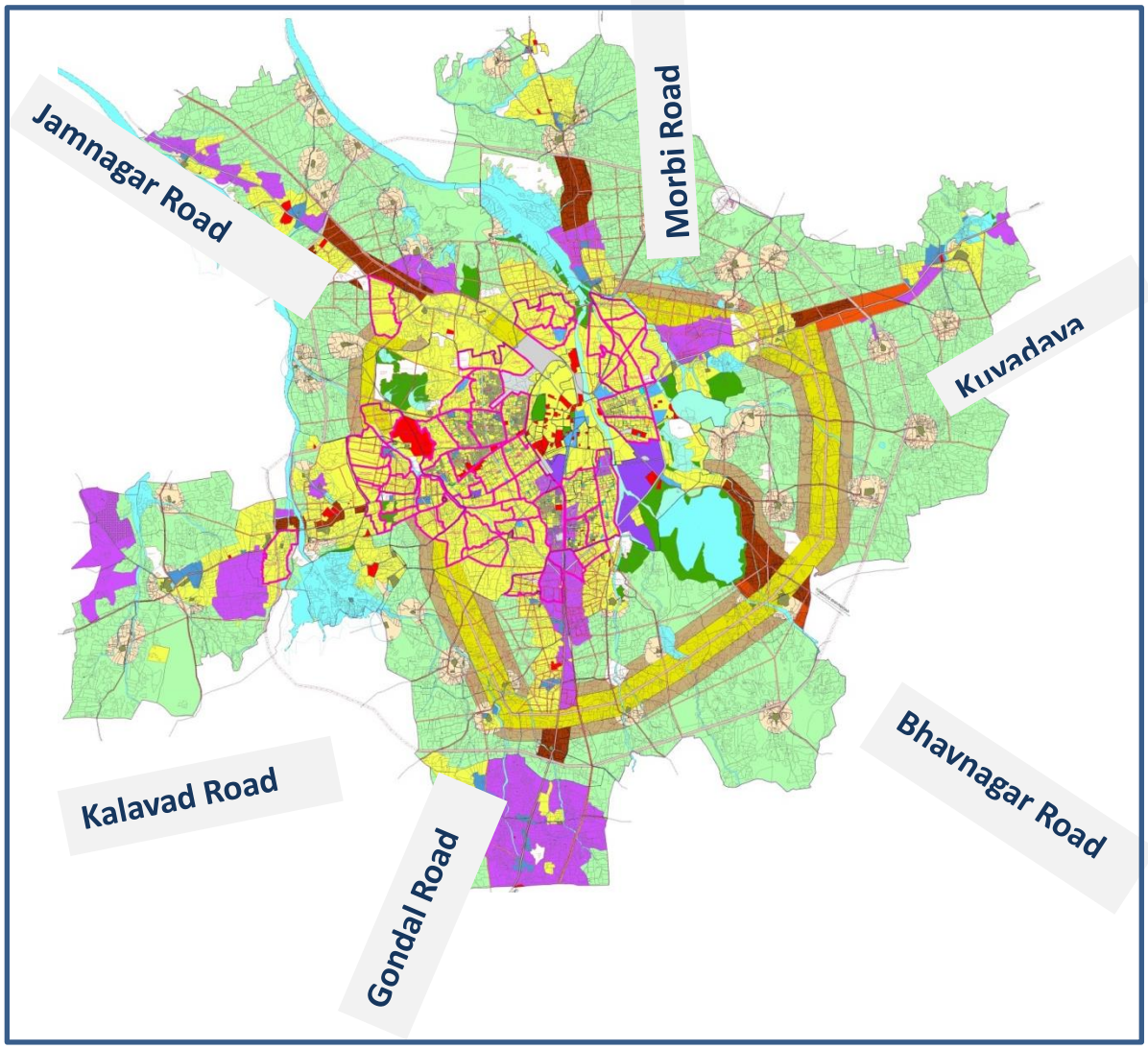
DRAFT
COMPREHENSIVE DEVELOPMENT PLAN 2031
(SECOND REVISED)

PART II: PLANNING PROPOSALS AND RECOMMENDATIONS



SUBMITTED TO THE STATE GOVERNMENT
UNDER SECTION 16 OF
THE GUJARAT TOWN PLANNING AND URBAN DEVELOPMENT ACT, 1976

Rajkot Urban Development Authority

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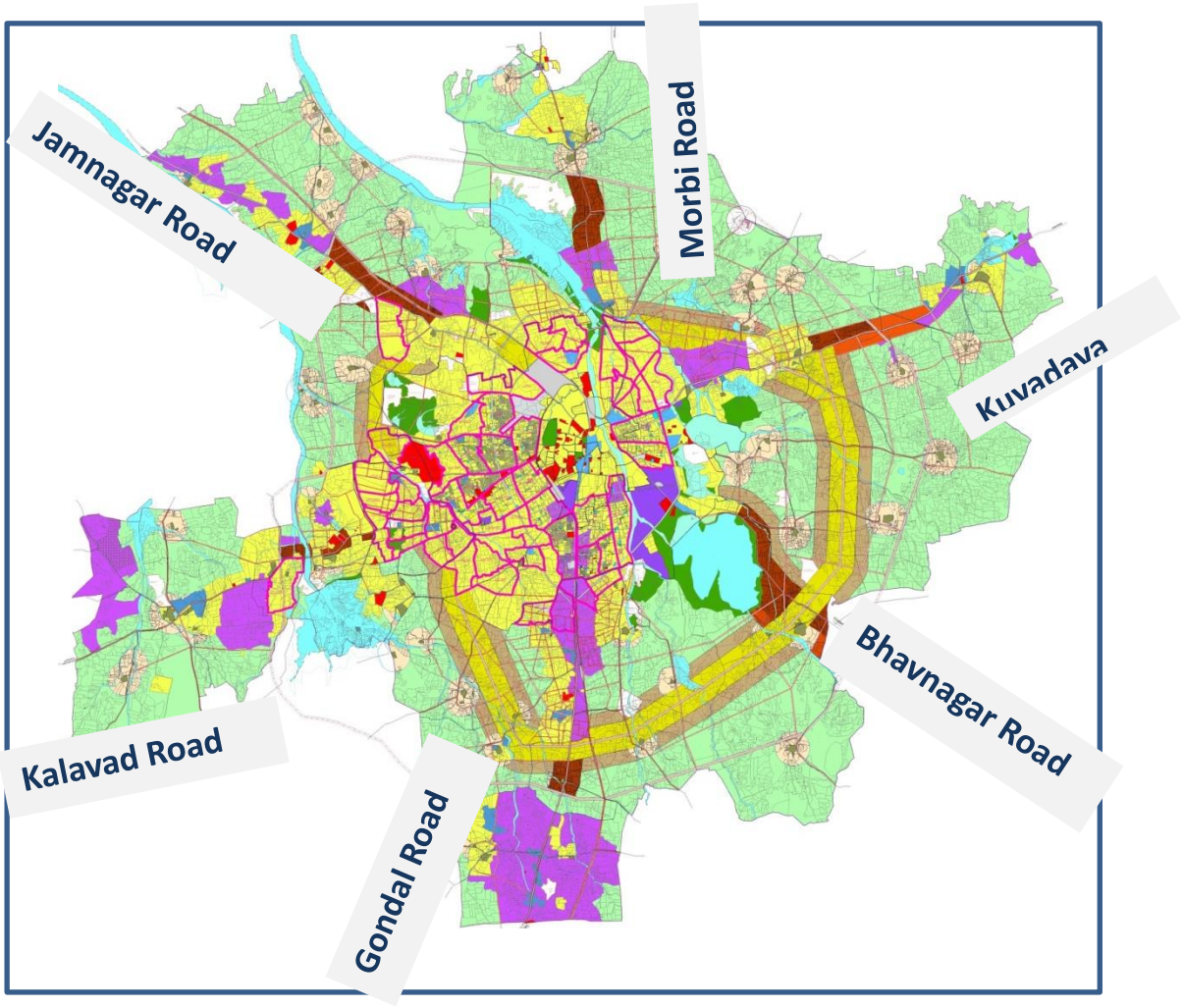

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Rajkot Urban Development Authority

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CONTENT

SECTION I: INTRODUCTION

The Second Revised Draft Development Plan, 2031 is prepared considering the demand of projected population of next two decades for the entire area of 686 sq. km. of Rajkot Urban Development Authority (RUDA). This total area consists of Rajkot Municipal Corporation (RMC) Area, 54 (52*)villages under RUDA. (* As Kotharia and Vavdi are recently added in RMC Boundary)

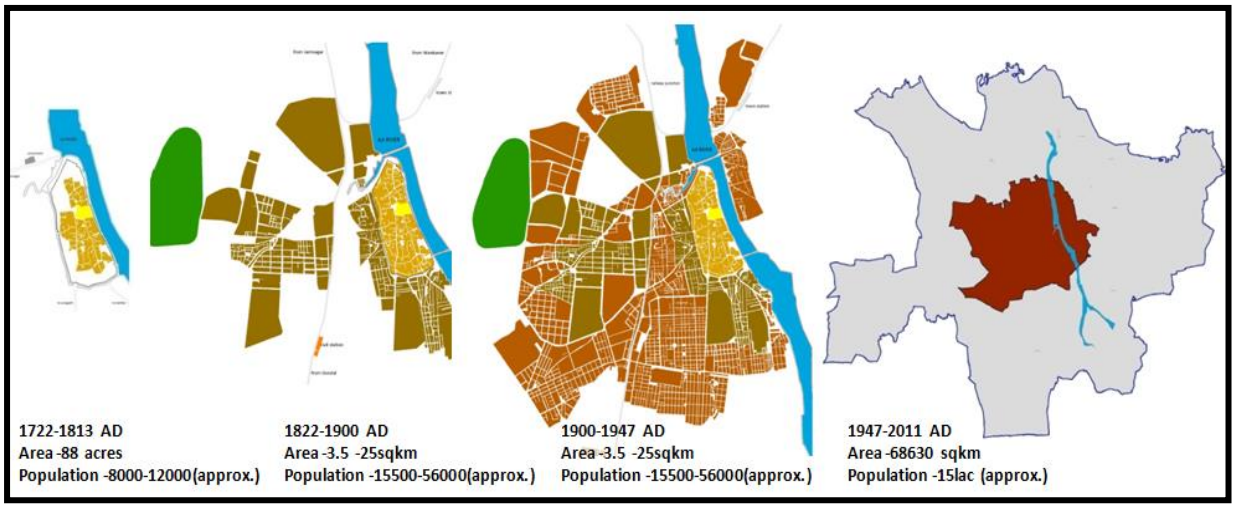
Rajkot is one of the most important, rapid growing industrial centers for small scale industries in this region. As well it is the center for social, cultural, commercial, educational, political and industrial activities for the whole of Saurashtra region. The new developmental forces and activities that were in vogue in the region during the last four decades have posted a challenging problem to the architects and planners while creating manmade environments within the domain of the natural landscape that the region offers.

Going forward, in a globalizing scenario, the role of the city is even more pronounced. Ultimately, if Rajkot is to improve as quality of life and sustainable place with affordable costs, short commutes, low travel times and sufficient amenities, it must plan with necessary foundations and organize its land resources carefully.

Following are some of the major considerations taken into account for deriving and formulating proposals of the Second Revised Draft Development Plan 2031.

1.1 GROWTH PATTERN AND TRENDS

FIGURE 1: GROWTH PATTERN OF RAJKOT



Source: Various publications about Development of Rajkot

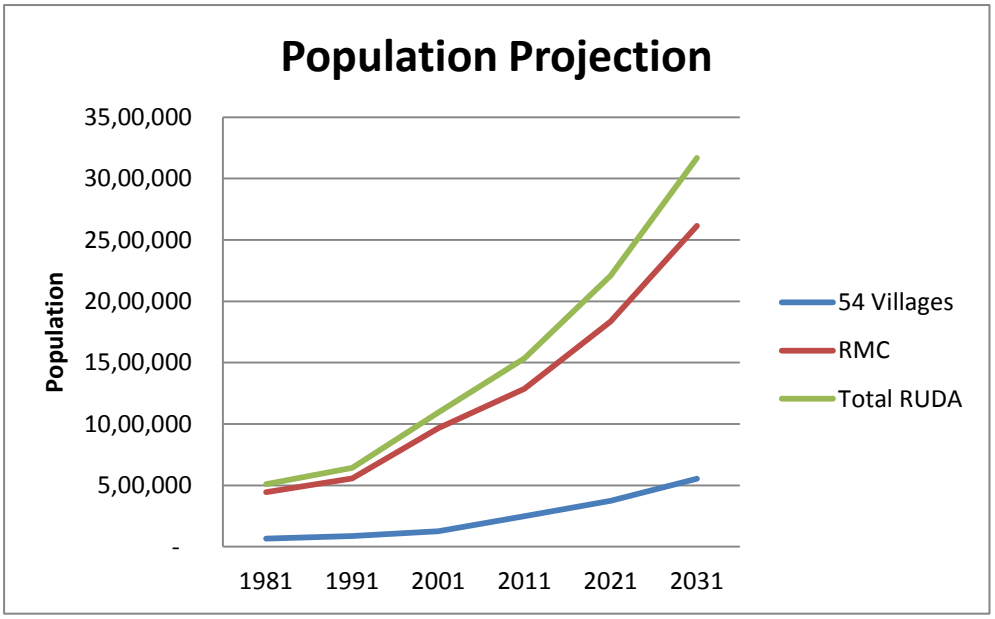
Over the past decades, the city of Rajkot has expanded rapidly in almost all directions from its core areas. The radial arterials have attracted a significant amount of this growth and

development while the Ring roads have improved the connectivity and ease of movement between them. Typically, the outward growth is also fuelled by availability of developable non agriculture land in the outer areas at lower price and high rate of return upon development of this land. However, such developments have also caused significant amount of low density sprawl and loss of farmlands.

1.2 POPULATION PROJECTIONS

As per Census 2011, RUDA area has witnessed an increase in population from 10.94 lakhs to 15.35 lakhs at a growth rate of 71% which is higher than India (21.54%), Gujarat (22.7%) and AUDA (30%). RUDA is highly urbanized with about 86% of its population living in RMC area. If the current growth trends continue, the total population in the RUDA area is expected to go up to 22 lakhs by 2021 and 31 lakhs 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. (Refer Appendix 1.A for further details)

CHART 1: POPULATION PROJECTION



Source: Census of India - 2011

1.3 SUGGESTIONS FROM STAKEHOLDERS

Extensive public consultations and stakeholder meetings were carried out which included experts from several Government and Semi Government institutes, Members of Parliament, Members of legislative Assembly, Nagar-Palikas, Gram Panchayats, NGOs, educational institutes such as IPSA and eminent citizens of Rajkot. Eight working groups, comprising experts from various fields were formed focusing on key areas as mentioned bellow.

(1) Regional Structure
(2) Traffic and Transportation
(3) Demography and Economic Studies

(4) Environmental Sustainability and Disaster Management
(5) Real estate, Housing and Land value
(6) Informal sectors and Slums
(7) Urban infrastructure
(8) GDCR

The inputs from the consultation were studied and reviewed, detailed analysis of existing situation was conducted and proposals and policies for the Development Plan were formulated based on the inferences.

1.4 VISION AND CONCEPTS OF GROWTH MANAGEMENT

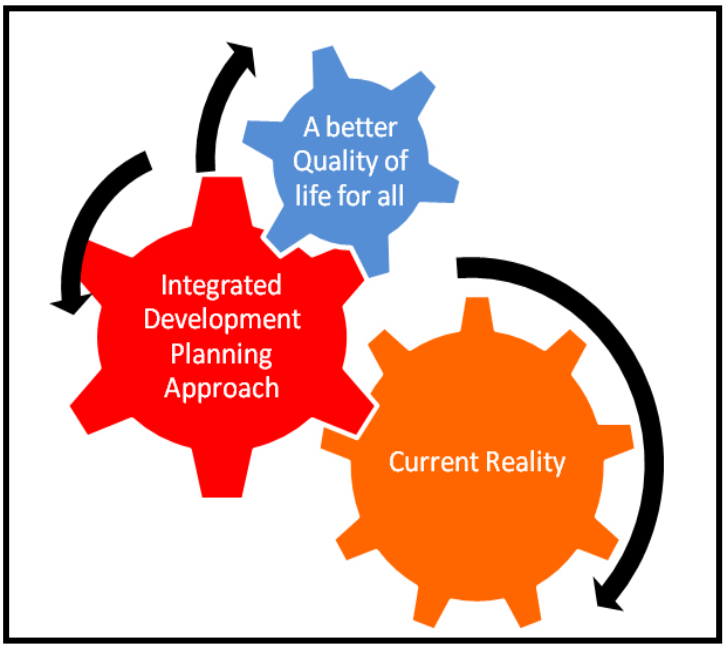
The vision and the principles identified after multiple discussions and deliberations played a crucial role in formulating the proposals of this Development Plan. The major concepts that shaped the proposals include environment friendly and responsive planning, co-ordination between land use and transport through transit oriented development, creating harmonious open spaces, encouraging sustainable and affordable development. The vision and concepts are further detailed out in Section 2 of this volume.

SECTION 2: VISION FOR DEVELOPMENT

2.1 VISION

The villages situated on the fringe of Rajkot city has become an integral part of Rajkot for all practical purpose as a result of increased urbanization. The villages situated on the fringe of RUDA and as Rajkot city continues to grow and prosper at a rapid pace, a comprehensive, forward looking vision is crucial for it to maintain and expand its lead and to become a truly world class city.

FIGURE 1: SCHEMATIC DIAGRAM FOR ADOPTING CONCEPTS



2.2 CONCEPTS FOR DEVELOPMENT PLANNING AND GROWTH MANAGEMENT

The concepts below further articulate the overarching vision and focus to guide planning and development of Rajkot in a manner that is coherent and aligned with the overall vision.

Concept 01: Promote Balanced, Harmonious and Sustainable Development

- Promote East-West and North-South balanced development that is based on principles and best practices of sustainability
- Provide adequate Harmonious spaces all around the city

Concept 02: Environmental evaluation for urban land-use planning

- Protect and enhance environmental assets to create development that is environment friendly
- Facilitate safe urban environment with responsive planning to natural slop and water channel

Concept 03: Enhance accessibility, connectivity and mobility options for all citizens

- Network of concentric as well as radial roads to provide easy accessibility
- Proposals for transport related nodes at most of the entry roads and Polycentric development proposals for peripheral development
- Enhance connectivity at local, urban and regional level

Concept 04: Integrated planning and proposal of Town Planning Schemes

- Proposal of Town Planning schemes across the peripheral roads for speedy implementation of roads.

Concept 05: Incentivize inclusive and affordable urban development

- Promote inclusive development policies for enhancing affordable access to housing
- Support inclusion of affordable housing around public transport corridors

Concept 06: Provide efficient physical and social infrastructure

- Proposal of Utility corridors across all the roads to provide efficient and adequate physical infrastructure
- Provide social infrastructure that supports the needs of developed areas

Concept 07: Proposal for GAMTAL EXTENTION (RURBAN) participative strategy

- Promote Urban development, practices and networks of local residents of Rural areas
- Support and fulfil the need of villages and Gram-Panchayats

Concept 08: Proposals of special development areas

- Plan and develop special area within the city that contain various use along with adequate gardens, parks and open spaces
- The special Development shall include: Aji River Development, Twin Lakes Development etc.

Concept 09: Facilitate vibrant, lively, and safe urban environment

- Facilitate the creation of vibrate, and lively urban environments by encouraging consistent and coordinated development regulations
- Facilitate safe urban environment with ‘eyes on the street’

Concept 10: Simplification of Development Control Regulations

- Land use based regulations.
- Incentives of higher FSI
- Intervention of mix development along major roads and at the nods

Concept 11: Development of Growth Centers

- Shapur, Metoda, Kuvadva, Madhapar-Nyara

Concept 12: Development of Potential Corridors

- Ahmedabad Road, Bhavnagar Road

2.3 DEVELOPMENT FRAMEWORK

The current city form of Rajkot has been shaped by the existing zoning development regulations and the "rings & radials" street network which has been evolved over past decades. This street network has shaped the nature and form of development that has taken place within the city. The general development pattern in the city has followed typical density patterns with concentration of highest density in the central areas, gradually reducing towards the periphery. The existing zoning and development regulations have resulted in a relatively moderate density and primarily low rise urban form with scattered sprawl on outer fringes.

The urban framework in the Second Revised Development Plan 2031 aims to build upon the vision and the principles to guide the urban form of the city so that development continues and urban infrastructure is optimized. Increase in density is proposed through introduction of telescopic FSI and transit oriented zones which can help facilitate densification and redevelopment in existing areas.

Higher densities are proposed along public transport corridors to facilitate transport, reduce congestion, reduce dependability on private transport and optimize investments in transport infrastructure. This will help define characters of the different neighborhoods, thereby improving and enhancing the image and legibility of the city.

2.4 CONSIDERATIONS FOR PROPOSED PLANS, PROPOSALS AND RECOMMENDATIONS

The proposals and recommendations form the main core of this Second Revised Draft Comprehensive Development Plan 2031. They are formulated after multiple deliberations, detailed analysis of existing conditions, future growth projections, the overarching vision, the principles and the input from stakeholders all combined. Even though many of these

proposals cover more than one focus area, for ease of organizing they are grouped under nine subsections which are as follows

1. Zoning and Development
2. Transport Network and Mobility
3. Housing
4. Green Network
5. Physical infrastructure
6. Social infrastructure
7. Economic development
8. Heritage
9. Environment

Generally, proposals are the proposed tasks that are to be carried out or implemented primarily by the Authority, Whereas recommendations include the 'tasks' or actions for which other government departments or entities may have to take primary role, with the authority supporting them.

SECTION 3: ZONING AND DEVELOPMENT

3.1 INTRODUCTION

Today urban areas within RUDA limits are home of about 15 lakhs people. As this number continues to grow and the city continues to prosper, additional supply of land and built spaces will be required to provide places for living, working, shopping, education, entertainment, healthcare, gardens, infrastructure and many such needs. Also, it would be crucial to organize this growth in a manner that maintains the quality of life and livability standards within the area while keeping it economically vibrant and environmentally sustainable. This development plan aims to satisfy these needs through various tools and mechanisms available under the existing legal frameworks and in a manner that is consistent with the overarching vision and principles of this plan.

Zoning is one of the important planning tools to manage growth, regulate density and organize land uses within the urban area. By regulating land uses it helps to segregate incompatible uses, increase livability and create desirable character for different areas for the city. Zoning combined with development regulations determines the supply of developable land and built space in various zones. However, before arriving at various proposals to accommodate growth and organize land uses, it is important to first understand the demand for development and various considerations to organize land use and densities.

3.2 CONSIDERATIONS FOR PROPOSALS

It is important to understand following considerations that were taken into account while deriving and formulating proposals included in this section.

- Existing Growth pattern and trend
- Population projections for 2021 and 2031
- Comprehensive assessment of existing conditions, land uses, development typologies, socio-economic parameters etc.
- Existing supply of buildable land in zoned areas
- Availability of land suitable for urbanization
- The overarching vision for Rajkot 2031, the planning and growth management principles including growth rate, transport network, sustainable environment and affordable development
- Study of State and Central Government policies and working group reports such as integrated mobility plan, City Development Plan (CDP), Tourism policy, Heritage policy, Hospital policy, slum redevelopment and rehabilitation population, etc

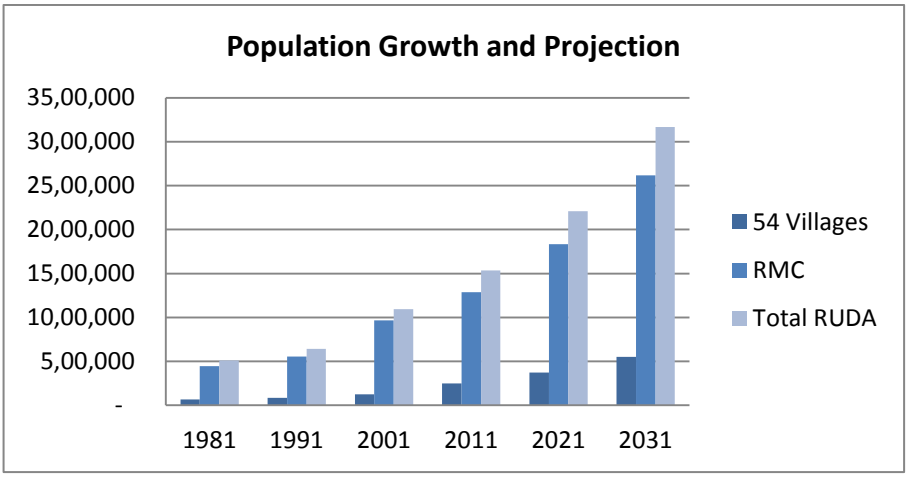
- Incorporation of comments and suggestions from Working group and stakeholder meetings
- Airport – expansion and relocation was one of the important point considered, and same was discussed in the stake-holder's meeting with the Representatives of Airport Authority, however, Airport Authority didn't came up with any such proposal hence, no relocation/expansion proposals could be proposed in the revised D.P.

Assessing Future Demand and Existing Supply:

Estimating demand for development is crucial to understand how much of additional zoned land will be required to accommodate growth in the coming decades. Currently, RUDA area is home of about 15 lakh people. This population is expected to grow to 22 lakh by year 2021 and to 31 lakhs by 2031. This means there will be about 6 lakh additional people living in the urbanized area of RUDA by 2021 and about 15 lakh by 2031.

At present 686.3 sq.km. of total RUDA area, 202.04 sq.km. of zoned area proposed in Revised Development Plan – 2011, of which, about 89.14 sq.km. of zoned area is still vacant and available for development. Some of this additional growth can be accommodated in this vacant zoned area. However, still there is a need to fulfill the demand by providing options for development in different areas. Now, if existing trends of development patterns and densities in various zones continue, Rajkot will require about 94.5 million sq.mt. of built space and about 84 sq.km. of zoned land by 2021; and 135 million sq.mt of built space and about 120 sq. km. of zoned land by 2031.

