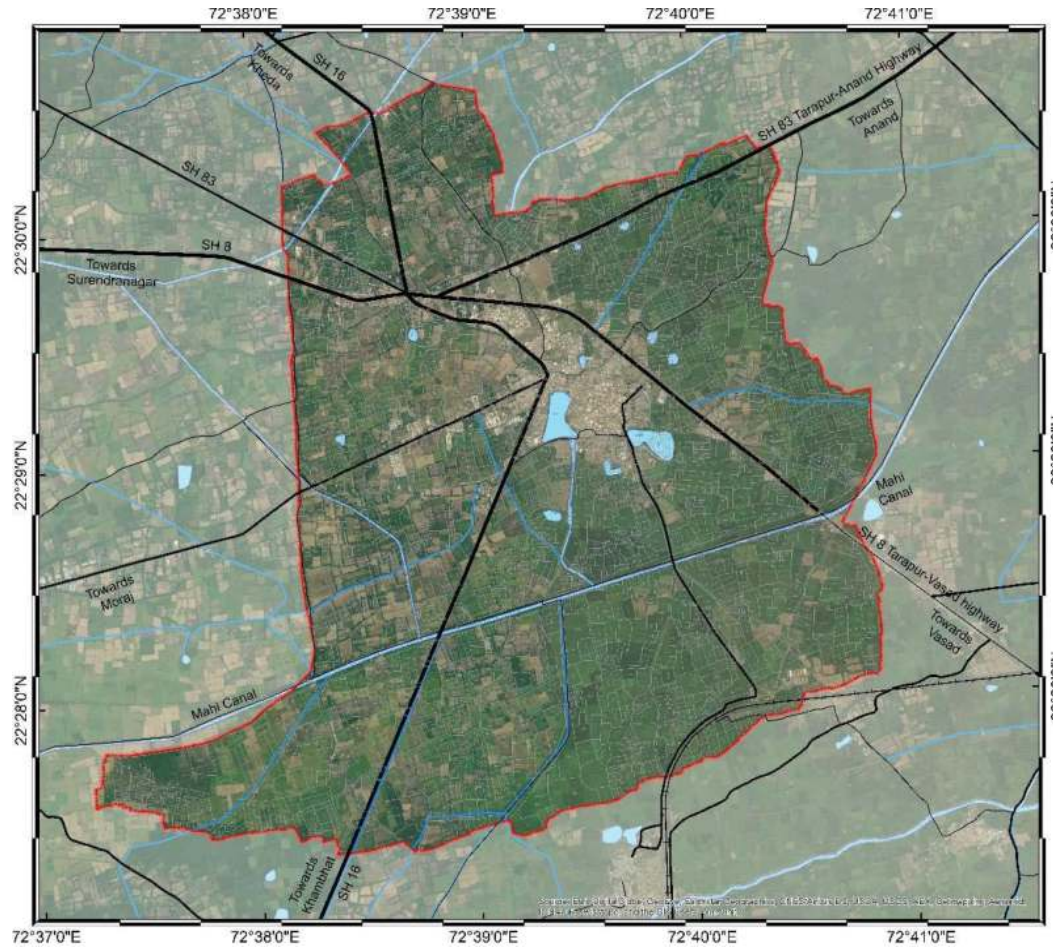
- LEGEND
- Tarapur GP Boundary
 - Revenue plots
 - Lakes
 - Canals
 - Streams
 - Railway Line
- Road Heirarchy**
road type
- State Highway
 - Other District Roads
 - village road



Area as per Base Map (Area in sq.km)		
	Area(sq.km)	Area in Percentage
Total water bodies	0.42	1.87 %
Lakes	0.26	---
Canals	0.16	---
Total Land Area	21.98	98.13%
Total Tarapur GP Area	22.40	---

Source: Revenue Maps from Anand DILR Office & NRSC

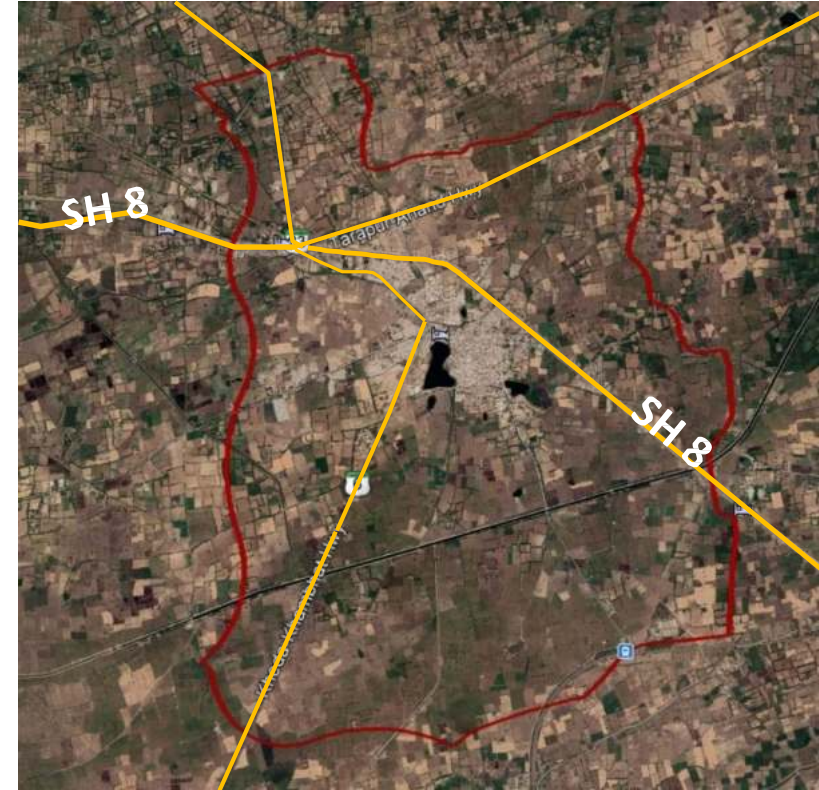
Tarapur GP Boundary



Boundary as per the Base Map

Area:- 22.4 sq.km

Base Map Boundary and Area considered for preparation the Spatial Development Plan



Boundary by NRSC

Area:- 17.00 sq.km

Existing Situation Analysis

Existing Land Use Map

Data Source

- Existing land use information from 7/12 documents – Revenue Department
- Canals and other water bodies – Base Map- NRSC
- Satellite Images as received- NRSC
- LULC information- NRSC (Received on 29th July 2020)

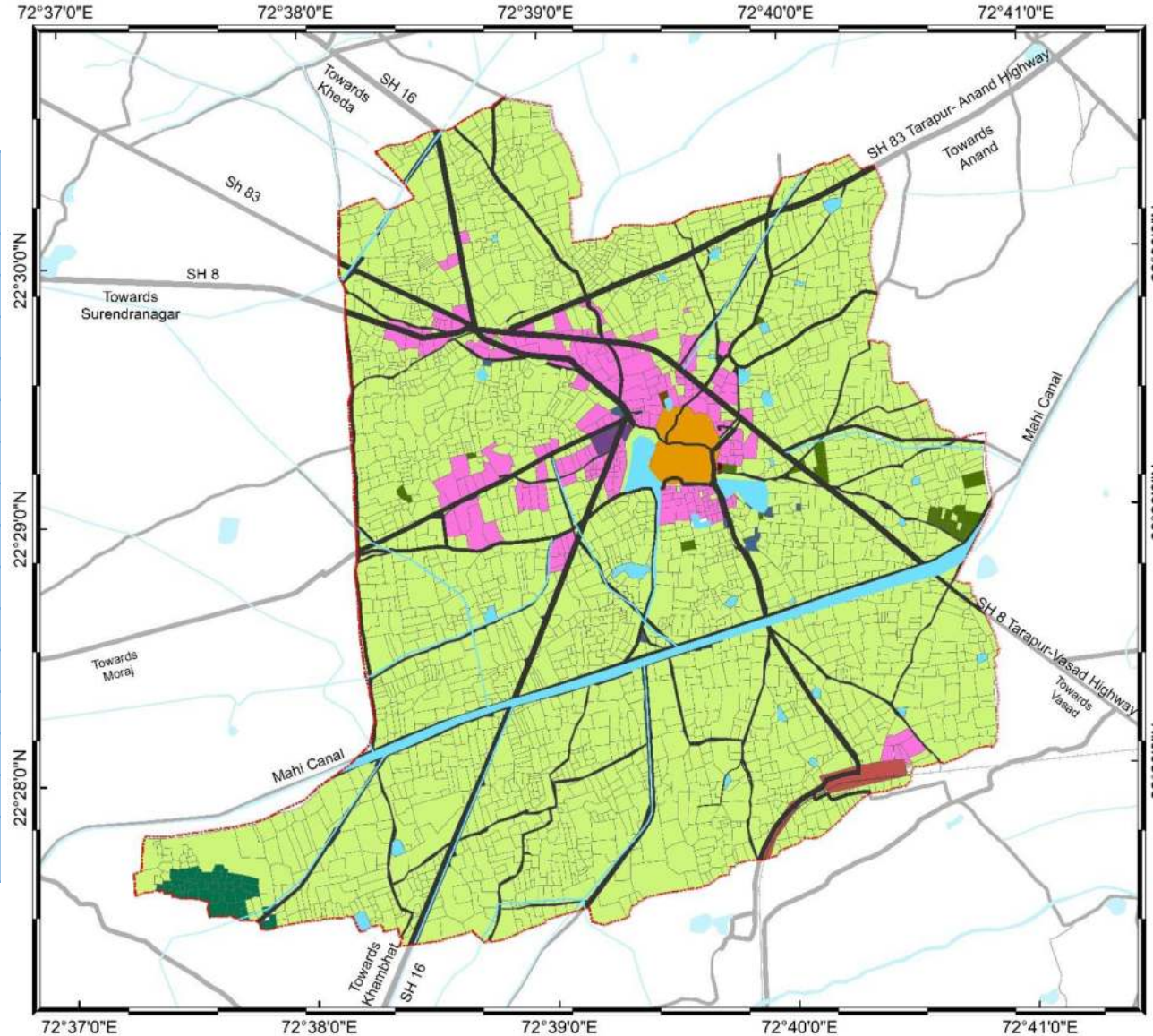
Methodology

- Plot-wise ELU map is prepared
- Transfer land use data as per the Revenue Department (7/12 documents) on the GIS platform
- Details for each survey plot numbers transferred on the GIS platform
- Verified plot details with satellite images & LULC map-NRSC
- Discrepancies in the ELU map verified with the Sarpanch

Existing Land Use Map

Sr. No	Land Use Categories	Area (in sq.km)	Area in %
1	Agriculture	18.31	81.74%
2	Roads	1.58	7.05%
3	Existing settlement	1.39	6.21%
4	Lake	0.26	1.16%
5	Abadi Area	0.22	0.98%
6	Pasture land	0.18	0.80%
7	Canals	0.16	0.71%
8	Fallow land	0.12	0.54%
9	Railway Station	0.11	0.49%
10	Industrial	0.03	0.13%
11	Crematorium	0.03	0.13%
12	Dumping site	0.01	0.03%
13	School	0.002	0.01%
	Total	22.40	100.00%

Total existing settlement + abadi area = 1.61 sq.km (7.19%)
 Total number of lakes= 28



TITLE
Existing Landuse Map

LEGEND

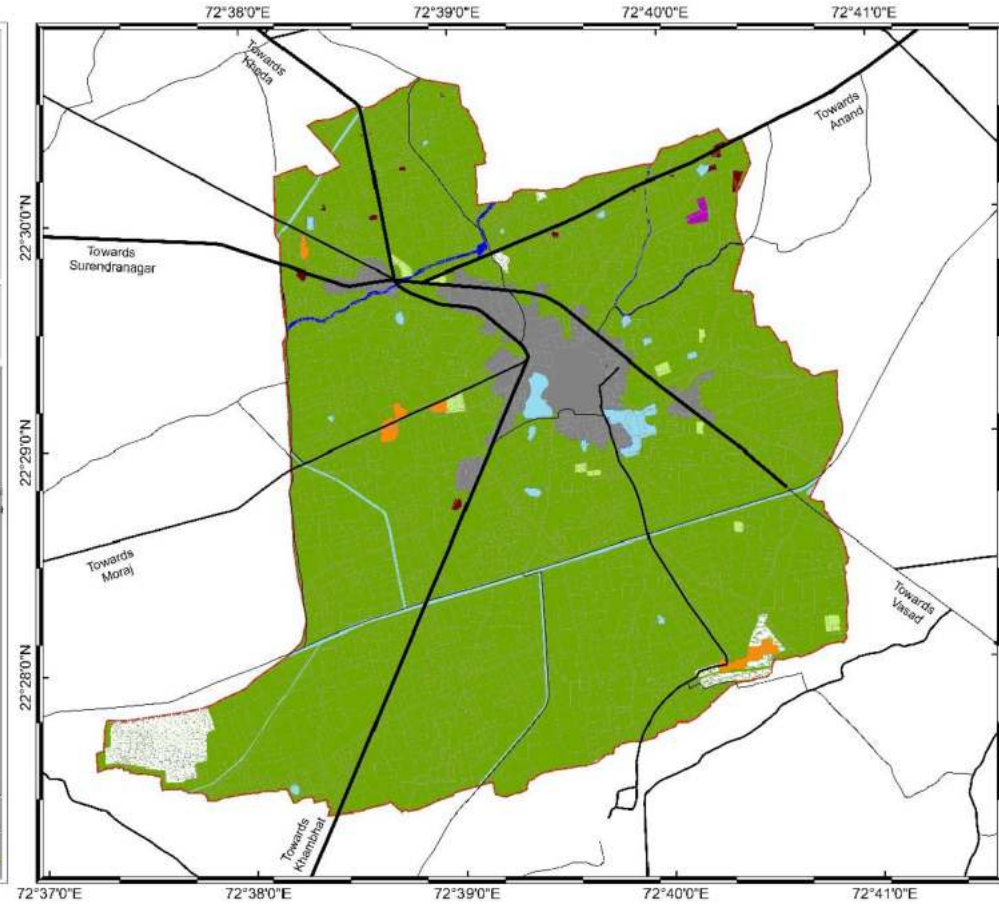
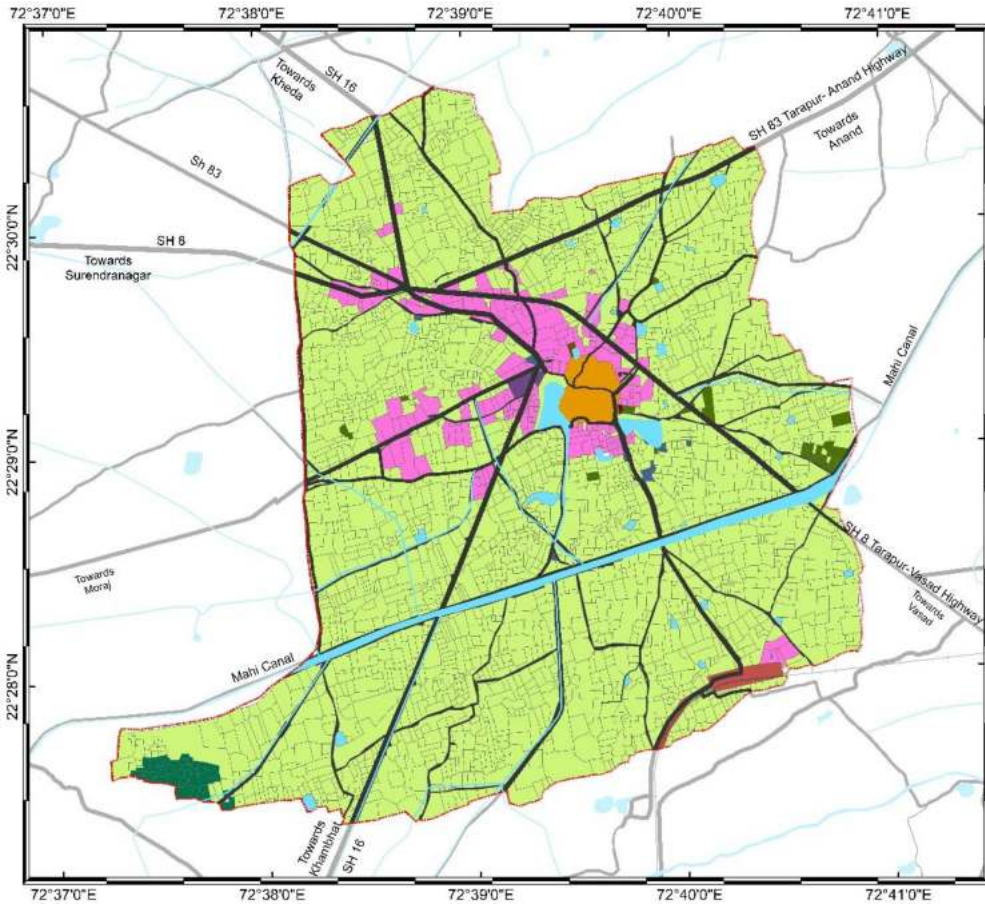
- Tarapur GP Boundary
- Streams
- Railway Line
- SH
- ODR
- village_road
- street
- other_road
- Fallow land
- Pasture Land
- Canal
- Lake
- Abadi area/Gamta
- Existing settlement
- Industrial
- School
- Crematorium
- Dumping Site
- Railway Station
- Roads

Existing Landuses Categories

- Agriculture

Scale: 1:25,000
 0 0.35 0.7 KM

Existing Land Use Map and Land Cover Map

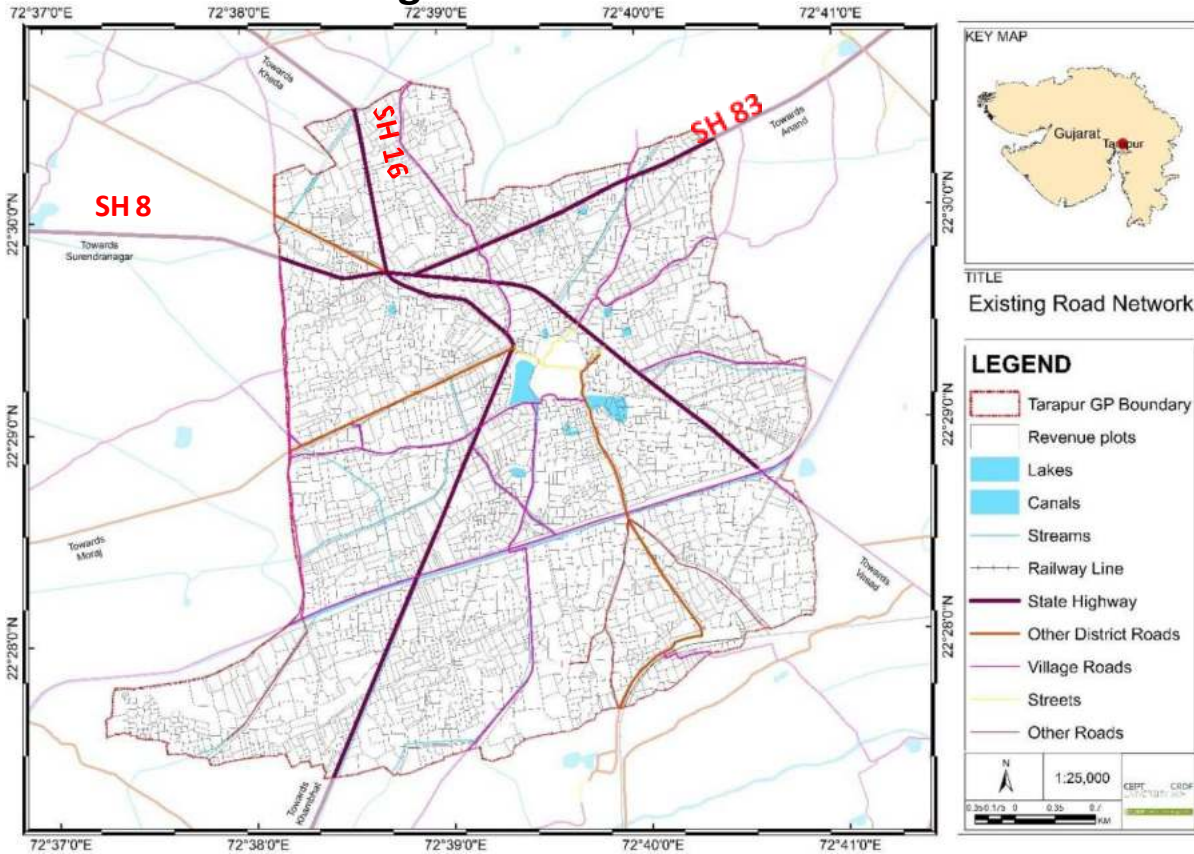


ELU map- Prepared and verified with Revenue records

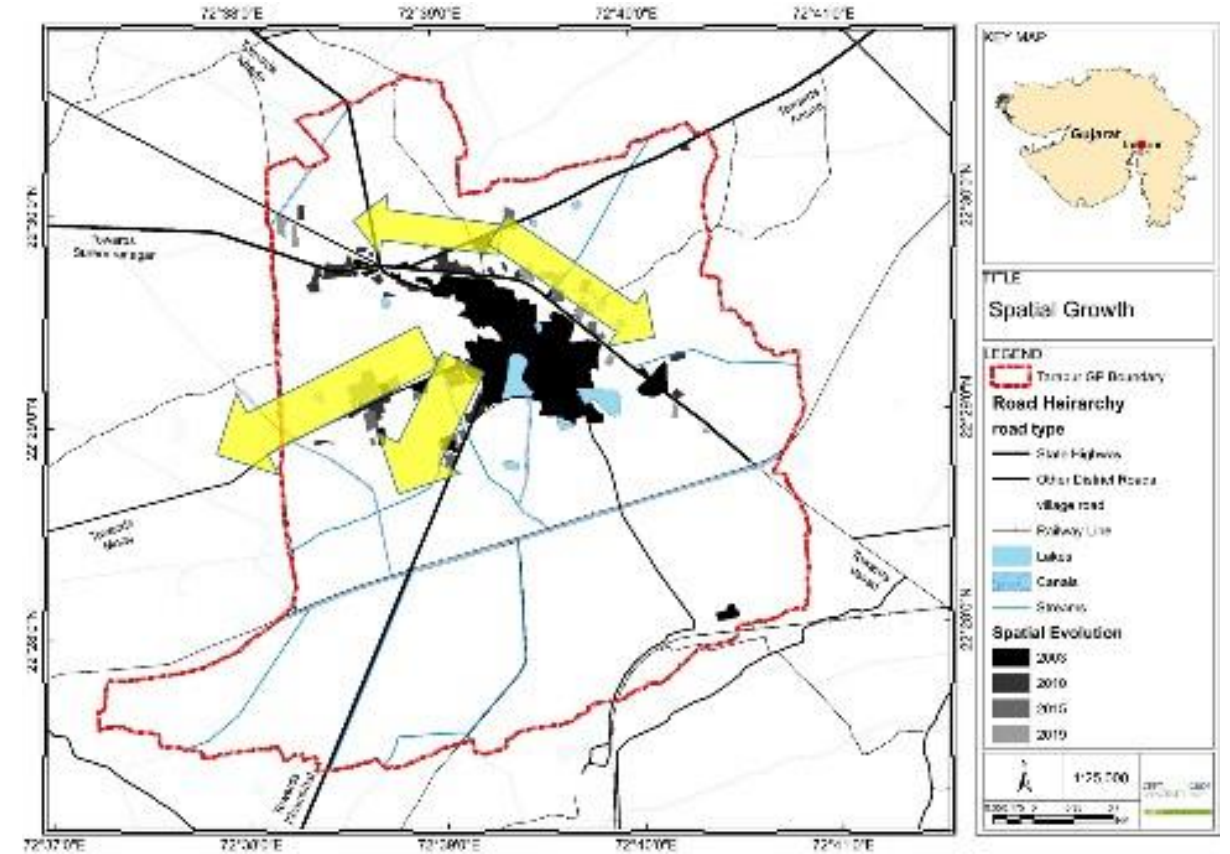
Land Use Land Cover Map by NRSC (Received on 29th July)

Existing Road Network & Spatial Growth Trend

Existing Road Network



Spatial Growth Trend



- Originally, the GP grew around the water bodies and along the transport axis
- Significant spatial growth of the village can be seen in the area located between the junction of the three-state highways and the lakes
- During the recent decade, the village is spatially expanding along the district road connecting the GP with Moraj in the west.