CHART 1: POPULATION GROWTH AND PROJECTION



Source: Census of India - 2011

3.3 PROPOSALS AND RECOMMENDATIONS

In order to encourage growth and to enhance mobility through transit oriented development. The zoning proposals are prioritized in the following order

- **Incentivize development** in existing zoned area
- Encourage compact development in **transit corridors**

- **Organize development** in Growth Centers
- Allow for **natural growth** around villages while preserving prime agricultural land

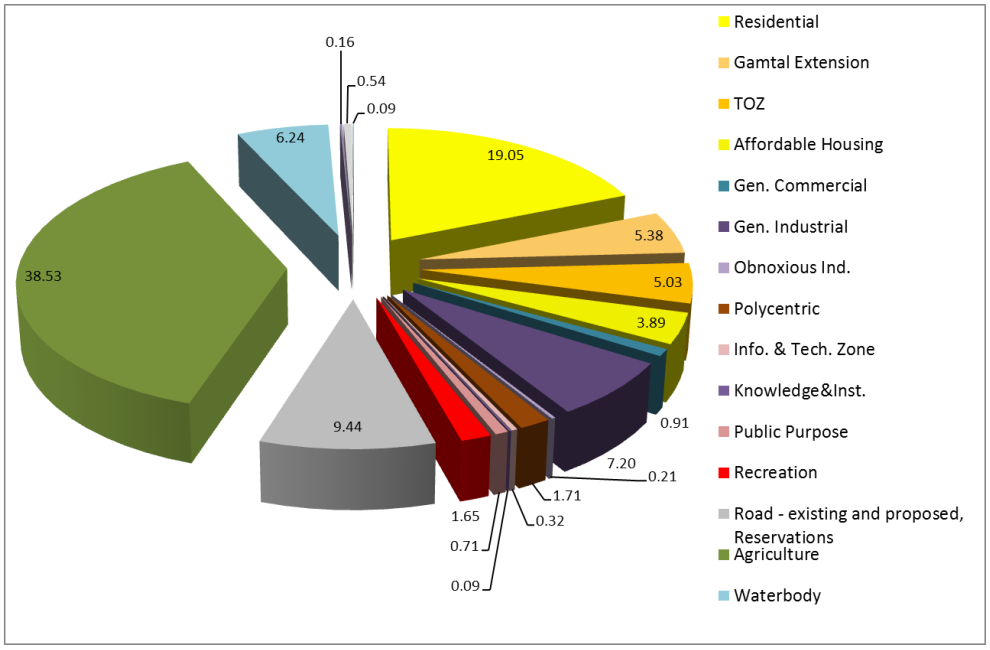
TABLE 1: AREA TABLE OF PROPOSED LAND USE 2031

Proposed Landuse**

S. N0	Landuse	RMC	%age	18 Village	36 Villages	54 Villages	%age	Total RUDA	%age
1	Residential	6228.16	59.40	3154	3693.00	6847.13	11.78	13075.29	19.05
2	Gamtal Extension			1217	2474.33	3690.84	6.35	3690.84	5.38
3	TOZ	154.03	1.47	76	3219.57	3295.30	5.67	3449.33	5.03
4	Affordable Housing	46.58	0.44	53	2570.95	2623.56	4.51	2670.14	3.89
5	Gen. Commercial	221.73	2.11	292	110.96	403.00	0.69	624.73	0.91
6	Gen. Industrial	635.24	6.06	3146	1157.64	4303.64	7.40	4938.89	7.20
7	Obnoxious Ind.			146		145.84	0.25	145.84	0.21
8	Polycentric			90	1080.98	1170.57	2.01	1170.57	1.71
9	Info. & Tech. Zone			40	178.65	218.16	0.38	218.16	0.32
10	Knowledge&Inst.				62.77	62.77	0.11	62.77	0.09
11	Public Purpose	305.37	2.91	84	98.84	182.35	0.31	487.72	0.71
12	Recreation	517.05	4.93	19	597.62	616.41	1.06	1133.46	1.65
13	Agriculture	69.34	0.66	9753	16619.69	26372.75	45.36	26442.09	38.53
14	Other area (Water body+Airport+Railway+rservations+existing and Proposed roads, etc.	2307.49	22.01	2262.90	5949.99	8212.89	15.37	10520.38	16.47
	TOTAL	10485	100	20330	37815	58145	100	68630	100

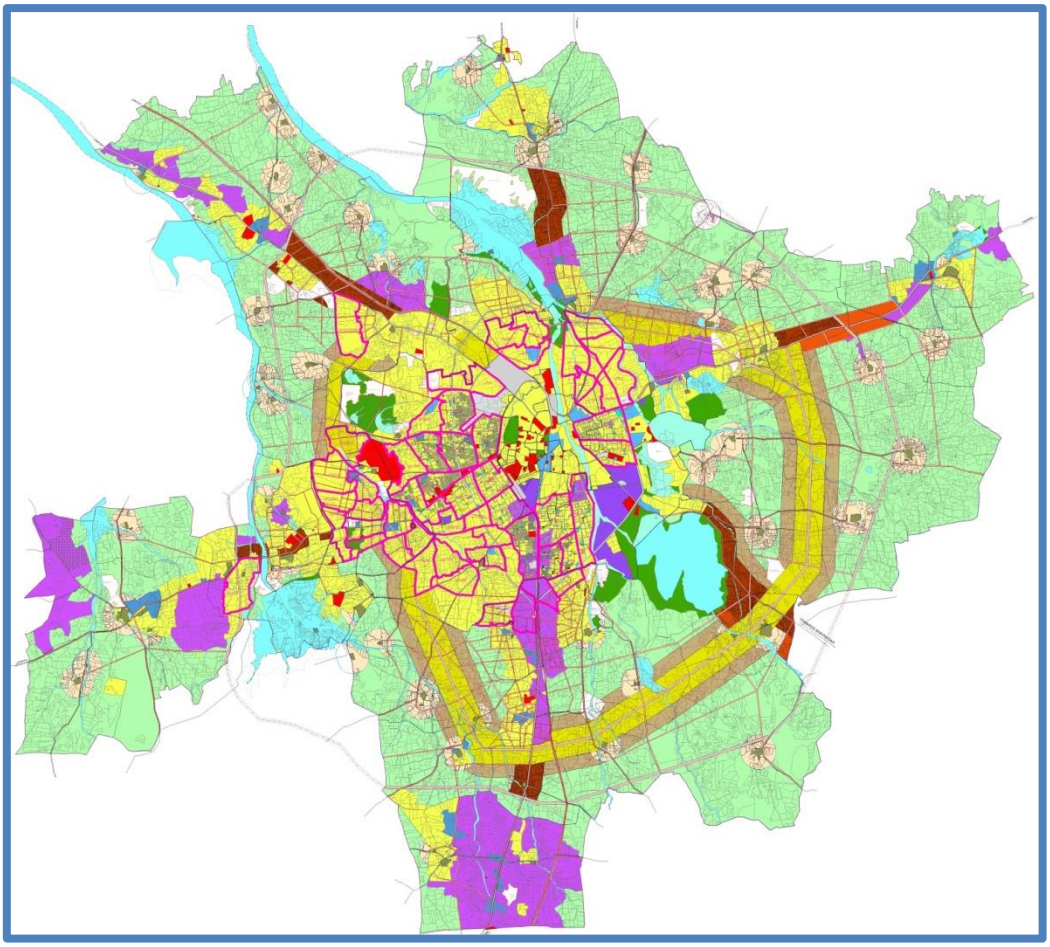
As per DP 2031 - Submitted u/s -9 and published u/s-13(**Kothariya and Vavdi recently added in RMC limit, which is not shown in the calculation of RMC)

CHART 2: PROPOSED LAND USE 2031



The map of zoning proposals along with the area table for Second Revised Draft Development Plan 2031 incorporating various zoning proposals is given bellow. The zoning map uses an improved nomenclature that simplifies and organizes some of the zoning categories to better reflect the uses they are intended for. The table includes zoning categories and areas incorporated under each zone.

FIGURE 2: PROPOSALS OF SECOND REVISED DRAFT DEVELOPMENT PLAN



3.4 PROPOSAL 1: RE-DENSIFICATION OF EXISTING ZONED AREAS

Based on inventory of existing land uses, currently, about 89.14 sq.km. of zoned area is still vacant and available for development. There are areas with old development that need to be redeveloped. In order to optimize the utilization of these zoned areas and to encourage development on this serviceable land, it is essential to provide incentives for densification to underutilized areas. The table below identifies the incentives in terms of payable FSI that would help encourage development in underutilized areas and redevelopment within dense area.

TABLE 2: FSI INCENTIVES

Sr.no	Use Zone	F.S.I Permissible (Base)	FSI Chargeable	F.S.I Maximum Permissible
	(1)	(2)	(3)	(4)
1	City Area – A	2.25	NIL	2.25
2	City Area – B	2	0.5	2.5
3	Gamtal	1.5	NIL	1.5
4	Gamtal Extension	1.8	NIL	1.8
5	City Area-C	**(With Respective zone as per mentioned below)**		
6	Transit Oriented Zone	1.8	1.95	3.75
8	Residential Zone	F.S.I Permissible (Base)	FSI Chargeable	F.S.I Maximum Permissib0le
	For low -rise	1.5	0.35	1.875
	For high-rise	1.8	0.45	2.25
	For others	1.2	0.3	1.5
9	Commercial zone	F.S.I Permissible (Base)	FSI Chargeable	F.S.I Maximum Permissible
		1.5	0.7	2.2
10	Industrial zone			
	Industrial zone - General	1.2	0.3	1.5
	Industrial zone - Obnoxious	1.2	0.3	1.5
11	Recreational zone	0.15	NIL	0.15
		Ground Coverage of Permissible uses as per Agricultural zone		

12	Residential Affordable Housing zone	1.8	0.9 (for RAH only)	2.7
13	Knowledge and Institutional Zone	1.8	Nil	1.8
14	Public Purpose Zone	1.0	NIL	1.0
15	IT Zone	1.8	Nil	1.8

Below is a scenario developed to illustrate how much of additional development potential can be generated through utilization of this vacant land.

Scenario Illustration:

Based on the existing land use analysis, presently, nearly 89.14 sq.km. of land is vacant and available for development. If approximately half (50%) of this vacant land is developed due to the development demand and FSI incentives, around 45 sq.km. of vacant land may be developed in the combined area of City Area A, B and C. Further, if this land area develops at the rate of 60% of the permissible FSI presently and 20% of plots undergo redevelopment in City Area A, nearly 38 million sq.mt. of built space is made available in the zoned areas.

Recommended Action:

Network Road Planning needs to be introduced for new areas proposed to be developed as dense zone areas, which will act as a micro level planning tool. This shall include proposing Network Road on individual plot basis as well as connectivity of public roads by the proviso of 15 mt. or more wide roads for interconnecting public roads as a separate exercise of micro-planning to help implementation of DP proposals and at a later stage for T.P.Schemes. It shall enhance livability of the area through coordinated improvements in transport, physical and social infrastructure taking into account the existing character, land uses and activities taking place in the area. This shall help implement the vision of Development Plan at local level taking into account the needs of the existing ward/ neighborhood or any area within RUDA. Refer Appendix 3.2.A for further details.

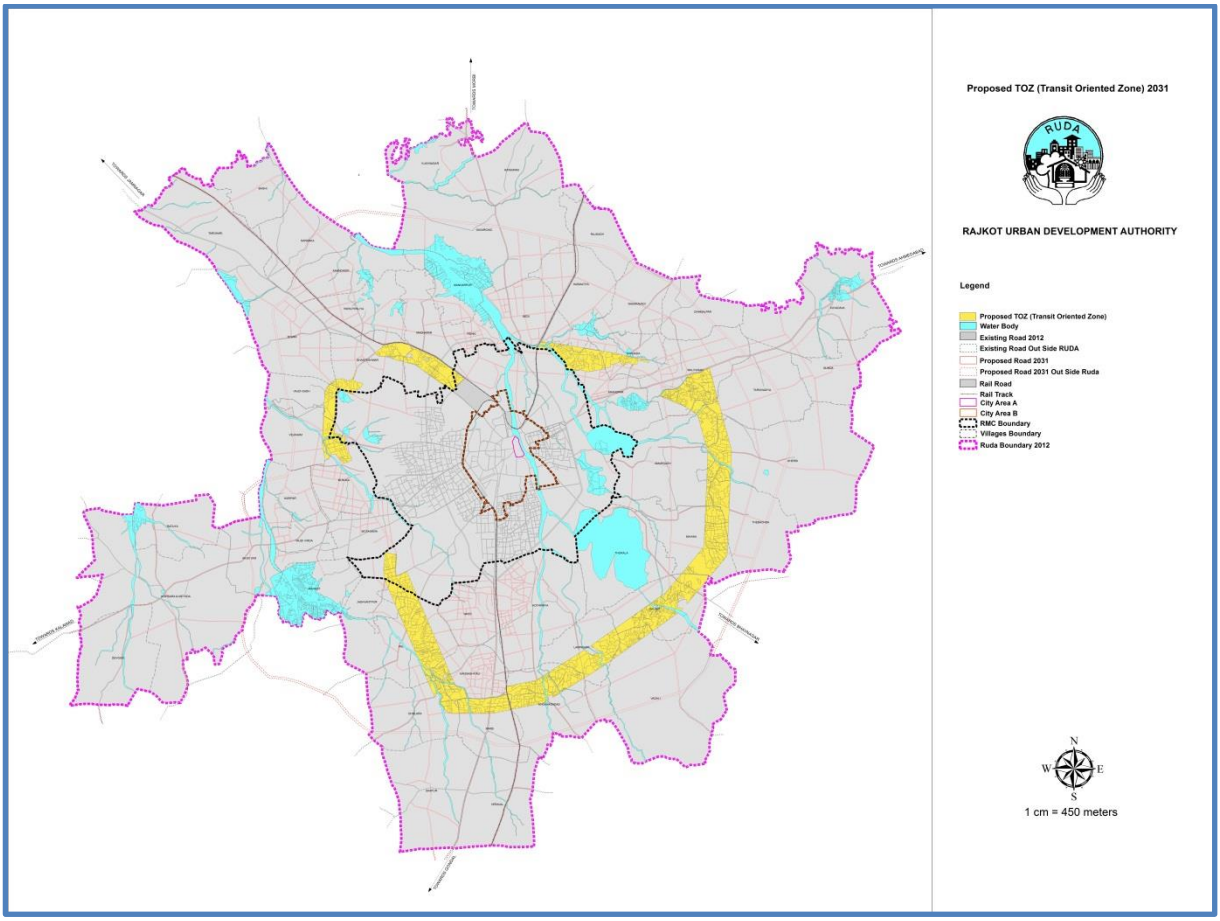
3.5 PROPOSAL 2: DENSIFICATION ALONG TRANSIT CORRIDORS THROUGH TOZ (TRANSIT ORIENTED ZONE)

In order to promote compact transit oriented development in the city and to coordinate land use and transportation, TOZ (Transit Oriented Zone) is introduced. TOZ is an effective tool to promote compact, transit oriented development within the walking distances of public transit routes such as BRTS and Metro. This zone takes precedence over underlying

Residential and Commercial zones by encouraging compact mixed use development. Sustainable transit oriented densification could be achieved through incentivizing development of additional floor space along the transit corridors.

TOZ is proposed along 2nd ring road, limited to area, which was not in the developable zone in the earlier Development Plan. This zone is along the 75 mt. Wide ring road with 500 mt. Buffer on both the side, making the entire corridor of 1075 mts. The Transit Oriented Zone covers about 3449 Hect. of area proposed on potential Transit corridor of Ring Road. This Zone is Proposed as an Individual Zone, that would require speedy implementation of the proposal, by enforcing T.P.Scheme or similar mechanism in this area. The Maximum FSI Permissible in this zone shall be 3.75 with base FSI of 1.8 and remaining as Saleble, as in the case of BRTS Corridor. The difference from the base FSI shall be availed as chargeable FSI as per the GDCR. Further details regarding the development allowed in this zone is proposed in GDCR.

FIGURE 3: PROPOSED TOZ (TRANSIT ORIENTED ZONE)



Recommended Action:

Implementation of TOZ requires detailed assessment, careful planning and a phased approach for implementation. Therefore, it is recommended to implement this zone based on recommendations identified in Network Road Planning.

Step 1: Prepare Network Road Planning for TOZ:

It is recommended to first prepare a **Network Road Planning** for TOZ which shall be helpful on proposing and finalizing T. P. Scheme roads/Public roads at a later stage. This can proposed at Macro as well as Micro level, depending upon the development potential of each area. On the receipt of the development permission for any of the plot within this zone, shall attract the deduction of 35% towards Public amenities, as per the T.P. Scheme norms as well as proposing a Network road for the connectivity of this plot with a wider Public road. The Network road so proposed for connectivity, shall be minimum 15.00 mt. wide. While finalising the Network Road Planning, assessment of existing conditions, accessibility, amenities, infrastructure, land use and urban environment shall be done on case to case basis. The Network Road plan should be consistent with the vision and principles of the Development Plan and should include specific recommendations for implementation.

Step 2: Implementation:

Depending on the type of recommendations various approaches for implementation can be identified. For example, specific recommendations related to providing certain amenities and improving infrastructure can be implemented through capital projects. However, it is intended that, mostly, This can be achieved by preparing Town Planning Schemes, to reduce the burden on Local/Urban Development Authorities. The revenue generated from sale of payable FSI and land resources generated through TP Scheme can be useful resource to recover the cost of improvements within the area. Refer Appendix 3.2.A for further guidelines on Network Road Planning and its implementation.

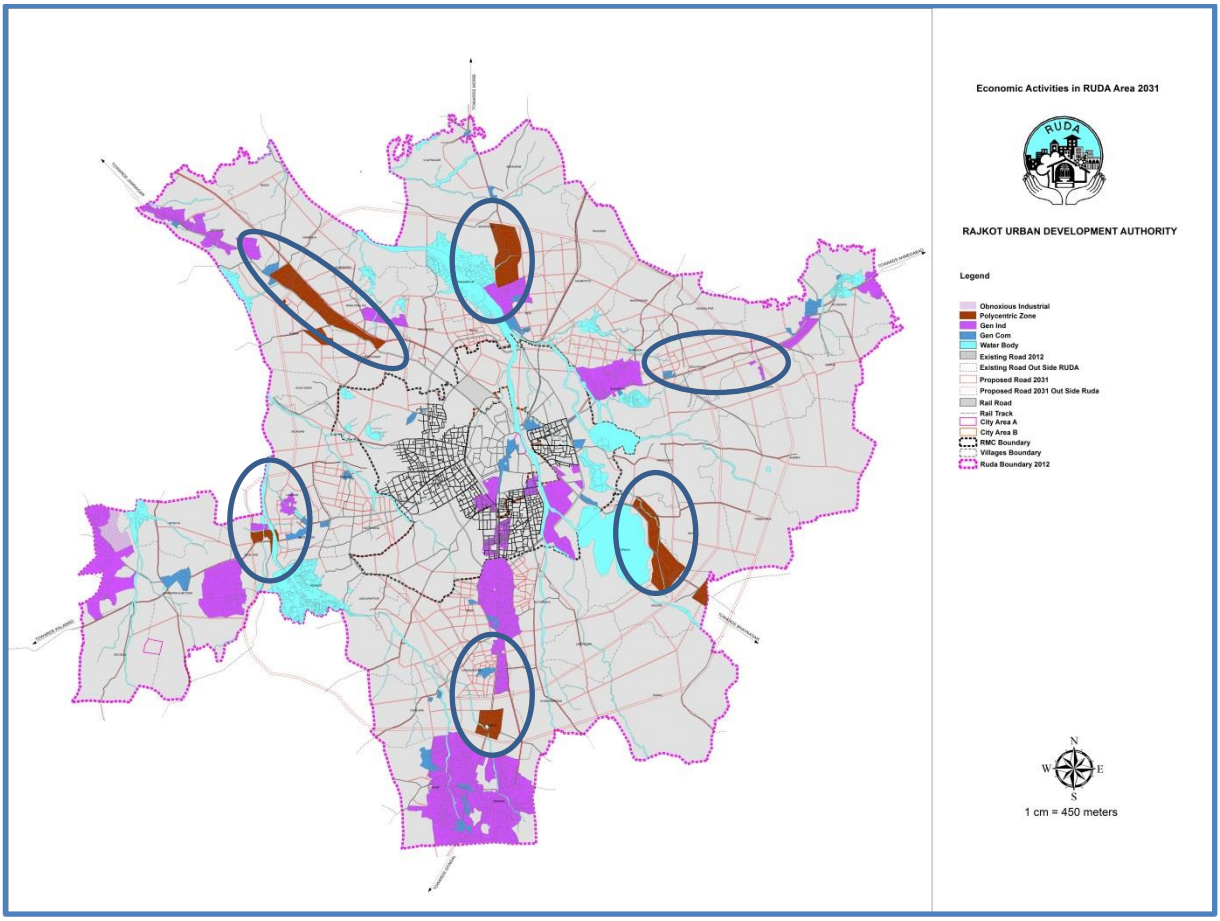
Special Provision of Local Area Planning:

Local Area Plan shall be prepared, in line with the regulations prepared by Urban Development & Urban Housing Dept. from time to time, for the improvement of existing T. P. Scheme area, where deemed necessary. The guidelines and regulations for the same shall be prepared, aimed at the de-densification of the existing T.P.Scheme areas

3.6 PROPOSAL 2: DEVELOPMENT OF POLYCENTRIC CORRIDOR

In order to promote compact development around existing highways in the city and to coordinate land use and transportation, Polycentric corridors are introduced. Polycentric node is an effective tool to promote compact development around existing highways within the walking distances of public transit routes such as BRTS and Metro. This zone takes precedence over underlying Residential and Commercial zones by encouraging compact mixed use development. Sustainable corridors densification could be achieved through incentivizing development of additional floor space along the corridors. These areas are identified based on the recommendations of CEPT study conducted for RMC and peripheral areas.

FIGURE 4: PROPOSED POLYCENTRIC NODES



Polycentric corridors is proposed along all the six existing highways, limited to area, which was not in the developable zone in the earlier Development Plan this zone is along the 75 mt. Wide ring road with 500 mt. Buffer on both the side, making the entire corridor of 1075 mts.

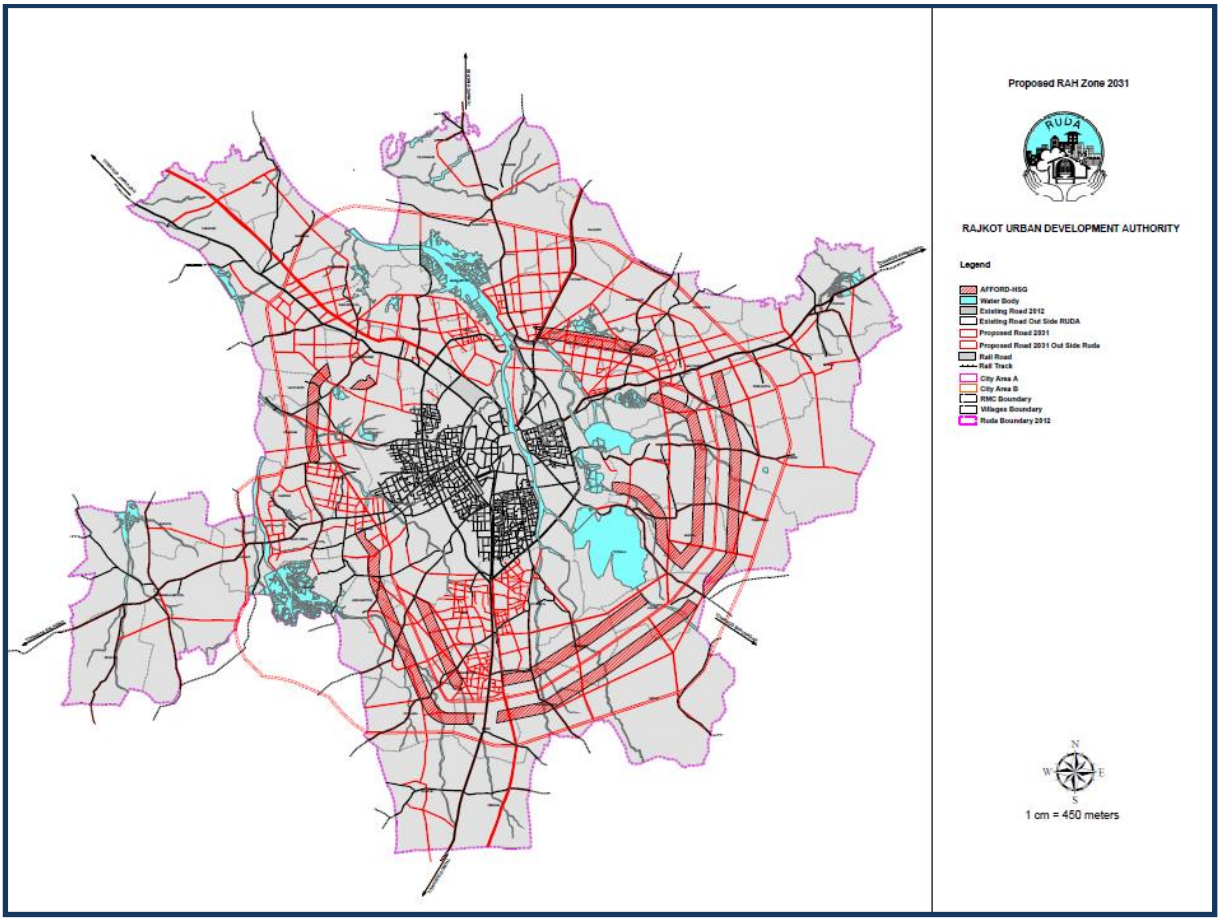
The Polycentric corridors cover about 1170.53 SqM of area that are superimposed on the base zones. The base FSI in this zone shall be provided as in the base zone, i.e 1.5 in City area A and B, 1.8 in other than city area A and B etc. However, the maximum permissible FSI in this zone shall be 4.0. The difference from the base FSI shall be availed as chargeable FSI as per the GDCR. Further details regarding the development allowed in this zone is proposed in GDCR.

3.7 PROPOSAL 4: DEVELOPMENT AROUND EXISTING ZONED AREAS TO INCENTIVIZE AFFORDABLE HOUSING

In order to enhance the supply of affordable housing, a new zone RAH is identified within 1 km wide stretch on the 75 mt. wide Ring Road, beyond TOZ, proposed along this Ring Road,

covering around 26.70 sq.km. of land area. This zone shall be applicable for development of affordable housing with unit sizes upto 80 sq.mt. as well as shall also be available for development of Residential use without using Affordable Housing Policy. All other developments shall be permissible as per the existing zones only.

FIGURE 5: PROPOSED RAH ZONE



The base FSI for affordable housing in this zone shall be 1.8 with chargeable FSI of 0.9 at reduced rates as specified in GDCR. For all other developments the FSI shall be permissible as per the provision of the Residential zone as identified in GDCR.

Recommended action:

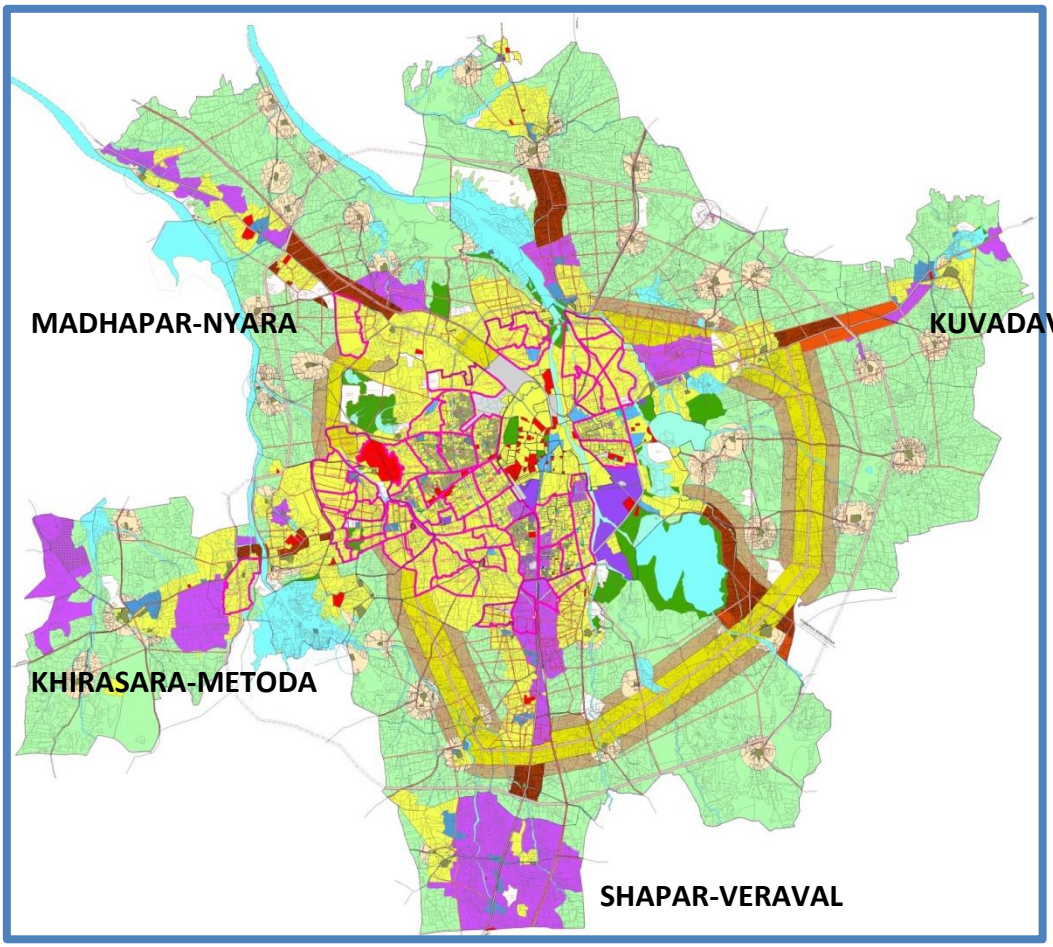
Network Road Planning shall be introduced in areas of RAH Zone also, which will act as a micro level planning tool. This shall include proposals of Network roads at plot level, that would provide comprehensive guidance to enhance livability of the area through coordinated improvements in transport, physical and social infrastructure taking into account the existing character, land uses and activities taking place in the area. Network Road Planning shall help implement the vision of Development Plan at local level taking into account the needs of the existing RUDA area. Refer Appendix 3.2.A for further details.

3.8 PROPOSAL 5: DEVELOPMENT IN GROWTH CENTERS

In order to promote large tracks of land around the existing industrial areas, it is important to develop additional zones that can accommodate future populations in nearby areas. Keeping the principals of growth and sustainable development in focus three growth centers are identified around the city in RUDA areas. They are Shapar – Veraval, Khirasara – Metoda and Kuwadva – Gunda.

Keeping the principals of growth in focus, growth centers are planned in order to support / accommodate population in various industrial clusters around Rajkot. The figure bellow indicates zoned areas in various growth centers.

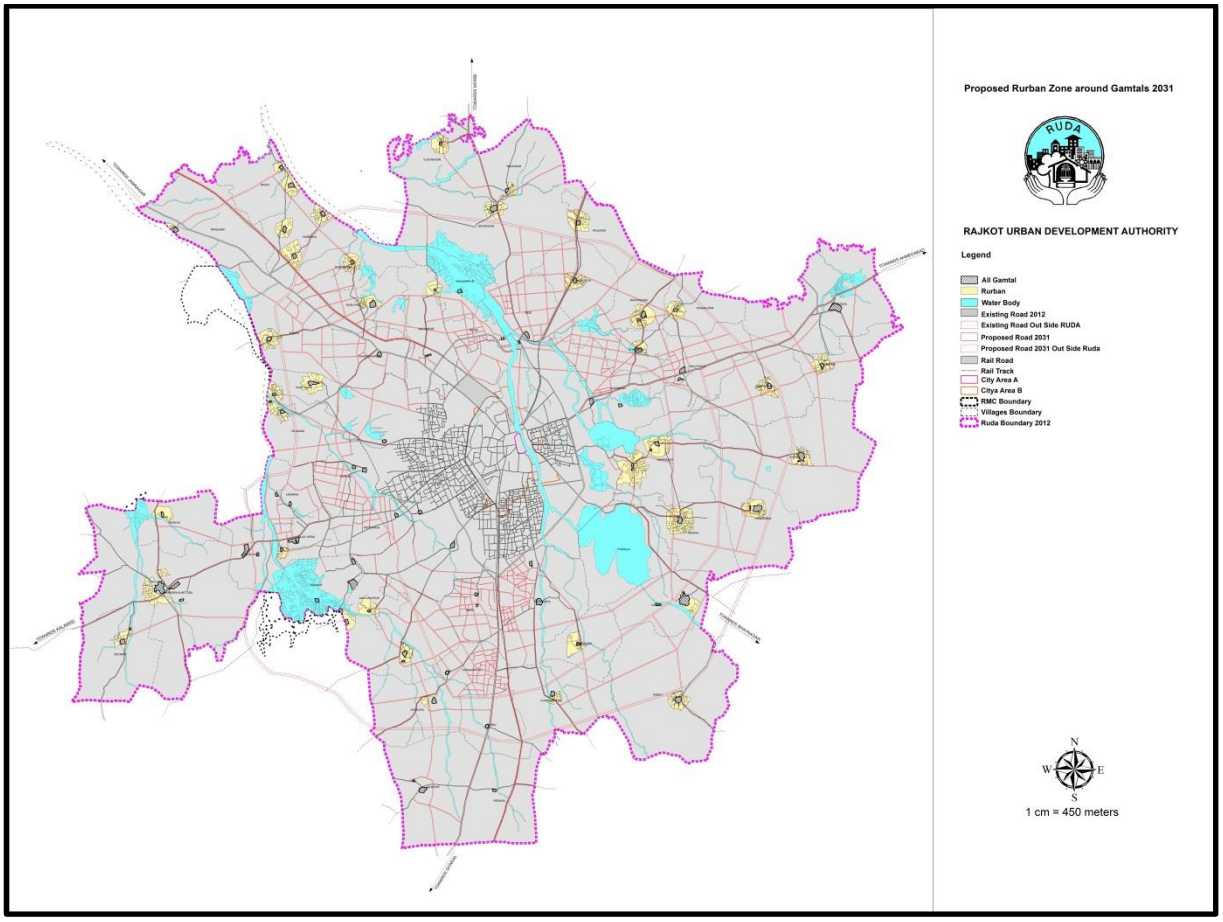
FIGURE 6: PROPOSED GROWTH CENTERS



3.9 PROPOSAL 6: DEVELOPMENT AROUND VILLAGE GAMTALS

The growth around village should be accommodated in immediate vicinity of the village Gamtal in contiguous manner. Therefore a buffer of 500m is provided around Gamtals where specific regulations and uses may be permitted according to GDCR.

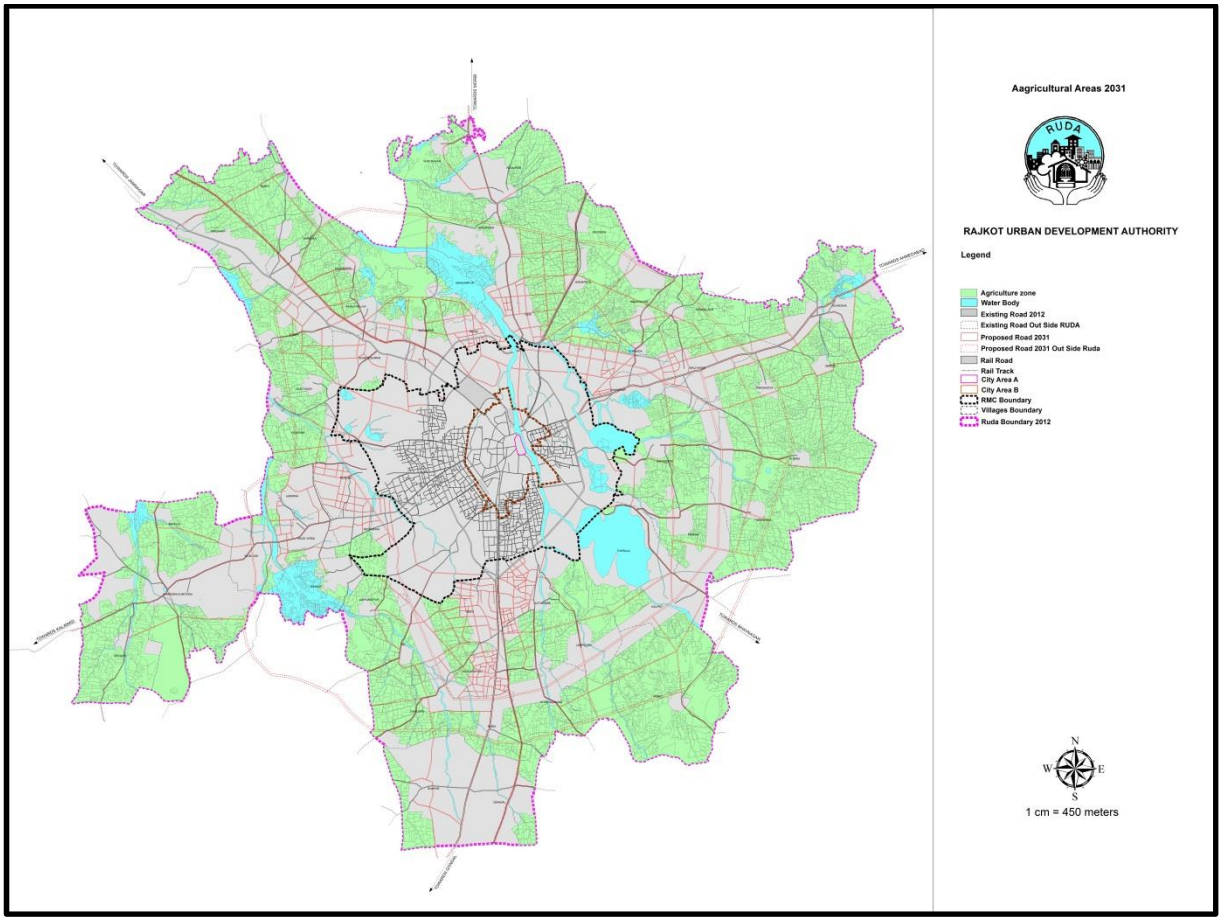
FIGURE 7: PROPOSED GAMTAL EXTENSION ZONE AROUND GAMTALS



3.10 PROPOSAL 7: AGRICULTURE ZONE TO PRESERVE AGRICULTURE LAND

To preserve the ecological balance and boost agriculture activities, the developable zone is restricted till 2nd ring road. It is also proposed certain pocket between RMC and 2nd ring road as agriculture zone, as well as the areas beyond 2nd ring road for the agriculture purpose. It has been tried to keep balance with the development to keep more part as green to boost agriculture activities.

FIGURE 8: PROPOSED AGRICULTURE ZONE



3.11 PROPOSAL 8: SPECIAL PLANNED AREA DEVELOPMENT ZONES

Special Planned Area Development Zones are large areas identified for focused development around important structures and to control specific uses. Aji Riverfront Development Project is an environmental improvement project that will renew Rajkot. Lalpari and Randarda twin lake Development project is similar as well. Following are the specific aspects that the project proposes to address:

- Urban and Environmental improvement
- Creating high quality public open spaces
- Providing adequate public access to the river and lake
- Rehabilitating the slums and informal economic activities
- Providing city level infrastructure
- Creating vibrant urban neighborhoods

3.12 RECOMMENDED ACTIONS FOR IMPLEMENTATION

- Prepare Guidelines for Network Road Planning
- Prepare Plans for Growth Centers, TOZ, Polycentric Corridors, RAH, Gamtals, Gamtal Extension Zone etc.
- Prepare Guidelines for TP schemes

SECTION 4: TRANSPORTATION AND ROAD NETWORK

4.1 INTRODUCTION

A high quality well connected and integrated transportation and Road network is essential to ensure healthy growth, thriving economy and high livability standard for a city. Today Rajkot city has about 1797 km of road network, with respect to road condition, 63% of the roads are surfaced and 38% are roads with earthen surfaces. As the city continues to grow improvements and expansions of its transportation network will be required. Such improvements however must be planned carefully as they influence existing population as well as future growth and their location choices in the long run.

Following the principles of accessibility and mobility, land use - transportation coordination and compact growth, this chapter identifies proposals and recommendations to improve transportation network and mobility in RUDA area.

4.2 CONSIDERATIONS

Similar to other Indian metropolitan cities, Rajkot is also facing severe problems such as traffic congestion, travel delays, unsafe travel conditions, parking issues, encroachment etc. Below are some of the important observations as identified in the existing condition analysis in Part I of this development plan.

- Increase in vehicular traffic volumes
- Lack of integration between Land use and transportation system
- Congestion and bottleneck on major junctions
- Inadequate, blocked or unusable sidewalks
- Absence of well-defined street classification system
- Incomplete street sections with undefined edges and unorganized margin space
- Lack of integration between modes of public transport
- Absence of pedestrian and bicycle network
- Unused and insufficient cycle lanes, not connected with destinations
- Inadequate on street and off street parking facilities
- Inefficient logistics facilities in and around the city

In order to improve on these transport issues, this Revised Draft Development Plan is elevating modes of transport and non-motorized transport at higher priority level. Currently Rajkot has two systems of public transport namely 'Rajkot Municipal Transport Service' (RMTS) and 'Bus Rapid Transit System' (BRTS). These systems are very helpful to alleviate traffic issues by providing additional choices to commuters. Below are brief descriptions of each of these systems.

Rajkot Mass Transport Service (RMTS):
Rajkot Mass Transport Service (RMTS) is working in the city limit and major stations around the city in RUDA Area, e.g. Shapur – Veraval GIDC, Metoda GIDC, VVP Engineering Collage, etc. RMTS is a major public transit mode with 56 routes and carrying approximately 6500 passengers' daily basis.

Bus Rapid Transit System (BRTS):
With the intension of providing frequent, comfortable and affordable mode of transit within the city BRTS has been started in 2012. BRTS plan includes 3 phases. Serving the rapid growth of the city currently BRTS is successfully running on 10.7 km of stretch implemented under phase 1. Additional 52.8 of proposed stretch has been identified under phase 2 and 3.

PROPOSALS AND RECOMMENDATIONS

4.3 PROPOSAL 1: SIMPLIFIED, UNIFIED STREET CLASSIFICATION SYSTEM

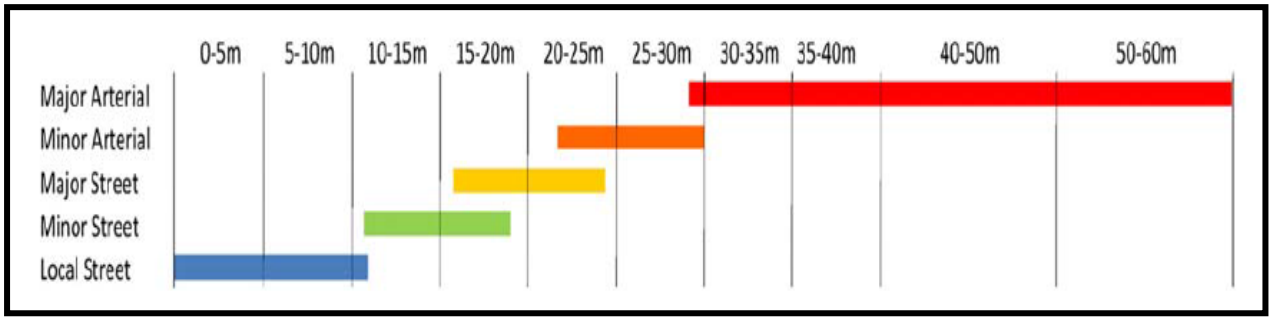
Classifying city's streets and roads in appropriate categories is the first basic and essential step towards organizing the network and improving its traffic and mobility. A simplified, unified street classification system will help classify streets in appropriate categories and organize the improvement measures based on their characteristics.

There are different street classification systems used by national, state and local government agencies. For example, the IRC's (Indian Roads Congress) road classification system is primarily designed for classifying inter-city roads such as highways, district roads etc. However, this system is not adequate to classify urban roads which are more than just vehicular carriageway. Some other systems classification systems used by various cities do classify urban roads based on ROW widths but do not reflect the complete character of urban streets.

The simplified and unified street classification system used here is based on character and context of a street rather than simply depending on the ROW width. For example, a relatively narrow street may be an important spine with significant urban activities and connecting important areas in different parts of the city. It would be a mistake to identify such street as a 'collector' or 'local' street under conventional ROW width based systems.

In addition to ROW widths, the classification system considers parameters such as length of the street, what does it connects, land use characteristics etc. It is proposed that any future work regarding the road/street network must be based on this street classification system and the relevant guidelines provided for them.

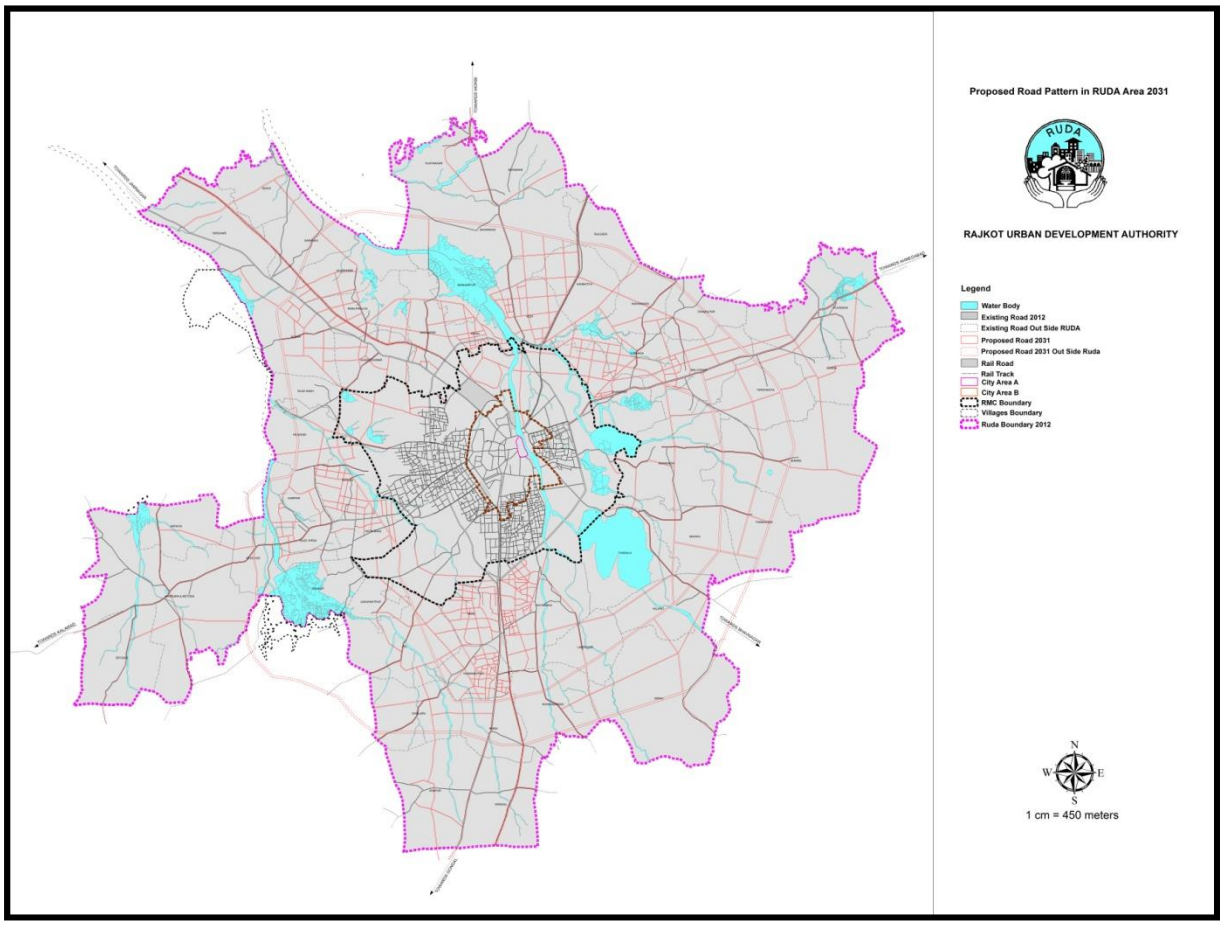
CHART 3: ROAD/STREET CLASSIFICATION BY ROW



SEGREGATION OF ROADS WITHIN RUDA AREA:

Sr. No.	Width	Length in mt.
1	up to 12mt.	13175
2	15	37761
3	18	43488
4	20	14707
5	24	174328
6	30	221530
7	45	427073
8	60	437212
9	75	30930
10	90	60975
	Total	1461179

FIGURE 9: PROPOSED ROAD PATTERN IN RUDA AREA



Recommended action:

Use the **Simplified Unified Street Classification system** to organize, design and improve transportation network within RMC and RUDA areas, and prioritize the model roads and street improvement projects using this framework.

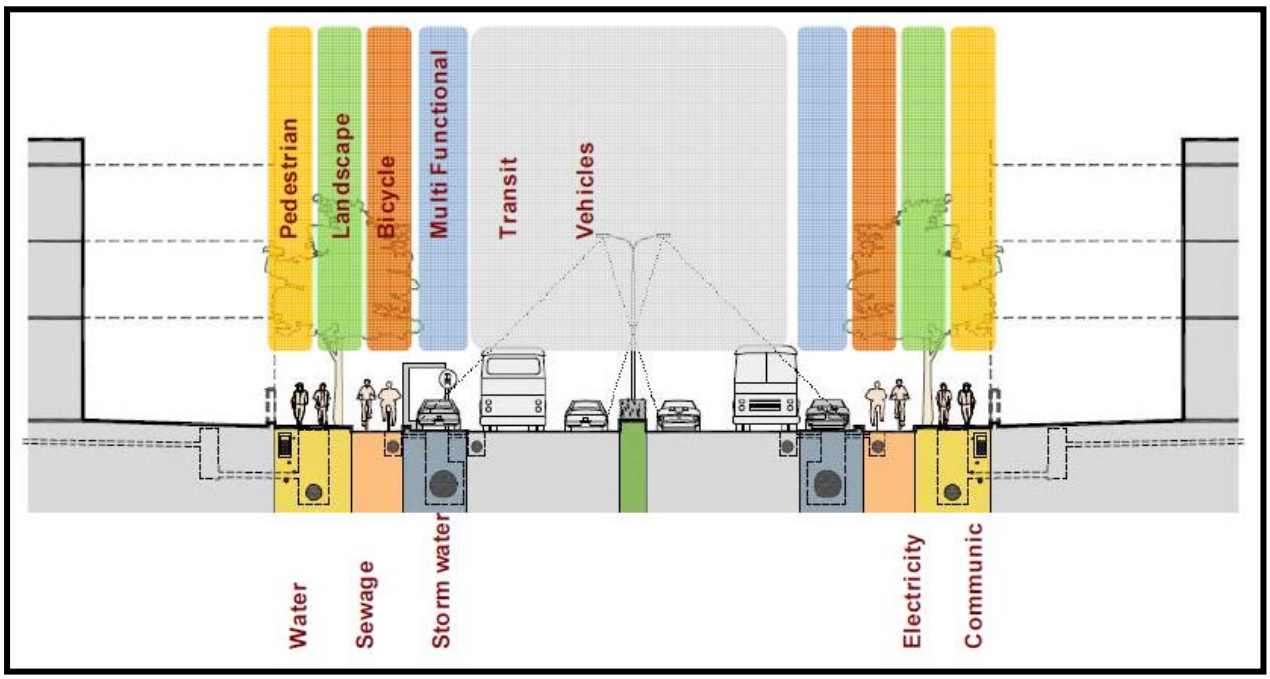
4.4 PROPOSAL 2: COMPLETE STREETS

Too often our streets are congested because they are incomplete and unorganized. Lack of sidewalks forces people to walk on road. Lack of well-designed on-street parking causes people to park on road. Frequent construction works degenerate the quality of streets, contribute to congestion and increase driving stress.

In order to improve the existing congested streets of city all streets need to be developed as **Complete Streets that enable safe and comfortable travel for users of all modes including walking, cycling and public transport; and for people of all ages and abilities.** Complete Streets provide dedicated space for all activities or zones like pedestrian movement, cycle tracks, parking space, commercial and informal activities, plantation and landscape, street furniture and lighting and also regulates traffic flow. Complete streets also integrate utilities

and infrastructure in the design to allow for seamless construction and ease of maintenance.

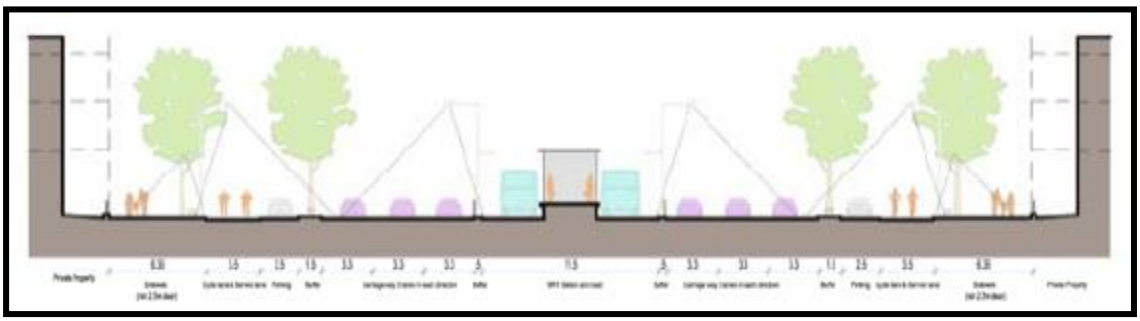
FIGURE 10: SECTIONAL DIAGRAM OF A COMPLETE STREET



[A] Major Arterials:

They are some of the most important roads within the city's network. Typically they run for longer distances, connecting different parts and different areas of the city, and connecting the city's network with intercity network of highways or expressways. Typically roads with ROW widths above 30 m are identified as Major Arterials. They accommodate faster moving traffic, public transport routes and significant amount of large to medium scale commercial uses or institutional frontages on both sides. Urban activities on these roads also generate significant pedestrian movement, on-street parking demand for short-term on-street parking, and informal activities such as vending, gathering, displays etc. 150ft Ring Road, Gaurav Path, Raiya Road etc. are some of the examples of Major Arterials within the city.

FIGURE 11: SECTIONAL DIAGRAM OF MAJOR ARTERIAL ROAD



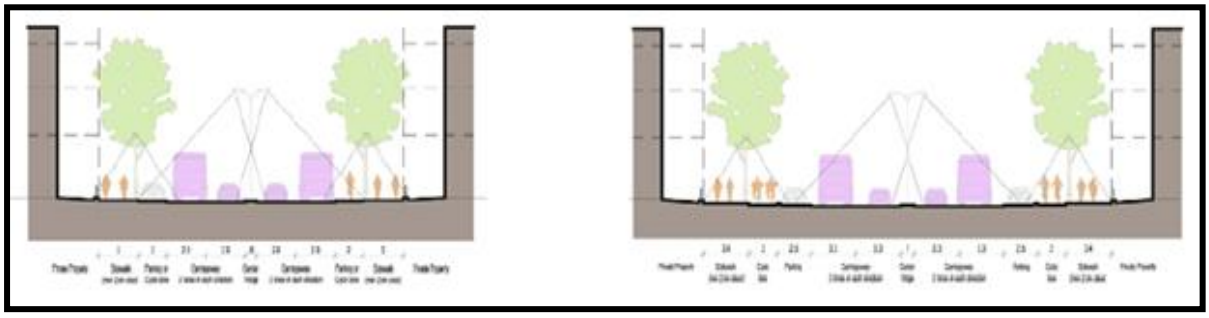
It is crucial for a Major Arterial to be a 'Complete Street' that would not cater to only vehicular traffic, but is also designed to balance the needs of all modes including

Pedestrians, Public Transport, Bicycles etc. Even though a majority of Major Arterials in the city may be well surfaced and divided with medians to take care of vehicular traffic, they still need to be designed as 'Complete Streets' to efficiently accommodate other modes and needs of their urban setting. This includes improvements to have well-surfaced, obstruction free, continuous, well-shaded, walkable footpaths with minimum clear widths, well-designed street sections to accommodate public transit, bicycle, on-street parking, informal activities etc. (Refer the Streets Classification Table (Appendix 3.3.A) that identifies recommended standards for various elements on Major Arterials.)

[B] Minor Arterials:

They generally run for shorter length than major arterials connecting different areas within the same part of the city. They typically connect with major arterial at one or both ends. Minor Arterials are generally flanked by medium scale commercial complexes, shopping centers or higher density residential complexes with shops at street level. Typical ROW width of Minor Arterial would range between 24m to 30m. However ROW width is not the only binding criteria. For example, in some cases a Minor Arterial may be wider than some Major Arterials. However, it may still be of less importance due to its length, placement in the network, urban character etc.

FIGURE 12: SECTIONAL DIAGRAM OF MINOR ARTERIAL ROAD

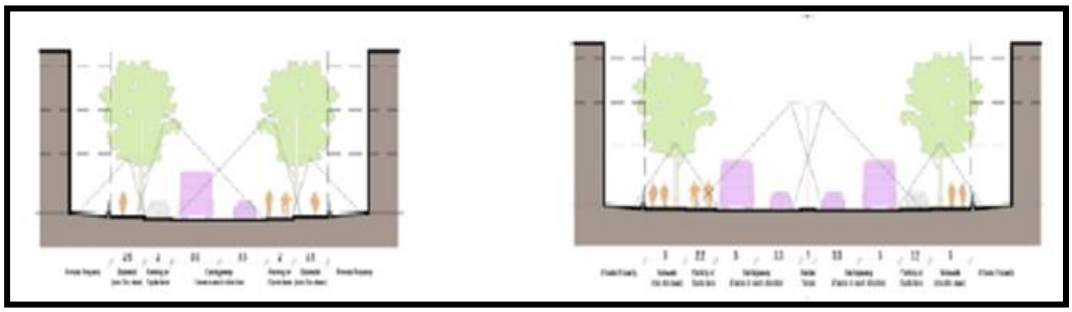


Minor Arterials in the city also face the similar issues as Major Arterials. They need to be designed to include clear walkable sidewalks, well designed spaces for public transit stops, rickshaw stands, on-street parking, informal activities etc. (Refer Street Classification Table Appendix 3.3.A for details on recommended standards)

[C] Major Streets:

They are generally shorter and smaller than Major and Minor Arterials. However, these streets may be some of the most important streets with local retail shops, commercial frontages and vendor activities. Typically they connect local areas, gamtals etc with arterial streets at one or both ends. ROW width for Major Streets generally ranges from 18m to 24m. However, they may be narrower in some parts such as gamtal areas etc.

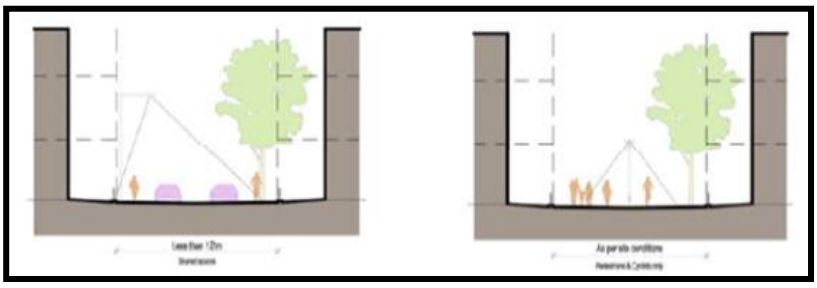
FIGURE 13: SECTIONAL DIAGRAM OF MAJOR STREETS



[D] Minor Streets:

Smaller streets that connect areas within residential neighborhoods, wards and villages are typically identified as Minor Streets. They may range from 9m to 18m in ROW width, generally incorporating maximum two vehicular lanes.