Source: Satellite Image- NRSC; Road and Railway –NRSC; Prepared Base Map

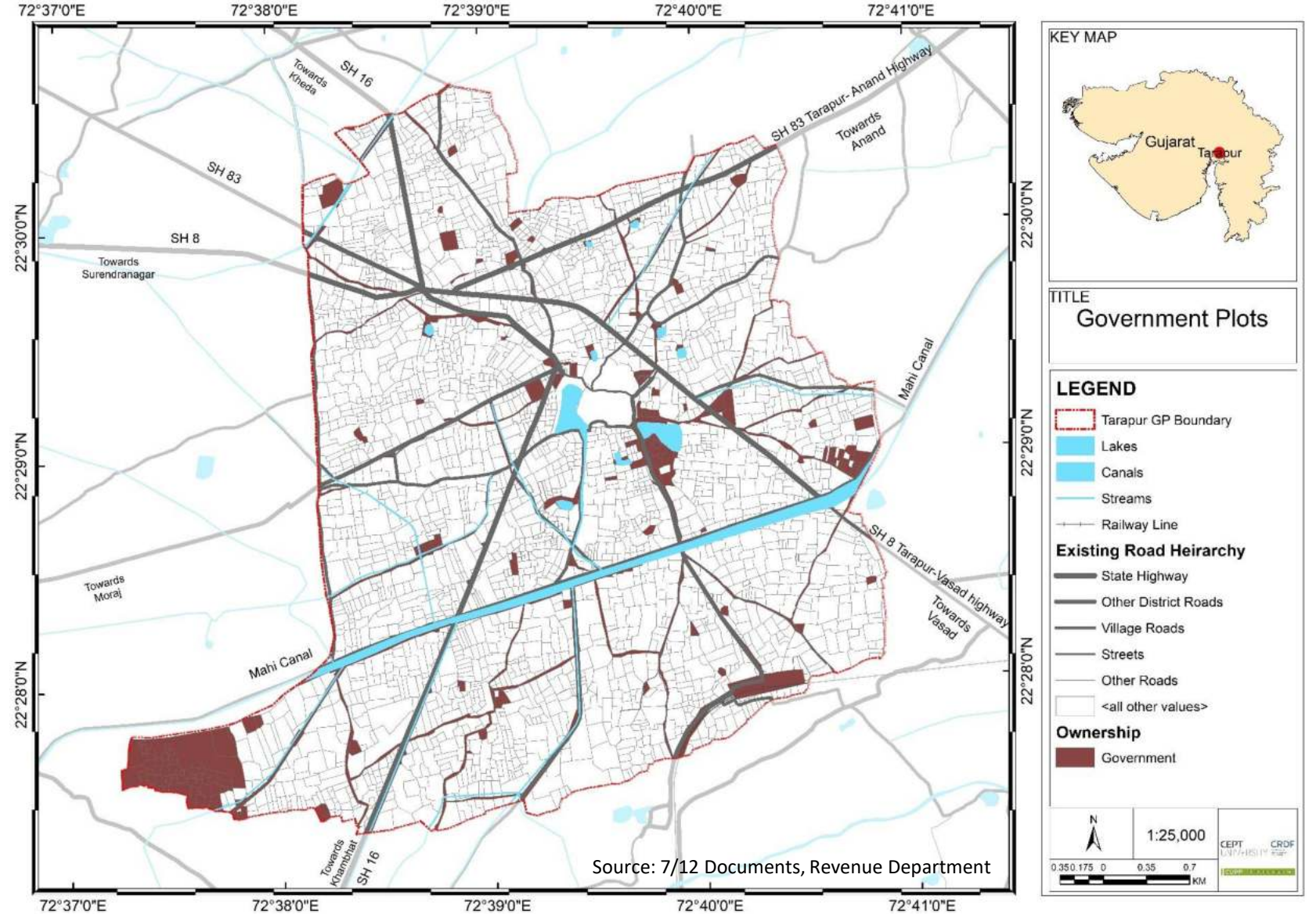
Land Ownership

Purpose

Information will help in identifying locations for development public amenities and utilities

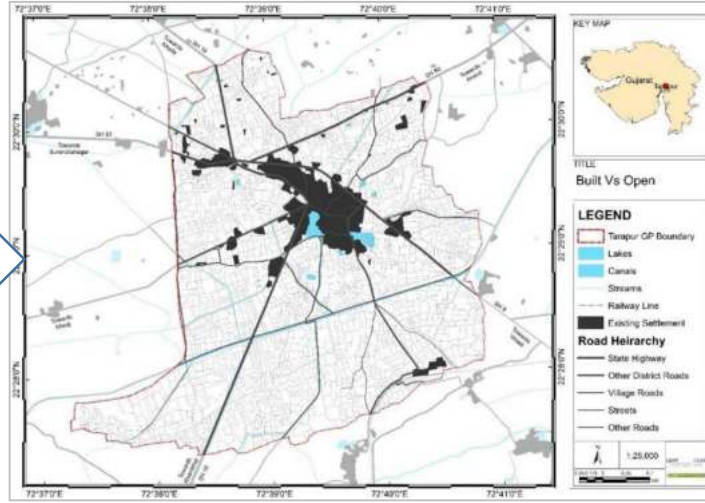
Government Land

- 2.17 sq.km (12.40%) (including lakes, canals, and roads)



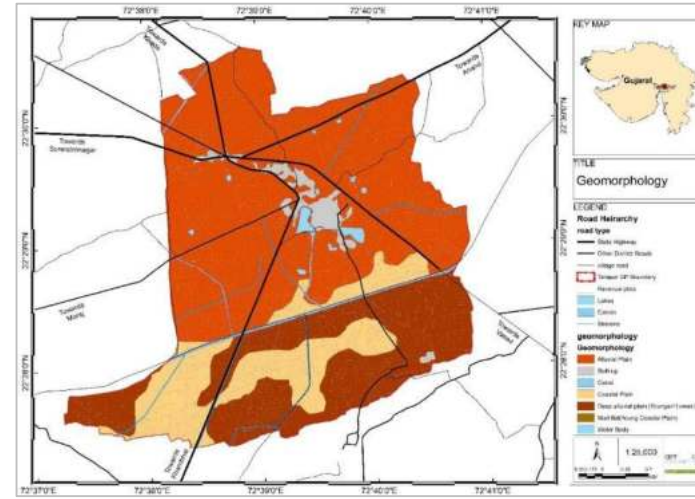
Thematic Maps (Based on Layers Received from NRSC)

Built vs Open



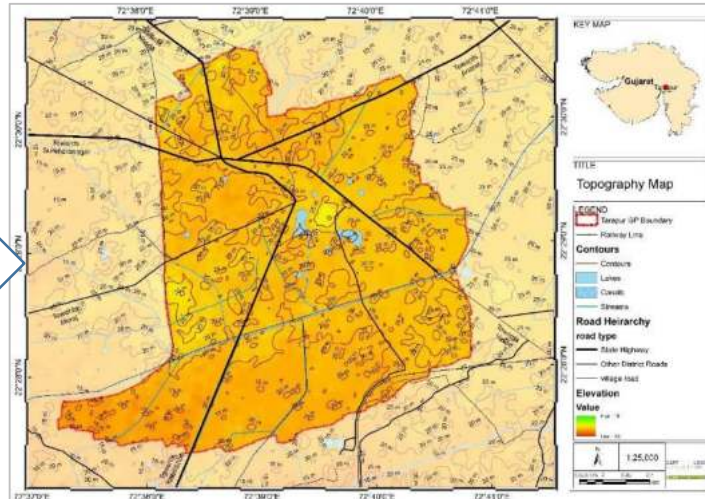
Built development is concentrated in the area situated between the junction of the three-state highways and the lakes in the south

Geomorphology



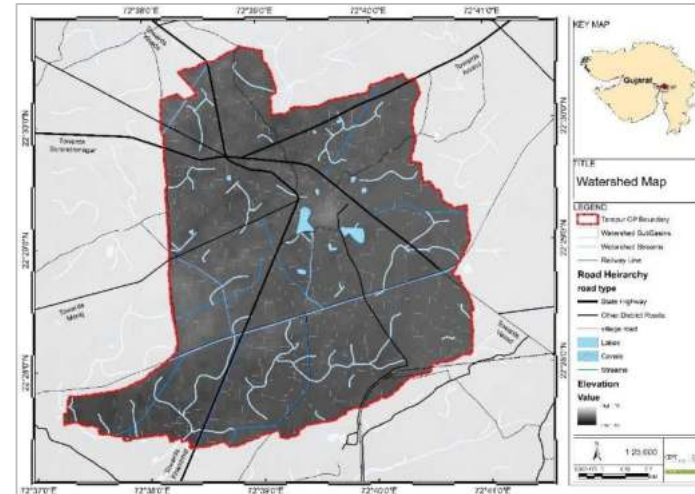
Majority of area under Alluvial Soil Categories. Soil is fertile and good for agricultural activities.

Topography



Overall, flat terrain with variation in the topology mostly between 15 meters to 25 meters

Watershed



Area situated in the south of Mahi Canal is prominently falling under low lying area & there is a change of waterlogging in this area during monsoons

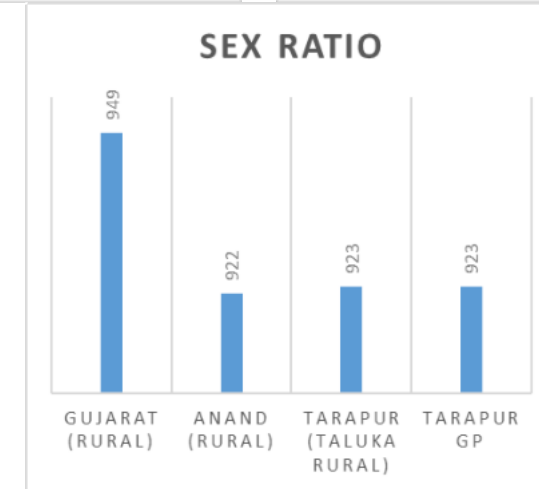
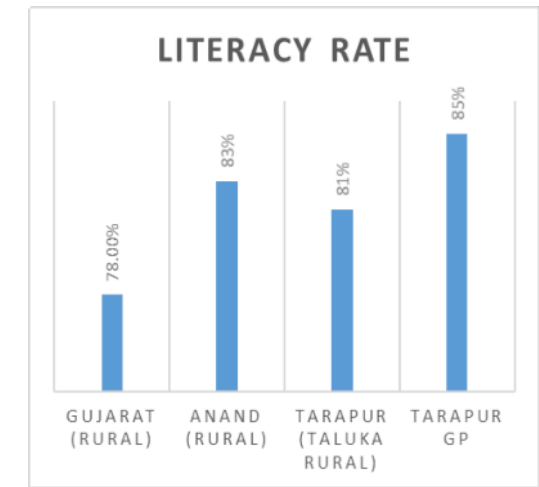
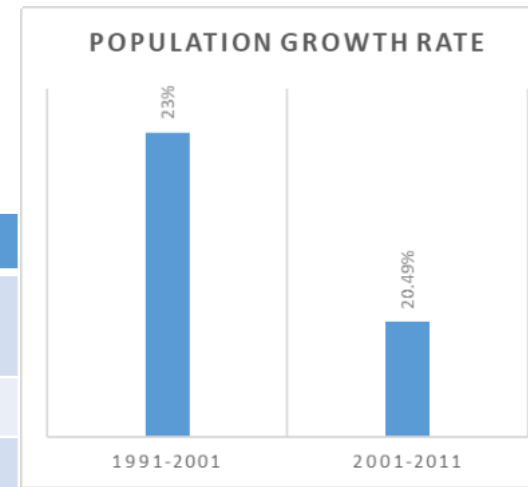
Demographic Profile

Population Distribution

Population Distribution				
Year	Gujarat (Rural)	Anand (Rural)	Tarapur (Taluka Rural)	Tarapur GP
2001	31,740,767	1,348,901	75,850	14,934
2011	34,694,609	1,457,758	88,522	17,994

Population Share				
Spatial Unit	Total Population (2001)	Population share to the Upper Spatial Unit	Total Population (2011)	Population share to the Upper Spatial Unit
Anand (Rural)	1,348,901	---	1,457,758	---
Tarapur (Taluka Rural)	75,850	5.62%	88,522	6.07%
Tarapur GP	14,934	19.69%	17,994	20.33%

Source: Census of India

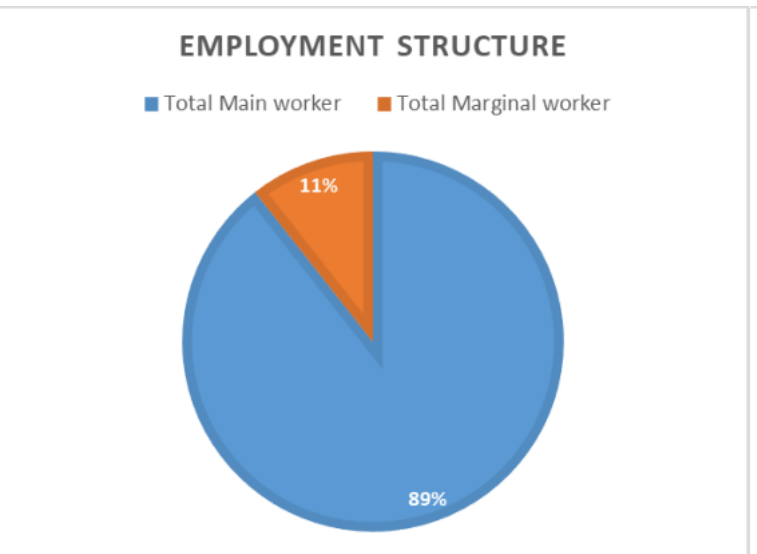
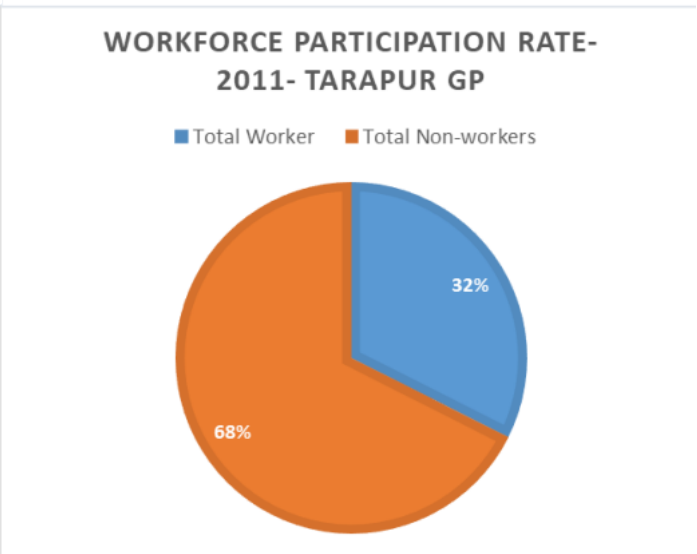
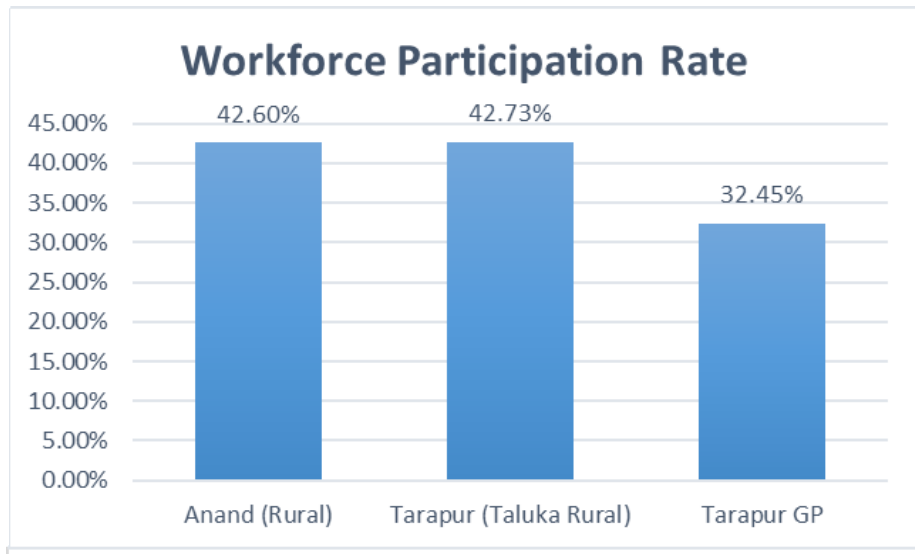


Purpose

- Comparative analysis is done to understand the GP's share to the upper spatial units

	% of SC Pop	% of ST Pop
Tarapur Gp	5%	0.79%

Workforce Profile







Change in Occupational Structure in Tarapur GP

	2001	2011	2001	2011
Total Worker	5,039	5,839	33.74%	32.45%
Total Primary worker	2,270	2,680	45.05%	45.90%
Total Non-Primary workers	2,769	3,159	54.95%	54.10%

Source: Census of India

58% Agri Laborers
42% Agri Cultivators

Economic Activities

Type of Activity	Related Facts	Related Issues	
	<p>Primary Activity- Agriculture</p>	<p>50% (primary survey & Interview with sarpanch); Double Cropping Irrigation:- Private bore wells & Mahi Canal Supporting Facility:- APMC- serves 40-45 surrounding villages</p>	<ul style="list-style-type: none"> • Highly depends on agricultural activities • Lack of knowledge amongst farmers and cultivates regarding new technology in farming • No KVK (Krishi Vigyan Kendra)
	<p>Industrial Labour</p>	<p>9-10% - daily commute to Indrjan Industrial Establishment- at 10 km distance</p>	
	<p>Daily Commute</p>	<p>10 -15%- (to Anand and surrounding villages)</p>	
	<p>Daily wager & other workers</p>	<p>5% - Auto drivers, van drivers, fruits and vegs sellers, etc. 20%- involved in other occupational activities such as shop-owner, shopkeepers, teaching, govt. jobs, small businesses, tea stall, hotel, restaurants etc.</p>	<ul style="list-style-type: none"> • No skill development centers (Kaushlya Vardhan Kendra (KVK) or ITI) in the village for students and young work pool; which can provide training to young work pool so they can be absorbed in the surrounding industrial establishment/ various economic activities.

Source: Primary Survey and Spar panch Interview

Civic & Social Amenities Assessment- Gap Analysis

Gap analysis for social infrastructure

Purpose

- Understand current status of social amenities
- Help in estimate future requirement

Source

- Census of India
- Primary Survey
- Village Profile, 2020
- URDPFI Guidelines
- Guidelines by Ministry of Health & Family Welfare

Type of School	Existing No. Facility	Required	Surplus/ Deficit
Educational Facility			
Aanganwadi	19	7	12
Primary Schools (primary + middle) I-VIII	10	4	6
Secondary Schools (IX to X)	2	2	0
Senior Secondary (XI-XII)	1	1	0
Colleges	0	0	0
Health Care Facility			
Sub-Center (SC)	1	4	-3
Primary Health Center	1	1	0
Community Health Center	1	0	1
Maternity & Child Welfare Centre	1	1	0



At present- Sufficient facility

Social-Cultural Facility



At present- Surplus facility

Banking Facility

Source: Census of India, Village Profile, 2020 , HouseholdSurveys and URDPFI Guidelines

Housing Profile

Existing Condition

- Total No. of HHs- 3,452
- Majority are one story
- 98% HHs are in good condition
- 99% for residential purpose
- Majority are pacca houses
- Latrine/ Toilet Facility-
 - **100%- Under Swach Bharat Mission**
 - **74% hhs within premises (as per the Census 2011)**

the gap is now covered under the mission

Related Issues

- Kaccha houses are mainly in the slums / unauthorized; mostly occupied by construction labourers

Source: Census of India, Primary Survey, Village Profile, 2020 and Household Surveys

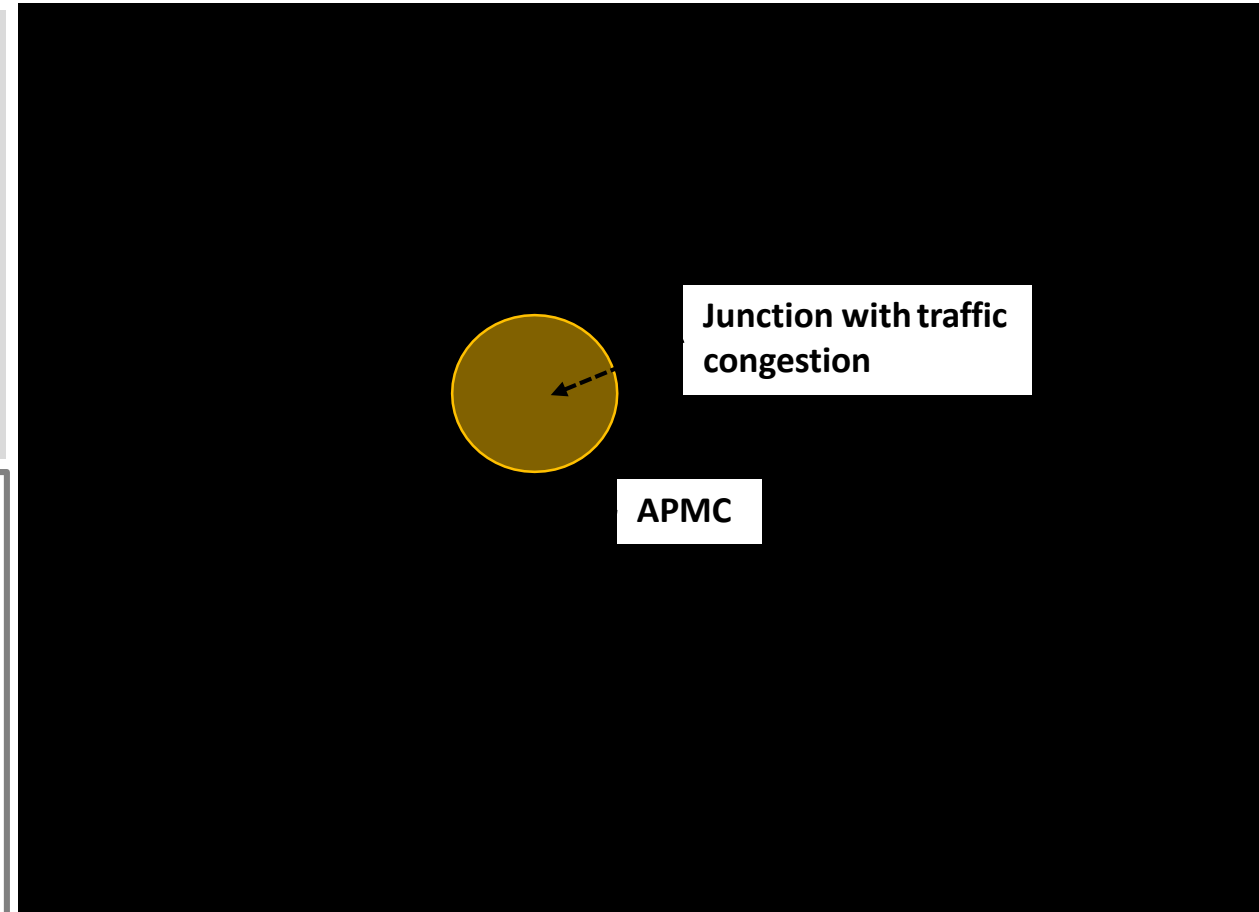
Inter Village Road and Connectivity

Existing Condition

- Access road to the GP- asphalt road with 2 lanes.
- Sufficient road network- connected well with the nearby centers for health, education and economic purposes.
- Road condition- Good- Almost all the internal village roads are paved roads.

Related Issues

- **Tarapur APMC is located on Kheda- Khambhat highway- SH 16 and the market serves the around 40 to 45 surround villages as well. During the pick hours, traffic chaos is noticed on the road approaching APMC.**
- Lack of streetlights; only 10% inter village roads have streetlights



Source: Primary Survey

Physical Infrastructure

Water Supply System

Existing Situation

- Water supply- Pipe Network-100% HH covered
- Supporting Infrastructure- 7 Bore wells- Storage capacity is 6 lakh liter & 3 lakh lit capacity sump is proposed by WASMO (Water and Sanitation Management Organization)
- Supplied water quality- Potable

Related Issues

- Age of pipe network is nearly 30 to 35 years- a problem of leakages, which requires frequent repairing. - Upgradation of the water pipe network is required.

Sewage and Drainage System

Existing Situation

- Open drainage
- Untreated waste water through the open drainage network discharges into the Bay of Khambhat
- **Under the Rurban Fund, laying of sewage network is the GP is done- no HHs connections are established**
- Toilets are connected with the soak pits

Related Issues

- Untreated wastewater from HH is discharged into the open storm water drainage network.
- Underground sewage network is not completed- HH sewage connection to the main sewage network is yet to be established.
- Soak pits are not maintained on regular basis

Source: Primary Survey and the sarpanch interview

Physical Infrastructure

Solid Waste Management

Existing Condition

- Responsible agency- Panchayat
- Daily door-to door collection
- No segregation before disposal
- Supporting Infrastructure- 3 trollies and 3 tractors.
- Waste land is identified by Panchayat for solid waste disposal

Related Issues

- Solid waste is directly dumped into an open field without segregation and any disposal treatment.

LPG Facility

At present- 74.5%
HHs

Related Issues

- Remaining HH-
BPL category

Electricity

Existing Condition

- Responsible agency- MGCVCL (Madhya Gujarat Vij Company Limited)
- No. of connection- 5,106
- 24 hr electricity supply
- Availability of 3 phase supply
- Electricity supply for- Residential., Ind. & Agri.

Related Issues

- No MGCVCL service station established- hence, during any faults in electric line, power cut last for 4 to 5 hrs

Source: Primary Survey & Village Profile 2020

Key Considerations for Planning Proposals

Key Considerations for Planning Proposals

- Strengths, Emerging Concerns and Opportunities
- Population Estimation
- Employment Estimation
- Housing Demand
- Area Requirement – Residential and Economic Activities
- Land Suitability Analysis- Environmental Consideration
- Spatial Growth Trend and Land Potential Analysis

Strengths, Emerging Concerns & Opportunities

Strengths

- Strategic locations
- A town like characteristics
- Presence of APMC

Emerging Concerns

Pur

- High Dependency on agricultural activity
- Traffic chaos at the junction of SH 16 & the district road approaching APMC

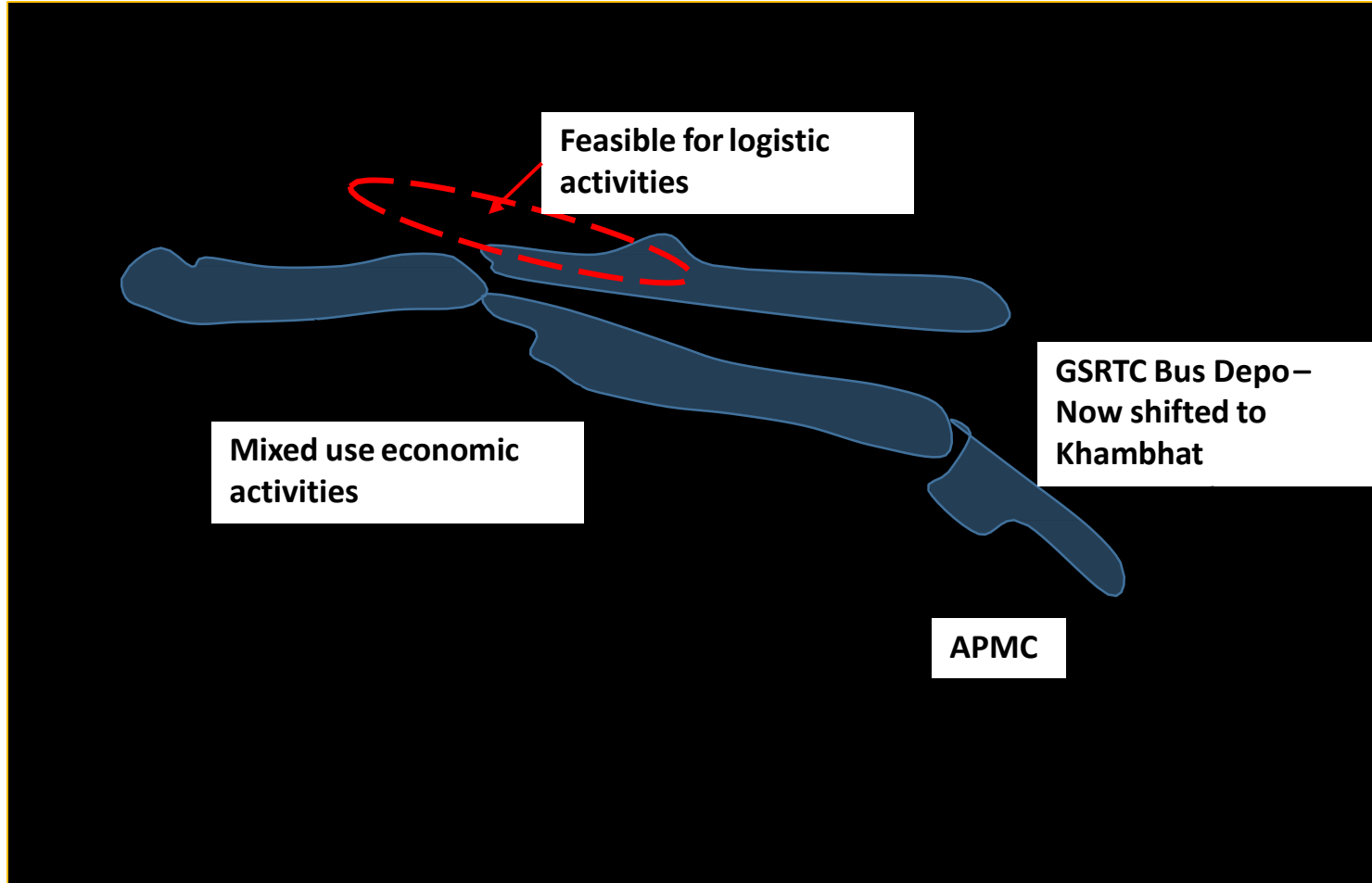
Opportunities

- Location- Potential for commercial, mixed use and logistic activities development

Purpose

To identify the areas where the most attention needed and helps in strategically plan and allocate the resources to fulfil the demand of the GP

Opportunity for Logistic Activities

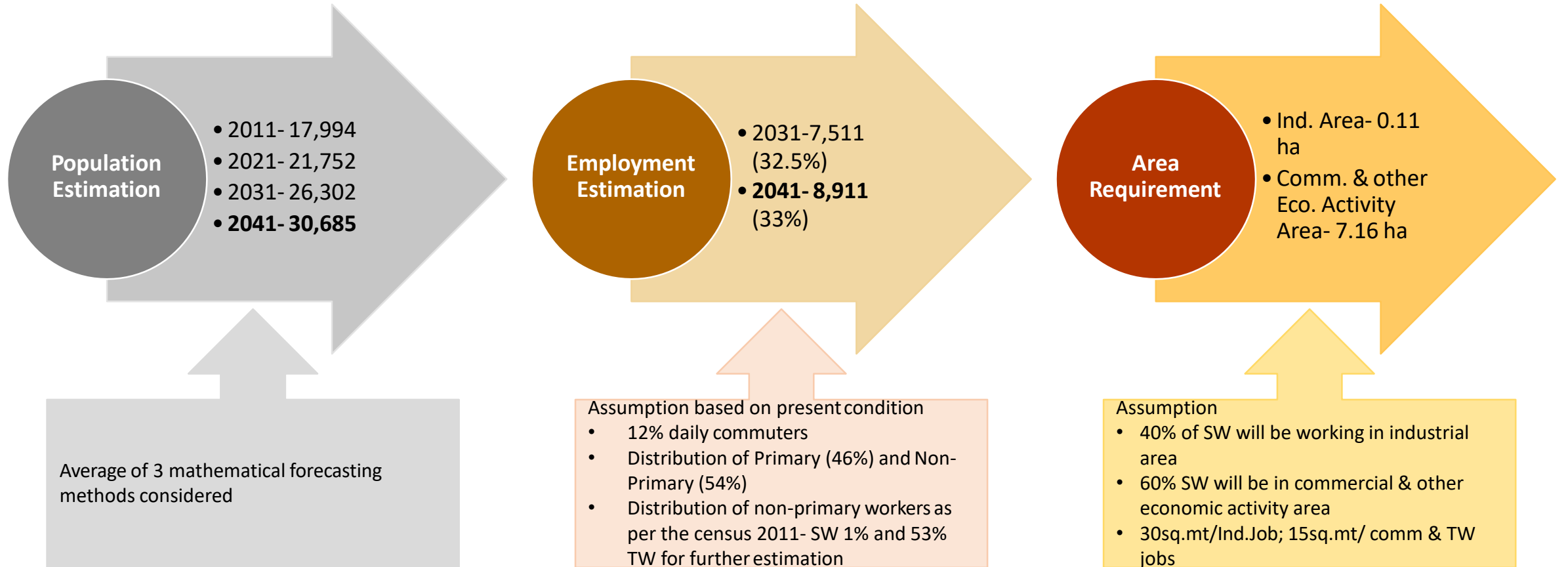


Existing Condition

- Mixed used economic activities along the highways
- GSRTC bus depo- shifted to Khambhat
- Haphazard auto and shared van parking along the highways

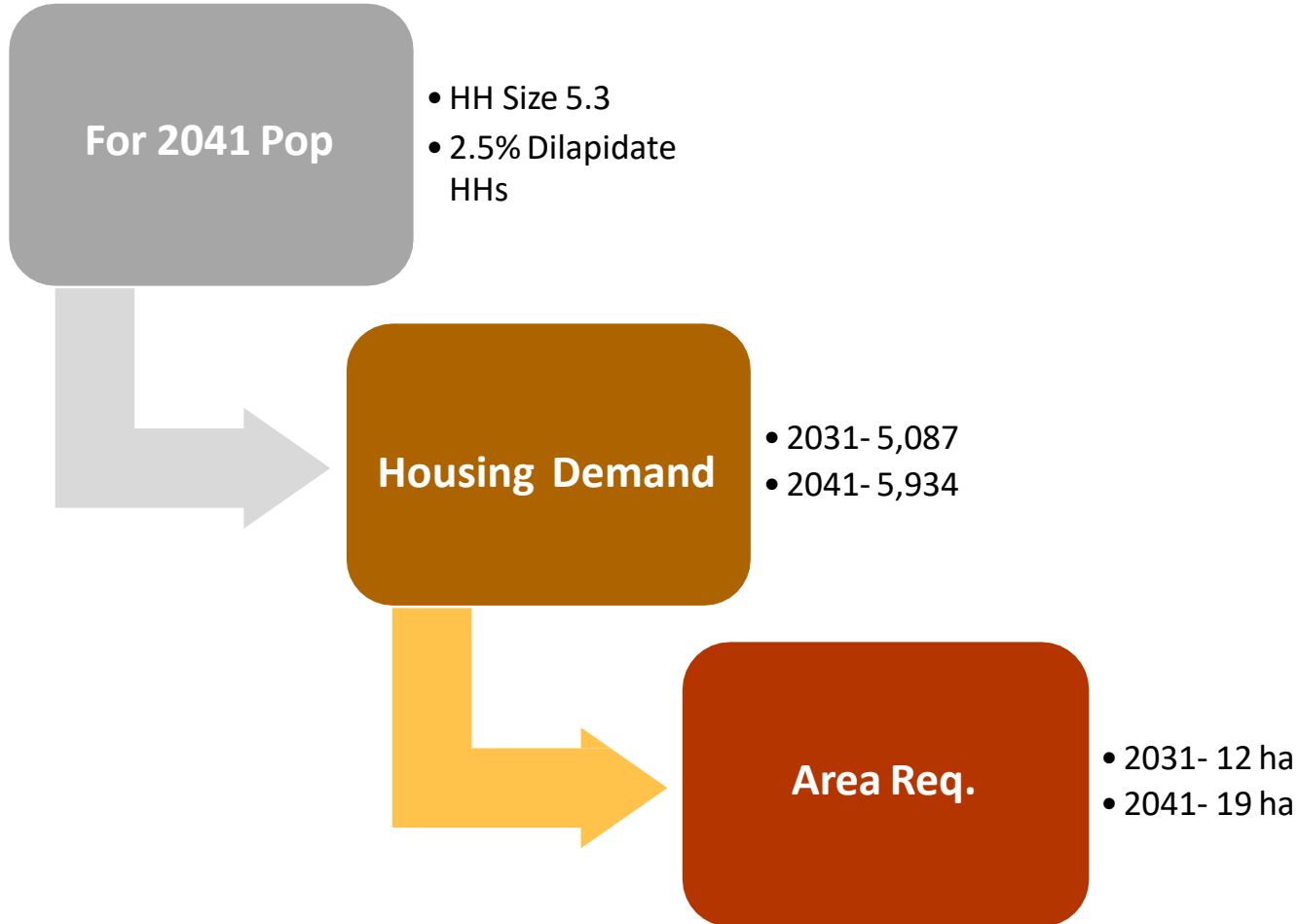
Source: Primary Survey

Growth Estimation



Source: Census of India

Housing Demand



Tarapur Housing Demand			
	2011	2031	2041
Population	17,994	26,302	30,685
Avg, Household Size	5.21	5.3	5.3
No. Houses Required	3,452	4,963	5,790
2.5% Dilapidated Houses	86	124	145
10% Vacant	-	-	-
Total No. of Houses Required	3,538	5,087	5,934
HH Area Requirement			
	2031	2041	
Additional No. of Houses Required	1,548	2,396	
Area Per Housing Unit (sq.mt)*	64	64	
Total Residential Area required (sq.mt)	99,101	153,349	
Assumed Additional 10 % Open Area Required**	9,910	15,335	
Assumed Additional 15% circulation area (Roads)**	14,865	23,002	
Net Area Requirement	123,877	191,686	
Required Residentail Area (sq.km)	0.12	0.19	
Required Residentail Area (ha)	12	19	
Note:			
*As per the Sarpanch the size of the new housing unit is 64 sq.mt; which is cross-checked and confirmed with the satellite image.			
** As per URDPFI Guidelines			

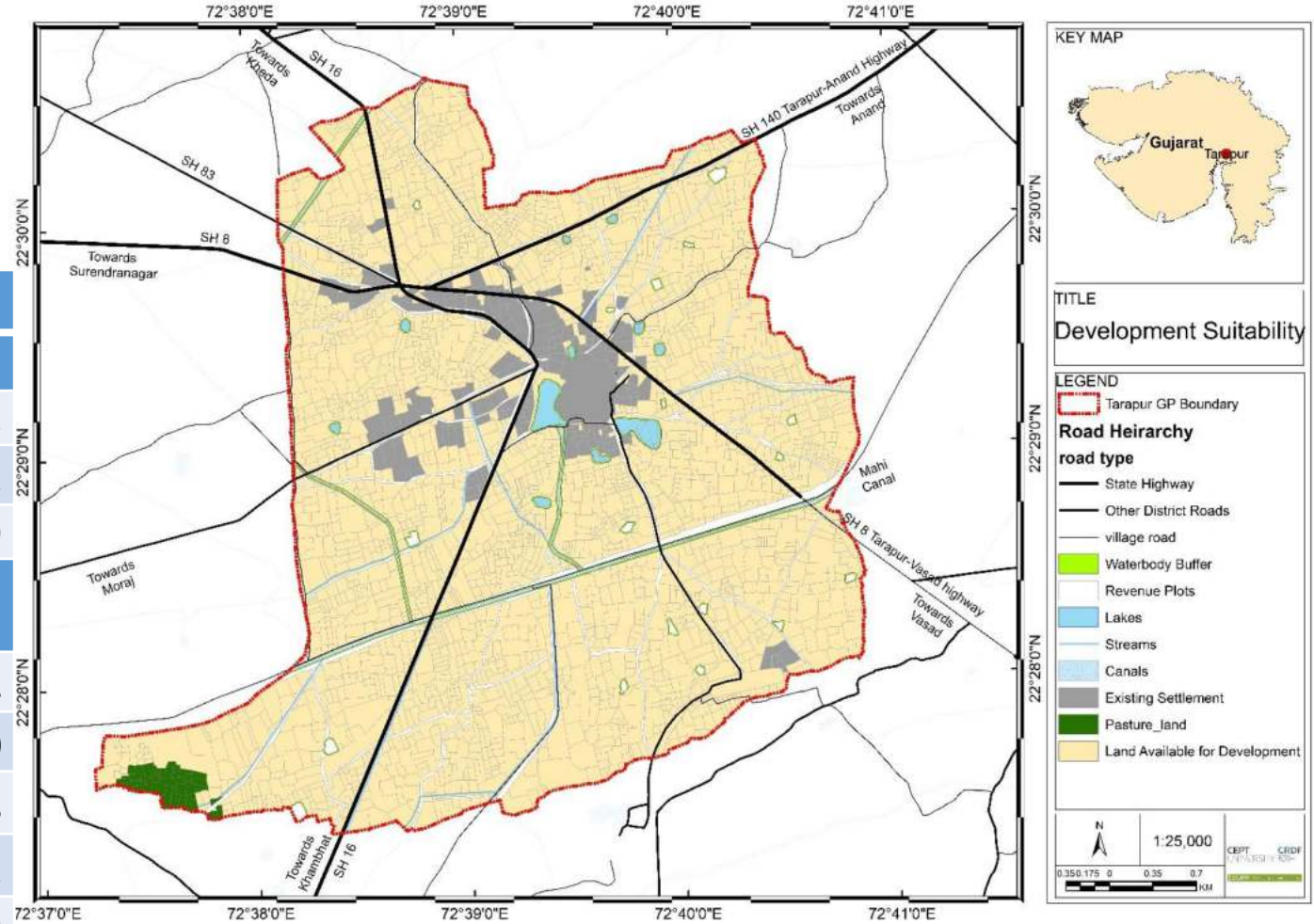
Environmental Consideration- Land Suitability Analysis

Purpose

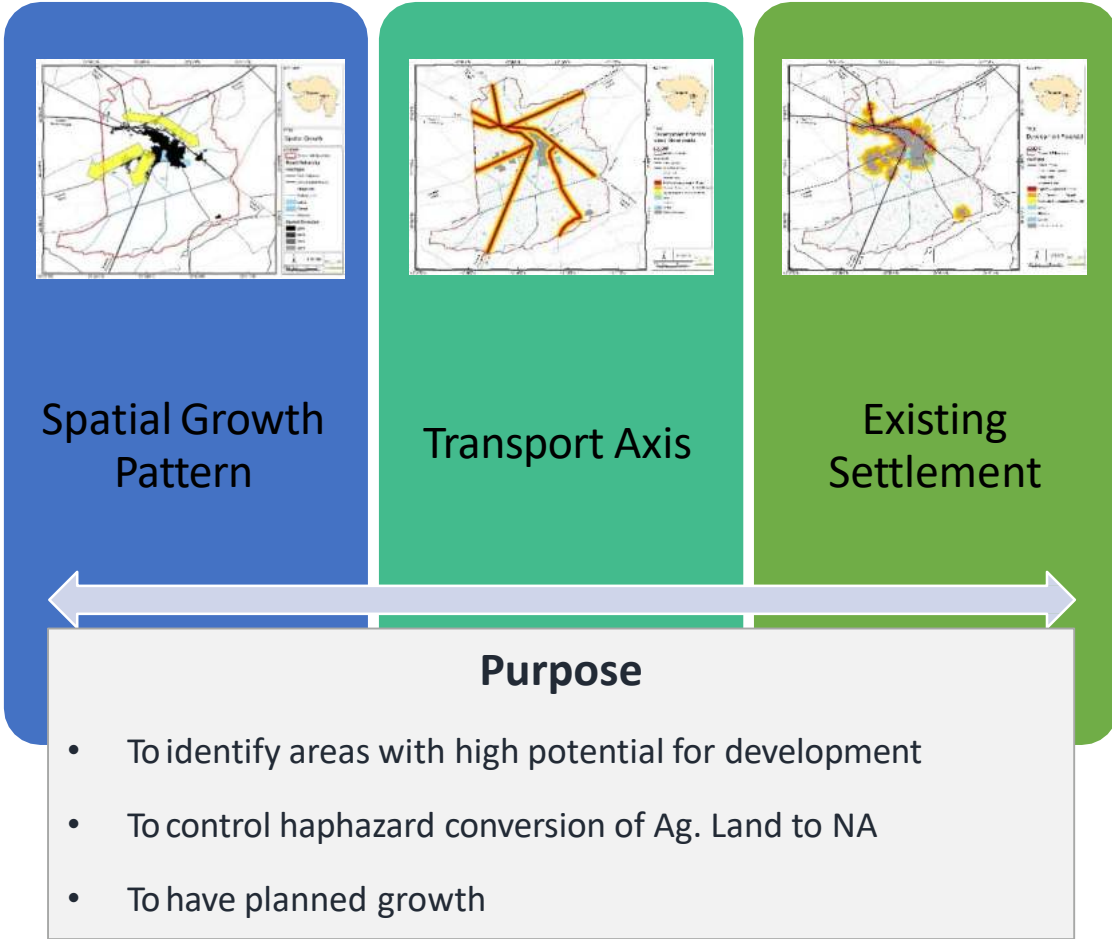
To identify eco-sensitive area that are required to be conserved

Total Land Available for Development

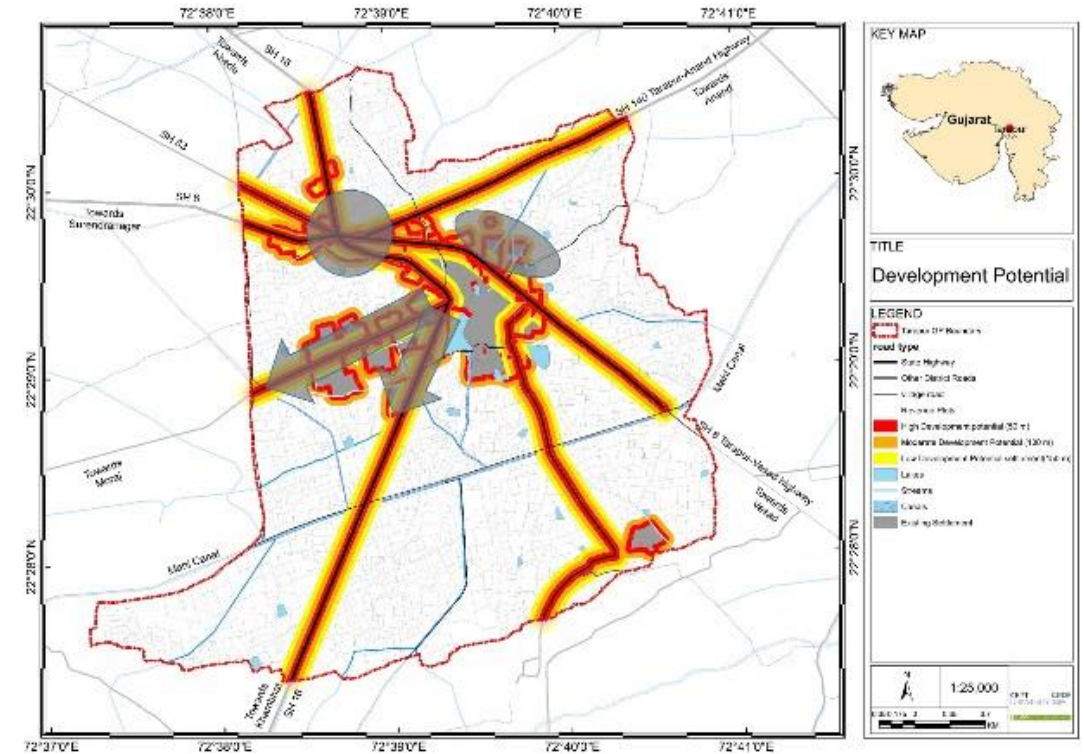
Parameter	Area(sq.km)
Non-Developable Area	
Total Water Bodies	0.42
Green Buffer Area (10 mts)	0.31
Pasture Land (Gauchar Land)	0.19
Green Buffer- no development buffer of 10 meters around the Full Tank Level of the water bodies	
Total Non-Developable Area	0.92
Total Tarapur GP Area	22.40
Total Land Suitable for Developable	21.48
Existing Settlement	1.61
Total Available Land for Development	19.88



Spatial Growth Trend & Land Potential Analysis



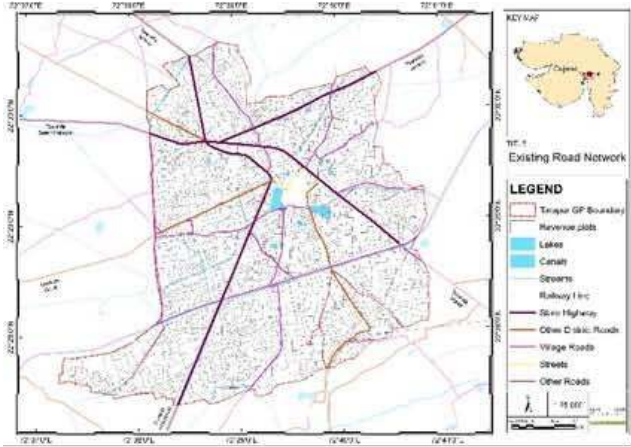
Composite Map-Spatial Growth Patten and Land Potential Analysis



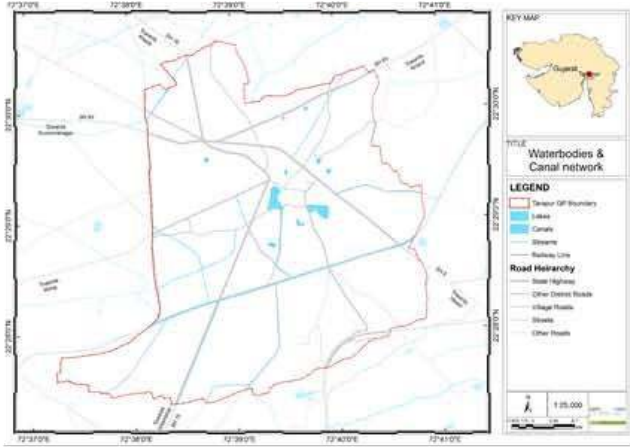
Considered Buffer-
 50mt. Buffer- high potential
 100mt. buffer- moderate potential
Significant Potential-
 Along the SH 8 towards south-east
 Along the District Rd, towards Moraj in the west.