FIGURE 14: SECTIONAL DIAGRAM OF MINOR STREETS



[E] Local Streets:

These are small streets, carrying local, slow moving traffic, serving local neighborhoods. Typically they have many entrances, or small shop fronts opening directly on it. These streets are much more than conduits for vehicles. They have many daily human activities people walking, meeting, road side sitting talking, children playing, local parking etc. Appendix 3.3.A further describes the street hierarchies based on various parameters like destination characteristics, purpose, access characterization, vehicular lanes, lane width, pedestrian sidewalks, bicycle, road side plantations, service lanes and design speed.

Recommended Actions:

Prepare Comprehensive guidelines for Complete Streets. This shall include guidelines for design of all types of streets identified in the Simplified Unified Street Classification System using above identified principles of complete streets.

Also it shall recommend a streamlined process for assigning and implementing the work. Often it is difficult to maintain the quality of our roads due to lack of inter-departmental or inter-agency coordination. For example, often our newly constructed or recently refurbished roads are dug up immediately after construction to improve underground infrastructure, or add elements at ground level or overhead. Also often it is difficult to

locate existing underground utilities for repair or maintenance. This can be avoided if the location and alignments for utilities are identified in the street design itself and implemented along with the road construction process itself. This would allow for a seamless integration, ease of maintenance and would avoid quality degradation due to utility work after construction.

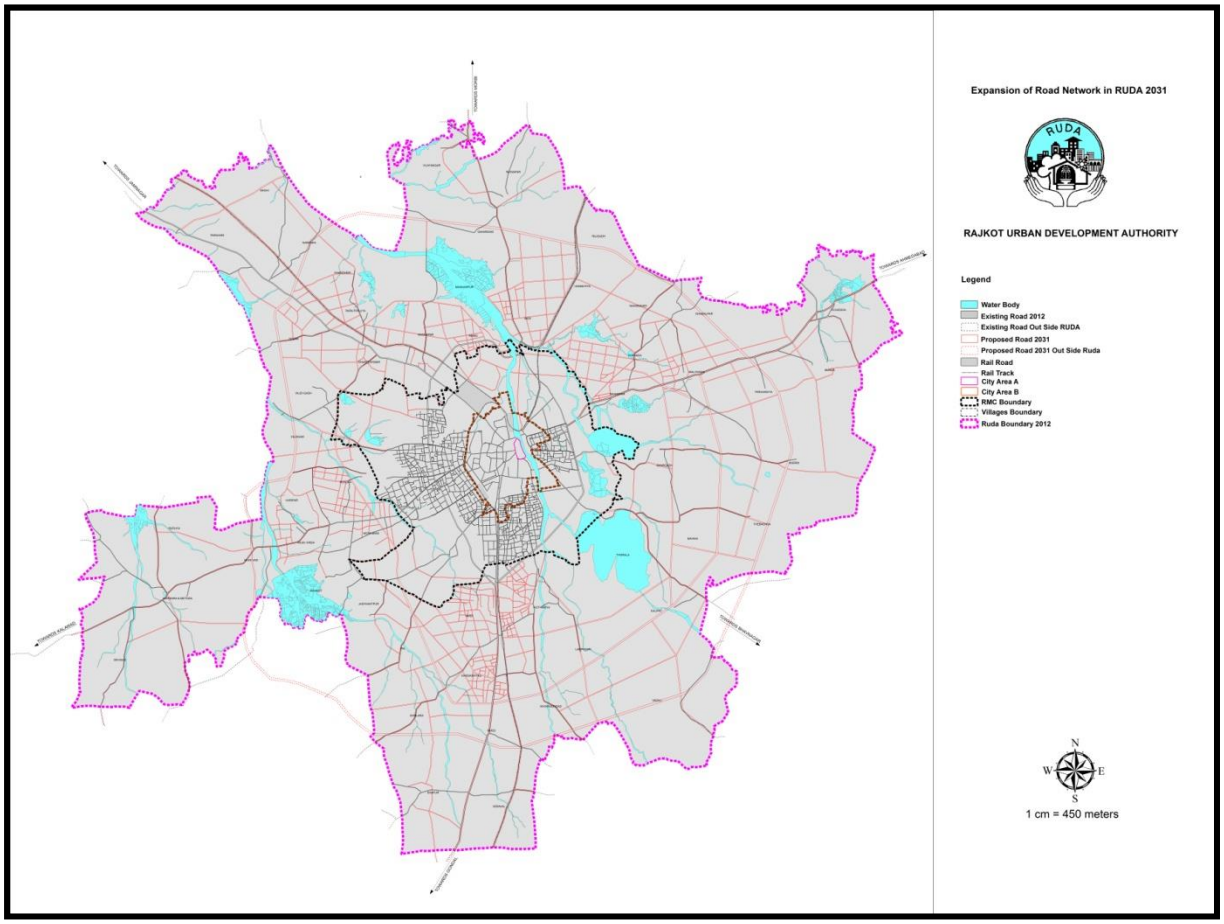
4.5 PROPOSAL 3: EXPANSION OF ROAD NETWORK

As the urban areas redevelop and expand to accommodate future growth, the transportation network will need to be improved or expanded to serve these areas. Planning for such areas, however, must be consistent with the principles of Planning/Development and produce coherent, walkable environment. All new streets must be designed as 'complete streets' to accommodate all modes and all users. And all new developments must be designed with small walkable block sizes, and with parks and social amenities well distributed and accessible within short distance. Within the existing planning framework, this can be done at two levels: [1] Macro level: By identifying area wide framework of important arterials and streets as identified in this development Plan. [2] Micro Level: Through sensitive design and implementation of Town Planning Schemes.

[1] Macro level framework:

Map below identifies the macro level framework of important arterials and streets that shall be designed and implemented as 'Complete Streets'. The proposed network of 146.1 km includes 95.6 km of Major Arterial, 39.6 km of Minor Arterials, 5.8 km of major streets and 5.1 km minor and other streets. The network follows Ring and Radial pattern which allows for the expansion of urban area in a contiguous and compact manner. It also provides easy connections in both directions, with radials connecting with city's central areas and rings connecting with the surrounding suburban areas. Some of these radials extend to connect with the Growth Centers. Achieving compact city form however, does not only depend on the right framework of transportation, but it must be supported by appropriate zoning framework that helps concentrate densities closer to the existing urban areas and along desirable corridors.

FIGURE 15: EXPANSION OF ROAD NETWORK IN RUDA AREA



Generally growth follows infrastructure. Anticipation and land speculations along proposed network may artificially trigger developments in far-flung areas without sufficient infrastructure, resulting into high traffic volumes on insufficient rural network, increased congestion, longer travel times and reduced quality of personal and social life. Therefore it is important to build the infrastructure at right time in phased manner and also to expand the zoned area in phased manner at appropriate time.

[2] Micro level network:

The micro level planning for the new development areas is to be carried out during preparation of Town Planning Schemes. For new developments to be sustainable, livable and walkable all new Town Planning Scheme layouts must be designed well to have integrated network of complete streets. It must keep the block sizes small. Parks, gardens and social amenities must be well distributed and located within easy walk distance from the residents. This will require a deeper understanding of sustainable site planning, land use transportation coordination and urban design while preparing Town Planning Schemes.

Recommended Actions:

Prepare Comprehensive guidelines for preparing Town Planning Schemes. This would help bring consistency and coherence in preparation of TP Scheme layouts and make them more

sustainable, livable and walkable. It would include guidelines for preparing layout to work with the existing natural topography and drainage systems, guidelines for laying out streets and blocks to make the development more walkable and for improved connectivity with public amenities. It would also include guidelines for implementation sequence in order to develop high quality streets, infrastructure and urban environment.

4.6 PROPOSAL 4: NETWORK IMPROVEMENT

In urban context, a network with multiple smaller streets providing alternative routes and distributing traffic is more efficient and desirable than a network with a few larger roads funneling large volumes of traffic. The latter has higher chances of creating bottlenecks and chokepoints in the network. Releasing congestion pressure on network requires strategic insertion of new connection and strategic improvements on selected locations, including widening of selected alternative routes, strategic improvements of certain intersections, installing Intelligent Transportation Systems (ITS) etc.

It is important to carry out a detailed study of existing travel patterns by various modes on the network, and travel demand analysis to understand where to make such improvements. Some of the major improvements proposed to improve the network throughout the city and increase its capacity are as below.

[A] Connecting missing links:

In order to release congestion pressure from the network, to improve connectivity and to enhance walkability a set of new or improved linkages and/or improved intersection design are required, Below is the map showing some of the links and intersections for potential improvements. A more detailed assessment and study is recommended to verify them and identify more such links and intersections for improvements.

[B] Flyovers, Rail over bridges and Underpasses:

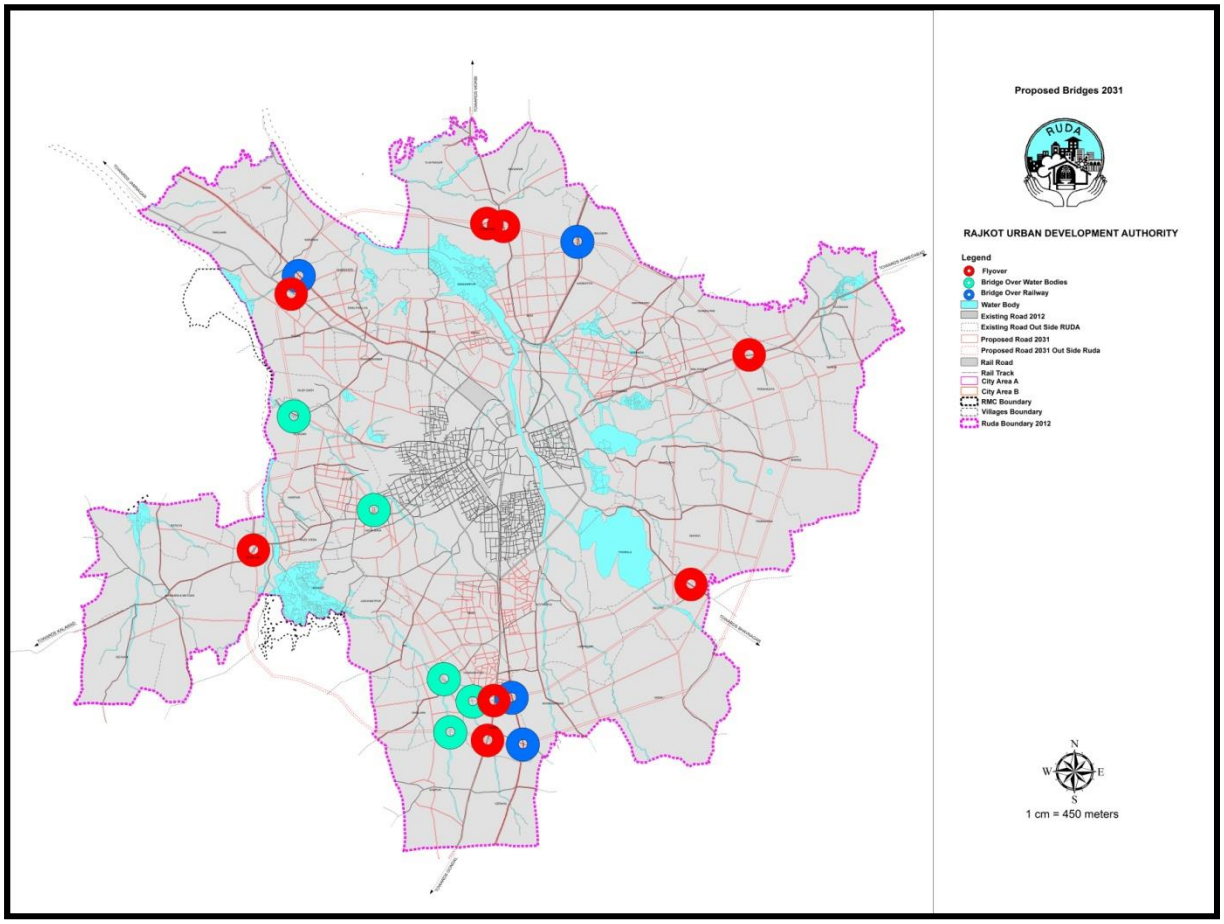
Features such as bridges, flyovers and underpasses are important to ensure connectivity of major arterials and to reduce congestion in the network.

TABLE 3: NUMBER OF PROPOSED BRIDGES IN RMC AND RUDA

No.	Type	RMC	RUDA	Total
1	Bridge over River	1	4	5
2	Bridge over Canal	0	0	0
3	Flyover	0	8	8
4	Rail over Bridge	0	4	4
5	Rail Underpass	0	0	0
6	**Total**	**1**	**16**	**17**

Below is the map identifying locations of the proposed Bridge over river, Bridge over canal, Flyover, Rail over bridge and Rail Underpass.

FIGURE 16: PROPOSED BRIDGES



Flyovers and underpasses are important to reduce congestion. They may end up dividing the neighbourhoods and impacting commercial viability of existing business on the street sides. Therefore, it is crucial to design the flyovers in a way that allows cross connectivity for pedestrians at street level and causing minimum impact on the adjoining properties.

4.7 PROPOSAL 5: PEDESTRIAN NETWORK

Every trip first begins on feet and ends on feet. Walking is the first and the worst natural mode of transport for us as human beings. Everyone is a pedestrian for part of their trip even if they are driving or using public transport. Walking is also the most energy efficient, healthy and sustainable mode of transport. Therefore, allowing and encouraging walking must be the first priority while planning our cities transport infrastructure and building our streets.

It is essential for all city streets to have walkable sidewalks and to have pedestrian friendly environment. Thus, it is very essential to develop street sections which would consider

adequate facilities for the pedestrian along with building regulations that also prioritizes access and egress of pedestrians. Below are some of the major elements our streets need to incorporate to develop / create pedestrian friendly environment.

- Continuous, obstruction free, well paved walking surfaces of along both sides of the streets.
- Clear 2 m sidewalk
- Tree covered well streetscape with well designed street furniture and other elements.
- Clearly defined, safe pedestrian crossing at intersections and appropriate locations.
- Active street frontages to create safe environment
- Small block sizes to allow better pedestrian connectivity in perpendicular direction with surrounding neighbourhoods.

In order to create a pedestrian friendly city with walkable streets and neighbourhoods, these elements must be incorporated in design of all urban roads to be constructed in future. Developing the city's network as a network of Complete Streets as identified in proposals 1 & 2.

4.8 PROPOSAL 6: BICYCLE NETWORK

Cycling is the second most efficient, healthy and sustainable mode to travel for short to moderate distances up to 5km. Currently, this mode is being used by a very limited user group within the city. The only user group using this mode on daily basis are primarily school going children and industrial workers. Multiple factors are responsible for such low usage of this mode which includes mismatch between where these lanes are required versus where they are provided. For example, such lanes would be very desirable for safe routes to schools, educational institutes, parks and employment centers with concentration of low income group workers, transit stations, etc.

FIGURE 17: EXISTING BICYCLE LANE

Thus it is essential to connect public transit node, industrial areas, educational institutions and parks and open spaces with the continuous and efficient bicycle network. Hence, it is recommended to prepare **'Bicycle network plan'** that suggests the potential streets to be developed with bicycle track facilities. The plan shall identify appropriate types of bicycle lanes on various street types. The bicycle network shall comprise all types of bicycle lanes such as

- Dedicated Bicycle Lanes
- Demarcated Bicycle Lanes
- Shared Bicycle Lanes

The plan shall identify guidelines and standards for designing these lanes and facilities. Also it will identify important locations for various bicycle facilities such as bicycle parking at transit stations, parks and gardens, major shopping centers, major public institutions, education institutions.

4.9 PROPOSAL 7: SAFE ROUTES TO SCHOOLS

As the number of fast moving motorized vehicles are increasing in the city it has become increasingly unsafe for school going children to travel on their own. Therefore, it is important to identify major schools and improve the routes leading to them so that children can safely walk or cycle to school. A plan for **'Safe Routes to schools'** shall be prepared and it shall be recommended to integrated with the Complete Streets Plan and the Bicycle Network Plan.

4.10 PROPOSAL 8: PARKING MANAGEMENT

Parking is an essential and integral component of the urban transport system. Rapid growth in vehicle ownership and use of vehicles have led to increased demand for parking for both, on-street parking as well as off-street parking. This combined with lack of organized parking system and enforcement mechanism leads to chaotic parking on the city roads. Vehicles parked in unorganized manner on city streets hinder vehicular movement and encroach on pedestrian spaces, forcing people to walk on vehicular right of way, putting them in direct conflict, increasing traffic congestion, bottlenecks and unsafe conditions on city roads.

A more comprehensive solution is required to be able to improve such situation on city streets. A major part of solution lies in [1] managing on-street parking through implementation of a comprehensive parking management system and [2] managing off-street parking through implementing travel demand measures and through specific parking provisions in GDCR.

[1] Managing on-street parking through Parking Zones:

On-street parking is a crucial element of urban streets. Convenient on-street parking on commercial streets helps attract customers and boosts commercial viability of businesses.

Similarly, on-street parking on residential streets allow convenient additional parking for residents. However, unless the on-street parking is organized and enforced well, it spills over vehicular and pedestrian right-of-way causing congestion and inconvenience to all. Currently in Rajkot the streets do not have any system or provision for on-street parking. However, this is not functioning as expected as many customers try to evade parking fees by parking on vehicular ROW or on the adjacent residential streets. Such conditions can be avoided only if a comprehensive **parking management plan** is worked out and a **parking zone system** is implemented. Below is a brief description of what would such parking management plan include.

Parking Management Plan:

This plan would identify various Parking Zones across the city as necessary. The parking zones may be identified around major parking generators such as prime commercial streets, local business districts, transit station areas, informal market areas, and would typically include streets of surrounding residential areas that are likely impacted by spill-over parking and related issues.

FIGURE 18: EXISTING ON STREET PARKING

Within each parking zone the plan would identify two types of streets considering the type of street frontage and land uses: (1) Commercial Streets with retail storefronts and uses (2) Streets with residential frontage and uses.

The commercial streets identified on the parking zone map shall be improved to implement a pay-and-park system, that would allow customers to conveniently and safely park their vehicles and pay the required fees for parking. The parking fees may vary based on the demand depending on location of the zone and time etc.

The residential streets identified on the parking zone map shall be improved to implement a Residential Parking Permit system, where the residents living in the parking zone will be eligible to buy an annual parking permit, which will enable them to park on the residential streets of their zone. Only the vehicles displaying appropriate Parking Zone Permit will be allowed to park on the residential streets of the zone.

Each zone shall be managed by a parking management agency, appointed by the authority (RMC or **RUDA**) who will be allowed to take the parking fees, as well as will be responsible for keeping the streets free of any illegally parked vehicles, by means of charging fine or towing as necessary. The primary objective of Parking Management Plan is to develop and implement a self-sustaining mechanism:

- To organize on-street parking
- To enable enforcement
- To manage spill-over effect on adjacent streets
- To generate revenue to pay for the cost of implementing the system

In addition to identifying various parking zones, Parking Management Plan may also include detailed design for a pilot project, guidelines and standards for parking spaces, signage, parking lanes etc.

[2] Managing Off-Street Parking:

Off street parking can be classified in 2 categories.

- Off-street public parking and
- Off-street private parking.

Off street public parking includes public parking plots and multilevel parking structures. These must be strategically located

- Near public transit stations to incentivize commuters to park their vehicles and use public transit.
- At significant destinations with high demand

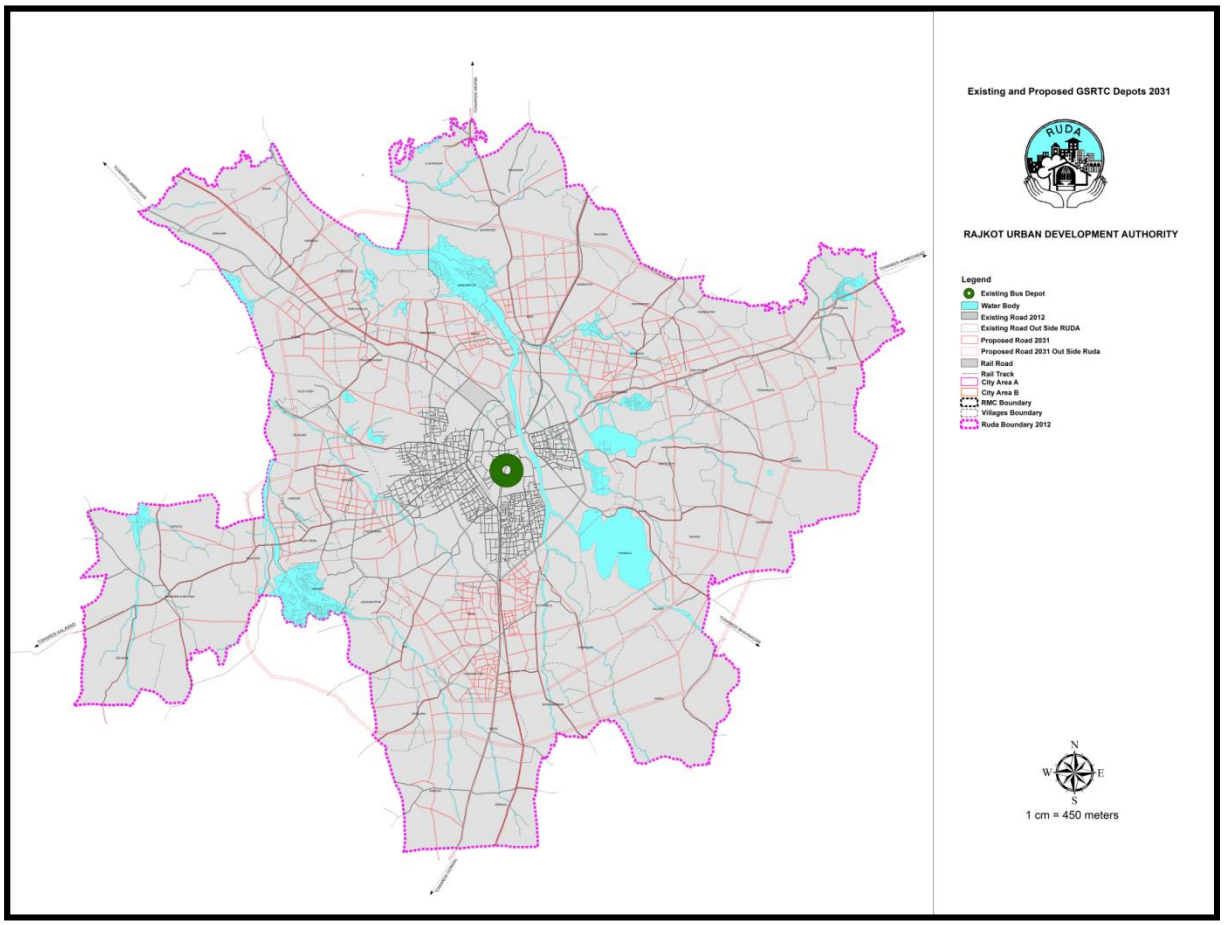
Public parking must be on chargeable basis and the parking fees must be carefully determined. Also, Parking Management Plan should identify appropriate location and recommend guidelines for identification of such locations and parking fee structures.

Off street private parking includes parking provided on individually owned plots with commercial, residential, etc. uses. Parking requirements for these plots are identified in GDCR.

4.11 PROPOSAL 9: DECENTRALIZATION OF GSTRC DEPOTS

The GSRTC buses provide a major connectivity between Rajkot and other destinations of the state. In existing scenario, all GSRTC traffic is forced to connect with the central depot at Dhebar Road near RMC office. As a result it attracts commuters within the city and again travels through the city center to reach its destination. This centralized location causes traffic congestion, parking issues and number of problems within the city.

FIGURE 19: EXISTING AND PROPOSED GSRTC DEPOTS



4.12 RECOMMENDED ACTIONS FOR IMPLEMENTATION

In order to improve cities traffic and transportation scenario in the future, following actions need to be taken under the major proposals identified in this chapter.

- Designation of all existing streets under Simplified and unified street classification system
- Prepare comprehensive set of guidelines for designing and implementing a complete street cross section
- Prioritization and phasing of streets for development as per complete street guidelines
- Expansion of road network with the help of Town Planning Scheme mechanism following new classification guidelines
- Identification and reconnection of missing links for the efficient traffic flow
- Smart and efficient solutions to be derived for the congested intersections
- Comprehensive pedestrian network plan to be prepared to identify potential pedestrian only zones and also develop an guidelines for over all safe and comfortable facilities to walk

- A Comprehensive Bicycle Network Plan should be prepared to connect industrial, institutional, residential and commercial activities spread all over the city.
- Congested commercial corridors and transit nodes to be identified to prepare a detail parking management plan for each.
- Develop off street parking lots with public private partnership.
- Logistic park to be developed for the ease of freight Transit
- Designation of transit nodes for the provision of required respective facilities around
- A comprehensive city level signage and way finding plan should be prepared and implemented
- Comprehensive Freight Management Plan to be prepared

SECTION 5: HOUSING

5.1 INTRODUCTION

As the city continues to grow, there is an increasing demand of affordable housing to cater to the growing needs of lower and middle income groups. A set of proposals and recommendations have been identified in this section to cater to the housing needs and make provisions for housing units that can be afforded by the EWS, LIG and MIG segment.

5.2 CONSIDERATIONS TO ARRIVE AT PROPOSALS

Following are some of the major considerations that are taken into account while deriving and formulating proposals included for housing in RUDA area.

- Provide sufficient housing stock to fulfill existing demand
- Ensure creation of adequate housing stock for the future population growth
- Ensure sufficient supply of housing affordable for Economically Weaker Sections as well as Lower and Middle income groups (LIG and MIG)
- Provide night shelters and facilities for pavement dwellers, homeless and migrants
- Improving living conditions in slums through up-gradation of service and redevelopment of slums

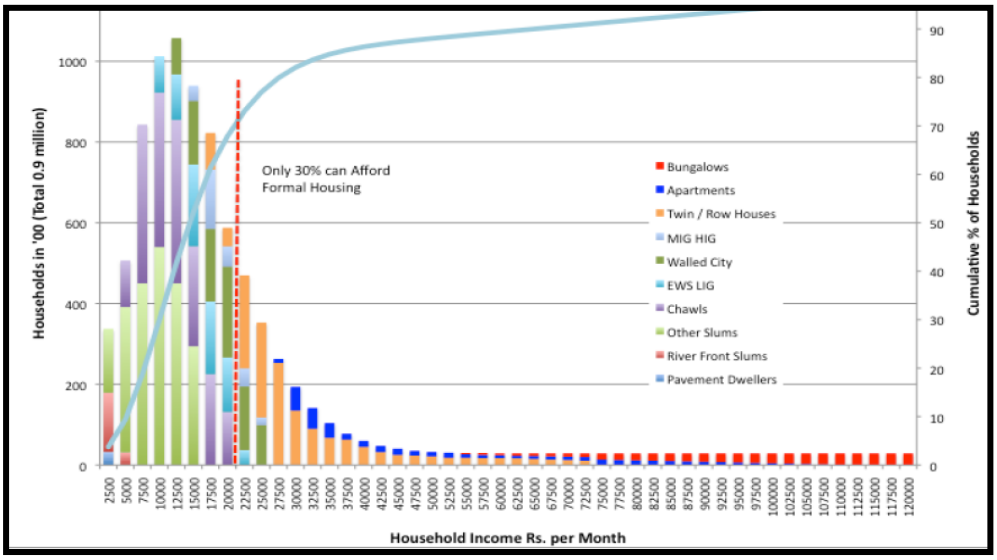
Assessing Future Demand and Existing Supply:

Estimating demand for housing is crucial to estimate the number of units to be constructed and amount of land required in the coming decades. Based on the population, Households and Slums about 79,288 dwelling units are required today and based on the population projection more than 3.5 lakhs dwelling units will be required just to accommodate the additional population by 2031. This is in addition to the housing required to cater to the demand for upgrading the living conditions of the Economically Weaker Sections, LIG and MIG.

Moreover, as per the housing demand assessment, there is a considerable high demand for EWS and LIG segment compared to the MIG and HIG segment as per the Housing survey conducted by RUDA. Therefore, housing demand for 1 BHK and 1 room kitchen housing units needs to be catered.

The graph shows that housing supply is available for the upper middle income and higher income groups. Moreover, there is a surplus of housing units in these sections of the society, but in the Economically Weaker Sections' group, Lower income groups and the lower middle income groups, the housing supply does not meet the requirement.

FIGURE 20: ALLOCATION OF HOUSEHOLDS TO HOUSING STOCK



Based on the considerations and studying the demand assessment for housing in the city, a set of proposals and recommendations have been formulated for the next decades in order to cater the housing needs for right price/target segment of the society.

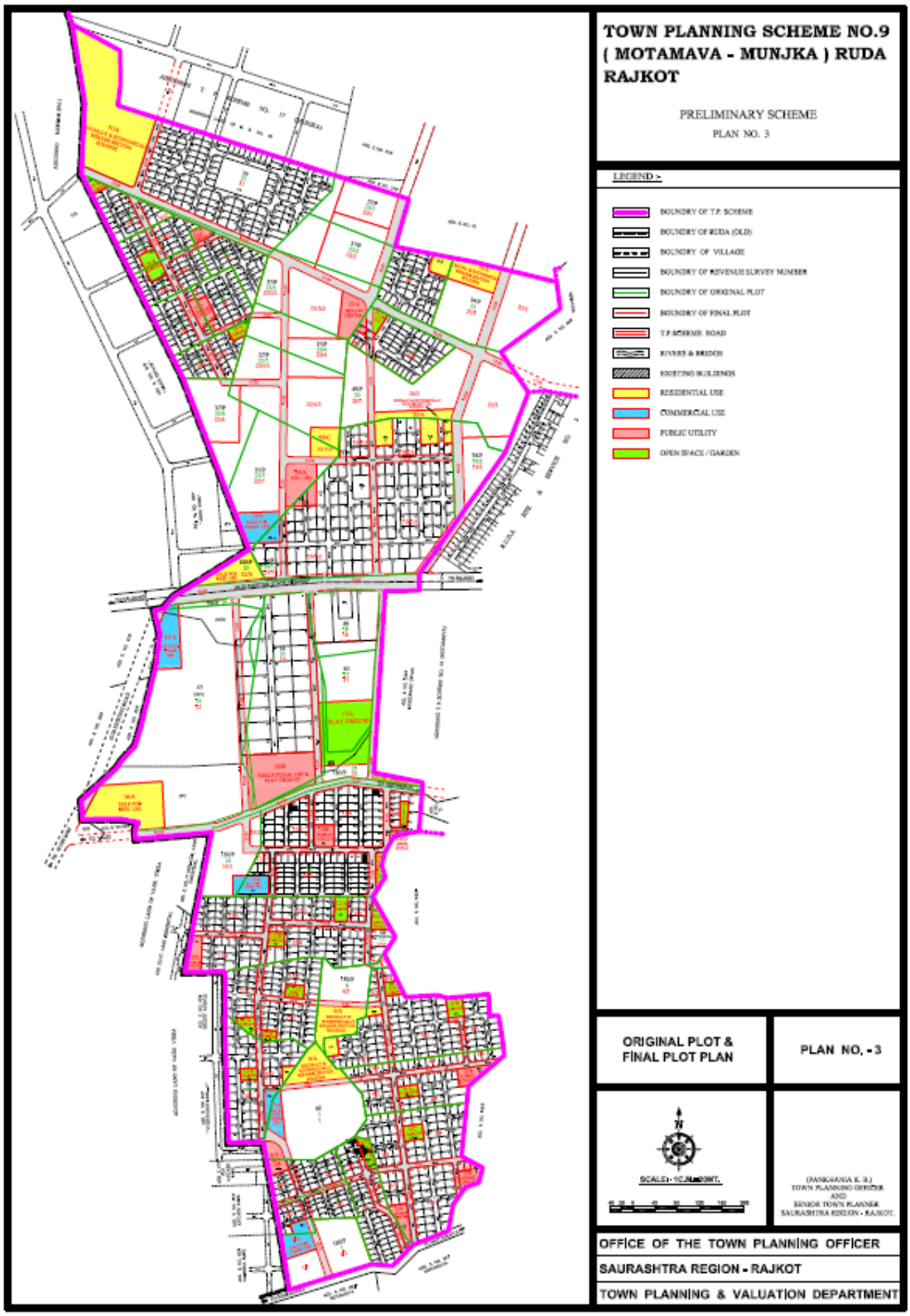
PROPOSALS AND RECOMMENDATIONS

5.3 PROPOSAL 1: PROVISION OF EWS HOUSING BY AUTHORITY

Cost of land is one of the largest components impacting the affordability of housing. Therefore, availability of inexpensive urban serviced land is crucial for the Authority to be able to increase the supply of housing units for EWS.

Typically, TP scheme mechanism is an effective way through which land parcels are made available for EWS housing. Currently, around 91,032 SqM of land is allotted for EWS housing in RUDA, whereas around 81.93 Ha land is available in RMC.

FIGURE 21: LAND RESERVED FOR EWS HOUSING IN A TPS

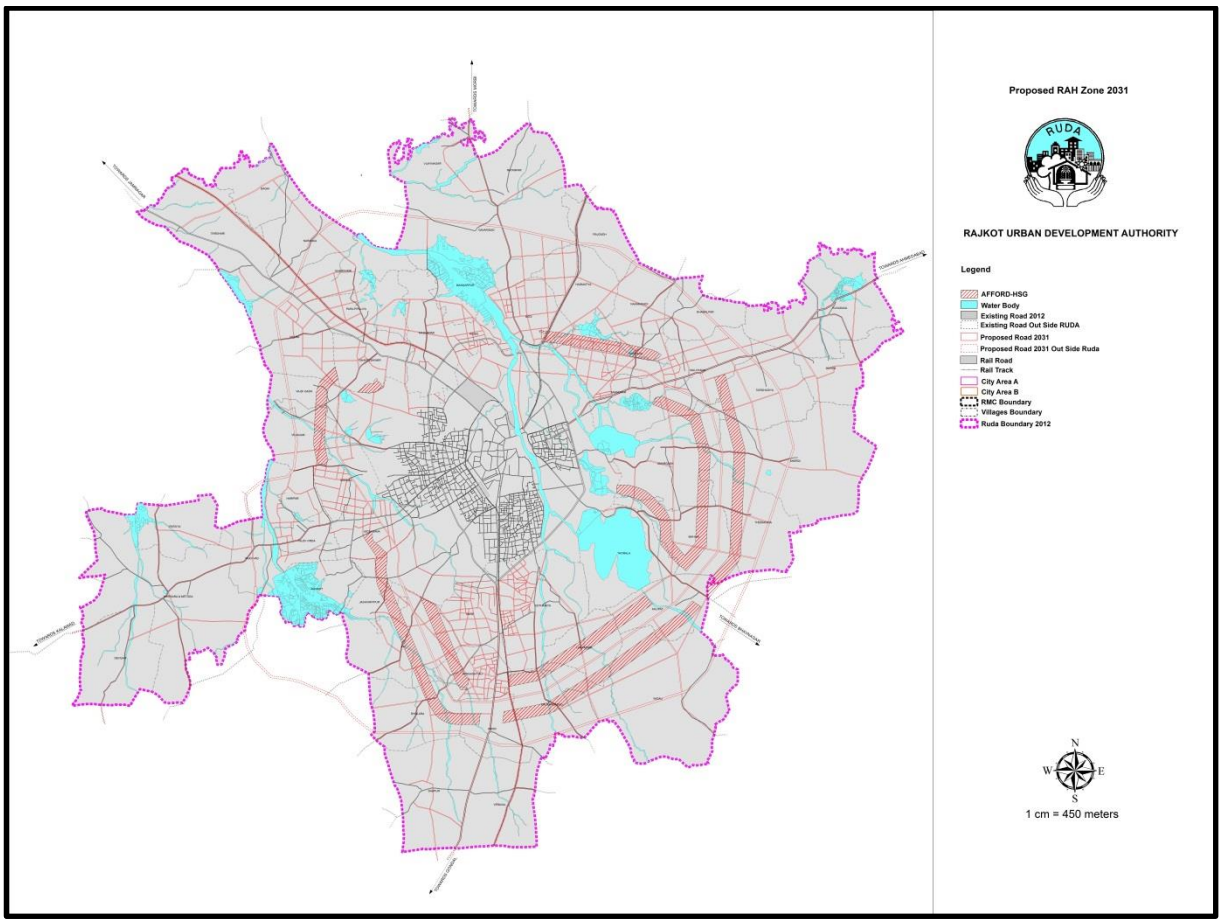


Sample map of T.P.S. – 9 - Rajkot

5.4 PROPOSAL 2: INCREASING SUPPLY OF AFFORDABLE HOUSING THROUGH RAH ZONE

In order to enhance the supply of land for affordable housing, a new dedicated zone RAH of 500 mt. width has been proposed on either sides of the 2nd Ring Road, Beyond TOZ. This accounts for 28.40 sq. km of area and shall accommodate about 3 lakh affordable housing units. This overlay zone shall be applicable only for development of affordable housing with unit upto 45 Sq. Mt. Carpet area, as suggested in RAH policy of Govt. of Gujarat. The base FSI for affordable housing in this zone shall be 1.8 with chargeable FSI of 0.9 at reduced rates as specified in GDCR. For all other developments, the FSI shall be permissible as per the provision of the Residential zone as identified in GDCR. This incentive shall be available subject to the construction of affordable housing units by the developer within two years from the date of the GDCR coming into force.

FIGURE 22: PROPOSED RAH ZONE



5.5 PROPOSAL 3: ENCOURAGING AFFORDABLE HOUSING THROUGH REGULATIONS

Currently, there is a lack of supply of housing units for the MIG and LIG segment due to the high development cost imposed by requirements in the previous development regulations.

Considering this, the development regulations have been revised with appropriate modifications which include

- No ground coverage criteria after leaving required margins and common plot
- Parking requirement of affordable units has been relaxed and shall be 10% of utilizable FSI
- Additional FSI which is chargeable shall be available at reduced rates i.e.
    - For housing unit size upto 50 sq.m – 10% of Jantri rates
    - For housing units above 50 sq.m - 66 sq.m – 20% of Jantri rates
- Common open plot shall be provided as 10% of the total plot area. However, if common plot is provided at one place in one contiguous piece then the requirement shall be only 8%.

5.6 RECOMMENDATIONS

Recommendation 1: Improving shelter for homeless through night shelters

In order to improve provision for shelter for homeless, night shelters shall be provided by utilization of bridges/flyovers' under spaces or other such mechanisms such as public schools.

Recommendation 2: Improving existing stock of Low income housing

[A] Slum Upgradation:

Slum networking has been successful in RMC area where slums occupy 49,93,713 Sq.Mt. land area. Since provision of additional unit space is a challenge in these cases; therefore, upgradation of basic services needs to be provided for better and hygienic living environment. It is recommended to encourage and implement the upgradation and improvement of the city slums in line with the policy of Regulation for Rehabilitation and Redevelopment of Slums 2011.

[B] Improving other informal housing:

Apart from the slum locations identified by RMC under the Slum definition, the rest of the slums and other informal settlements should be identified and also be considered for upgradation and provision of basic services, infrastructure etc.

Recommendation 3: Public land inventory study

There is a need to carry out Public land inventory study so as to estimate the amount of land available with the authority and estimate the amount of underutilized and vacant public land. This study will help identify land that can be potentially available for affordable housing and other public amenities.

5.7 RECOMMENDED ACTIONS FOR IMPLEMENTATION

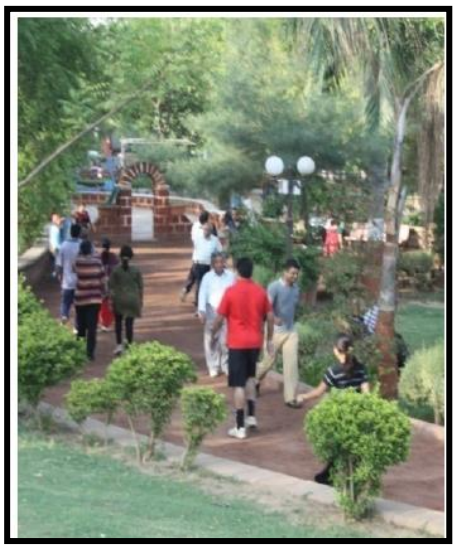
- Improve shelter for homeless through night shelters
- Carry out Housing Demand and Supply Assessment Study
- Prepare Comprehensive slum networking, redevelopment and rehabilitation plan for RMC and RUDA areas
- Carry out Public land inventory and study

SECTION 6: GREEN NETWORK

6.1 INTRODUCTION

Green network includes parks, green streets, waterfronts and urban groves. Green open spaces such as parks and gardens play indispensable role in maintaining the physical environment and social character of the neighborhoods in the city. They serve as community forums for social interactions, for children to play, for people to entertain and exercise, etc. Green cover along the city streets also make the streets more walkable and make the city environment more pleasant and helps reduce heat island effect.

FIGURE 23: PRAHLADNAGAR GARDEN JOGGING TRACK



With increase in population, the need for a variety of parks and open spaces is constantly increasing. The proposals in this section are focused on developing a vibrant livable city that has variety of parks, gardens, public open spaces and green streets for its residents providing a healthy and high quality environment.

6.2 CONSIDERATIONS

Currently, we have about 4% of the area identified as parks and gardens in RUDA area. Therefore, there is a need to increase amount of parks and gardens to align with UDPFI guidelines to sufficiently serve the existing population. Below are a set of major considerations for the subsequent proposals included in this chapter.

- Transform the city character by increasing the green cover across various parts in the city.
- Develop parks and gardens to serve at neighborhood level and city level and regional level.

- Distribute parks and gardens within ten minutes of walking distance to all the residents.
- Create a well connected network of contiguous green spaces which includes parks, gardens, plazas, groves, green streets and green boulevards.
- Develop green streets as attractive streetscapes to serve as community connections linking schools, parks, open spaces, offices through improved pedestrian and bicycle connectivity.

Understanding the considerations and the existing level of parks and open spaces in RUDA, a set of proposals and recommendations have been planned to provide adequate recreational spaces catering the needs of the neighborhoods in the city.

PROPOSALS AND RECOMMENDATIONS

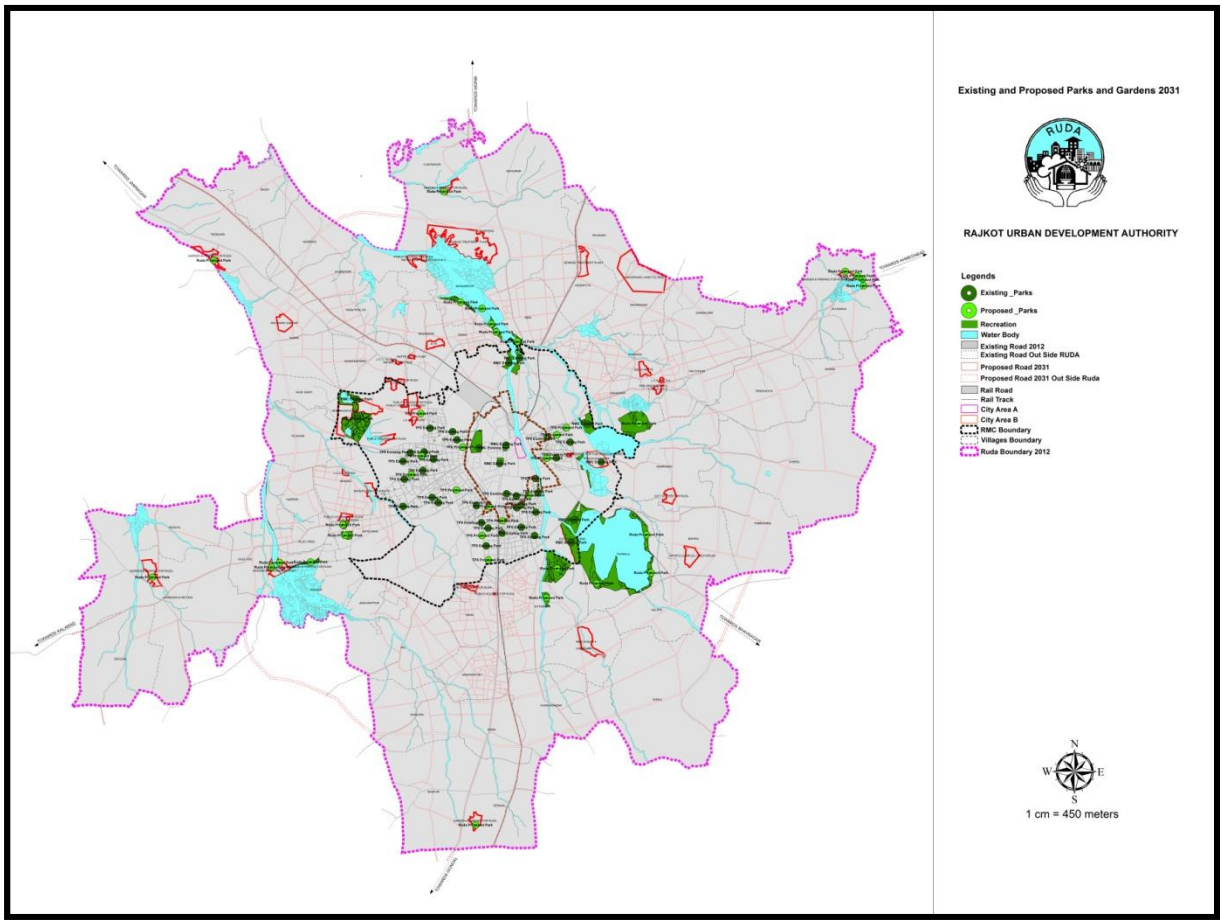
6.3 PROPOSAL 1: NEW PARKS AND GARDENS

Implementation of the Second Revised Draft Development Plan 2031 will propose around 1079 SqM of recreation spaces with in RUDA area in various categories. These categories are defined based on the size of parks, their characteristics and their catchment area. It is important for these amenities to be distributed evenly to ensure that almost every household has easy access to a park/garden.

TABLE 4: CATEGORIES OF PARKS WITH STANDARDS

No.	Category	Area (Hectares)	Pedestrian access	Catchment
01	Neighbourhood parks	0 – 0.4	400 m	Up to 5 min walk
02	Community parks	0.4 – 2.0	800 m	Up to 10 min walk
03	City parks	2.0 – 80.0	800 m	Up to 10 min drive
04	Regional parks	More Than 80.0	-	Up to 1 hour drive

FIGURE 24: EXISTING AND PROPOSED PARKS AND GARDENS



For the newly developing areas the allocation of land parcels for parks and open spaces are majorly implemented through the Town Planning Scheme Mechanism.

Recommended Action:

New parks and gardens can be developed within the developed area through Network Road Planning. These plans will assess existing conditions and identify improvements related to community spaces, development or upgradation of parks and open spaces etc. In case of large scale improvements, TP scheme may be modified. Refer Appendix 3.2.A for further guidelines on Network Road Planning and its implementation.

6.4 PROPOSAL 2: GREEN STREET NETWORK

Green shaded streets create attractive streetscapes that increase walkability, increase green cover, reduce direct heating of paved surfaces and reduce heat island effect. The purpose of Green Street is to

- Enhance pedestrian circulation and create open space opportunities in medium to high density residential areas lacking adequate public open space.

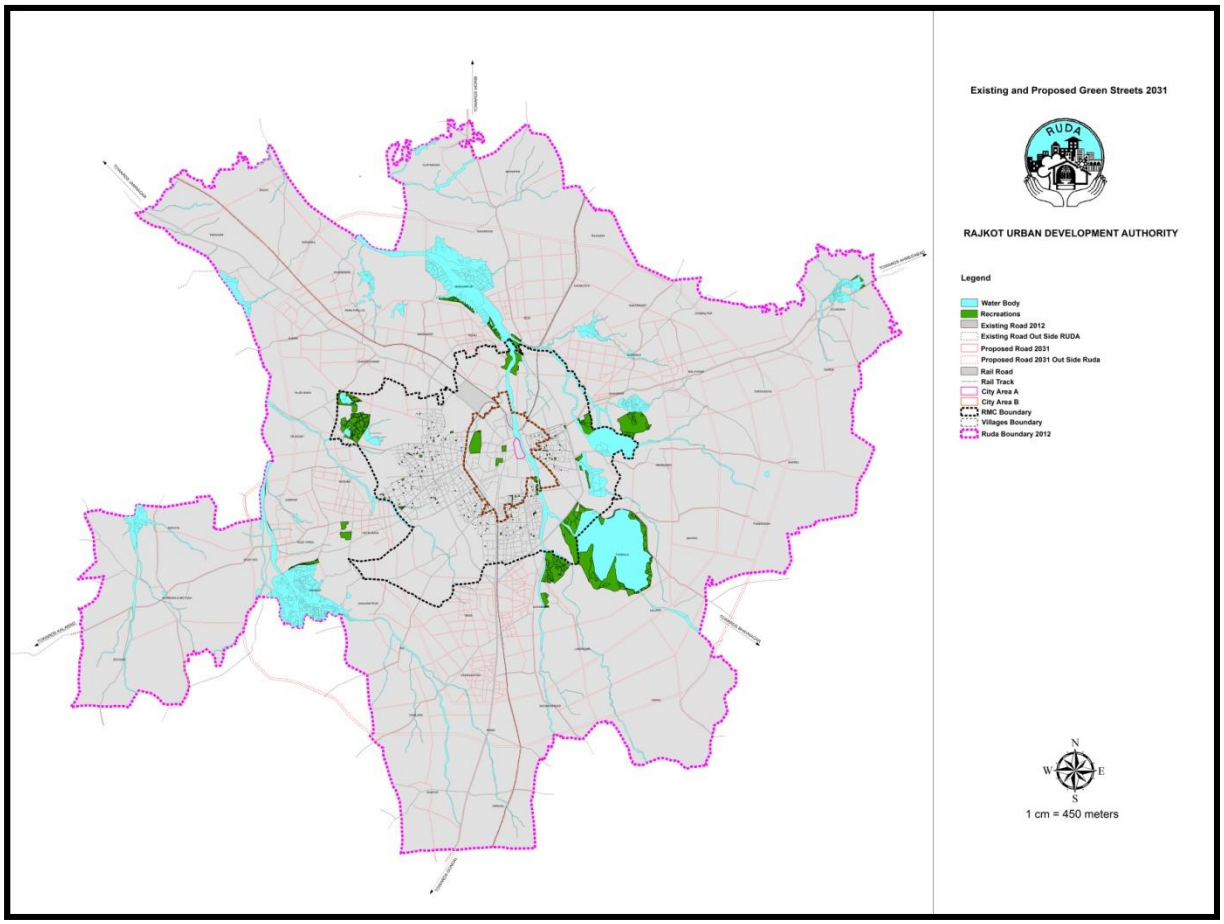
- Create a vibrant pedestrian environment in the street right-of-way that attracts pedestrians.
- Support economic activity by creating an attractive and welcoming "front door" for pedestrians.
- Strengthen connections between residential enclaves and other amenities by improving the streetscape for pedestrians, bicycles and transit patrons.

FIGURE 25: GREEN SHADED PEDESTRIAN STREET AND LANDSCAPED STREET

Considering the hot and dry climatic context, mixed use development, shorter average trip lengths and high pedestrian volume it is very essential to develop green streets in the city which would encourage people to walk and cycle but in organized way on street ROW. Thus identification of existing green streets and extending them up to important public open spaces and amenities, educational institutes, transportation and recreational nodes in the city should be done to form a complete green network; facilitating safe and pleasant path for the pedestrians to commute.

Currently only a few of streets could be considered as Green streets with continuous streets on both the sides. It is proposed to identify and implement approximately 11.45 sq.km.of additional Green Street network across the city as shown in Map below.

FIGURE 26: EXISTING AND PROPOSED GREEN STREETS



While designing the Green Streets following design principles should be considered:

- Emphasize pedestrians and open space over other street functions.
- Design should complement and enhance adjacent land uses.
- Keep traffic speed and volume low.
- Response to site specific conditions.

Recommended Action:

Detail design of all the identified Green Streets would be the part of the 'Green Streets Plan' that would identify types of green streets and include the details of necessary amenities, street section, contextual requirements, type of trees and landscape and correlation with traffic flow on the street.

FIGURE 27: ENVISIONING GREEN STREET DEVELOPMENT

6.5 PROPOSAL 3: WATERFRONT DEVELOPMENT

RUDA area contains two major rivers, and 12 lakes. Development of waterfront not only preserves the water body but also helps in creation of additional recreational and green space. Waterfront development projects will make the waterfronts accessible to the public with new parks, gardens, plazas and numerous public facilities like cultural centers, museums, sports facilities, open air markets, etc. While developing the waterfronts it is crucial to consider the location and environmental context within which the water body is located. Based on their urban context, the waterfront development can be categorized in three categories.

i) Water bodies in urban context
ii) Water bodies in rural context
iii) Water bodies in natural context

[A] Lake Front Development

Development of Lake Front will help in organizing and managing the development around lakes, control degrading conditions of the natural lakes and act as an economical boost to the local areas. RMC have already initiated to develop a couple of lakes in the past year. i.e. Lalpari lake and Randarda lake. As shown in the image below, the Lake is envisioned to develop with ample amount of recreational spaces in the form of walkways, gardens and

open spaces. Lake front developments would provide access to the water and landscaped parks and gardens creating a lively environment for the people.

Recommended Action:

'Comprehensive Lake Development Plan' needs to be prepared that classifies the lakes based on their contexts and identifies guidelines for their development considering their natural environment and urban setting.

FIGURE 28: ILLUSTRATION: ENVISIONING LAKE DEVELOPMENT

[B] Riverfront Development

The Aji Riverfront Development Project is an environmental improvement, social uplift and urban rejuvenation project that will renew the city. The project will make the riverfront accessible to the public by reclaiming required land from the river bed.

Many new parks, gardens and plazas proposed on the reclaimed land will provide the much needed green space to the city. **The project will add more than 100 Ha of parks, gardens and plazas to the city.** Proposed new parallel streets to the river will augment the city's road network and provide better access to the riverfront. Pedestrian promenade along the complete length of the Riverfront forms a major public open space which allows people to reach close to water and permits water recreational activities. The new Development Plan

has identified the area around Aji Riverfront and twin lake development as a special area development zone to carry out focused development.

6.6 PROPOSAL 4: URBAN GROVES

Urban groves are areas that have substantial natural or planned tree cover, with restrictions on development of any kind. They generally form spaces of passive activities like jogging track rather than active entertainment. Cautious care and management of urban green cover is very essential for improving the urban environment. Urban groves advocate the role of trees as a critical part of the urban infrastructure.

RUDA area has few institutions having green coverage and very less built space, contributing to urban groves in the city. Some of these are Shahid Chandra Shekhar Azad Udyan in Nanamava TP Scheme 5, Nehru Udyan in Rajkot TP Scheme 1, Mahadev Temple Garden etc. Under this Development Plan some of the additional urban groves are proposed in Town Planning schemes of Motamava, Munjaka, Raiya etc.

Recommended Action:

Suitable land near environmental features such as lakes and rivers shall be identified for developing Urban Groves. Such institutions and private owners should be encouraged for increasing and maintaining green cover on their own land. Looking in to the scarce green open space scenario of the city, it is very essential to identify and develop urban groves where ever the land is not suitable for urban development or designated for tree plantation.

6.7 RECOMMENDATIONS

Recommendation 1: Provide plazas and chowks

It is recommended to develop plazas and chowks which shall act as public spaces for community gathering, public interaction etc. where a diverse mix of people can meet or retreat.etc. These spaces can be used for multiple activities in the day and night. Also, bridge under spaces could be utilized for creation of public platforms and community events such as, community meetings, street plays, folk performances, exhibitions, art display etc. Creation of such dynamic and flexible spaces would help convert the presently neglected spaces between flyovers into vibrant community areas.

Recommendation 2: Utilize the underutilized public spaces

It is recommended to identify the underutilized public land or a land that is unsuitable for any kind of development such as geographical undulations and water front to convert it into recreational public open spaces. This will serve dual purposes of maintaining public land and providing public open spaces within the city.

Lack of existing open spaces within the developed areas of the city can be also fulfilled by proposing multi-functional uses on utilized spaces during different time slots of the day. It is recommended to identify time slot based multifunctional open spaces, when they are not utilized for their daily activities such as weekend pedestrianization of commercial streets, utilizing playground of public schools for other community activities like yoga, walk etc. beyond school hours.