Criteria taken into Consideration for the Concept Plan

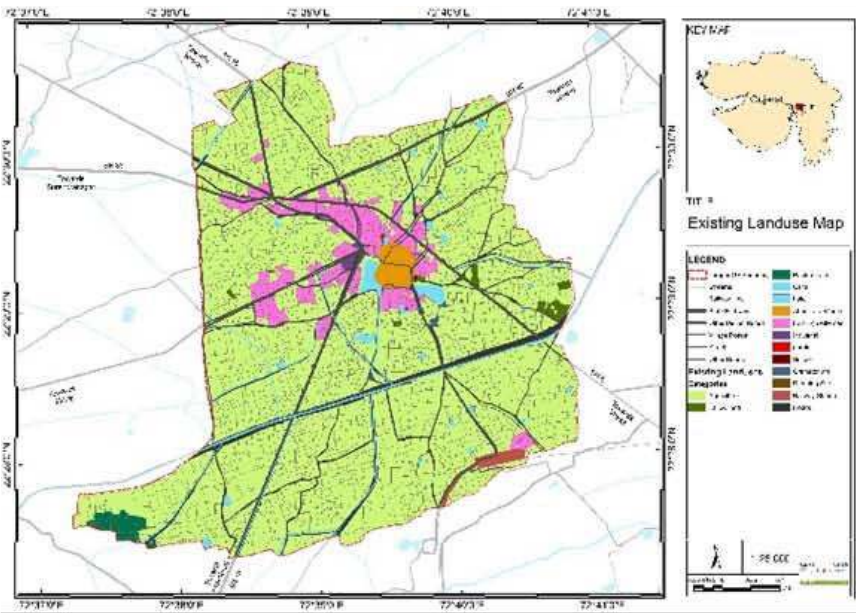
Existing Road Network



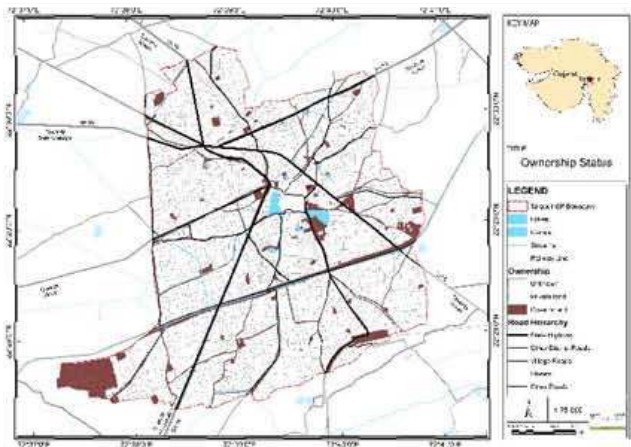
Eco-Sensitive Areas- Water Bodies



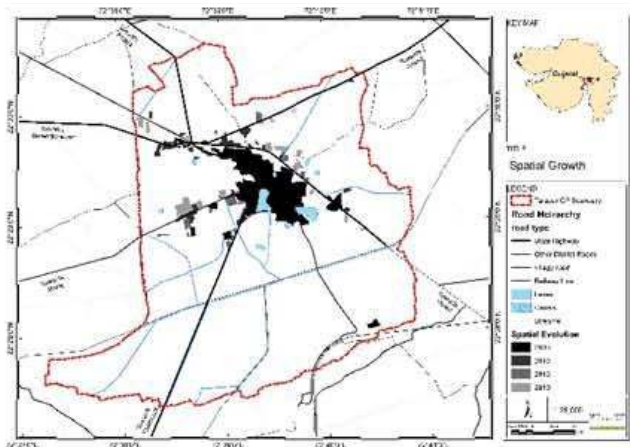
Existing Land Use



Land Ownership



Spatial Growth Pattern



Planning Proposals

Proposed Road Network

Criteria taken into Consideration for the Proposed Road Network

Consideration for Proposed Road Network

Existing Road Network

Strengthening existing roads as far as possible

Proposed New Road

To release pressure on the leading to the APMC

Proposed Road Hierarchy

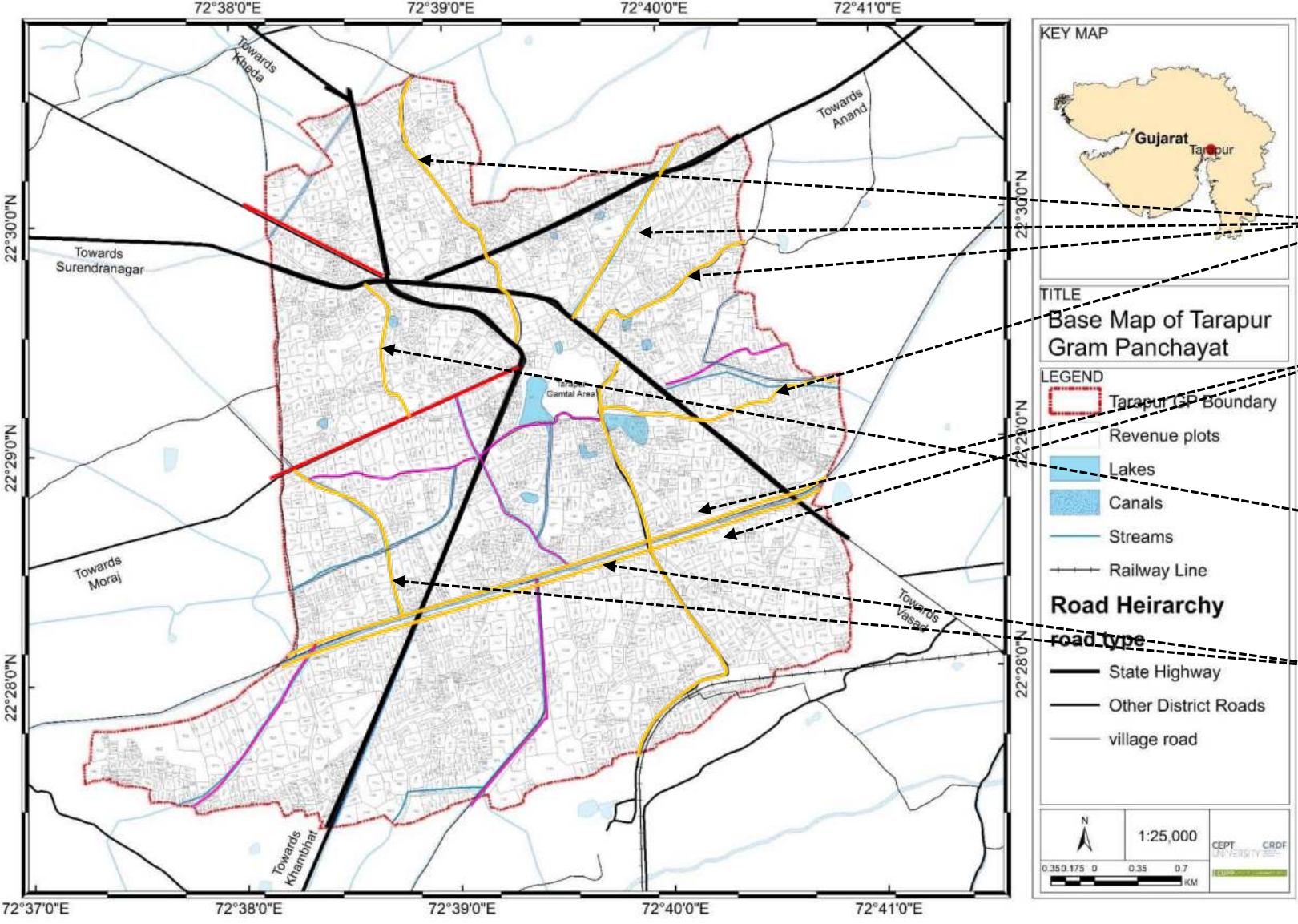
Is based on the Model Guidelines prepared for Rurban Clusters by for MoRD

Proposed Road Hierarchy

- Road 16 meter and above
 - State highways passing through the gram panchayat
- 12-meter-wide roads
 - District roads
- 9-meter-wide roads
 - Connects the GP with the highways & district roads
 - Works as an access road to the village
- 6-meter-wide roads
 - They are village road connecting 12-meter-wide and 9-meter-wide roads.
- 4.5-meter-wide roads
 - Facilitate inter-village connections
- 3-meter-wide roads
 - They are for the internal movement within the village
 - Mainly existing internal village roads

Note- 12 mt, 9, mt and 6 mt wide roads are with drains on both the sides to facilitate the drainage system in the GP.

Concept Development for the Proposed Road Network



Emphasis is given to utilization of the existing roads

Strengthening the existing roads by widening as required

9 mt wide road both sides along the Mahi Canal - Diverting inter villages traffic

9 mt wide new road connecting the district road (toward Moraj) to the SH 8 in the north to divert traffic leading to APMC

Strengthen the roads along the canal

KEY MAP

TITLE
Base Map of Tarapur Gram Panchayat

LEGEND

- Tarapur GP Boundary
- Revenue plots
- Lakes
- Canals
- Streams
- Railway Line

Road Heirarchy

road type

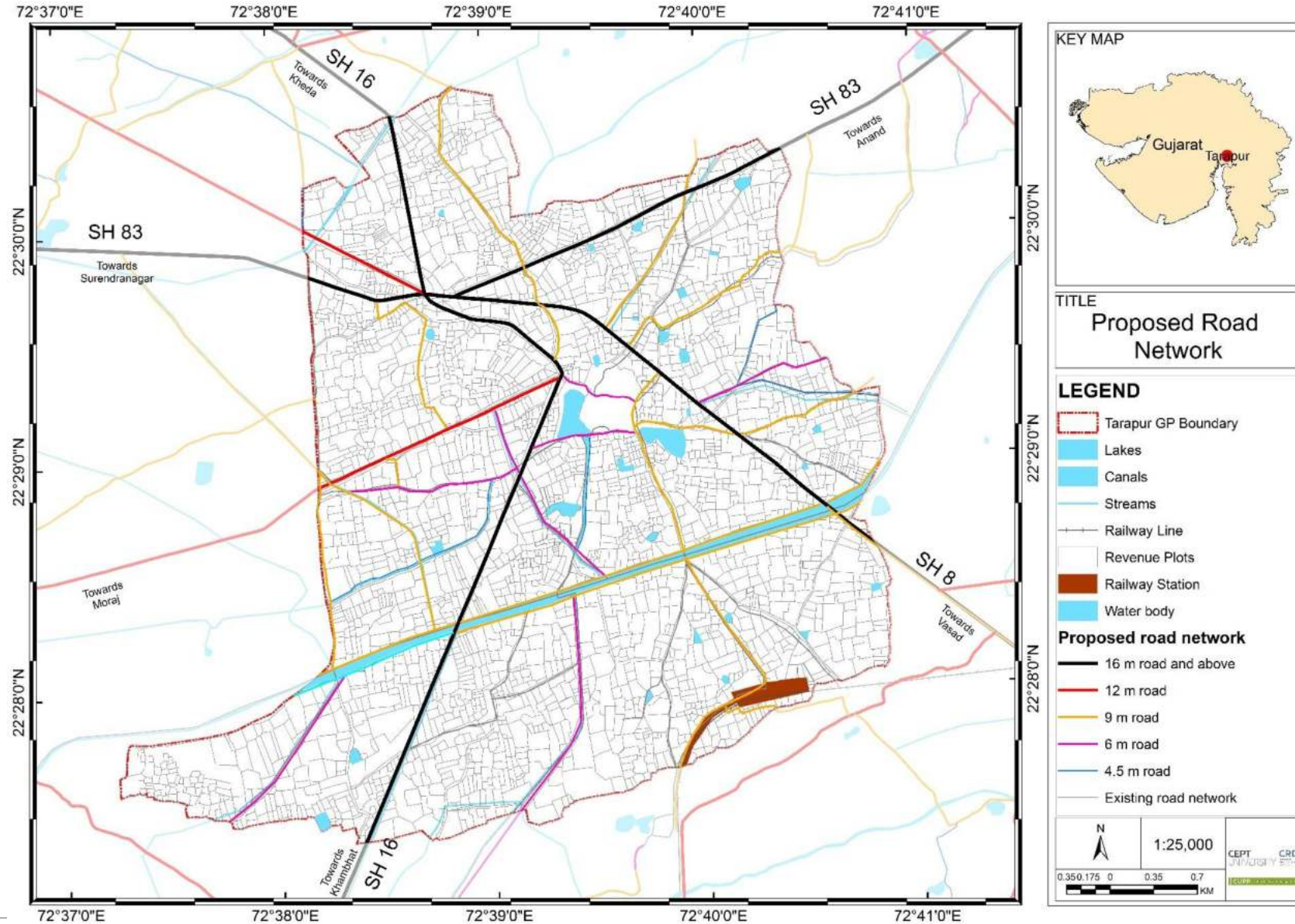
- State Highway
- Other District Roads
- village road

Scale: 1:25,000

Scale bar: 0 0.35 0.7 KM

Logos: CEPT UNIVERSITY, CRDF

Proposed Road Network



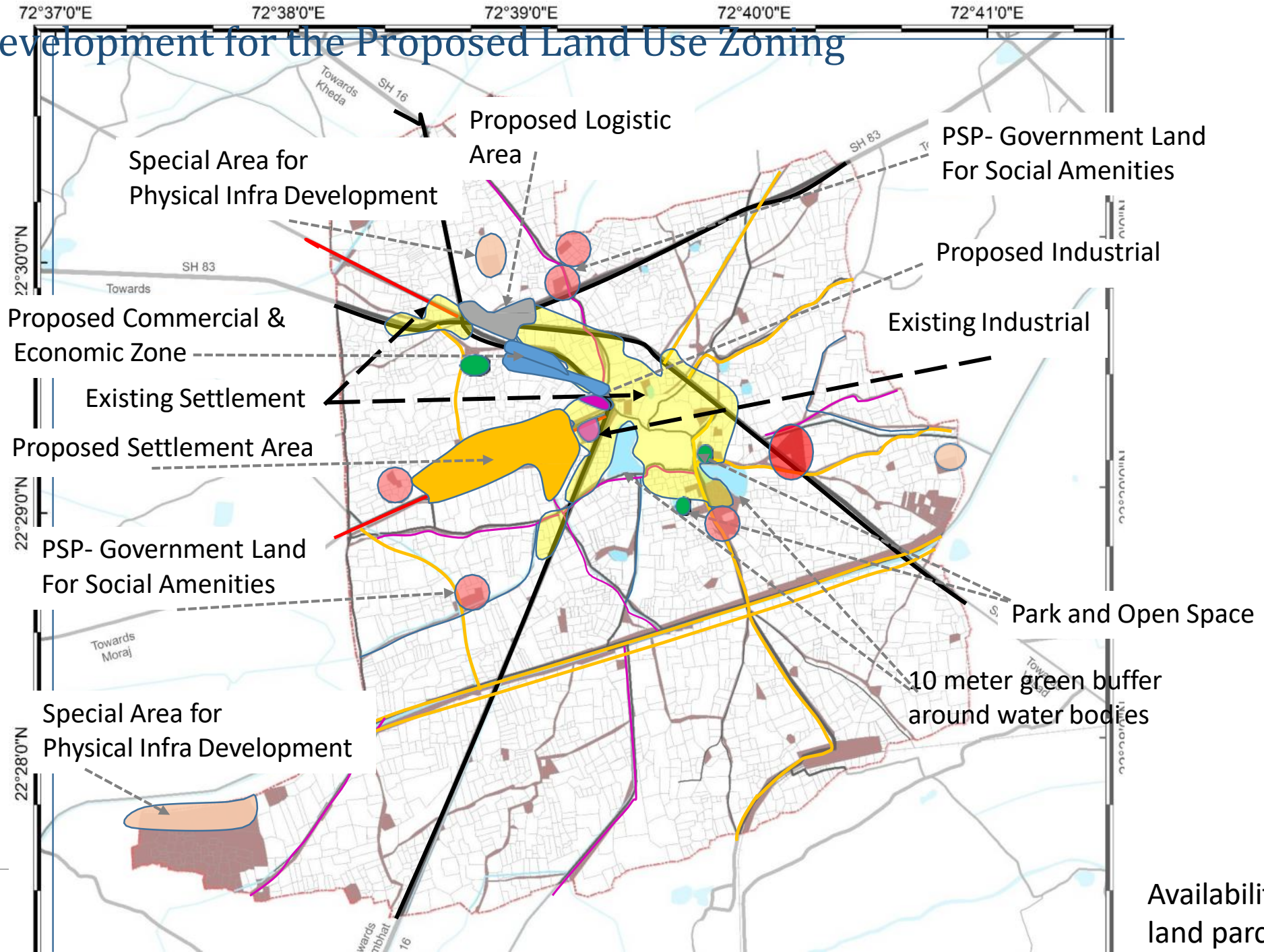
Planning Proposal

Proposed Land Use Zoning

Criteria taken into Consideration for the Proposed Land Use Zoning

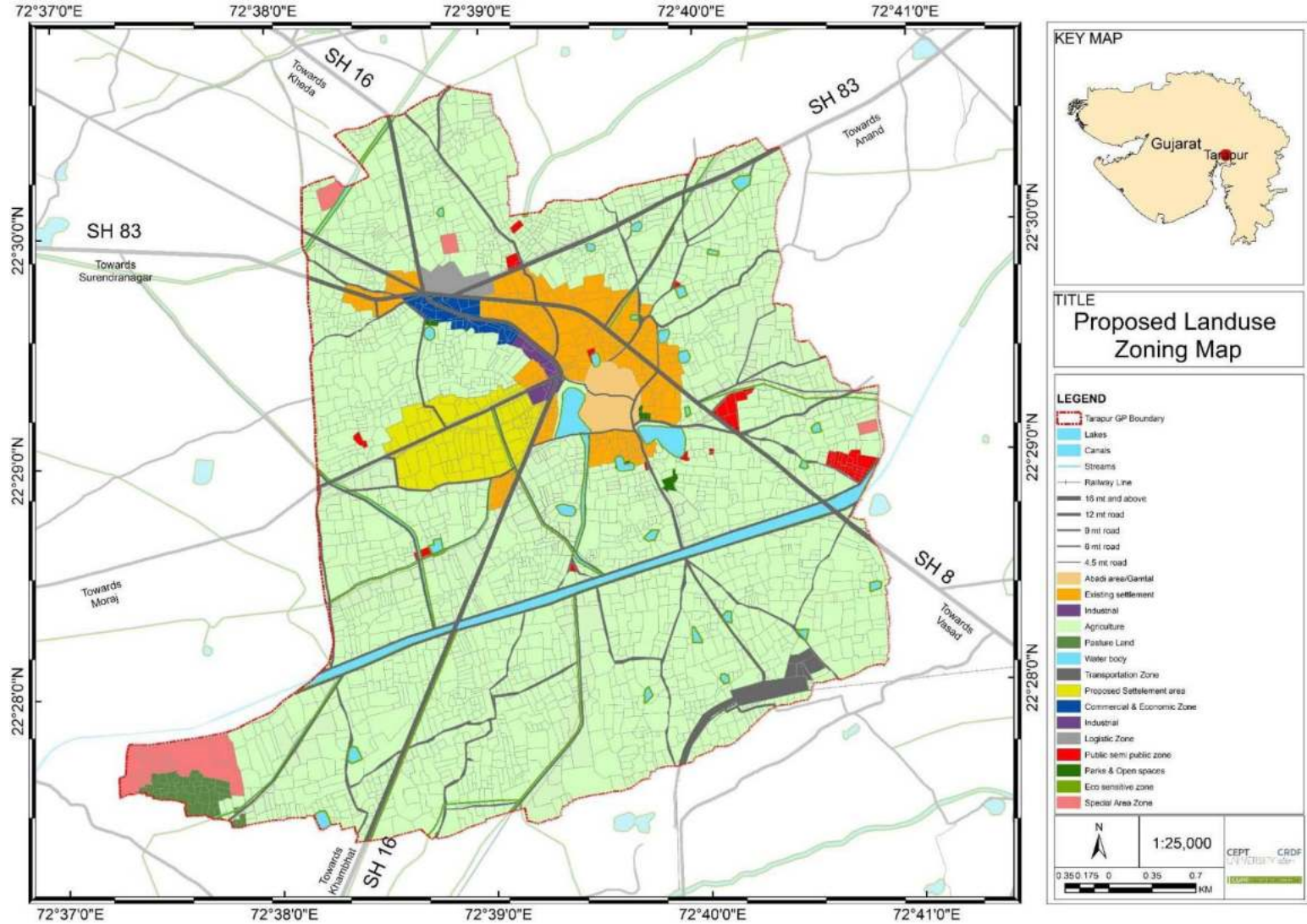
- **Existing Land Use and Settlement Pattern**
- **Identify Pockets for the future industrial development**
 - In proximity to the existing industrial area
- **State highways fall under high potential development possibility**
 - A high potential for **commercial and mixed-use activities** where any kind of economic activities (formal and informal)
- **Junction of the three-state highway**
 - Area is feasible to have **logistic activities** where transport-related activities- such as bus stands, organized parking are for auto, shared van, etc.
- **No-development buffer (Green Buffer) of 10 meters**
 - Green buffer kept surrounding the water bodies to conserve and protect the sensitivity of such features
 - Conserve pasture lands
- **Identify Pockets of government land is identified as a special area**
 - As a **special area**- shall be reserved to develop large scale public infrastructure, such as wastewater treatment plant, solid waste compost treatment plant, etc.
 - For **Public semi-public zone**- for development of social amenities, government land identified under

Concept Development for the Proposed Land Use Zoning

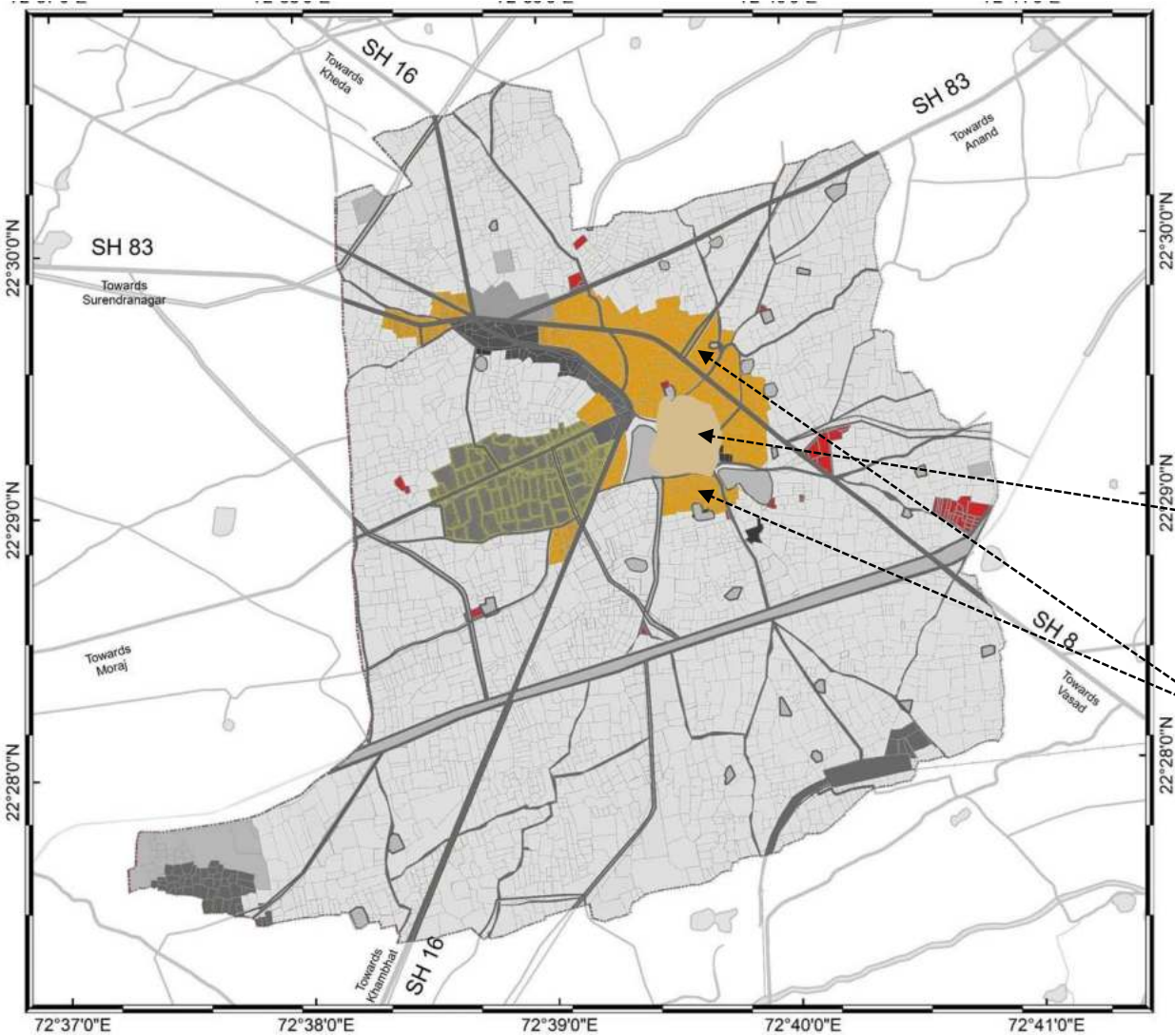


Proposed Land Use Zoning

Sr. No	Proposed Land Use Zoning Categories	Area (sq.km)	Area (%)
1	Abadi Area (Gamtal Area)	0.22	0.98%
2	Existing Settlement Zone	1.95	8.70%
3	Proposed Settlement Zone	0.85	3.79%
4	Commercial and Economic Zone	0.16	0.71%
5	Industrial	0.08	0.36%
6	Logistic	0.13	0.58%
7	Public Semi-Public	0.18	0.80%
8	Park and Open Area	0.04	0.18%
9	Transport Zone	2.32	10.36%
10	Agriculture	14.83	66.19%
11	Pasture Land (Gauchar Land)	0.18	0.80%
12	Water Body	0.42	1.87%
13	Eco-Sensitive Area	0.69	3.08%
14	Special Area Zone	0.35	1.56%
	Total	22.40	100.00%

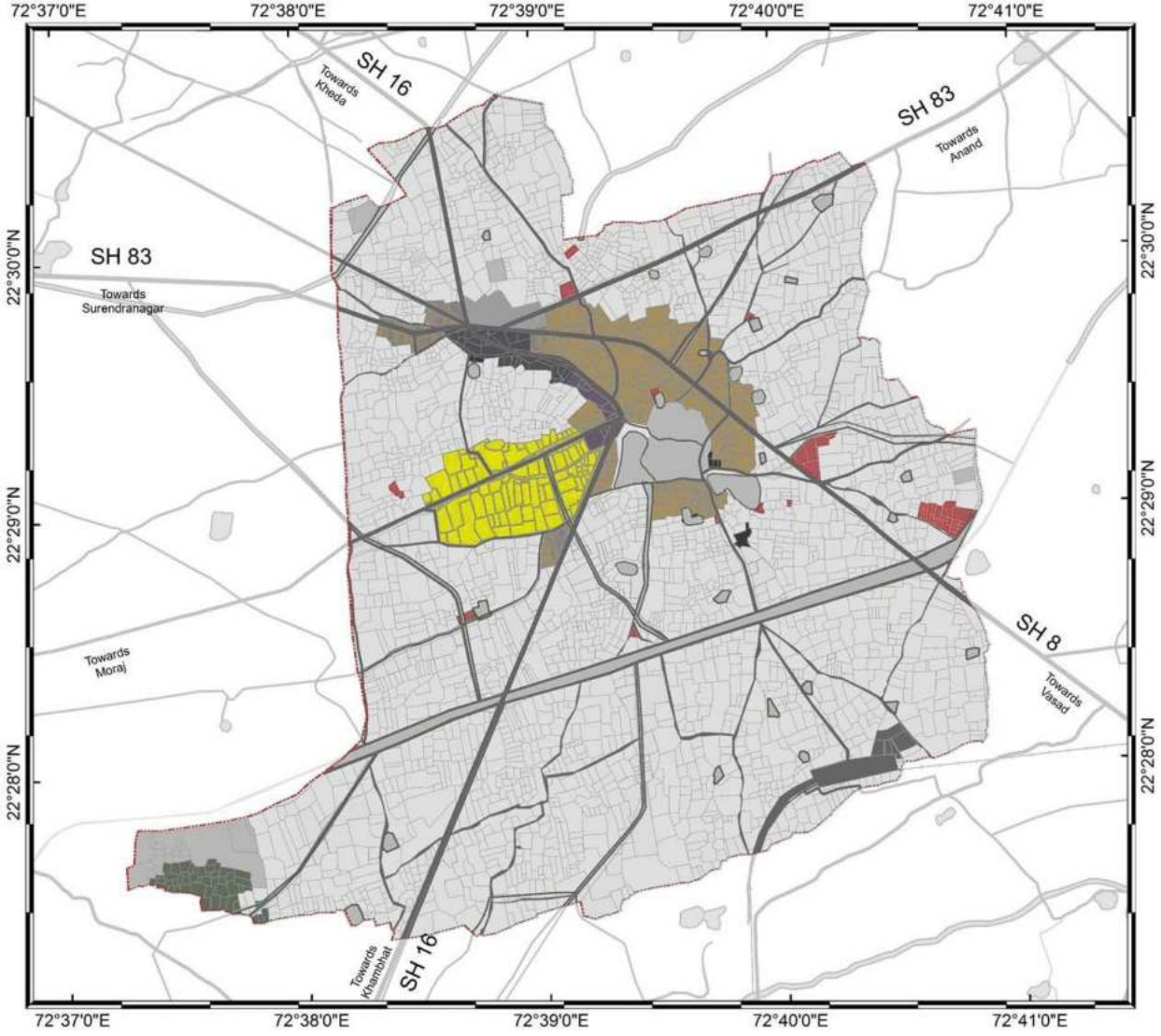


Proposed Land Use Zoning- Recommended Allowed Uses



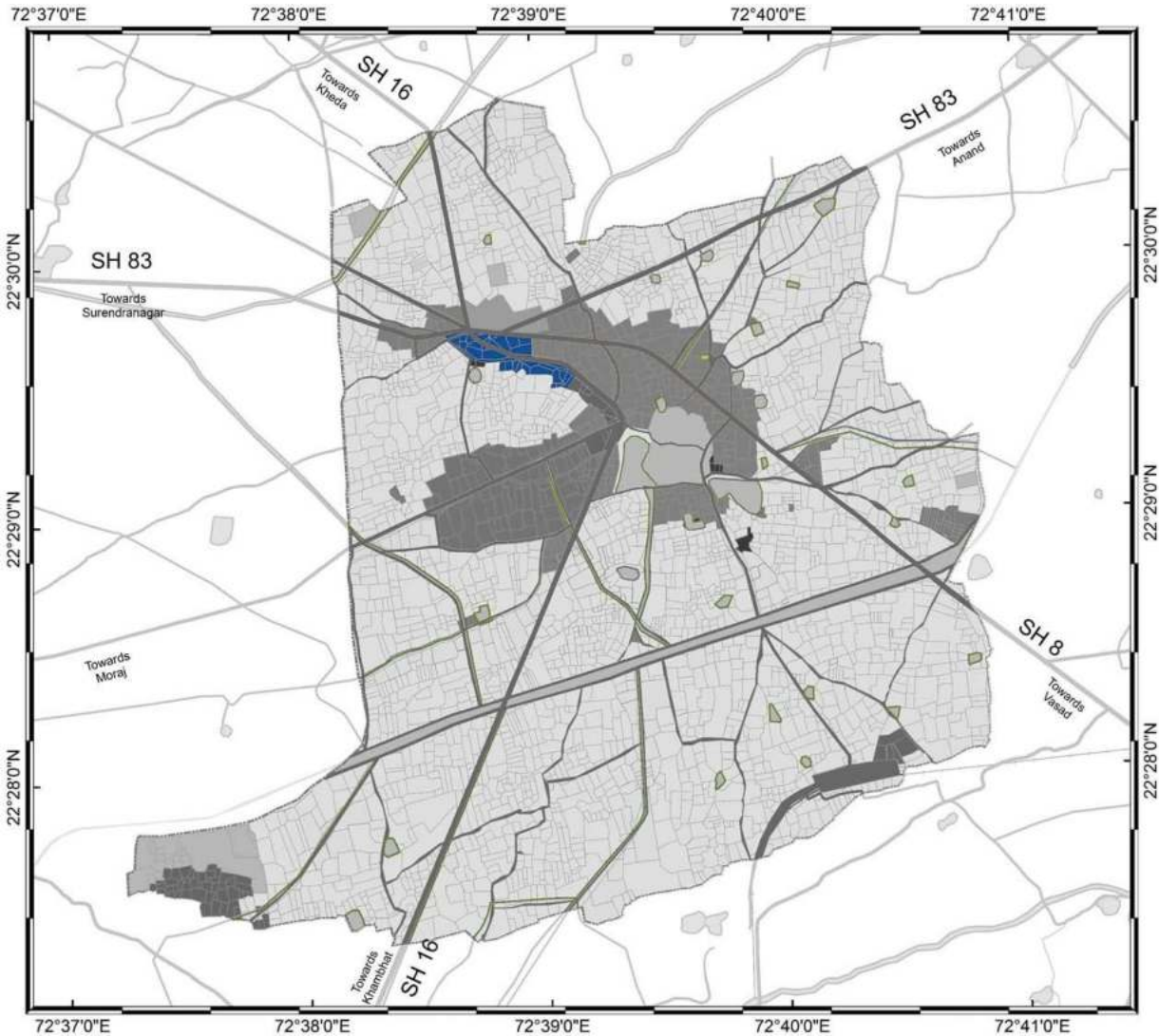
Proposed Land Use Zoning	Description	Recommended Allowed Uses
Abadi Area (Gamtal Area)	The existing village area is known as Abadi or Gamtal area	<ul style="list-style-type: none"> All existing uses, as per current development regulations
Existing Settlement Zone	Existing settlement area, outside Abadi area	<ul style="list-style-type: none"> All existing uses, as per current development regulations Convenient shopping

Proposed Land Use Zoning- Recommended Allowed Uses



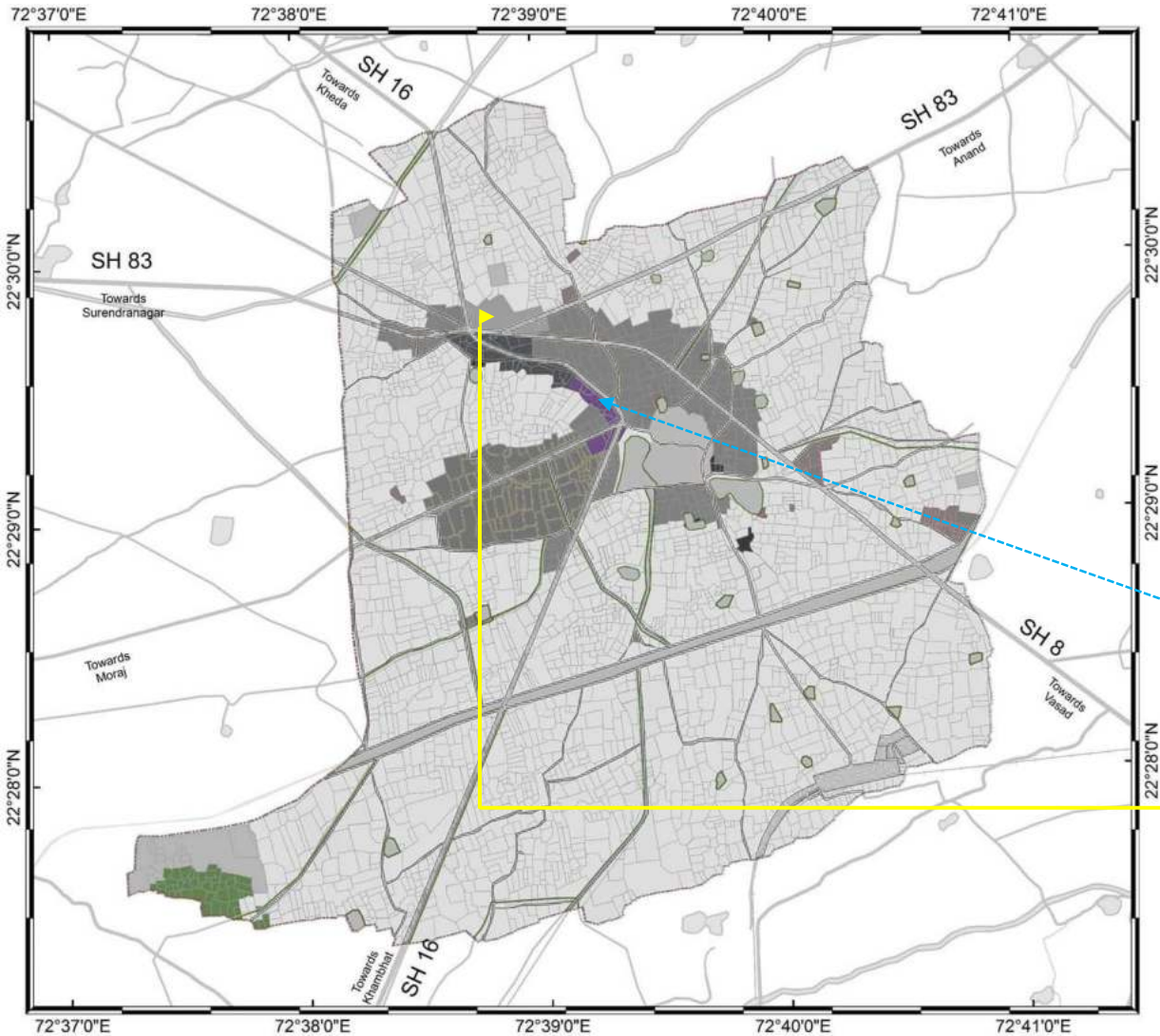
Proposed Land Use Zoning	Description	Allowed Uses
Proposed Settlement Zone	Proposed expansion area to accommodate future housing demand	<ul style="list-style-type: none"> • Residential activities • Incidental commercial activities for day-to-day needs of shopping use • A comprehensive range of community facilities, including schools, medical facilities, neighbourhood retail, and open space are permitted

Proposed Land Use Zoning- Recommended Allowed Uses



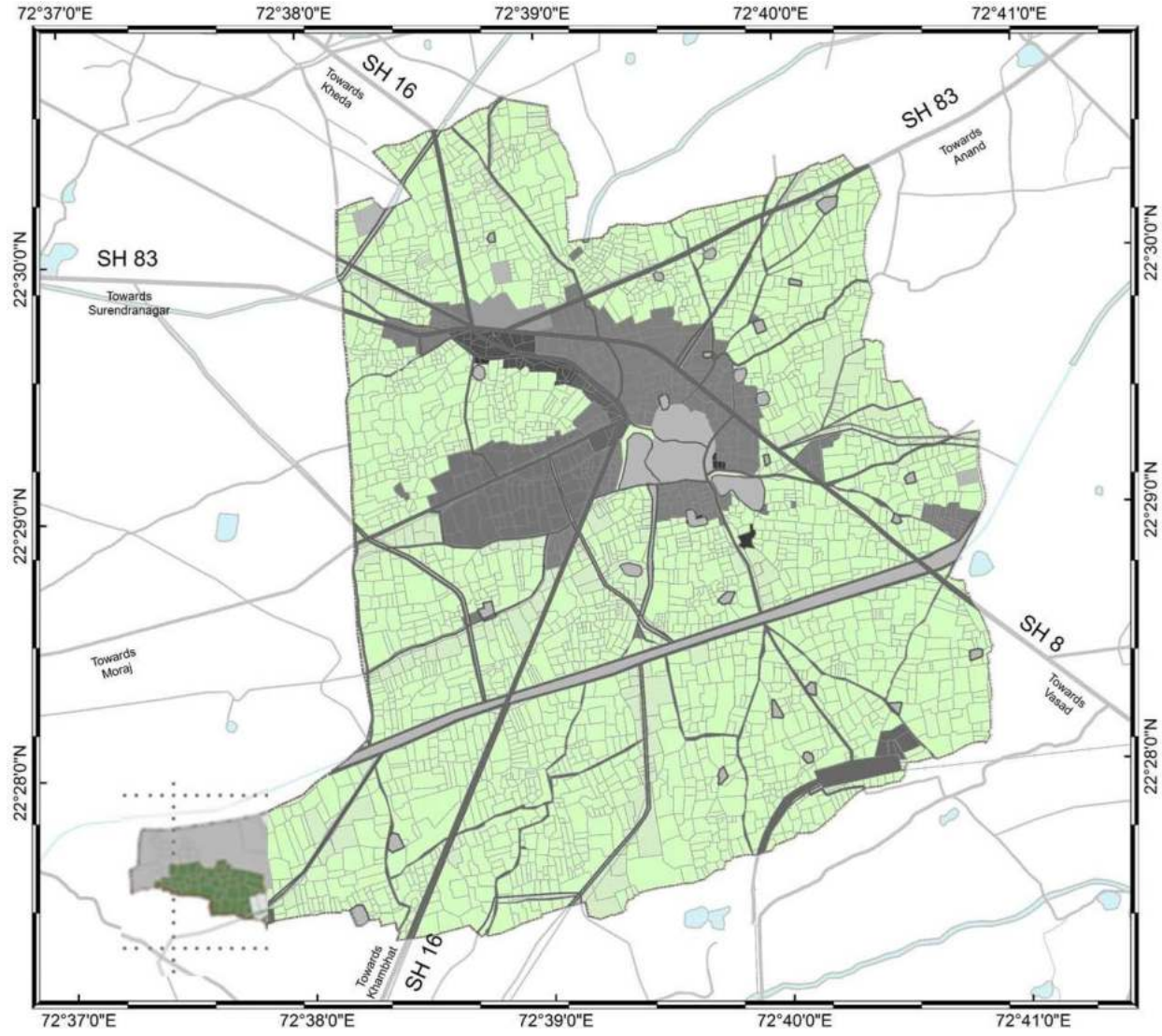
Proposed Land Use Zoning	Description	Recommended Allowed Uses
Commercial and Economic Zone	The proposed area to accommodate additional economic activities	<ul style="list-style-type: none"> • All existing uses • Informal commercial activities- daily market, informal shopping, weekly market, • Formal commercial activities- Retail shopping, market complex, godowns, storage units, grain and vegetable mandi, slaughters house, etc. • Hotels, restaurants, provision store, carpentry workshop, private health and educational facilities workshops or working space related to economic activities, etc. • A comprehensive range of community facilities, including schools, medical facilities, neighbourhood retail, and recreational space are permitted

Proposed Land Use Zoning- Recommended Allowed Uses



Proposed Land Use Zoning	Description	Recommended Allowed Uses
Industrial	Area to accommodate household industries	<ul style="list-style-type: none"> Existing industries Household industries Warehouse, cold storage, etc.
Logistic	To accommodate transport-related activities	<ul style="list-style-type: none"> Bus stand, truck terminal, parking stand for para-transit vehicles (auto stand, van stand, private transport picking up and drop-off, public parking space, etc.

Proposed Land Use Zoning- Recommended Allowed Uses



Proposed Land Use Zoning	Description	Recommended Allowed Uses
Agriculture Zone	Agricultural land, cultivable land	<ul style="list-style-type: none"> • Agricultural related activities • Poultry farm • Tree plantation

Proposed Land Use Zoning- Recommended Allowed Uses

Proposed Land Use Zoning	Description	Recommended Allowed Uses
Public and Semi-Public Zone (PSP)	Government land for social and physical infrastructure	<ul style="list-style-type: none"> • Educational centres- Anganwadis, schools • Skill development training institute, skill development centre, • Health Facilities- sub-health centre, dispensaries, primary health centre, maternity centre, community health centre, hospital, private clinic, veterinary clinic and hospital • Community space- community hall, Dharamshala, social welfare centre, religious buildings, neighbourhood centre, • Bank and ATM, RO plant, cooperative and credit society, police post and station, cremation ground, burial ground, temple, mosque, church, and other religious institutions • Government and semi-government offices, common village land, and government land
Park and Open Space (OP)	Area with recreational activities, government land identified for the public recreational activities	<ul style="list-style-type: none"> • Public park, garden, public open space, playground, sports field
Transport	All roads, railway line, railway station	<ul style="list-style-type: none"> • Roads -NH, SH, District roads, and other roads, Existing rail line and railway station • Railway line, railway station
Pasture Land (Gauchar Land)	Existing pasture land	<ul style="list-style-type: none"> • Tree Plantation
Water Body	Existing all water bodies- Lakes, canal, stream	<ul style="list-style-type: none"> • No development allowed
Eco-Sensitive	Green Buffer (10 mt) is created to protect the water bodies by providing a no-development buffer around them.	<ul style="list-style-type: none"> • No development allowed • Tree plantation
Special Area Zone	Government land is reserved for the development of public level large scale infrastructure	<ul style="list-style-type: none"> • Public level large scale infrastructure, such as water treatment plant, landfill (SWM site), ESR, Sump, etc.