Recommendation 3: Increase the green cover in the city

Apart from green streets, there exist additional opportunities to increase the green cover. Some of these are

- Increase number of trees in the city through tree plantation drives along the potential road edges ensuring an adequate space for plantation.
- A standard inventory of trees and plants shall be prepared for selection of trees for pocket parks, gardens, urban groves, road side edges, margins, medians, land under high tension lines, etc.

6.8 RECOMMENDED ACTIONS FOR IMPLEMENTATION

In order to implement the proposals and recommendations to further enhance green network in Rajkot, following actions need to be taken to improve green open space scenario as identified under major proposals in this chapter.

- Categorization of all existing parks and open spaces as a pocket park, neighborhood park, community park, city level park and regional park.
- Inventory of all existing public land for identification of vacant or underutilized parcels.
- Converting those vacant or underutilized public land parcels in to green parks and gardens
- Preparation of 'Green Network Plan' for detail design and implementation of green streets
- Prioritization of potential lakes, Rivers and water bodies stretches for water front development
- Prepare a Comprehensive Lake development Plan for RUDA area
- Prepare Lakefront Development Plans for individual lakes
- Identification of existing and proposed sites for urban groves
- Develop a mechanism for frequent monitoring and periodic maintenance of parks and open spaces
- Standard inventory need to be established for selection of trees at various locations and functions
- Ensure public transport access to all city level and regional parks

SECTION 7: PHYSICAL INFRASTRUCTURE

Provision of high-quality physical infrastructure facilities is necessary to make any city more habitable. Various measures had been taken in the previous development plan for improving the physical infrastructure facilities in Rajkot. However, due to the rapid growth of population within the city and the expansion of developed areas there is a need for constant upgradation and expansion of the physical infrastructure.

Therefore, the current Development Plan introduces several plans, proposals and recommendations taking into consideration the future population growth for improvement in physical infrastructure facilities which include water supply, sewerage system, storm water management and solid waste management.

7.1 WATER SUPPLY

7.1.1 BASIC CONSIDERATIONS –WATER SUPPLY

Below are some major considerations that are useful for various proposals for water supply in RUDA area. Currently, nearly 89 % of households of Rajkot city area is served by water supply network. However, due to increasing population there is constant pressure to upgrade and install the water supply network lines.

- Ensuring water is accessible to all the citizens on a continuous basis
- Assure availability of 226 liters of water per capita per day for domestic as well as for various civic purposes.
- Increase the treatment capacity of the water treatment plants in order to fulfill the need of the population for the coming 20 years.
- Assure availability of a complete water supply network in entire RMC area as currently our water supply network does not cover the full extent of RMC; primarily the newly added areas.
- Considered surface water as the primary source for water supply so as to prevent the usage of ground water resources by the residents.

There is a demand gap of and RUDA area including RMC needs to be provided with water supply network.

TABLE 5: DEMAND ANALYSIS OF WATER SUPPLY

Sr. No.	Particular	2006-2007	2011-12
1	Current Demand	1386.65	2008.72
2	Arrears Demand	3996.83	8313.31
3	**Total Demand**	**5383.48**	**10322.03**
4	Current Collection	580.55	1820.01
5	Arrears Collection	176.57	318.58
6	**Total Collection**	**757.12**	**2138.59**
7	Collection Efficiency (Current)	42%	91%
8	Collection Efficiency (Arrears)	4%	4%
9	**Collection Efficiency (Total)**	**14%**	**21%**

7.1.2 PROPOSALS & RECOMMENDATIONS:

Keeping the principle of provision of efficient and adequate physical infrastructure, proposals and recommendations have been formulated. Through this development plan, an efficient water supply system is proposed to serve Rajkot area adequately.

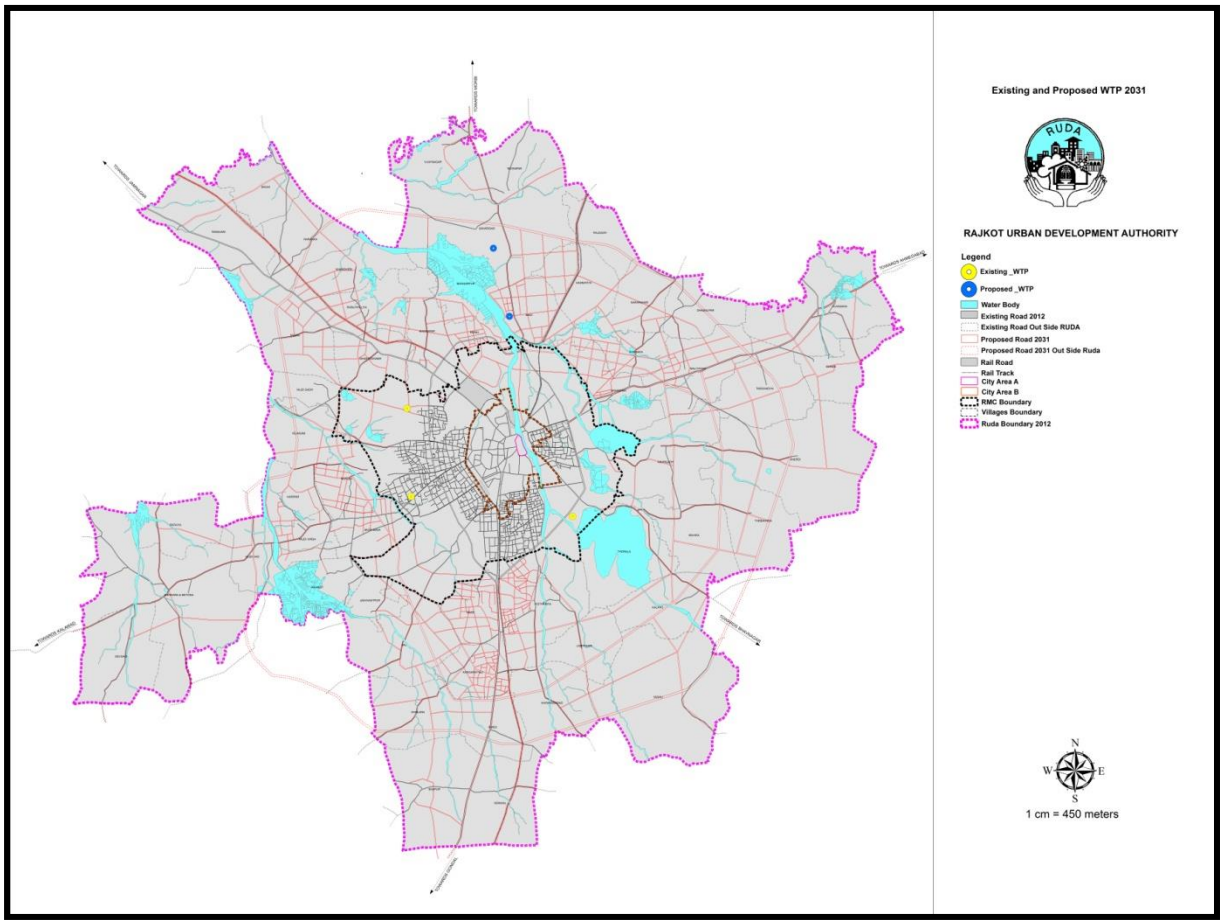
Proposal 1: Upgradation and provision of new water treatment plants (WTPs)

In order to cater to future requirement for RMC and Urbanized area of RUDA, upgradation and provision of WTPs shall be carried out. Currently, the four WTPs are located at Aji, Nyari – I, Raiya and Ghanteshwar.

Upgradation of these treatment plants is proposed to increase the total treatment capacity as per the demand under this development plan, so as to facilitate the present as well as future population of RMC as well as RUDA area with adequate water supply.

In addition, two new Water Treatment Plants are proposed at Aji – II and Gavridad villages having capacity of 100 MLD and 50 MLD respectively to serve the population in the surrounding areas. For the provision of these WTPs.

FIGURE 29: EXISTING AND PROPOSED WATER TREATMENT PLANTS- REQUIREMENTS FOR 2031



Proposal 2: Upgradation and development of new water supply network

Currently approximately 89% area within RMC limit is served by the water supply network. To serve the remaining un-served area it is proposed to expand the water supply network within RMC area. To facilitate existing population within urbanized area of Rajkot and to cater the needs of the future population, additional water supply network lines are proposed to be implemented in urbanized area of Rajkot area. Similarly of new water supply network lines are proposed to be implemented in the growth centres considering current as well as future population.

Other Recommendations:

Other than the above mentioned proposals regarding adequate water supply and complete water supply network, some of the recommendations that can be taken up as projects in the coming years

- Replace the existing decaying consumer connections to avoid problems of leakage, low pressure and contamination.

- Currently, water is being provided only for a few hours in a day. The water supply system may be enhanced to provide 24 hour supply of water and should be regulated by water meters.
- Develop a GIS based management information system to collect and maintain detailed information on every pipeline section and pumping machinery with attributes on age, material, etc.

7.2 SEWERAGE

Currently nearly 70% of area within RMC is covered under sewerage network. The remaining shall be catered through expansion of sewerage network through this Development Plan.

7.2.1 BASIC CONSIDERATIONS– SEWERAGE

Following considerations have been taken into account while formulating the proposals and recommendations related to sewerage infrastructure.

- Ensure that the sewage generated in the peripheral areas is not discharged into open fields and rivers so as to avoid pollution
- Sewerage system is planned in tandem with storm water system.

7.2.2 PROPOSALS AND RECOMMENDATIONS

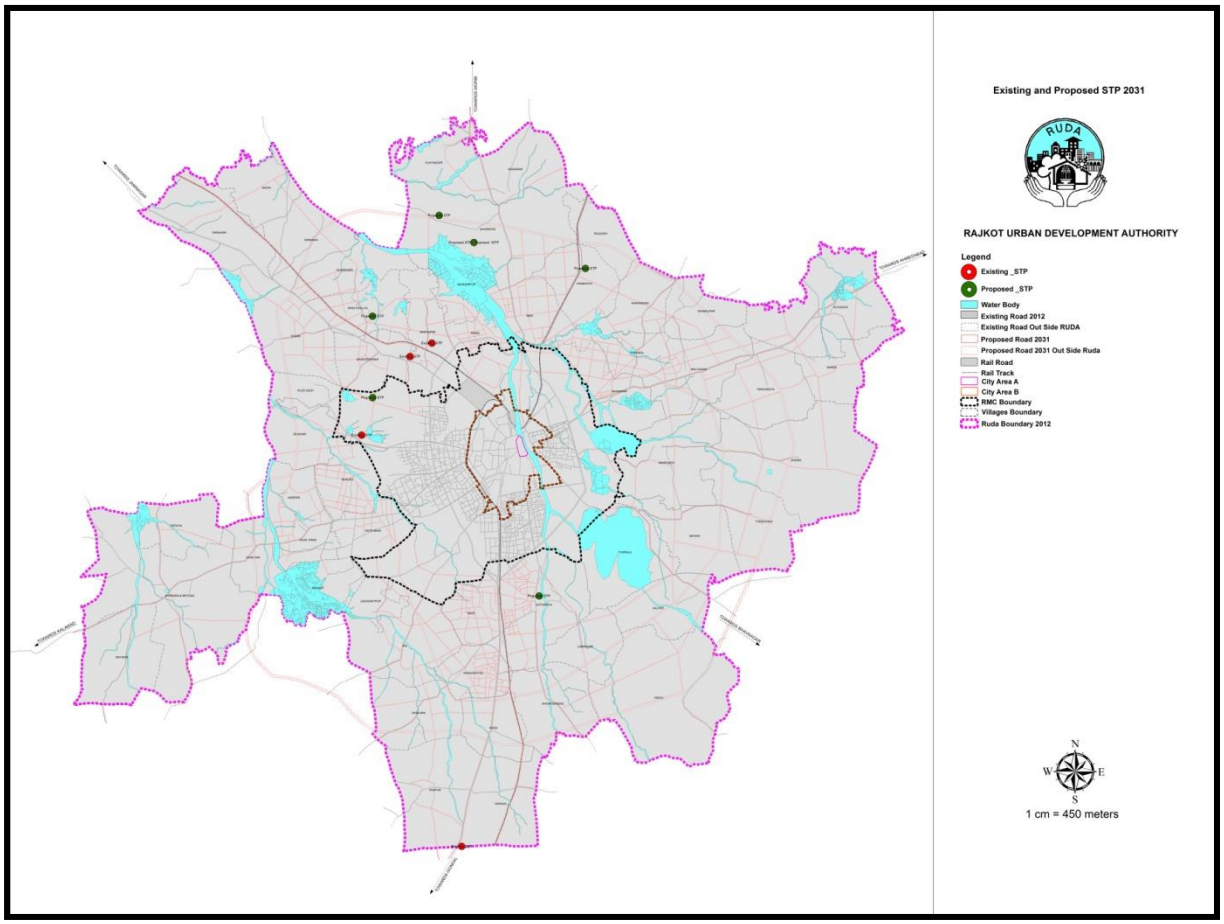
Keeping the principle of provision of efficient yet adequate physical infrastructure, proposals and recommendations have been formulated. Through this development plan, an efficient sewage system is proposed to serve Rajkot area adequately.

Proposal: Upgradation and provision of New Sewage Treatment Plants (STP)

The entire RMC area currently depends upon two sewage treatment plants located at Madhapar and Raiya having capacity of 48.6 MLD and 47.3 MLD Respectively.

In order to cater the demand of the future population, it is proposed to provide four new STPs as shown in the map, located in Kotharia, Raiya, Ghaneshwar and Gawridad.

FIGURE 30: EXISTING AND PROPOSED SEWAGE TREATMENT PLANTS



Other recommendations:

Other than the above mentioned proposals for complete sewerage network and adequate sewage treatment capacity, it is recommended to develop a GIS based management information system to collect and maintain detailed information on every pipeline section and pumping machinery with attributes on age, material, etc.

7.3 STORM WATER SYSTEM

Presently city does not have a designed storm water drainage network. During monsoons, the rain water flows into the vonklas or natural drains and meets with the Aji Rriver. The annual average rainfall received by the city nearly 500mm. moreover, the rains area irregular and at time lesser than average. In such conditions the natural drains suffice the need for storm water drains.

7.3.1 BASIC CONSIDERATIONS – STORM WATER

Below are some major considerations that are useful to prepare various proposals for developing a complete and efficient storm water drainage network in the city.

- First of all it is very important to initiate and have have an efficient storm water system.
- Assure availability of storm water network coverage in area outside RMC limit and newly urbanized areas.
- Develop techniques like lake linkages in the city so that the excess water flows into the lakes.

7.4 SOLID WASTE MANAGEMENT

In RMC area total 358 tons solid waste is generated per day. In order to develop a sustainable, environment friendly and efficient solid waste management system in RMC as well as in RUDA area, various efforts have been taken by the development authority in this development plan.

7.4.1 BASIC CONSIDERATIONS –SOLID WASTE MANAGEMENT

Below are some major considerations that are useful to prepare various proposals for solid waste management in RUDA area.

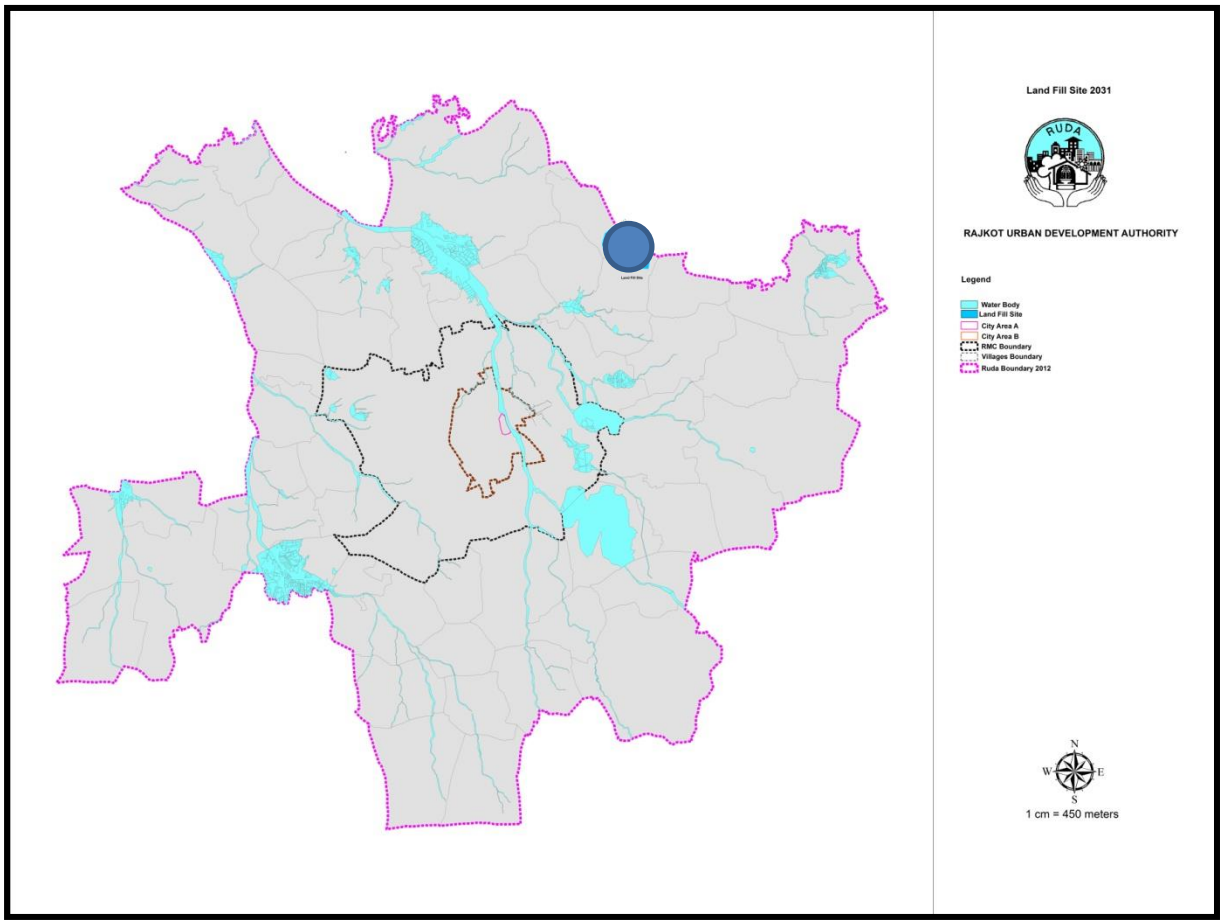
- Increase the treatment capacity of the solid waste treatment plants in order to fulfill the need of the population for the coming 20 years.
- Adopt large scale waste treatment, recycling and disposal, maximizing source segregation, localized recycling and target zero waste.
- Establish eco friendly techniques for solid waste treatment as well as disposal.

7.4.2 PROPOSALS AND RECOMMENDATIONS

Proposal: Upgrading Old Landfill Site at Nakravadi

Currently total 358 tons of solid waste is generated in RMC area per day. Considering the additional demand for managing solid waste for the year 2031, upgrading of old landfill site has been proposed.

FIGURE 31: EXISTING LAND FILL SITE AND PROPOSED BUFFER



Other recommendations

Other than the above mentioned proposals the following set of recommendations can be adopted or can be taken up as the separate projects in future for developing an efficient solid waste management system.

- Create awareness among the citizens for segregation of waste at source; that is two domestic bins for biodegradable waste and for recyclable waste.
- Develop mechanism through which the villages in RUDA areas can be catered for solid waste management.
- Develop localized treatment and disposal options like vermin composting and community composting.
- Develop a complaints redressal system; maintain records of complaints for disposal of all kinds of solid waste disposal.
- Carry out appropriate waste treatment and disposal techniques through public private partnerships.
- Encourage/ create public awareness regarding 3 ‘R’s – Reduce, Reuse and Recycle.

7.5 RECOMMENDATIONS FOR IMPLEMENTATION

- Prepare Physical Infrastructure Development and Management Plans
- Prepare and update Physical Infrastructure GIS database

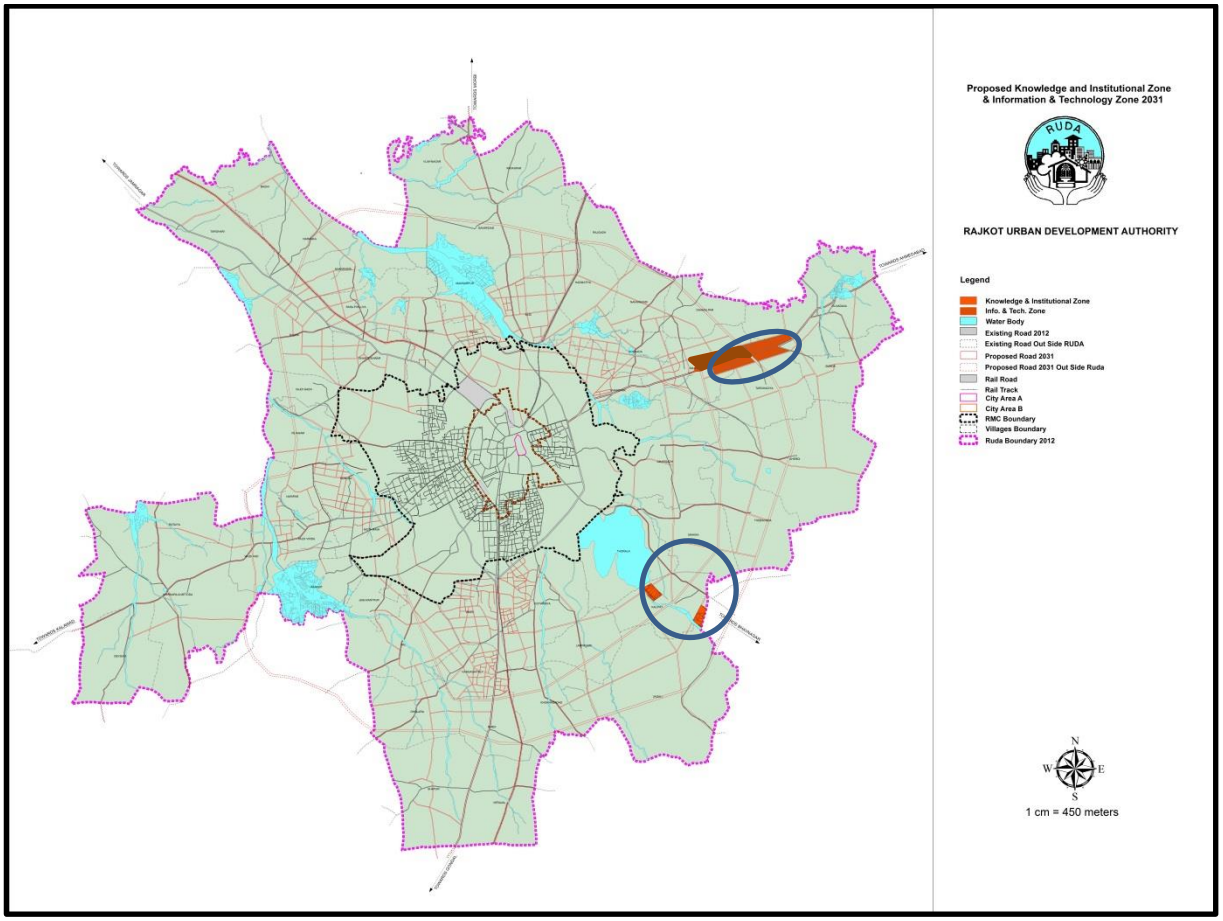
SECTION 8: SOCIAL INFRASTRUCTURE

Social infrastructure ensures access to the basic facilities like education, health, recreational facility and safety. The economic growth of a city cannot be looked in isolation without considering the social welfare of people. The proposals identified in this section shall help to make various educational. Medical, fire and emergency and sports facilities available in a well distributed manner in different parts of the city.

8.1 PROPOSALS

Proposal 1: Encourage development of educational and research facilities through provision of Knowledge and Institution Zone

FIGURE 32: PROPOSED KNOWLEDGE AND INSTITUTIONAL ZONE



Currently, Rajkot is known for some state level and national level of the renowned educational and research institutes such as VVP engineering collage, Indubhai Parekh School of Architecture, Saurashtra University, Marwadi Collage, etc. In order to further facilitate development of such large education and research institutes, new provisions have

been made in the Knowledge zone in this revised Development Plan. This zone shall allow uses such as schools, colleges, universities; education and research centers and campuse etc. the residential uses such as hostels and faculty housing shall also be permitted in this zone only if such uses are within the education or research institute campuses and supporting the main use.

Various areas in the eastern parts of RUDA area has been identified as knowledge zones as illustrated on the map.

Proposal 2: Provision of land for educational facilities through Town Planning Mechanism

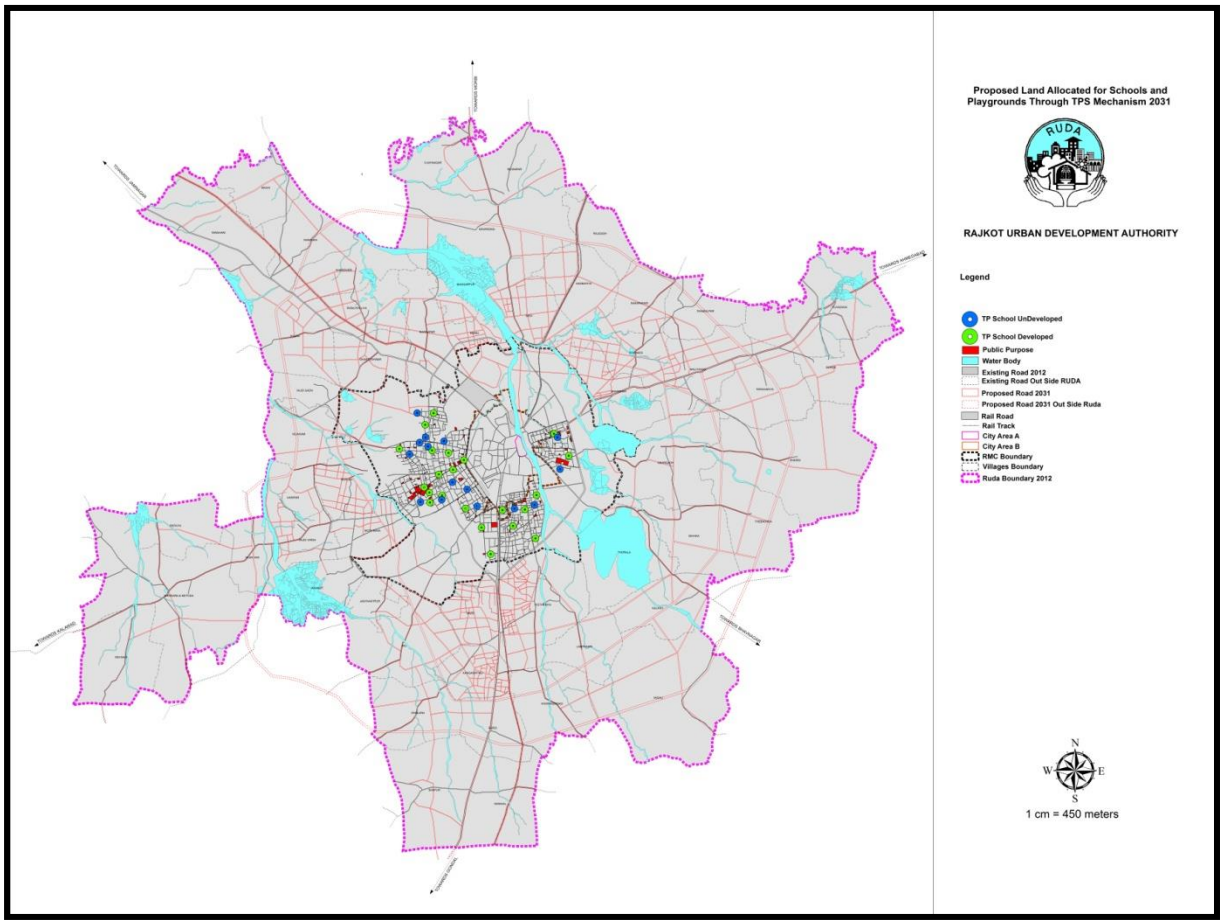
Education is a foundation stone for a progressive, harmonious and prosperous society. As per the Bombay Provincial Corporation Act 1949, it is obligatory for the Municipal Corporation to provide primary education facilities within the city.