Note:

- Here recommended allowed uses in each zone are indicative and can be modified/applied as per the suitability and decisions are taken by a local implementing authority.
- Note here that all the existing nonconforming uses are allowed in all the proposed zones until the redevelopment of such land parcels. However, whenever the parcel is subject to alteration, improvement, reconstruction, and redevelopment, the nonconforming uses will be terminated and the parcel will be subject to the respective proposed zoning requirements. Nonconforming uses mean the existing uses of a parcel which is not allowed as per the proposed land-use zoning for that specific parcel.

Planning Proposals

Other Proposals & Dev.
Recommendations

Proposal & Recommendations for Physical Infrastructure

Water Supply System

Water Demand Estimation

- 2041- 2.99 MLD
- Based-
 - CPHEEO Guideline
 - Projected Pop

Additional Water Supply Req.

- 2041- 2.09 MLD
- Based-
 - Existing Capacity- 0.90 MLD

Proposal & Recomm.

- Additional 2,879 water connection
- **Expansion of the piped water network**
- **Up gradation of the existing pipe network**

Sewage System

Wastewater Generation Estimation

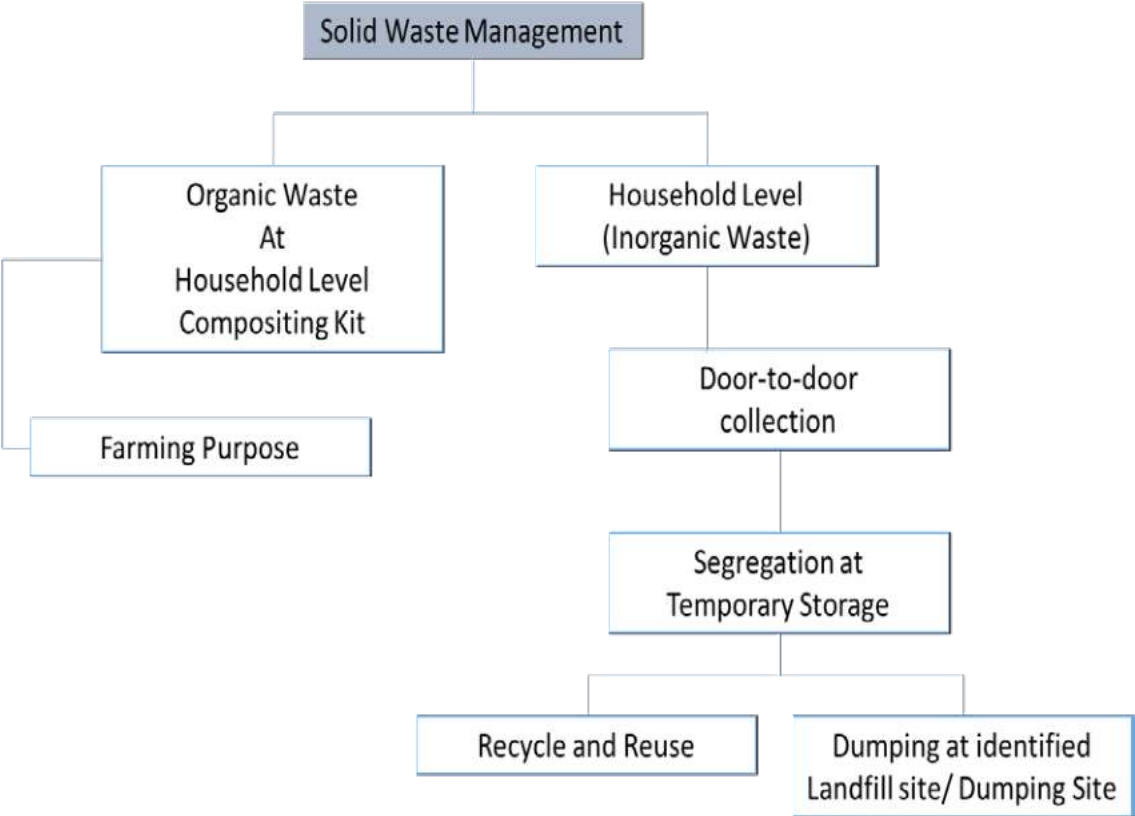
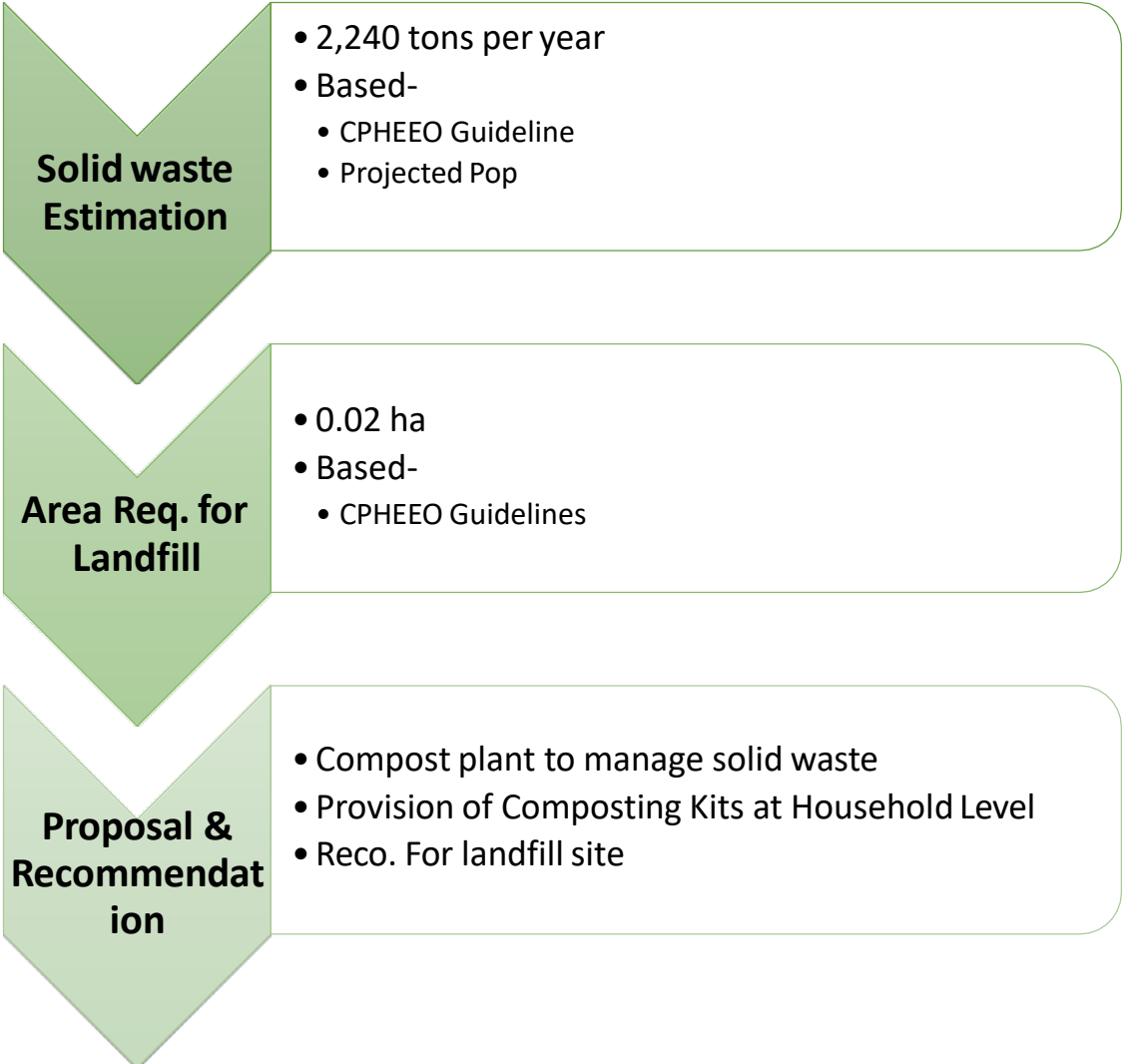
- 2041- 2.39 MLD
- Based-
 - CPHEEO Guideline
 - Projected Pop
 - Water Demand Estimation

Proposal & Recomm.

- Priority shall be given to **complete the incomplete work of sewage network**
- HH sewage connection with the sewage network should be established.
- **A centralized conventional treatment plant**
- Site for Sewage Treatment Plan
 - Proposed Special Area Zone
- Based-
 - Existing Situation Analysis

Proposal & Recommendations for Physical Infrastructure

Solid Waste Management



Recommended Tentative Locations for Physical Infrastructure

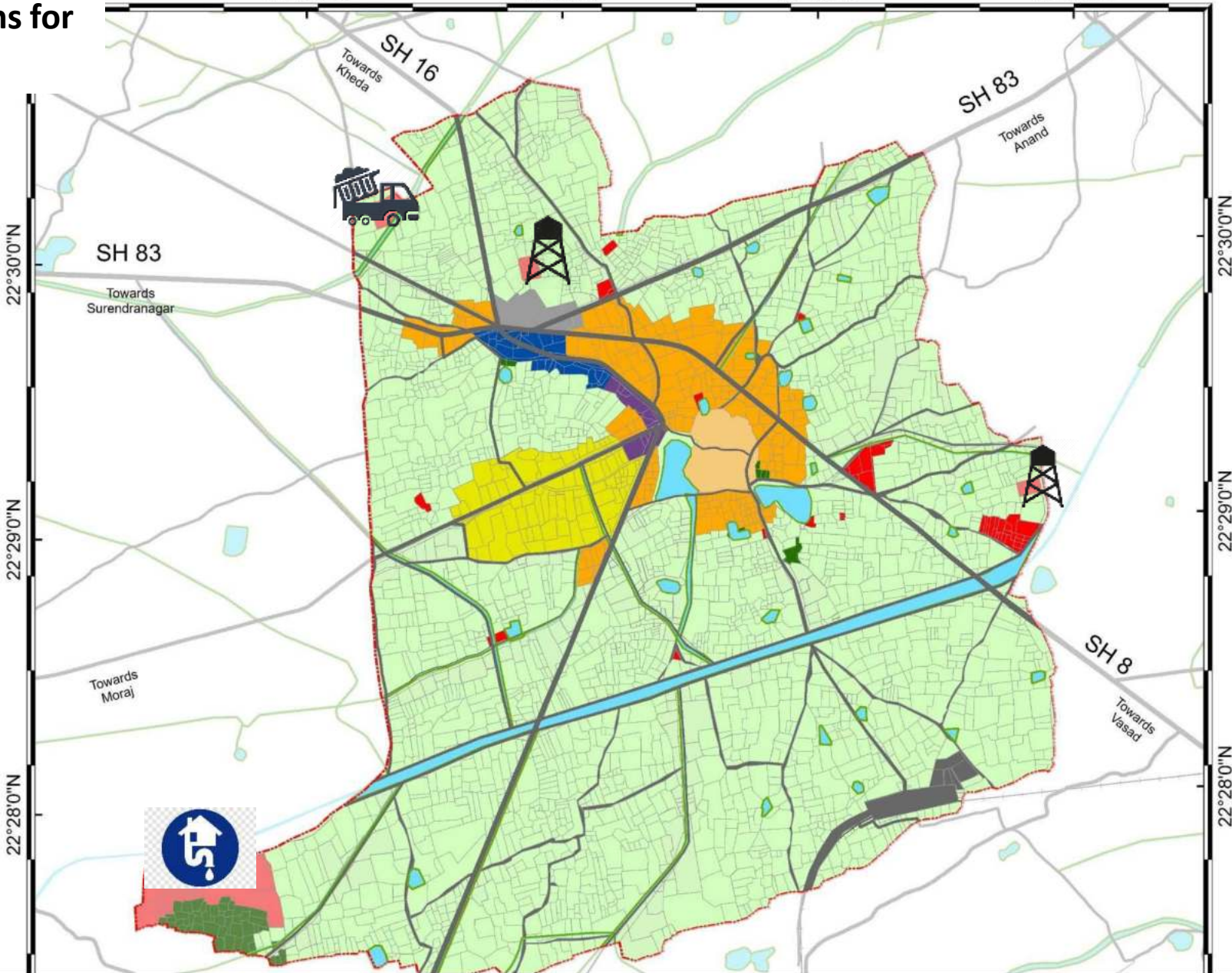
Location for Water / Tanks



Location for Landfill Site



Location for Sewage Treatment Plan

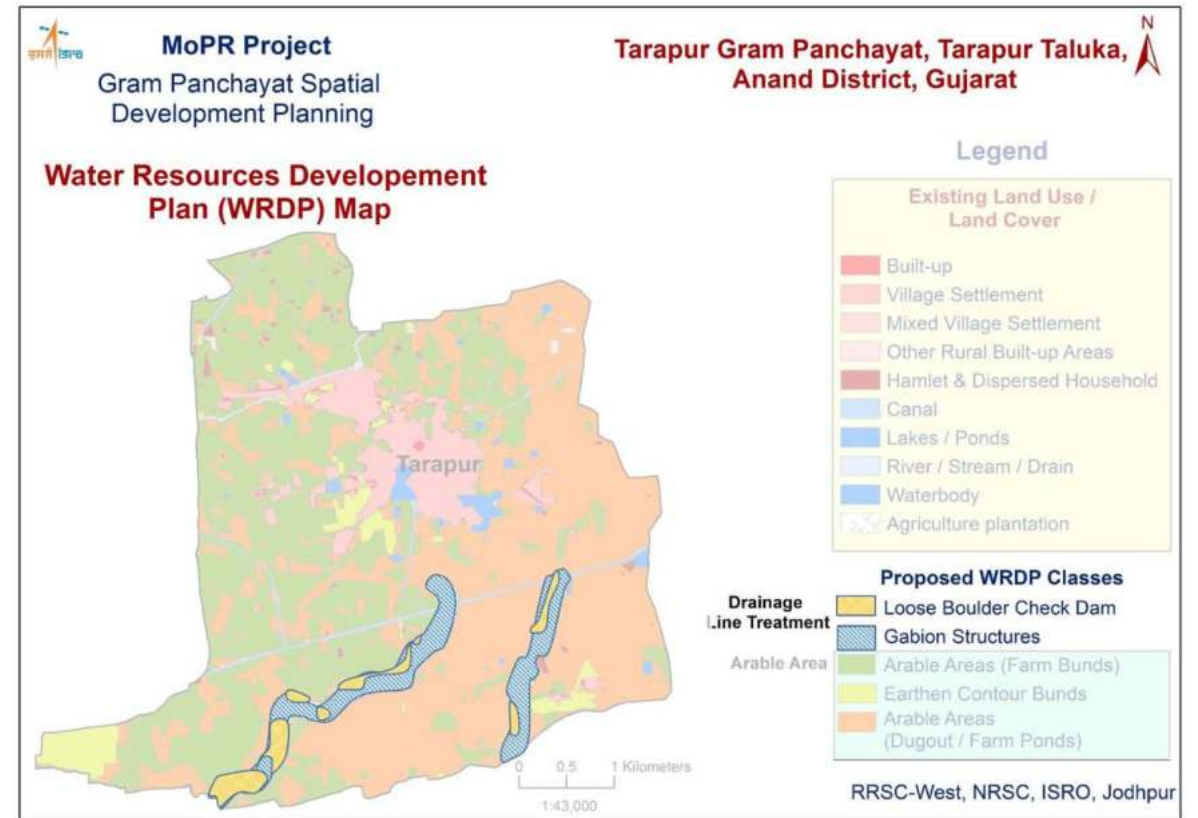


Proposal & Recommendations for Storm Water

Proposals and Recommendations

- New roads should be planned in accordance with the slope- allow the natural drains to strengthen.
 - Major storm water drainage should be converged towards the waterbodies/ canals
 - Green buffer proposed around all water bodies and canals- strengthens the storm water canals
 - storm water drainage should be parallel to the major transportation network.
 - Roads should be proposed to be a carrier for the storm water
- by NRSC**
- Check Dam- For the purpose of controlling the hydraulics in the channel flow the loose bolder check dams are suggested confining to 100-meter buffer of streams
 - Gabion Structures

Recommended Locations for Check Dams and Gabion Structure

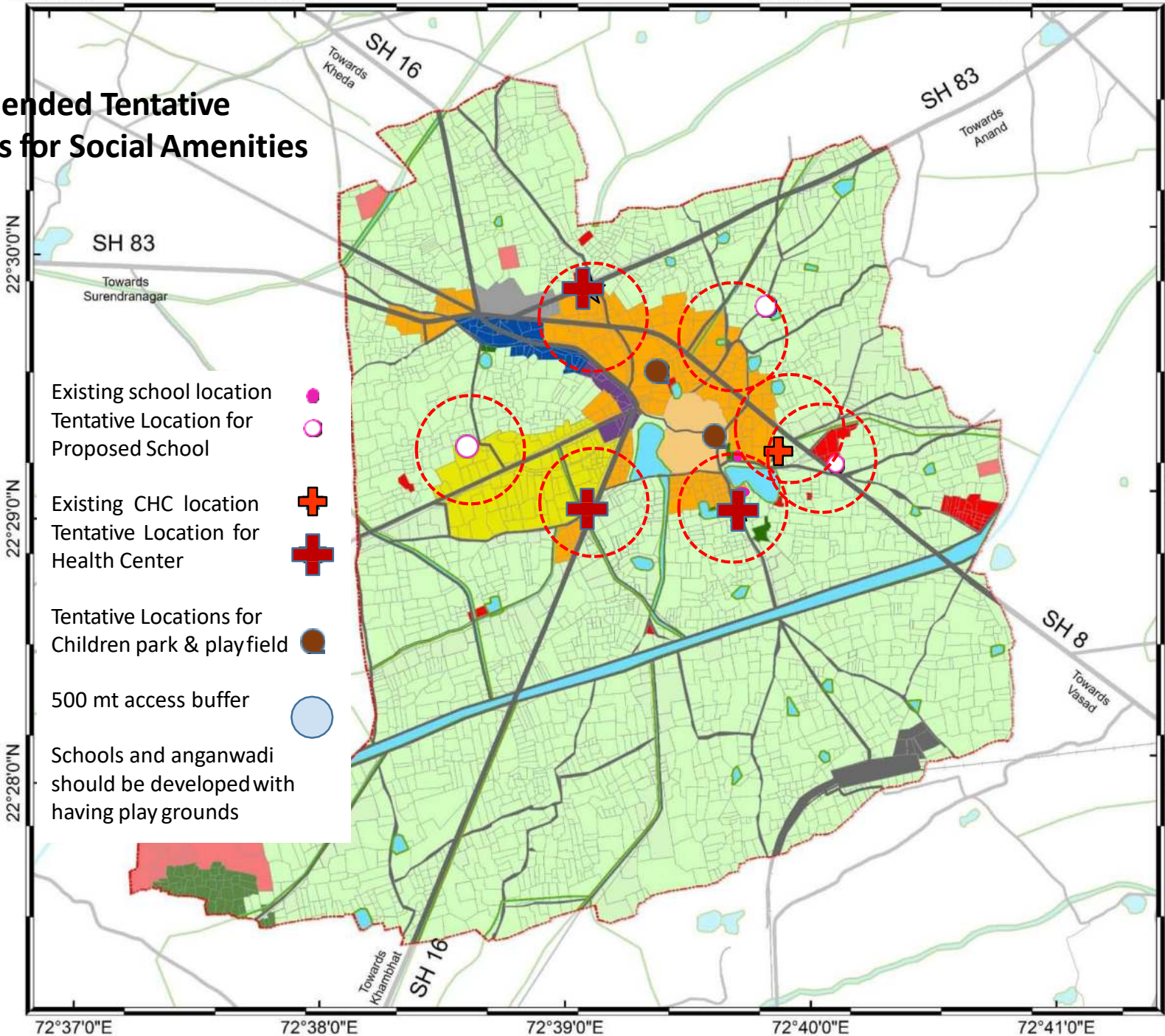


Proposal & Recommendations for Social Amenities

List of Amenities/ Activities	Proposal & Recommendation	Recommended Zones	Minimum Req. Road Widths
Economic Activity	6 Skill Dev. Centers Krishi Vigyan Kendra, ITI, Kaushlya Vardhan Kendra	PSP, Proposed Commercial & Activity Zone	6 mt.
Educational Amenities	1 Senior School	PSP, Proposed Commercial & Activity Zone, Residential	6 mt.
Health Care Facility	1 Sub-Center	PSP, Proposed Commercial & Activity Zone, Residential	
Recreational Facility	1 Park and	Park & Open Space	---
Communication	1 Post Office	PSP, Proposed Commercial & Activity Zone, Residential	---

Source: Existing Situation Analysis; and URDPFI Guideline & Guideline for Rurban Cluster by MoRD

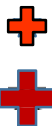
Recommended Tentative Locations for Social Amenities



Existing school location
Tentative Location for Proposed School



Existing CHC location
Tentative Location for Health Center



Tentative Locations for Children park & playfield



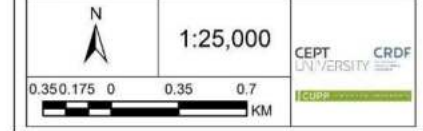
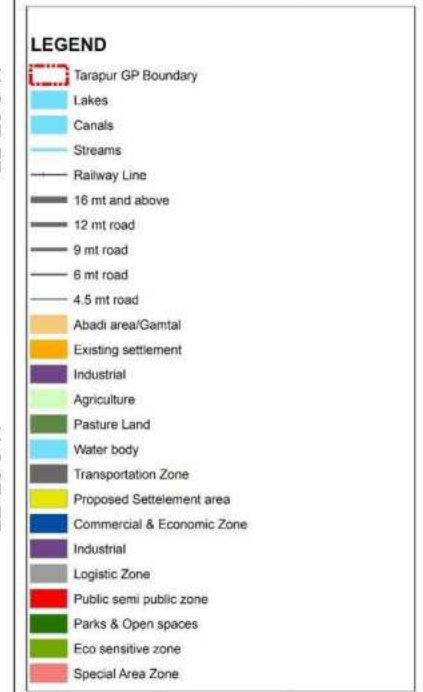
500 mt access buffer