Currently there are 87 municipal schools in Rajkot city. Of these, 81 are primary schools and six are high schools. There are total 37258 students in the government schools with 35,775 students in primary schools and 1,483 in high schools. The 81 Primary Schools are run by Nagar Prathamik Shikshan Samity under the control of RMC General Board. As the city's population continues to grow, there is a need to increase the number of schools that can provide good quality, affordable education for the lower and middle income groups.

Traditionally, TP scheme has been the primary mechanism through which land for social infrastructure is made available. Typically this includes land for schools, hospitals, neighborhood center, civic center, gardens and open spaces etc. In the past decade, land has been reserved for schools in RMC and RUDA area, is made available for 17 schools at subsidized rates for RUDA. The remaining will be made available through TP scheme mechanism for education facilities under this Development Plan. Hence, land will be made available education facilities to be developed in the next decade.

It is recommended to allocate sufficient amount of land for the educational purpose through the TPS mechanism to meet up the future needs.

FIGURE 33: PROPOSED LAND ALLOCATED FOR SCHOOLS AND PLAYGROUNDS THROUGH TPS MECHANISM

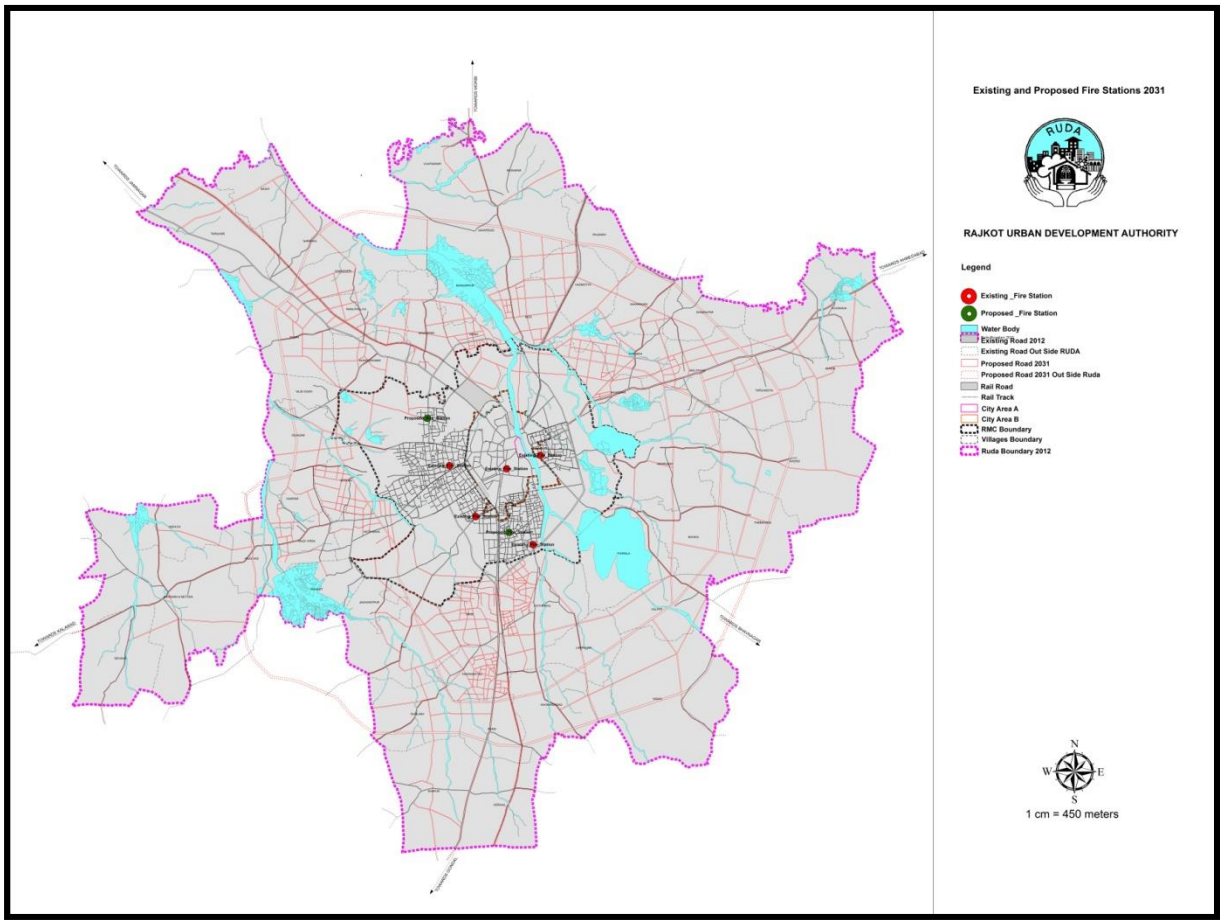


Proposal 3: Provision of land for fire and emergency services through TPS Mechanism.

Currently there are 4 fire stations within the limits of RMC. A majority of these fire stations are concentrated within central zone in RMC. There is a considerable need to increase the number of fire stations and expand its service area. Location of the new fire stations shall be well distributed within the RMC and RUDA limits to serve maximum population. The fire services department also provides facilities such as medical emergencies, other services. Medical emergencies are catered by both private and government agencies. Such a service has been initiated by public private participation and provided by Emergency Management Research Institute.

Considering the need, locations of 2 fires stations are identified to ensure uniform distribution and prompt availability of fire and emergency services. Required land for the purpose could be made available through T.P. Schemes.

FIGURE 34: EXISTING AND PROPOSED FIRE STATIONS



Proposal 4: Provision of land for recreational facility through TPS Mechanism

Recreation activities are important for the physical and social development of an individual. The city shall provide requisite infrastructure, equipments and facilities for the overall development of the citizens. At present, there are number of facilities such as playgrounds, art galleries, sports club, library etc within the RMC limit. As the city is expanding the need for recreational facility would be in high demand so more number of such services shall be made available which can serve well within the RMC and RUDA limit. Looking at the expansion of the city, the locations for new recreational facilities shall be rationally located within the RMC and RUDA limit through the TPS mechanism.

8.2 RECOMMENDATIONS

With the rapid increase in urbanization and city limits the demand for schools has been increasing. Looking at the pace of supply from the government there is a shortfall observed in the past years. It is possible to overcome this by encouraging private sector to develop, manage and maintain education facilities like high schools and institutes through Public Private Partnership (PPP).

SECTION 9: ECONOMIC DEVELOPMENT

Rajkot plays a pivotal role towards the contribution for the state economy. In the past decade a shift from secondary to tertiary sector has been observed. The secondary sector shows a decline in the share of manufacturing and processing sector other than household industries. On the other hand tertiary sector appears to be growing in trade and commerce, transportation and other services etc.

9.1 CONSIDERATIONS

The basic considerations for economic development for Rajkot city are based on the principle of supporting diverse economic activity at various scales. The economic development in the city can be promoted through its primary, secondary and tertiary sectors considering the requirements and need of each sector and fulfilling them through proposals and recommendations.

9.2 PROPOSALS AND RECOMMENDATIONS

Improvement of physical infrastructure, transportation network and freight would lead to promotion of commercial development in RUDA areas. Moreover, commercial developments in the city are major areas generating employment opportunities; thereby increasing growth and economy for the area.

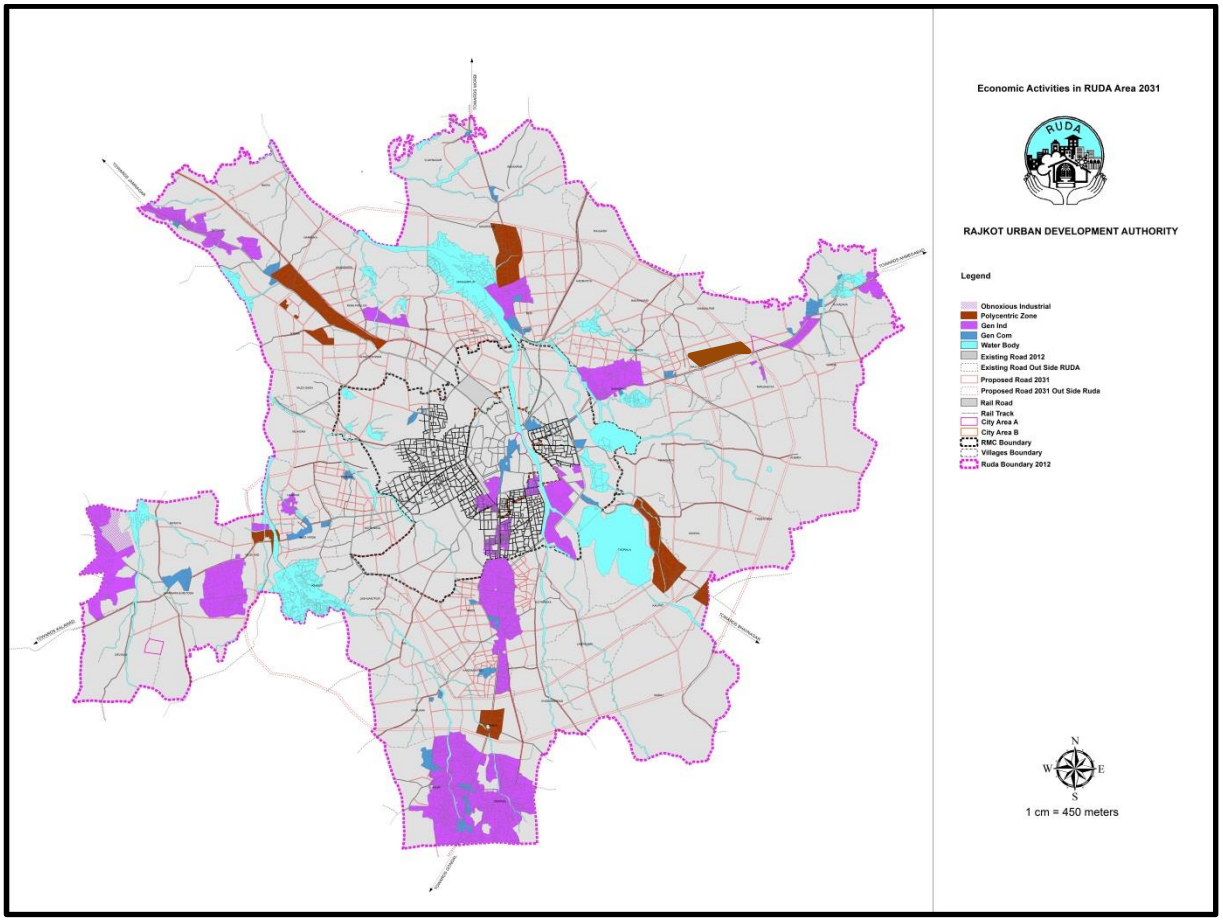
Proposal 1: Enable and support industrial centers and corridors

To encourage and support industrial development and generate employment, additional area has been added in the Industrial Zone in GIDC and surrounding villages. The industrial areas are connected by transportation network and infrastructure with the city and growth centers. To support the industrial activities, additional area has been included in the respective zones warehouses and godowns.

The city would be experiencing an impact of few special projects and industrial areas within and around the city limits in the coming decade. These special projects would act as economic magnets and generate employment for the city. It is important to develop growth centers that can accommodate future population living and working in these employment centers and corridors.

It is required to support and provide a favorable environment with well equipped modern infrastructure facilities for these economic activities in the region to boost the present and future economy of the city. Considerations for the necessary regulations have been framed in the General development regulations.

FIGURE 35: ECONOMIC ACTIVITIES IN RUDA AREA



Proposal 2: Organize informal sector

Informal sector plays an important role in city's economy and providing employment to the economically weaker section. However, there is a need to organize this sector in order to avoid the negative impacts it generates through encroachments on city streets and properties. The National Policy for Urban Street Vendors is one of the tools that can be used to organize informal sector. Also, a detailed study and a plan can be prepared to identify and develop appropriate locations in order to organize the informal sector.

Recommended action:

It is recommended to carry out a detailed study and a plan can be prepared to identify and develop appropriate locations in order to organize the informal sector. Dedicated spaces for informal markets and vendors need to be created in order to make it more organized. Some of the existing examples include – formalized spaces allotted to vendors at Law garden

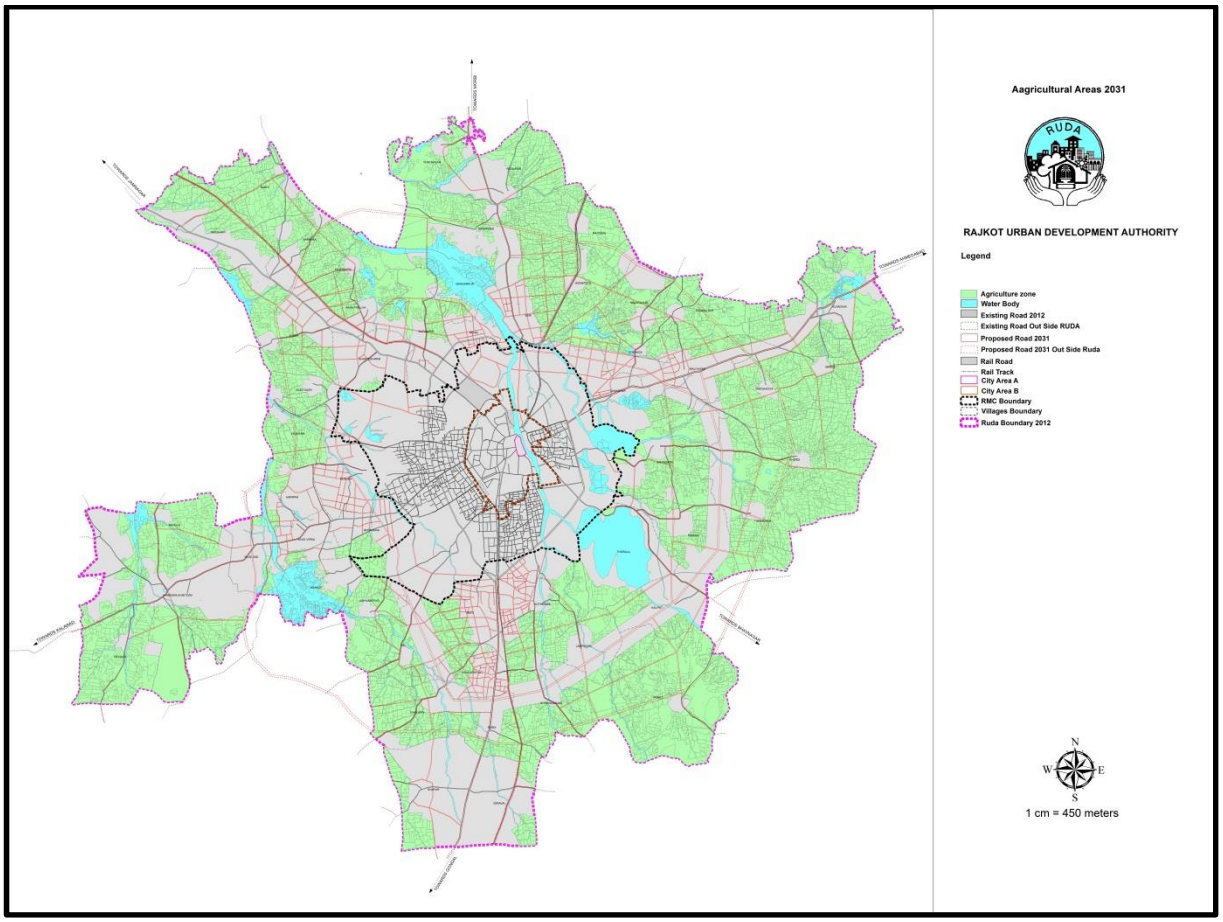
Proposal 3: Organize employment centers and corridors for sustainable economic development

This would require preparing an economic development plan that would identify and study various employment centers and commercial corridors and make recommendations to better organize the development and growth pattern to improve job housing balance, increase affordable housing options, reduce travel time and congestion and improve livability within the city.

Proposal 4: Support Rural economy

With the expansion of city, the peripheral agricultural land is continuously under pressure for urbanization. Moreover, the land under double cropping is more fertile and well irrigated and occupies a major part of land within the city as indicated in the map. Many of these peri-urban fertile lands however stands threatened by the encroachment of urban land use resulting in the decrease in agricultural production. In the past decade, more than 700 Sq.Km. of land was under agriculture use.

FIGURE 36: AGRICULTURE AREAS



In order to improve primary sector in RUDA area, zoning of appropriate agricultural land in development Plan has been reduced to an area of 306.52 sq.km.(Still contributing to 44.62% of RUDA area) Further, to protect the agricultural land, necessary regulations have been framed. However, along with agricultural activities development of agro-based industries, processing units is allowed in order to support activities like farming, livestock etc. in conjunction with the development regulations.

Recommendation 1: Develop city level trade, exhibition and convention facilities

Conventions are not only social gatherings but major economic growth engines which contribute by attracting national and global audience. With the increasing trade and commerce, the demand to cater for city level trade, exhibitions and convention facilities are required to be increased in numbers.

Presently, there are four large convention and exhibition facilities within the city however the number needs to be increased as per the requirement. Therefore it is proposed to develop such city level trade cum exhibition and convention centers to promote the city through large scale national and international conventions and generate ample job opportunities in the city.

Recommendation 2: Maintain records for data needed in order to build job opportunities in the city

Creation of a robust database related to household income and employment is recommended to help support job opportunities in the city. Database should include details related to population distribution of households by income, employment, income details according to the age sex pyramid, consumption expenditure, employment type, participation rate, employment generating centres in the city and its periphery, employment in different sectors, shifting/relocation of industries, growth of informal sector, shifting of employment centres. The data should be updated on a regular basis to make this system more effective.

9.3 RECOMMENDED ACTIONS FOR IMPLEMENTATION

- Plan to organize and manage informal sector
- Create and maintain records for data needed in order to build job opportunities in the city
- Prepare and maintain database of existing employment by various categories and location to assess job-housing balance, travel demand and infrastructure demand

SECTION 10: HERITAGE

A society's identity and civic pride is rooted in its physical and cultural links to its past. Heritage is something that gives a sense of belongings and informs us about who we are and how our society has developed over time. Heritage can be something valued by a single person or it can be part of a wider group's sense of identity and character. It may be significant for scientific, aesthetic, architectural or historical reasons or for any other special cultural value. Heritage is something that is passed down through the generations. The heritage of a city can also have national and world-wide significance.

Heritage can be manifested throught sites, buildings, structures artefacts or objects with cultural and historic associations. The heritage values of such sites, buildings or structures may vary based on their scale of significance, ranging from, global and national to city or local level.

10.1 CONSIDERATIONS

There is a need to preserve, protect and conserve the heritage structures within the Old City. In spite of presence of these buffer zones it is observed that there is continuous redevelopment happening in the Old City.

Lack of financing support mechanism for heritage structures and precincts owned by private individuals leads to the deterioration of heritage buildings and replacement by the new structures. Also these areas lack infrastructure and amenities to meet the contemporary demands.

All these concerns are addressed through special development regulations which are beneficial to the owners. The area within Old City has been identified as City Area A to conserve the heritage character.

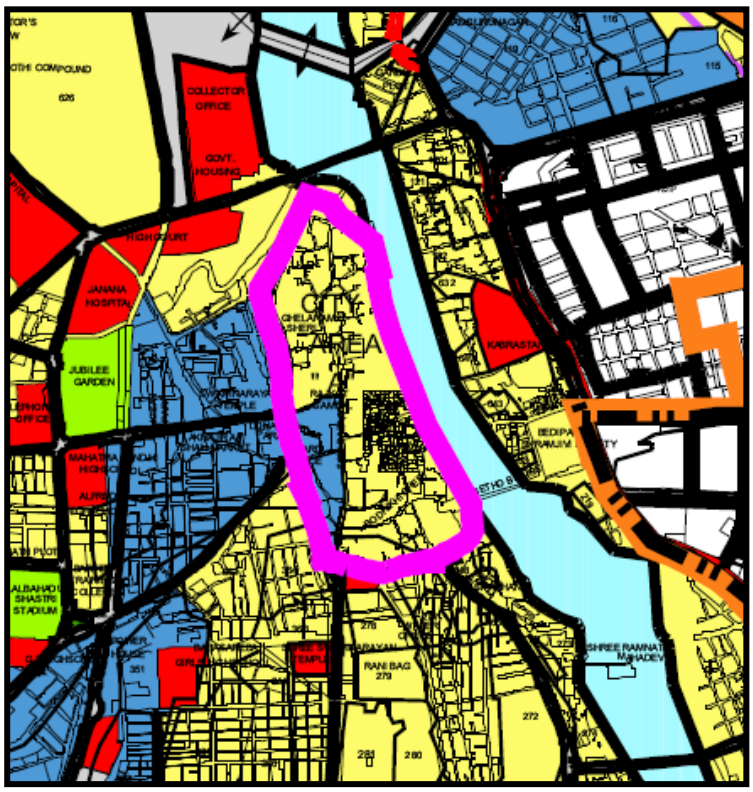
10.2 PROPOSALS AND RECOMMENDATIONS

Proposal 1: Encourage conservation and preservation of the Old City through introduction of City Area A

The Old City of Rajkot developed over centuries, is comprised of more than 100 residential clusters with traditional courtyard houses, havelis, chabutaras and other structures. The urban fabric of the Old City is crucial to maintain its traditional historic character and its heritage value. The City Area A covering the complete Old City area shall help to preserve the historic fabric by restricting plot amalgamation and reconfigurations. The development

regulations for the City Area A are specifically formulated to preserve and conserve the heritage structures and precincts. Depending upon the integrity and heritage value, these structures are categorized in various grades are getting listed and which shall be verified by the competent Authority with the help of Heritage Committee.

FIGURE 37: CITY AREA A



Proposal 2: Introduction of Tradable Development Rights (TDR) for listed structures

All properties within the City Area A are permitted a blanket FSI of 2.0. Further, to incentivize preservation and conservation of such structures and sites, new regulations have been introduced. This includes Tradable Development Rights (TDR). These TDR incentives vary based on the grade of the heritage structures as listed in the Heritage Conservation Plan. The heritage structures will be eligible to receive Tradable Rights Certificate (TRC). Using this TRC, the structure owners shall be able to trade the FSI and generate revenue for conservation of the structure.

Proposal 3: Prepare detailed Heritage Conservation Plan

Heritage in the city comprise of the protected and unprotected monuments, sites, neighborhoods or precincts which recognize the visual, spatial and cultural character of the city. A Heritage Conservation Plan should take in account all the mentioned components to protect, conserve and maintain the heritage structures and precincts.

Potential and priorities of reuse of heritage structures as hotels, museums, commercial use etc, and heritage related tourism activities should be determined.

The Competent Authority should identify the ways to raise revenues for conserving the heritage structures and precincts. An implementation plan needs to be supplemented with a financial strategy for identifying various alternative resources for funding. Scope of financing through various agencies such as international, central, state or local governments, or private sector, public private partnership needs to be worked. An innovative financing mechanism of Transfer of Development Rights (TDR) needs to be introduced to reduce the burden on the privately owned heritage structures and precincts.

Recommendation 1: Prepare a visual pollution control guidelines and standards for the city

A set of guidelines and standards should be prepared for controlling visual pollution within the existing city. Depending upon the local character, separate set of guidelines need to be formulated to address contextual requirements and enhance the traditional ambience. Some of the distinct character exists in city such as old city; various commercial commodities, special projects need to be thought as a separate entity. There are several issues identified in existing situation and analysis (Part-I), which need to be solved through these guidelines.

A dedicated committee should be formulated for implementation as per the detailed guidelines. Those who violate these guidelines must be penalized by the 'Visual Pollution Controlling Committee'.

Recommendation 2: Organized display of hoardings to enhance the aesthetics of the city

It is recommended that the right of displaying any kind of hoardings on street should be reserved with the local authority. That will create a check on number and size of signage and also generate revenue for the local authority. As an example, the photographs of Commercial Street, from Jaipur shows organized and uniform way of signage system which enhances local architectural character.

Thus, expected uniformity and consistency could be achieved in billboards and signages which would not overpower the aesthetics of the streets and architectural character of the historic structures. The right of permitting hoardings along the street will also generate revenue to the local authority.

10.3 RECOMMENDED ACTIONS FOR IMPLEMENTATION

- Prepare Heritage Conservation Plan including listing of heritage structures and precincts, regulations for the heritage structure influence zones and heritage precincts, TDR mechanism to incentivize conservation, design guidelines for controlling visual and physical character etc.
- Prepare a visual pollution control guidelines and standards for the city
- Organize display of hoardings to enhance the aesthetics of the city

SECTION 11: ENVIRONMENT

Due to the rapid growth of population and urbanization, the environment quality is fast degrading. As a result, it is leading to further deterioration of conditions and over extraction of resources. This chapter is focused on the improvement in the environmental conditions of the city to sustain the fast growth of population.

11.1 CONSIDERATIONS

As mentioned in existing condition and analysis (Part I) following are the major issue and observations of existing environmental quality of the city

- There is a constant need to preserve natural elements like water bodies, ravines and eco-sensitive areas.
- With the pace of development there is a need to take higher precautions to maintain the air quality in the city due to high vehicular growth and industrialization.
- The untreated waste water from commercial and industrial sectors is disposed into the natural water bodies leading to water pollution.
- The levels of noise have been constantly increasing due to the increase in the vehicles on the road.
- Incompatible land uses, for example party plots located in residential areas, mall or a market places nearby the institutions cause noise pollution.
- Due to the hard and reflective surfaces in urbanized areas heat effect can be seen through the climate change in the city.

11.2 PROPOSALS AND RECOMMENDATIONS

Below are the set of proposals and recommendations grouped by various issues to address; air quality, water quality, noise level, visual quality, eco-sensitive areas, heat, energy efficiency and climate change.

11.3 INCENTIVIZING GREEN DEVELOPMENT

Proposal 1: Encourage energy efficient buildings

In order to encourage construction of energy efficient buildings, special regulations and incentives have been introduced in the revised Development Regulations. These include

- Any energy efficient building having a certificate from GRIHA (Green Rating for Integrated Habitat Assessment) or any other Government recognized Institute, shall be eligible for incentives in the rate of premium FSI upto 5%.

- Provision of solar assisted water heating system in Hospital & Nursing Homes, Hotels, Lodges and Guest Houses, Hostels of schools, colleges, training centres, Community centres and Banquet Halls
- On the external wall of any building, maximum 50% of the surface area of the wall can be covered by sun reflecting material/ reflecting glass, with the provision of safety railing up to sill level.

11.3.1 WATER QUALITY AND WATER RESOURCE MANAGEMENT:

Rapid urbanization and industrialization are the vital causes of deterioration in water quality and depletion of water resources in the city. The untreated water effluent from polluting industries, inadequate infrastructure network and untreated disposal of sewerage and storm water are the major causes behind the degradation of ground water and surface water quality. Following are the recommendations for the improvement in water quality and water resource management in future.

Proposal 2: Ground water recharge through Recharge wells

Ground water recharge has been proposed through development of Recharge wells, Retention ponds, Rain water harvesting systems etc. For this, suitable regulations have been introduced in the GDCR as well. Also, lake linkages schemes shall be carried out to further increase ground water level

Recommendation 1: Recycle and Reuse of waste water

Recycling and reuse of waste water should be encouraged as recycled water can satisfy most water demands, as long as it is adequately treated to ensure water quality appropriate for the use. Recycled water is most commonly used for non potable (not for drinking) purposes, such as agriculture, landscape, public parks, toilet flushing, dust control, construction activities, etc. By providing an additional source of water, water recycling can help us find ways to decrease the diversion of water from sensitive ecosystems. Other benefits include decreasing wastewater discharges and reducing and preventing pollution.

Recommendation 2: Controlling water quality through strict monitoring and enforcement of regulations

RUDA and RMC to work with GPCB to identify/develop mechanism to monitor quality of ground water, water in lakes and rivers on regular basis and also rank the water sourced based on their quality

11.3.2 AIR QUALITY:

Looking at the existing air quality situation and pace of urbanization, long term and time bound strategies should be formulated to achieve healthy and safe air environment in future. Motorized vehicles and industries are the major sources of air pollution in the city.

Apart from that, addition of dust particles into the air is another means of air pollution. Following are recommended measures to overcome the air quality issue in future.

Recommendation 3: Controlling vehicular emission

With the population growth and economic development, there is a rapid increase in private motorized vehicles in the city. Along with the high vehicular volume, poor condition of the vehicles, use of polluting non-renewable fuel and also slow and congested traffic flow are the major causes behind the increase in air pollution due to vehicular emission.