Schools and anganwadi should be developed with having play grounds



TITLE
Proposed Landuse Zoning Map

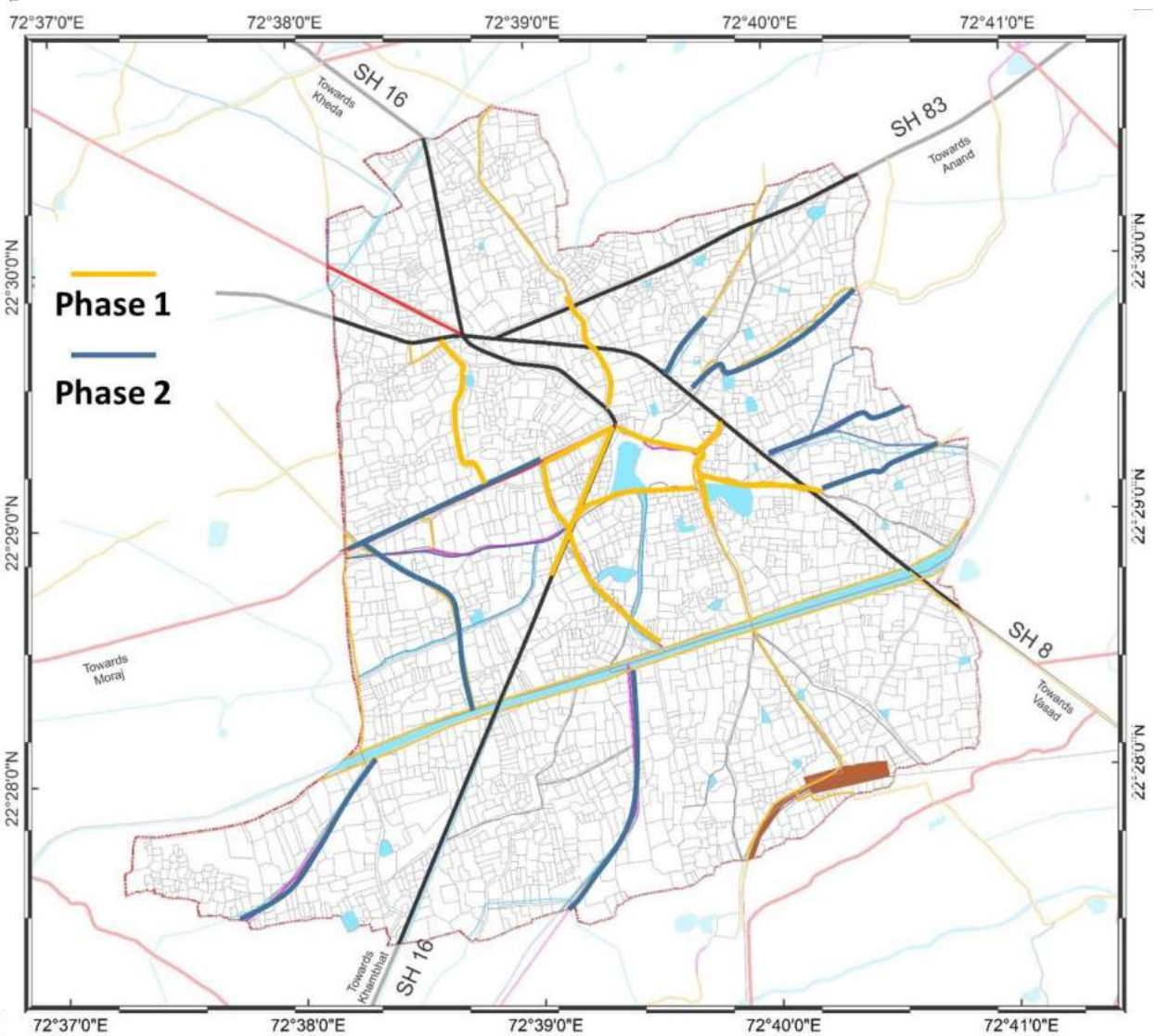
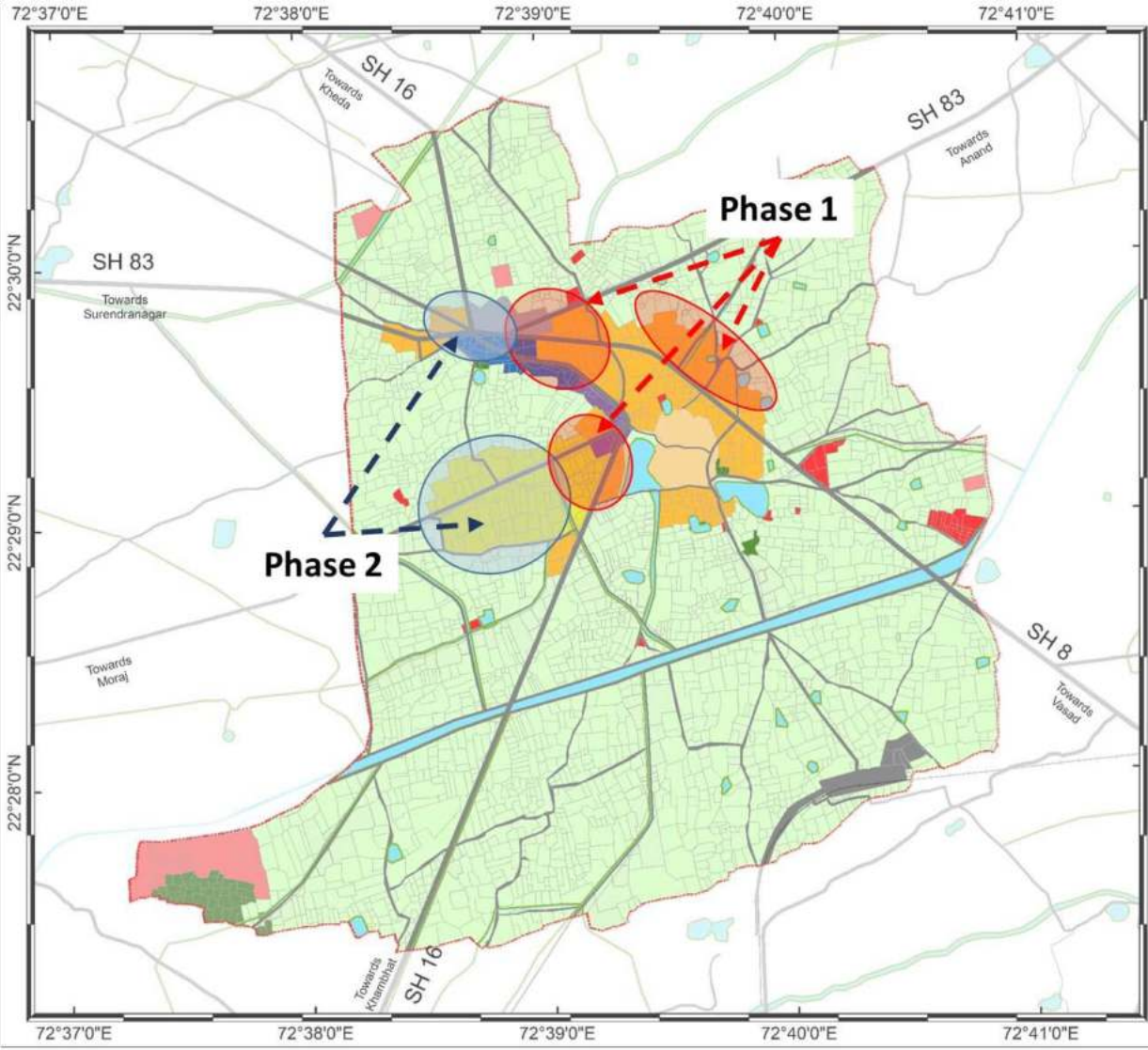


Recommendation for Implementation Strategy

Recommendation for Implementation Strategy- Through Central and State Schemes

Category	Project	Scheme Name
Housing	Upgradation of Kaccha Houses	PMAY
Village Road	New road construction and bridge across the canal connecting two roads	District Fund, MLA Fund, Pradhan Mantri Gram Sadak Yojana
	Provision of Streetlight	Jyoti Gram Yojana
Skill training linked to economic activities	Skill Development Center	DDU-GKY, National Backward Classes Finance & Development Corporation, GCSRA, Mason Training- PMAY
Water Supply	Expansion of water supply pipe network	National Rural Drinking Water Programme (NRDWP), Quality Monitoring and Surveillance (WQMS), GWSSB, WASMO, MGNREGA
	Upgradation of the existing pipe network	
	Additional water storage capacity	
Sewage Network/ Sanitation	Provide remaining HHs with Individual Toilets (Laterin facility at HH level)	Swachh Bharat Mission/ MNREGA
	Establishing HH sewage line connection with the sewage network, to the main sewage network trunk	
	A centralized conventional sewage treatment plant	
Solid Waste Management	Provision of Composting kit at Projected HH for 2041 (5,934 HH)	Swachha Gram Swastha Gram
	Provision of Treatment Plant/ Compost Plan	SBM Gramin
	Provision of additional Transportation Infrastructure	SBM Gramin
Education	One additional Senior Secondary School required by 2041	Sarva Siksha Abhiyan
Health	One new Sub-Health Center	National Rural Health Mission (NRHM)
	One Maternity and Child Welfare Center	National Rural Health Mission (NRHM)
Communication Facility	Additional Post Office required	
LPG Connection	Provision of LPG Connections to the remaining 27% HHs	Pradhan Mantri Ujjwala Yojana

Recommendation for Implementation Phasing



Development Control Regulation

Development Control Regulation for GPSDP is as per the model **Guidelines for Land Uses, Development Controls, and Service Benchmarks for Rurban Clusters**, prepared by Ministry of Rural Development

Thank you!

Population Estimation

Methods	Census 1991	Census 2001	Census 2011	Projected Pop for 2021	Projected Pop for 2031	Projected Pop for 2041
Arithmetic Method (AM)	12,149	14,934	17,994	20,917	23,839	26,762
Geometric Method (GM)	12,149	14,934	17,994	21,894	26,639	32,412
Incremental Increase Method (IIM)	12,149	14,934	17,994	22,447	28,429	32,882
Average of AM, GM and IIM**	---	---	---	21,752	26,302	30,685

Source: Census of India

Note:

** Considered as the projected population for TarapurGP.

Employment Estimation

COMPONENTS	2011	2031	2041
Population	17,994	26,302	30,685
WFPR	32.45%	32.45%	33.00%
Total Workers	5,839	7,511 (8,535)**	8,911 (10,126)**
DISTRIBUTION OF WORKERS**			
Primary Sector (%)	45.90%	46%	46%
Secondary Sector (%)	1%	1%	1%
Tertiary Sector (%)	53%	53%	53%
Total Primary Workers	2,680	3,455	4,099
Total Secondary Workers	53	75	89
Total Tertiary Workers	3,106	3,981	4,723
Source: Census of India			
**Assuming 12% working outside Tarapur (Currently 10 to 15% working outside of Tarapur -Primary Survey)= 1,215 workers			

Note:

** Considered as the projected population for Tarapur GP.

Area Requirement for Economic Activity

Area Statement for Industrial Land Use		Population 2041	Area Unit
Projected Secondary Workers		89	---
Number of Secondary Workers in Industrial Sector		36	40%
Area Statement for Industrial Land Use			
Projected Secondary Workers		89	
Number of Secondary Workers in Industrial Sector		36	40%
Assuming about 30 sq.mt area per industrial jobs		1,069	sq.m
Area required for industrial jobs		0.00	sq.km
		0.11	ha
Note:			
Assumed 40% of the total secondary worked will be in Industrial sector remaining 60% will be working in commercial and mixed-use areas.			
Area Statement for Commercial And Mixed Land Use			
Number of Secondary Workers in Commercial and Mixed Land Use Sectors		53	60%
Assuming about 15 sq.mt area per Commercial/ Mixed use Jobs		801.98	sq.mt
Area Required for Commercial Jobs (Secondary Workers)		0.08	ha
Projected Tertiary Workers		4,723	---
Assuming about 15 sq.mt area per Tertiary Jobs		70,842	sq.mt
Area Required for Tertiary Jobs		7.08	ha
Total Area Required Commercial and Economic Activity		7.16 (0.07)	Ha (sq.km)

Housing Demand

Household Size

	1991	2001	2011	Ave. HH Size
Household Size	5.25	5.41	5.21	5.29 (5.3)
Source: Census of India				

Housing Demand

	2011	2021	2031	2041
Population	17,994	21,752	26,302	30,685
Avg., Household Size	5.21	5.3	5.3	5.3
No. Houses Required	3,452	4,104	5,058	5,790
2.5% Dilapidated Houses	86	103	124	145
Total No. of Houses Required	3,538	4,207	5,087	5,934
Source: Census of India				

Area Requirement for Residential Activity

Parameters	2031	2041
Additional No. of Houses Required	1,548	2,396
Area Per Housing Unit (sq.mt)*	64*	64*
Total Residential Area required (on sq.mt)	99,101	153,349
Assumed Additional 10 % Open Area Required**	9,910	15,335
Assumed Additional 15% circulation area (Roads)**	14,865	23,002
Net Area Requirement	123,877	191,686
Required Residential Area (sq.km)	0.12	0.19
Required Residential Area (ha)	12	19

Note:

*As per the Sarpanch the size of the new housing is 64 sq.mt; which is cross-checked and confirmed with the satellite image.

** As per URDPFI Guidelines

Proposal & Recommendations for Social Infrastructure

Educational Facility Estimation

Type of School	Population 2011	Existing No. Facility	Required	Surplus/ Deficit	Population 2041	Required	Additional
Pre-Primary School (Aanganwadi)	17,994	19	7	12	30,685	6	-13
Primary Schools (primary + middle) I-VIII		10	4	6		6	-4
Secondary Schools (IX to X)		2	2	0		2	0
Senior Secondary (XI-XII)		1	1	0		2	1
Colleges		0	0	0		0	0

Source: Census of India and URDPFI Guidelines

- If the additional school is a **government school**, then it can be developed in the **proposed PSP zone/ on the government land**
- If it is a private school then it can be developed in the proposed new settlement and commercial and economic zones.
- In any case, new school location should be in proximity to the settlement areas.
- Minimum road width required for a new school establishment is 6 meter.
- It is recommended that all aganwadies and school should have children playground as part of the school.

Proposal & Recommendations for Social Infrastructure

Health Facility Estimation

Type of Facility	Population 2011	Existing No. Facility	Required	Surplus/ Deficit	Population 2041	Required	Additional
Sub-Center	17,994	1	4	-3	30,685	6	5
Primary Health Center		1	1	0		1	0
Community Health Center		1	0	1		0	---
Maternity & Child Welfare Centre		1	1	0		2	1

Source: Census of India, and Indian Public Health Standards by Ministry of Health and Family Welfare (MoHFW)

- Overall, the village has surplus health care facilities to serve the present population.
- Tarapur has one CHC, as per the URDPFI guideline one CHC per 1 lakh people- GP not require to have CHC in the GP area.
- Considering the fact- Instead of adding 5 sub-health center, **one new sub-health center and one new maternity and child welfare centre**
- Any new government health center can be developed in the proposed PSP zone/ on the government land; while private hospitals, dispensaries, maternity health center developed in the proposed new settlement and commercial and economic zones.
- In any case, location for any new health center should be in proximity to the settlement areas.
- Minimum road width required for a sub-health establishment is 6 meter and for a hospital development is 9 meters.

Proposal & Recommendations for Social Infrastructure

Social and Cultural Facility Estimation

Type of Facility	Population 2011	Existing No. Facility	Required	Surplus/ Deficit	Population 2041	Required	Additional
Recreational Center	17,994	1	1	0	30,685	2	1
Socio-Cultural Facilities other than Recreational Center		0	0	0		0	0

Source: Census of India and URDPFI Guidelines

- One recreational center- such as public park, children play ground and park, community hall, etc. will be required to develop by 2041 to serve the projected population.
 - Public park, children play ground and garden can be developed in the proposed park and open space zone; while small community hall can be developed in the proposed new settlement and commercial and economic zones as well.

Other Proposals and Recommendations

- Additional 1 new post offices will be required to meet the demand.
- Establish LPG connection to the remaining 27% of households

Criteria taken into Consideration for the Proposed Road Network

- **Emphasis was given to utilize existing road axis** as far as possible with the purpose of strengthening the existing road axis and the overall existing road network as much as possible with new roads proposed only where it is absolutely necessary.
- **No development green buffer around the water bodies**, especially along the canals were utilized for village road axis so the unwanted development in the green buffer can be managed.
- **9 mt wide road along both sides of the Mahi canals** is proposed to diver inter villages traffic passing east-west.
- **A new road requirement connecting the district road (toward Moraj) to the SH 8 in the north to divert traffic leading to APMC**; this would release pressure on the junction of SH 16 and the district road approaching APMC. 9-meter wide road is proposed to divert the APMC traffic.
- **Road hierarchies**

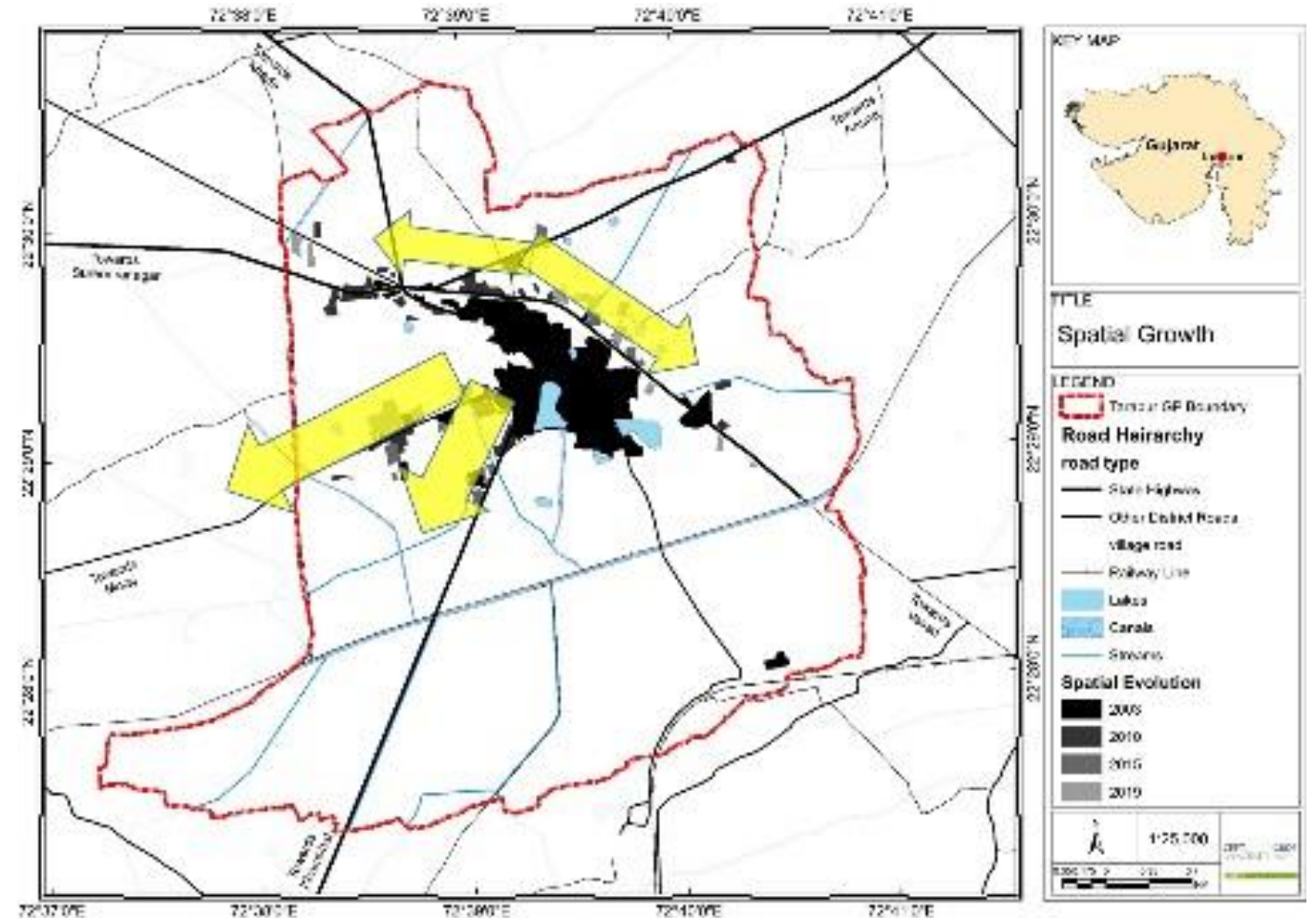
Recommended Road Hierarchy

S. No.	Road Description	Road Widths	Functions and Remarks
1.	Internal Village Road	3 m – 4.5 m	Village lanes meant for internal movement within a village.
2.	Village Road	Above 4.5 m–up to 6.0 m	These roads facilitate inter-village connections.
3.	Collector Street	Above 6.0 m up to 9.0m	Roads meant to take major traffic to the village. Village roads with a drain on both sides to facilitate drainage system in a village
4	Other Village Road/ District Roads	Above 9.0 m up to 12.0 m	Roads meant for connecting a village to nearby areas, connecting villages of villages with each other to the nearest road of a higher category. They also connect to major village activity nodes such as market place, lake, social amenities, etc.
5	Other District Roads	12.0 m above	Roads serving rural areas and providing them with outlets to market centres, taluka headquarters, block headquarters or major district roads, and serves to connect villages with a population of 1,000 and above or a cluster of villages.

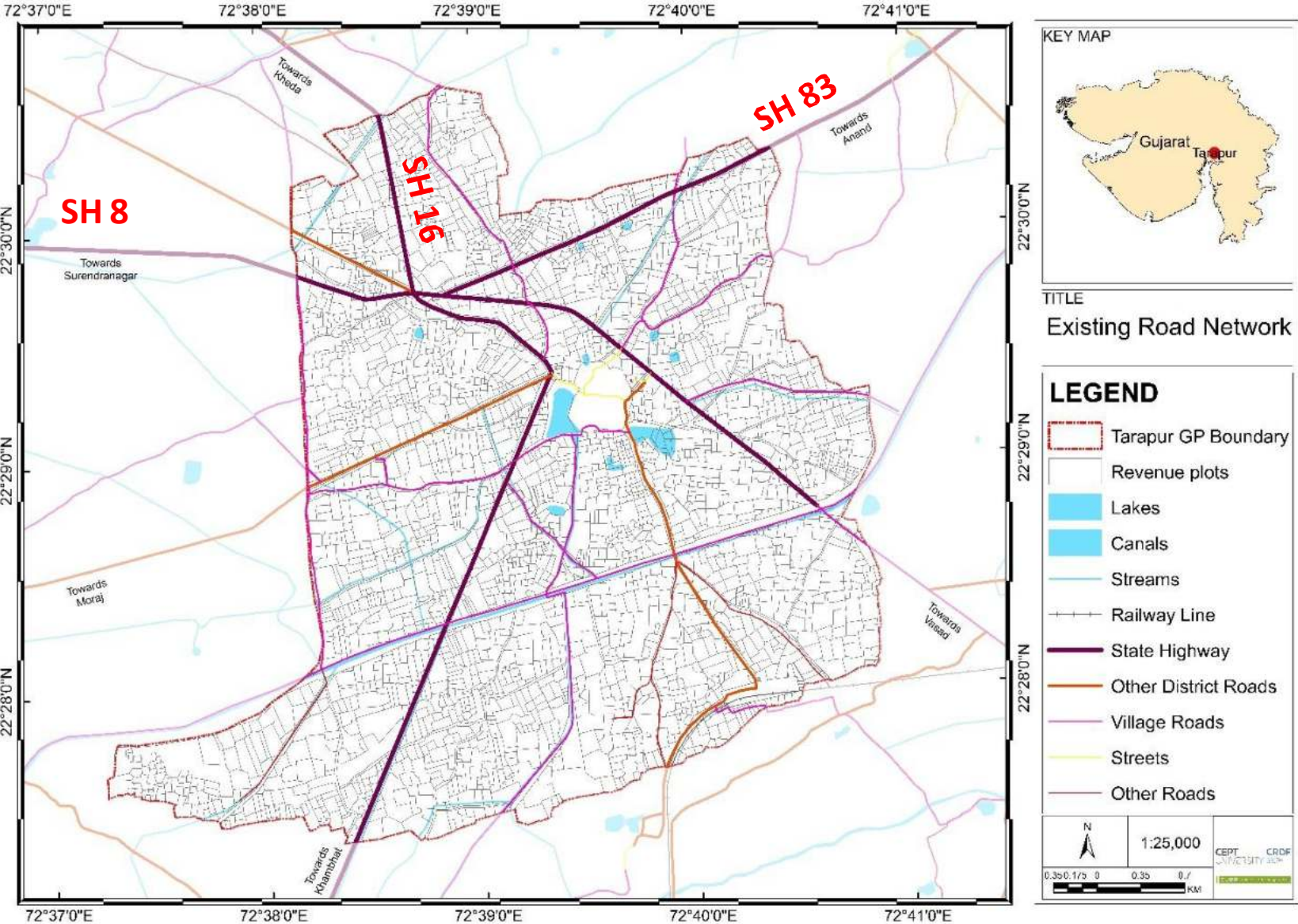
Source: Framing Guidelines for Model Land Uses, Development Controls, and Service Level Benchmarks with Appropriate Enforcement Mechanisms for Rurban Clusters, prepared for MoRD by SPA Delhi

Spatial Growth Trend

- Tarapur village grew around the water bodies and along the transport axis; especially in the area located between the junction of the three-state highways and the lakes
- Significant spatial growth of the village can be seen in this area. However,
- During the recent decade, the village is spatially expanding along the district road connecting the GP with Moraj in the west.

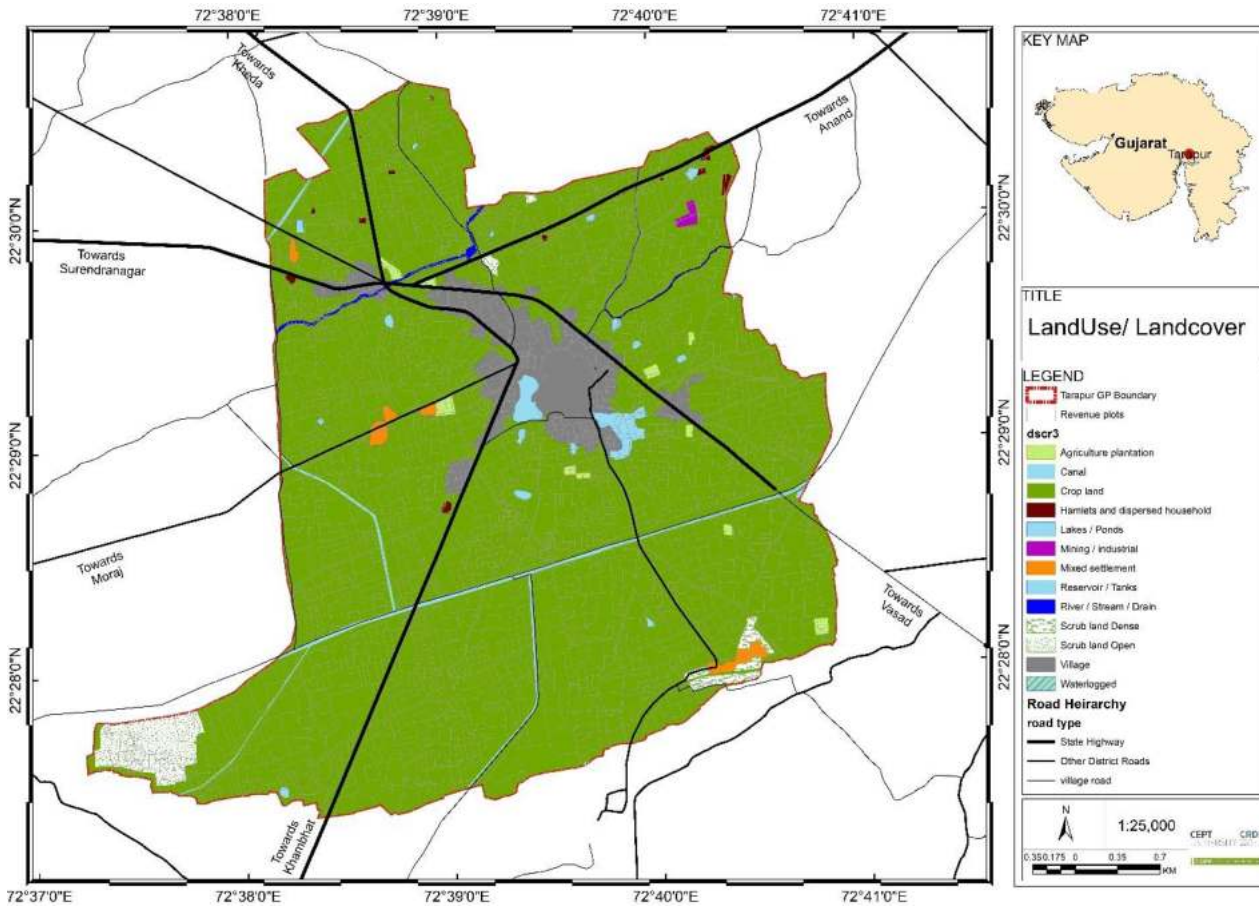


Existing Road Network

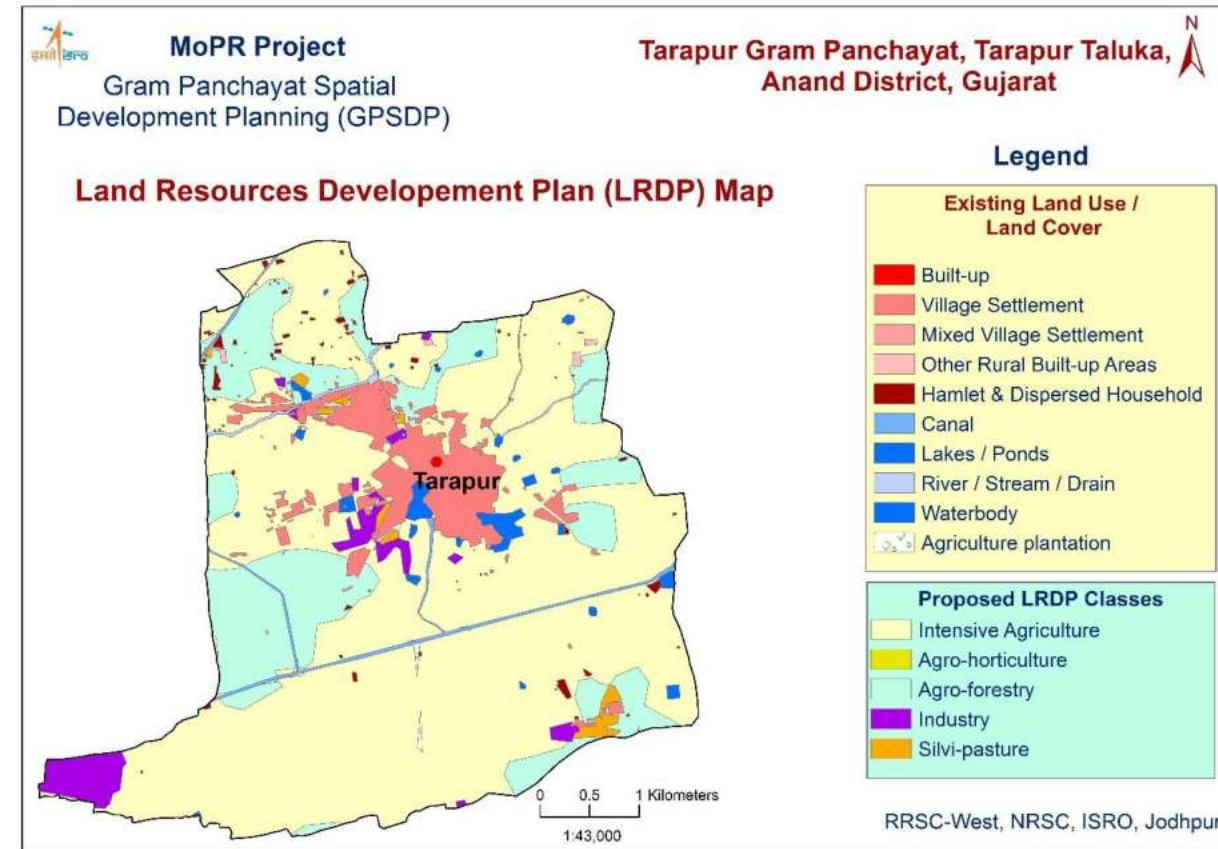


Source:
Satellite Image- NRSC
Road and Railway-NRSC
Prepared Base Map

Land Use Land Cover Maps

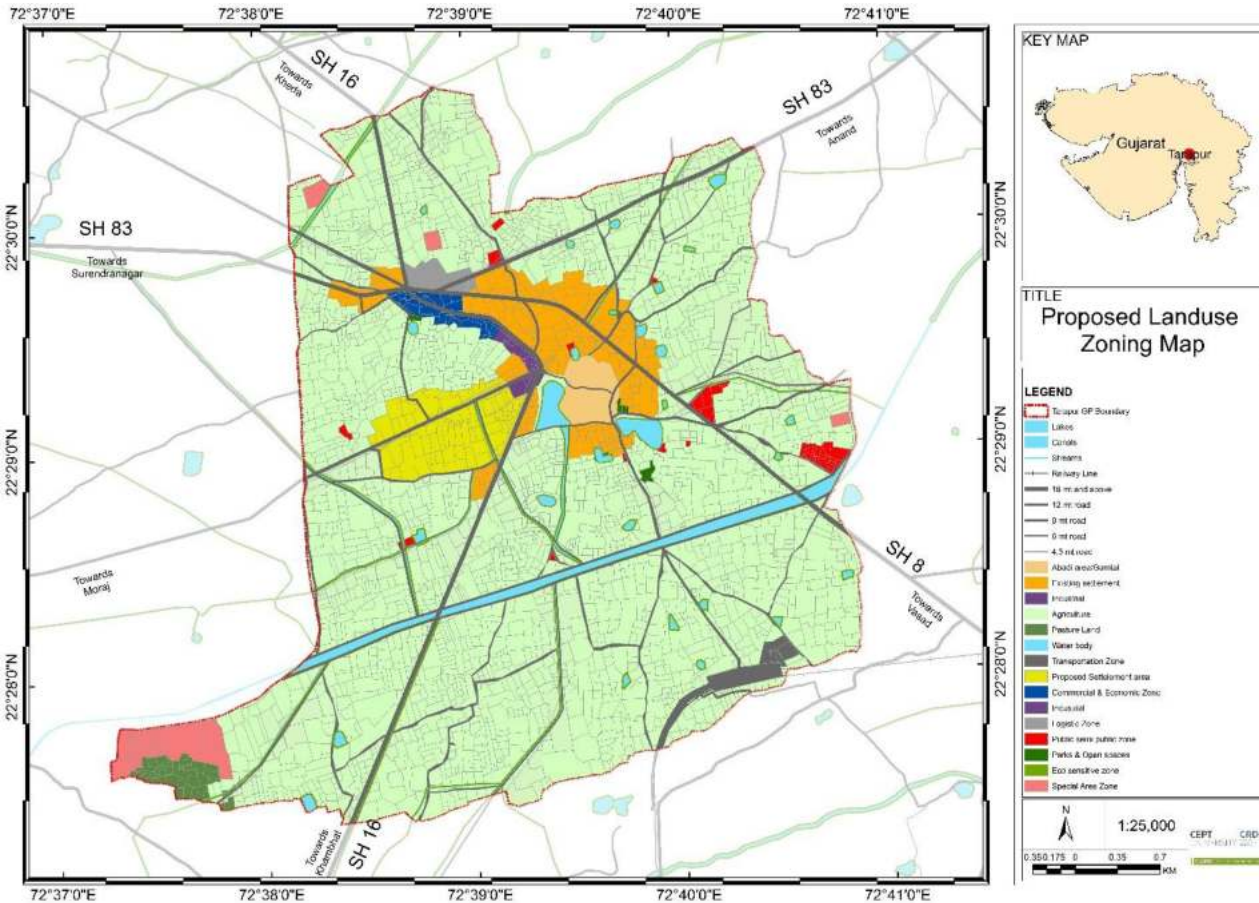


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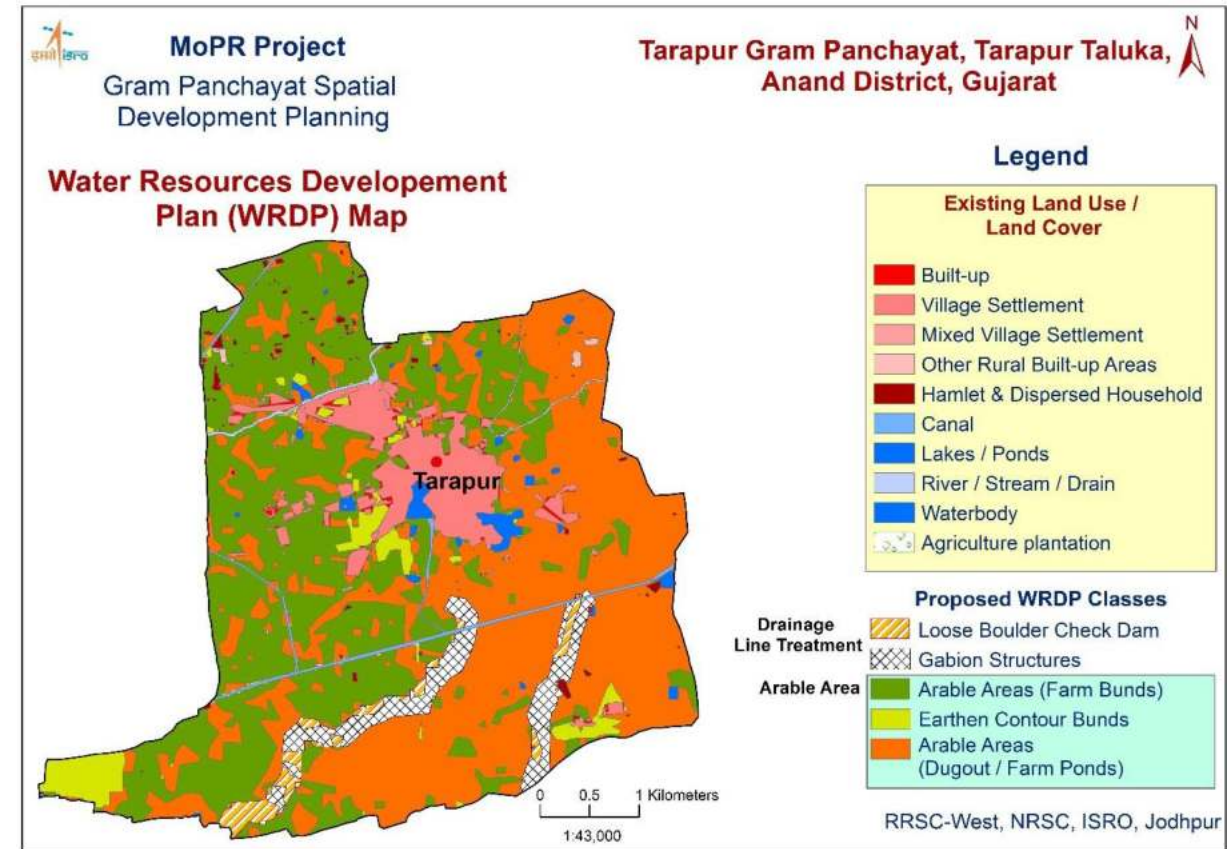


Received on 2nd November from NRSC

Land Use Land Cover Maps

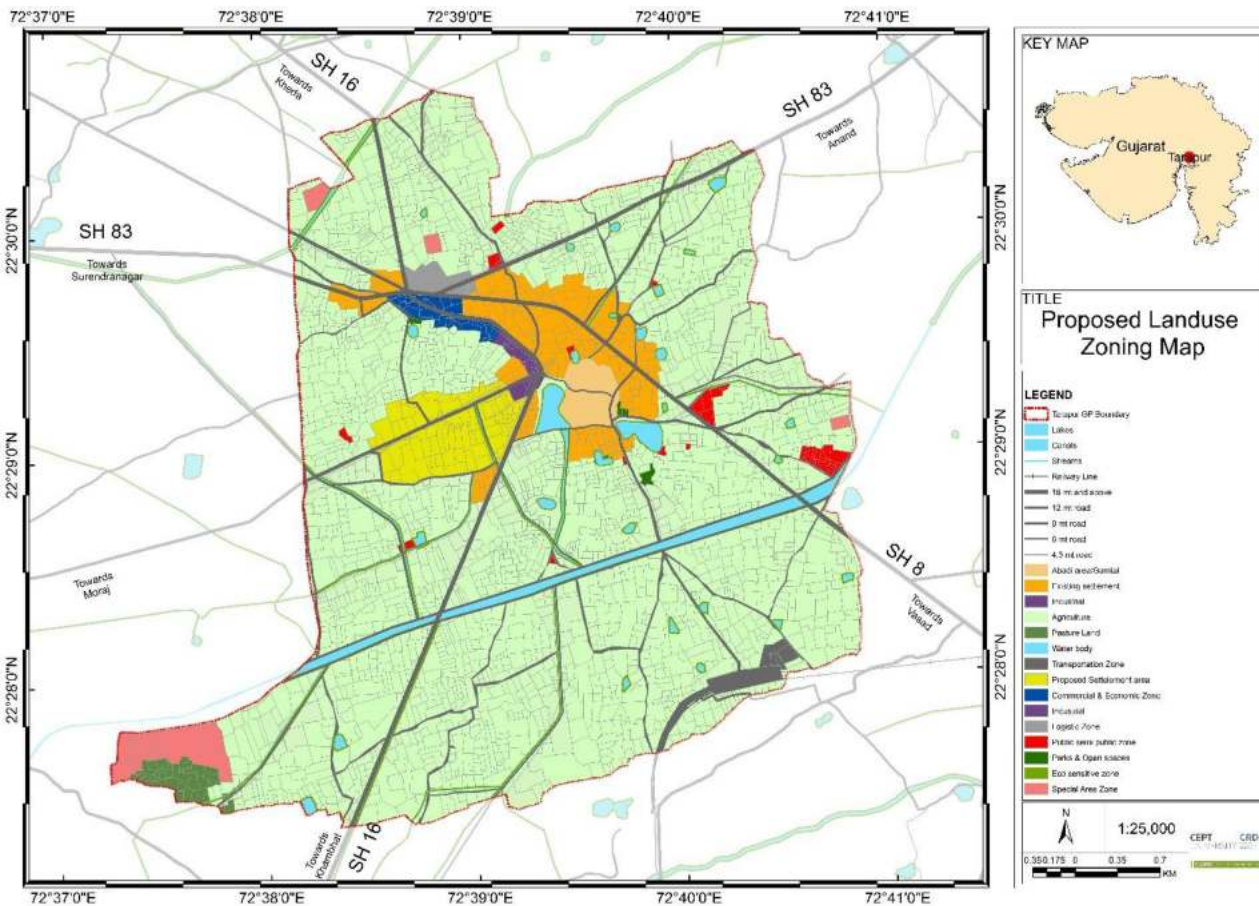


Proposed Land Use Zoning Map

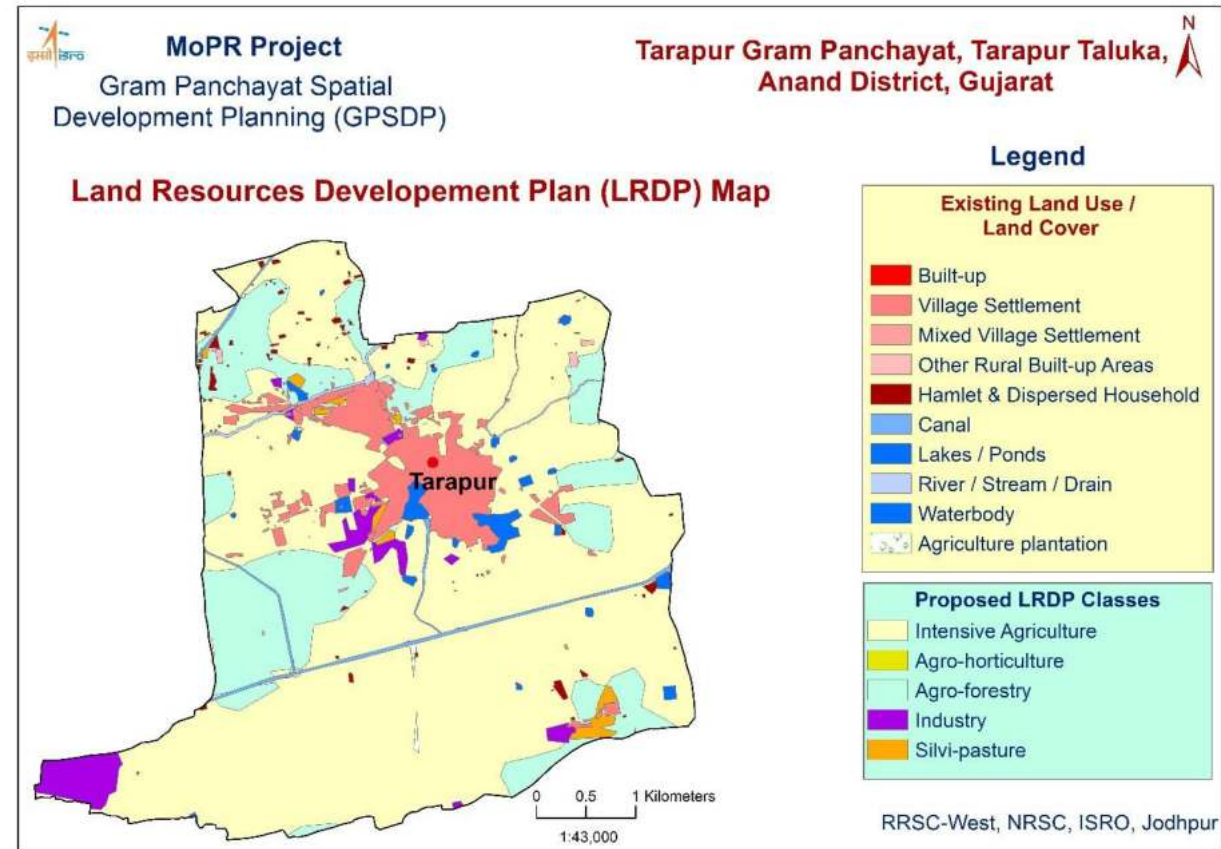


Received on 2nd November from NRSC

Land Use Land Cover Maps



Received on 2nd November from NRSC



Recommendation for the Development Control Regulation

Recommendations are adopted from the *Framing Guidelines for Model Land Uses, Development Controls, and Service Level Benchmarks with Appropriate Enforcement Mechanisms for Rurban Clusters* developed by School of Planning and Architecture Delhi (SPA Delhi) for Ministry of Rural Development.

Space Requirements for Reservation of Land for Amenities at Village Level

S.No	Amenities at Village Level	Population Range	Area Requirement	Minimum Road Width Requirement
1	Skill Development Center	1,000 - 5,000	300 - 500 sq.m	Minimum 6 m
2	Agriculture Services and Processing Center	1,000 - 5,000	300 - 500 sq.m	Minimum 6 m
3	Warehouses for Cold and Dry Storage	1,000 – 5,000	300 - 500 sq.m	Minimum 6 m
4	Primary School	One for 2,500	800 sq.m	Minimum 6 m
5	Secondary School	One for 5,000	4000 sq.m	Minimum 6 m
	Senior Secondary	One per 15,000	Area per school is 1.80 ha; Maximum ground coverage 50 per cent	Minimum 9 m
6	Health Sub – Center	3,000-5,000	800 – 1,200 sq.m	Minimum 6 m
	Primary Health Centre	Oner per 30,000	0.20 - 0.30 ha	Minimum 9 m
7	LPG Distribution Center	2,500	100 sq.m	Minimum 6 m
8	Common Service Center	1,000	100 sq.m	Minimum 6 m

Note: The space norms provided are indicative and can be applied as per the suitability and decisions taken by a local plan preparing agency.

Recommendation for the Development Control Regulation

Recommendation for Building Development Guidelines

Road Width in meter	Minimum Plot Size (sq. m)	Uses Permissible	Front Setback in m	Side Setback in m	Rear Setback in m	Maximum Permissible Building Height and Maximum Ground
Less than 9 m	<100	Residential, Commercial, others	A = 1.5	A = 1.0	A = 1.0	MPBH = 7 m GC = 60 %
			AE = 1.5	AE = 1.0	AE = 1.0	Others = 75 %
09 to 12	100	Residential, Commercial, others	A = 1.5	A = 1.0	A = 1.5	MPBH = 10 GC = 60 %
			AE = 3	AE = 1.0	AE = 1.5	Others = 75 %
12 to 18	100	Residential, Commercial, others	A = 1.5	A = 1.0 AE = 2.25	A = 1.5	MPBH = 15 GC = 50 %
			AE = 3		AE = 3.0	Others = 60 %
18 to 24	100	Residential, Commercial, others	A = 3	A = 1.5 AE = 2.25	A = 2.25	MPBH = 15 GC = 50 %
			AE = 3		AE = 3.0	Others = 60 %
Note: <ul style="list-style-type: none"> A= Abadi & Existing Settlement Area AE= Abadi Extension areas, such as Proposed Settlement Zone, Commercial & Economic Zone, Industrial Zone, and Logistic Zone Animal crossing in the form of an underpass to be provided if village animals will have to cross a road with a right of way of 18 meters or more. MPBH = Maximum permissible building height; GC = Ground Coverage for Commercial Use; GI = Ground Coverage for Industrial Use; O = Ground Coverage for Other Uses 						

Recommendation for the Development Control Regulation

Recommendation for Parking Norms

Land Use Category	Parking Norms
Residential	1 ECS for 100 sq m of built space
Commercial	2 ECS for 100 sq m of built space
Public Semi-Public	2 ECS for 100 sq m of built space
Mandi and Godowns	2 ECS for 100 sq m of the plot area
Industry	2 ECS for 100 sq m of built space
Note: ECS= Equivalent Car Space	