There are two parts to controlling pollution from vehicular emission - improvement through vehicle and fuel technology and reduction in vehicular travel. To control this situation the following measures are recommended

- Strict enforcement of PUC standards for all vehicles
- Providing and encouraging public transport, pedestrianization and non-motorized transport instead of motorized private vehicular mode
- Promoting and incentivizing use of low pollution generating renewable energy fuel
- Ensuring smooth flow of traffic
- Restricting use of very old and dilapidated vehicles

Recommendation 4: Controlling Industrial emissions

Industries are a crucial part of the city's economic growth and development. However, existence of industries and related activities can be a major cause of degradation of air and water quality. Segregating such heavy industries from other residential and commercial areas is important for health and safety of people living in the urban areas. This shall be facilitated through the zoning regulations of the Development Plan. However, strict enforcement of pollution controlling standards is crucial for industries in urban and rural areas. It is expected that there should not be any adverse effect on the surrounding atmosphere due to emission from such industries and commercial activities.

Compulsory air filtration and purification is recommended before releasing it into the atmosphere. Also, it is recommended to develop continuous and thick rows of foliaged trees which will act as an absorptive screen for pollutants. Specific foliaged trees and land for tree plantation need to be identified for such green buffer development.

Recommendation 5: Reducing suspended particulate matter in air

Due to hot and dry climate, flat topography and type of ground surface, the city faces considerable dust pollutants in air. Higher amount of such particles in air can cause issues related to breathing and respiratory diseases. Also, they capture and contain heat and

contribute in urban heat island effect. Therefore, it is important to treat the exposed earth surfaces through provision of green cover, permeable pavement or other such technologies.

The proposal to develop 'complete streets' would help cover such exposed surfaces along city streets and amount of dust particles in the air due to vehicular movement. Provision of green cover on open plots by creation of plazas, pocket parks and gardens will also help tremendously to reduce the suspended particulate matter in air. It is also recommended to encourage private land owners to develop their land with hard and soft landscape and offer them incentives for the same.

11.3.3 Noise:

Commercial areas in Rajkot city reach up to 63-68 db, and residential areas reach up to 55-60 db, which is higher than the limit suggested by GPCB. (60 db for commercial and 40 db for residential areas) Following measures are suggested to control the increasing noise pollution in a city.

Recommendation 6: Identifying 'no honking / silence zone'

Identify and demarcate 'No Honking zone'/ 'silence zone' around noise sensitive areas like hospitals, educational institutions, zoo, special areas like Gandhi Ashram, High Court, etc. with appropriate signage system all over the city. A set of guidelines and policy should be prepared for effective implementation and enforcement of such 'silence zone'.

Recommendation 7: Controlling noise levels during night time

As per the standards, maximum noise level during night time is less than that in day i.e. during day time, noise level is 55db and during night time should not be more than 45db in residential areas. Controlling noise level during night time is very crucial. Thus noise generated from party plots, club house, loud speakers because of festivals and events during the night time should be monitored and controlled by local enforcement.

11.3.4 Eco-sensitive areas

There are various kinds of eco-sensitive areas in RUDA which need to be preserved. The ravine along the river is not suitable for urban development and also likely to go under water during the flood. It is also dangerous for aquatic life if it is disturbed by digging, mining or any such activity. Hence, in order to preserve these eco-sensitive areas, following recommendation is formulated to enhance

Recommendation 8: Prepare Eco Conservation Plan

Eco conservation plan should be made that will identify eco-sensitive areas and the various elements within RUDA area and designate and protect from the rapid growth of

urbanization. In addition, a set of guidelines should be prepared for strictly avoiding non-compatible activities like mining, quarrying and industrialization in closer proximity of environmentally sensitive areas as demarcated above. Subsidies for the desirable development and penalties for the harmful activities and encroachments need to be formulated under these guidelines.

11.4 RECOMMENDED ACTIONS FOR IMPLEMENTATION

Below is a combined list of recommended action points to preserve and maintain the quality of environment in RUDA area

- Implementation of urban environment monitoring program, that monitors air quality, water quality, noise level and heat island effects in the urban areas on regular intervals.
- Active initiatives should be taken to generate awareness about urban environment issues within the citizen of the city
- Strict enforcement of PUC standards for all motorized vehicles
- Reduction of SPM is air by treating exposed land surface by green cover, landscaped surfaces, permeable pavers and other such techniques.
- Compulsory treatment of waste water generated in industries before releasing it into the natural water bodies
- Identification and demarcation of ‘no honking zone’ or ‘silence zone’
- Strict enforcement for controlling high noise level during night time

SECTION 12: RESERVATIONS:

12.1 INTRODUCTION

The sanctioned Development Plan of RUDA contained no. of Reservations for various agencies like: RUDA, RMC, SRP, GEB, STC, GHB etc. for various public purposes like : Garden and Parking, City Center, Fire Brigade, Zoo and Forestry, Water treatment Plant, Sewage Treatment Plant, etc., based on the requirement of the same considering the projected Population of app. 15.00 lakh for the year 2011. It was noticed that most of the reservations so proposed were not acquired/ unutilized, which were reserved for the agencies other than RMC and RUDA.

12.2 RESERVATION PROPOSED IN THE SANCTIONED DEVELOPMENT PLAN

The sanctioned Development Plan of RUDA, which is in force as on date contained various reservations as listed below:

TABLE -6 RESERVATIONS AS PER DP 2011

SR.NO.	VILLAGE	S.NO./B.NO.	PURPOSE	AREA
1	Nyara	224/P, 167/P , 161/1/P , 161/2/P, 166,167/P,167/P,224/P	Maldhari Vasahat	50.18
2	Mota Mava	180/p	Residential Site and Service Project (R.S.S.P.)	13.79
3	Mota Mava	180/p	Local Commercial Centre (L.C.C.)	1.88
4	Munjka	49/p	Saurastra University	23.20
5	Raiya	250/p (P7)	Gujarat Housing Board (G.H.B.)	17.69
6	Munjka	49/p	Local Commercial Centre (L.C.C.)	6.58
7	Raiya	250/p(P1)	Local Commercial Centre (L.C.C.)	5.65
8	Raiya	318/p (P8)	Gujarat Electric Board (G.E.B.)	7.02
9	R.M.C. & Raiya	519 (P9)	Residential Site and Service Project (R.S.S.P.)	38.10
10	Raiya	318/p	Sewerage Treatment Plant (S.T.P.)	13.80
11	Ghanteshwar	150/p	Local Commercial Centre (L.C.C.)	4.40

SR.NO.	VILLAGE	S.NO./B.NO.	PURPOSE	AREA
12	Ghanteshwar	318/p	Water Colony R.M.C	3.13
13	Ghanteshwar	150/p	Gujarat Electric Board (G.E.B.)	0.69
14	Ghanteshwar	150/p	State Transport Corporation (S.T.)	0.81
15	Rajkot	111/P	Water Filter Plant R.M.C.	6.27
16	Manharpur	61/P	Maldhari Vasahat	17.56
17	Manharpur	61	Water Pumping Station R.M.C.	6.90
18	Madhapar	120/121/62,-111/p	Sewerage Treatment Plant (S.T.P.)	25.08
19	Vavdi	149/p	Residential Site and Service Project (R.S.S.P.)	14.42
20	Vavdi	41/p	State Transport Corporation (S.T.)	0.41
21	Kothariya & R.M.C.	Kothariya 51/p, 52, 53/p, 54/p, RMC 86/p, 87/p, 89/p, 242/p, 243/p. 246/p	Khokhaddad -Lampasari water Scheme, Water Scheme – 1	56.08
22	Kothariya, Khokhadadad	Kothariya 2/p, 65/p, 70/p, 71, 72/p, 73, 74/p, 75, 76/p, 77/p, 78/p, RMC 83/p, 352/p, Khokhadadad 242/p, 243/p. 246/p	Water Scheme – 2	49.39
23	Kothariya	Kothariya 106/p, 107/p, 321/p, 322/p, 326/p, 327/p, Khokhadadad 160/p, 161/p, 162 to 170, 171/p, 172/p, 173/p, 174, 175/p, 187, 188/1/p, 201/p, 202/p	Water Scheme – 3	69.29
24	Lampasari	Lampasari 7/p, 8 ,9/p, 10 to 13, 17/p, 18,19, 20/p, 23/p, 56/p, 57/p, 60/p, 61/p, 62 to 64, 66/p	Water Scheme – 4	69.18
25	R.M.C.	237- &231/232	Zoo Forestry (RMC)	59.00
26	R.M.C.	Tps reservation - s.no. 86 & 91	Residential Site and Service Project (R.S.S.P.)	14.85
27	R.M.C.	Tps reservation FP- 78	Gujarat Housing Board	1.96
28	R.M.C.	Tps reservation FP- 83	Gujarat Housing Board	1.52
29	R.M.C.	Rmc63	Pradhyuman Park	57.00
30	Maliyasan	333/p	Fire Bridge	0.63
31	Maliyasan	333/p	Local Commercial Centre (L.C.C.)	3.61
32	Maliyasan	333/p	Local Commercial Centre (L.C.C.)	9.52
33	Amargadh	237/p	Maldhari Vasahat	26.97
34	Sokhada	109-p	Solid Waste	22.58
35	Nyara	224/p, 126/127/128/143-1/143-2/144/145,	State Reserve Police (S.R.P.)	47.00
36	Nyara	224/p-	Residential Site and Service Project (R.S.S.P.)	45.15
37	Raiya	250/p	City Centre For Socio Cultural Sports Activities -1	70.23
38	Raiya	250/p	City Centre - 2	23.20
	TOTAL			862.14

12.3 Reservations proposed in the DP of Extended Ruda Boundary

After submitting and sanctioning of DP 2011, Govt. extended the boundary of RUDA, and 18 more villages were included in the boundary of RUDA. Based on the requirement of the new area, few more reservations were proposed in the new development plan, the details of the reservations proposed in the area are:

Table -7 Reservations Proposed in Extended RUDA Limit

SR.NO.	VILLAGE	S.NO./B.NO.	PURPOSE	AREA in Hect.
1	Kuvadva	557/p-govt	Garden & Parking (RUDA)	19.04
2	Targhari	135/p-govt	Garden & Parking (RUDA)	33.22
3	Khirasara	412/p-govt	Garden & Parking (RUDA)	52.13
4	Vajdi Vad	100/p-govt.	Garden & Parking (RUDA)	23.65
5	Vajdi Virda	120/p-govt	Garden & Parking (RUDA)	15.36
6	Ratanpur	228/p-govt	Garden & Parking (RUDA)	18.74
7	Dholara	200/p-govt	Garden & Parking (RUDA)	20.99
8	Veraval	305/1a-7-govt	Garden & Parking (RUDA)	25.73
	Total			208.86

If we compile the reservation details, as proposed in DP 2011, as well as the new added area the total reservations proposed are in 46 nos. with total area of 1071 Hect. The most important part, in suggesting the said reservations was: a care was taken to propose the land under reservation to be Government land only, during the new plan. The sanctioned Development plan contained total 38 reservations, out of which 30 reservations were proposed in Government land only, whereas 8 reservations were suggested partly on Government land and partly on private land. It has been observed that, the acquisition of private land for public purpose is lengthy process, which involves a long tedious process, it was decided to propose the reservations on Government land only, so that the land can be acquired easily.

Compiling the informations regarding the reservations suggested in Govt. and Private lands, the details are summarized below:

TABLE -8 COMPILED RESERVATION LIST RUDA

COMPILED RESERVATION DETAILS – RUDA				
No.	**Reservations**	**Location**	**Organisation**	**Land Ownership – Govt./Private**
1	Garden & Parking For RUDA	Targhari	RUDA	135/p-govt
2	Garden & Parking For RUDA	Khirasara	RUDA	412/p-govt
3	Garden & Parking For RUDA	Vajdi Vad	RUDA	100/p-govt.
4	Garden & Parking For RUDA	Vajdi Virda	RUDA	120/p-govt
5	Maldhari Vasahat	Nyara	R.M.C.	224/p-govt &167/166/p-private
6	State Reserve Police (S.R.P.)	Nyara	State Reserve Police	224/p-govt.&126/127/128/143-1/143-2/144/145-private
7	Residential Site and Service Project (R.S.S.P.)	Nyara	RUDA	224/p-govt
8	City Centre For Socio Cultural Sports Activities -1	Raiya	R.M.C.	250/p-govt
9	City Centre – 2	Raiya	R.M.C.	250/p-govt.
10	Residential Site and Service Project (R.S.S.P.)	Mota Mava	RUDA	180/p-govt
11	Local Commercial Centre (L.C.C.)	Mota Mava	RUDA	180/p-govt
12	Saurastra University	Munjka	Saurastra University	49/p-govt
13	Gujarat Housing Board (G.H.B.)	Raiya	Housing Board	250/p-govt.
14	Local Commercial Centre (L.C.C.)	Munjka	RUDA	49/p-govt
15	Local Commercial Centre (L.C.C.)	Raiya	RUDA	250/p-govt
16	Gujarat Electric Board (G.E.B.)	Raiya	P.G.V.C.L.	318/p-govt
17	Residential Site and Service Project (R.S.S.P.)	R.M.C. & Raiya	RUDA	519-private
18	Sewerage Treatment Plant (S.T.P.)	Raiya	R.M.C.	318/p-govt
19	Local Commercial Centre (L.C.C.)	Ghanteshwar	RUDA	150/p-govt
20	Water Colony R.M.C	Ghanteshwar	R.M.C.	318/p-govt

21	Gujarat Electric Board (G.E.B.)	Ghanteshwar	P.G.V.C.L.	150/p-govt
22	State Transport Corporation (S.T.)	Ghanteshwar	State Transport	150/p-govt
23	Water Filter Plant R.M.C.	Madhapar	R.M.C.	150/p-govt
24	Maldhari Vasahat	Manharpur	R.M.C.	61/62/63-private
25	Water Pumping Station R.M.C.	Manharpur	RUDA	61 private
26	Garden & Parking For RUDA	Ratanpur	RUDA	228/p-govt
27	Sewerage Treatment Plant (S.T.P.)	Madhapar	R.M.C.	120/121/62-private &111/p-govt.
28	Garden & Parking For RUDA	Dholara	RUDA	200/p-govt
29	Garden & Parking For RUDA	Veraval	RUDA	305/1a-7-govt
30	Residential Site and Service Project (R.S.S.P.)	Vavdi	RUDA	149/p-govt
31	State Transport Corporation (S.T.)	Vavdi	State Transport	41/p-private
32	Water Scheme – 1	Kothariya & R.M.C.	R.M.C.	
33	Water Scheme – 2	Kothariya, Khokhadadad	R.M.C.	
34	Water Scheme – 3	Kothariya	R.M.C.	
35	Water Scheme – 4	Lampasari	R.M.C.	
36	Zoo Forestry (RMC)	R.M.C.	R.M.C.	237-govt & 231/232-private
37	Residential Site and Service Project (R.S.S.P.)	R.M.C.	RUDA	Tps reservation
38	Gujarat Housing Board	R.M.C.	Housing Board	Tps reservation
39	Gujarat Housing Board	R.M.C.	Housing Board	Tps reservation
40	Pradhyuman Park	R.M.C.	R.M.C.	Rmc63-govt
41	Solid Waste	Sokhada	R.M.C.	109-p-govt
42	Fire Bridge	Maliyasan	R.M.C.	333/p-govt
43	Local Commercial Centre (L.C.C.)	Maliyasan	RUDA	333/p-govt
44	Local Commercial Centre (L.C.C.)	Maliyasan	RUDA	333/p-govt
45	Maldhari Vasahat	Amargadh	R.M.C.	228/p-govt
46	Garden & Parking For RUDA	Kuvadva	RUDA	557/p-govt

12.4 Requirement of the land for the Projected Population of 2031

As per the population projections, the RUDA shall have the population of more than 22 Lakhs by the year 2021 and more than 31 lakhs by the year 2031. With the increase in the population, the area shall require more infrastructure: Physical and Social. To cop up with the requirement of the area, the details of physical infrastructure in terms of road, water supply, sewerage, etc. has been taken care of in earlier chapters, but the requirement of land for various public purposes like: Water treatment Plant, Sewage Treatment Plant, Garden, Parking, city center, etc. need to be considered and proposed in the current development plan. For the same, a review was made for the reservations proposed in earlier D.P. and few important points were noticed:

- Agencies other than RMC and RUDA does not seem to be interested in developing the social infrastructure through Development Plan mechanism, which was evident in the sanctioned DP of 2011, considering the same, it was decided that, there would not be any reservation for any other agency than RMC and RUDA
- Considering the population projections for the year 2031, it was felt necessary to retain the lands so reserved in earlier DP for the purpose of RUDA and RMC. This was also required in light of the Hon. Chief Minister's Affordable Housing Scheme. To cop up with these, the reservations proposed in earlier DP were retained and Proposed for revised use as per the requirements till 2031
- For some new requirements of Sewage Treatment Plant, Water Treatment Plant, Solid Waste Disposal and Recreation, few new reservations may be proposed in new DP, on Government land only.

The New Reservations Proposed in the New DP are:

Table -9 New Reservation list RUDA

SR.NO.	VILLAGE	S.NO./B.NO.	PURPOSE	AREA in Hect.
1	Mahika	283/p Govt.	Sports complex (RUDA)	40.79
2	Gavridal	512/p Govt.	Sewage Treatment Plant (RUDA)	251.28
3	HADMATIYA	230/P	Sewage Treatment Plant (RUDA)	40.05
4	Nakaravadi /Rajgadh	105/P,106/P,106/P , 116/P,109/P,107,108,110/P, 129/P,130 ,222/P,,222/P,222/P,222/P,222/P,222/P,222/P,131/P,	Solid Waste Disposal (RMC)	76.77
	TOTAL			332.12

The Compiled list of Reservations in New DP is listed Below:

TABLE -10 COMPILED RESERVATION LIST RUDA

A Reservation Continued as per Sanctioned DP

SR.NO.	VILLAGE	S.NO./B.NO.	PURPOSE	AREA
1	Nyara	224/P, 167/P , 161/1/P , 161/2/P, 166,167/P,167/P,224/P	Public Housing (RUDA)	46.85
2	Mota Mava	180/p	Public Housing (RUDA)	13.79
3	Mota Mava	180/p	Local Commercial Center (L.C.C.) (RUDA)	1.88
4	Munjka	49/p	Education Purpose (Saurashtra University)	23.20
5	Raiya	250/p (P7)	Public Housing (RUDA)	17.69
6	Munjka	49/p	Local Commercial Center (L.C.C.) (RUDA)	6.58
7	Raiya	250/p(P1)	Local Commercial Center (L.C.C.) (RUDA)	5.65
8	Raiya	318/p (P8)	Local Commercial Center (L.C.C.) (RUDA)	7.02
9	R.M.C. & Raiya	519 (P9)	Public Housing (RUDA)	38.10
10	Raiya	318/p	Sewage Treatment Plant (RMC)	13.80
11	Ghanteshwar	150/p	Local Commercial Center (L.C.C.) (RUDA)	4.40
12	Ghanteshwar	318/p	Water Colony (RMC)	3.13
13	Ghanteshwar	150/p	Local Commercial Center (L.C.C.) (RUDA)	0.69
14	Ghanteshwar	150/p	Local Commercial Center (L.C.C.) (RUDA)	0.81
15	Madhapar	111/P	Water Filter Plant (RMC)	6.27
16	Manharpur	61/P	Public Housing (RUDA)	17.56
17	Manharpur	61	Water Pumping Station (RMC)	6.90
18	Madhapar	120/121/62,-111/p	Sewage Treatment Plant (RMC)	25.08
19	Vavdi	149/p	Public Housing (RUDA)	14.42
20	Vavdi	41/p	Local Commercial Center (L.C.C.) (RUDA)	0.41

21	Kothariya & R.M.C.	Kothariya 51/p, 52, 53/p, 54/p, RMC 86/p, 87/p, 89/p, 242/p, 243/p. 246/p	Recreation Center for RMC	56.08
22	Kothariya, Khokhadadad	Kothariya 2/p, 65/p, 70/p, 71, 72/p, 73, 74/p, 75, 76/p, 77/p, 78/p, RMC 83/p, 352/p, Khokhadadad 242/p, 243/p. 246/p	Recreation Center for RMC	49.39
23	Kothariya	Kothariya 106/p, 107/p, 321/p, 322/p, 326/p, 327/p, Khokhadadad 160/p, 161/p, 162 to 170, 171/p, 172/p, 173/p, 174, 175/p, 187, 188/1/p, 201/p, 202/p	Recreation Center for RMC	69.29
24	Lampasari	Lampasari 7/p, 8 ,9/p, 10 to 13, 17/p, 18,19, 20/p, 23/p, 56/p, 57/p, 60/p, 61/p, 62 to 64, 66/p	Recreation Center for RMC	69.18
25	R.M.C.	237- &231/232	Zoo Forestry (RMC)	59.00
26	R.M.C.	Tps reservation - s.no. 86 & 91	Public Housing (RUDA)	14.85
27	R.M.C.	Tps reservation FP- 78	Public Housing (RMC)	1.96
28	R.M.C.	Tps reservation FP- 83	Public Housing (RMC)	1.52
29	R.M.C.	Rmc63	Recreation (Pradhuman Park)	57.00
30	Maliyasan	333/p	Fire Bigade (RMC)	0.63
31	Maliyasan	333/p	Local Commercial Center (RUDA)	3.61
32	Maliyasan	333/p	Local Commercial Center (RUDA)	9.52
33	Amargadh	237/p	Public Housing (RUDA)	26.97
34	SOKHADA &	109-p	Solid Waste Disposal (RMC)	22.58
	TOTAL – A			673.23
B	Reservations modified			
35	Nyara	224/p-govt.&126/127/128/143-1/143-2/144/145-private	Public Housing (RUDA)	20.61
		224/p-govt.&126/127/128/143-1/143-2/144/145-private	Public Housing (RUDA)	5.31
	Nyara	224/p-govt.&126/127/128/143-1/143-2/144/145-private	Public Housing (RUDA)	10.66
36	Nyara	224/p-	Public Housing (RUDA)	22.77

	Nyara	224/p-	Public Housing (RUDA)	18.61
37	Raiya	250/p	NEW RACECOURSE (RUDA)	70.23
38	Raiya	250/p	NEW RACECOURSE (RUDA)	23.20

C New Reservations proposed in Revised DP

SR.NO.	VILLAGE	S.NO./B.NO.	PURPOSE	AREA in Hect.
1	Mahika	283/p Govt.	Sports complex (RUDA)	40.79
2	Gavridal	512/p Govt.	Sewage Treatment Plant (RUDA)	251.28
3	HADMATIYA	230/P	Sewage Treatment Plant (RUDA)	40.05
4	Nakaravadi /Rajgadh	105/P,106/P,106/P, 116/P,109/P,107,108,110/ P, 129/P,130 ,222/P,,222/P,222/P,222/P ,222/P,222/P,131/P,	Solid Waste Disposal (RMC)	76.77
	TOTAL			332.12

D NEW RESERVATIONS AS PROPOSED IN 18 VILLAGE D.P. EARLIER

SR.NO.	VILLAGE	S.NO./B.NO.	PURPOSE	AREA in Hect.
1	Kuvadva	557/p-govt	Garden & Parking (RUDA)	19.04
2	Targhari	135/p-govt	Garden & Parking (RUDA)	33.22
3	Khirasara	412/p-govt	Garden & Parking (RUDA)	52.13
4	Vajdi Vad	100/p-govt.	Garden & Parking (RUDA)	23.65
5	Vajdi Virda	120/p-govt	Garden & Parking (RUDA)	15.36
6	Ratanpur	228/p-govt	Garden & Parking (RUDA)	18.74
7	Dholara	200/p-govt	Garden & Parking (RUDA)	20.99
8	Veraval	305/1a-7-govt	Garden & Parking (RUDA)	25.73
	Total C			208.86
	Total C+D			540.98

	Total A+B+C+D		1385.60

Thus total 1385.60 Hector of lands have been proposed for various Public Purposes under reservations in Current Revised Development Plan

12.5 Costing

The Details of Costing for the Reservation so proposed at the current Jantri rates shall be Rs. 1245.6 Crore over next 20 Years, hence average per year proviso of app. Rs. 60-80 Crores shall be required, considering the price hike also. It is also possible, that, the Govt. land may be granted to RMC/RUDA free of cost or Revenue free or may be at a token price, under various govt. scheme, than the cost towards land acquisition may go down

12.6 Action Plan

A detailed action plan for the implementation of the proposal shall be required for the speedy implementation. This shall include the action plan based on regional basis, considering the pockets of threshold population, availability of finance under various govt. scheme and requirement of the region

SECTION 13: IMPLEMENTATION OF DEVELOPMENT PLAN

13.1 INTRODUCTION

Success of Development Plan depends on how effectively it is implemented. Various tools identified for its implementation include General Development Regulations, projects, proposals, detailed plans and implementation and monitoring. These tools will require certain mechanisms through which they can be carried out. Such mechanisms include town planning schemes, Network Road Planning, public private partnerships, dedicated team to prepare and monitor detailed projects.

13.2 IMPLEMENTATION TOOLS

Below are the tools that can be deployed to implement various aspects of the Development Plan

i. General Development Control Regulations (GDCR)
ii. Implementation of projects
iii. Implementation of proposals
iv. Preparation of Detailed Plans and Studies and other improvements
v. Creation of Resource Cell

13.2.1 GENERAL DEVELOPMENT CONTROL REGULATIONS (GDCR)

General Development Control Regulations are important tools to regulate the use of land and the urban form of the city while ensuring safe, healthy and livable urban environment. In order to implement the Second Revised Development Plan 2031 in accordance with the overarching vision and the principles of growth management, the GDCR are suitably modified. The revised GDCRs have also been simplified and illustrated as necessary to make them easy to interpret and implement. The revised GDCR are structures in five sections as follows:

Section A: Introduction and definitions
Section B: Procedure Regulations
Section C: Planning Regulations
Section D: Building performance regulations
Section E: Schedules and forms

Following are some of the major features of the revised GDCR

Procedural Regulations:

These regulations mandate the procedures and requirements for construction of buildings and for obtaining development permission and building use permission. Salient features included in this section are as follows

- Requirement for landscape plan along with building plan approval
- Registration of fire protection consultants
- All sanctioned building plan to be published on website of the authority
- Revision in different kind of fees,
- Improved check-list for scrutiny

Planning Regulations:

This section consists of Regulations pertaining to land use, density, height and setbacks of building and parking requirement. Salient features included in this section are as follows

- Simplified and improved zoning nomenclature that organizes the zoning categories to better reflect the uses they are intended for.
- FSI incentives for development for existing City Area A, City Area B and around the Ring Road
- Introduction of Transit Oriented Zone to encourage compact development along transit corridor
- Introduction of Knowledge and Institution zone to enhance educational and research activities
- Introduction of Information Technology zone to enhance educational and research activities
- To incentivize development of affordable housing, Residential – Affordable Housing (RAH) zone has been introduced
- Enhanced Regulations for affordable housing
- Specific area/zone for Old City to encourage conservation and preservation of the Old City
- Enhanced Regulations for heritage to incentivize preservation of listed heritage structures
- Tradable Development Rights for Heritage preservation
- Enhanced Regulations for development of Gamtal extension areas

Building Performance Regulations:

These regulations define minimum performance standards and specifications that buildings are required to comply with. Salient features are as follows

- **Fixed margins:**
  - Fixed Road Margins (Build-to-line) based on road width resulting into a uniform street facade and harmonious urban form

  - Revised and fixed other than roadside margins based on building height range to increase the use of ground space and at the same time meeting the fire safety requirements
  - Removal of ground coverage restrictions allowing full utilization of ground space subject to margin, common plot and parking regulations
  - Improved parking requirements: removed restrictions on number of cellars or number of floors for parking purpose
  - Parking area not included in FSI requirement
- **Building height**
  - Revision of building height classification to enable optimum utilization of FSI
  - Building height considered from ground level
  - Buildings to be classified based on height range
  - Improved norms for fire safety related to fire
- Improved norms for fire safety related to fire exit routes
- Expanded scope for requirements related to disabled persons
- Introduction of rainwater storage requirement and grey water recycling requirements
- Enhanced rainwater harvesting requirement with provision of retention ponds for larger developments
- Incentives for Green Buildings

13.2.2 PROJECTS

These projects typically include construction and development activities proposed, such as transportation, physical infrastructure, social infrastructure, green network and housing. They may require capital investments and may require the need to prepare Detailed Project Reports (DPR).

Following are the list of projects to be constructed and developed as identified in this Draft Development Plan 2031

Transportation

- Development of Complete Streets Network
- Expansion of Road Network -
- Network Improvement through construction of bridges, flyovers and underpasses

Housing

- Construction of EWS housing
- Slum upgradation
- Improving shelter for homeless through night shelters

Green Network

- Development of regional, city level and neighbourhood level parks and public plazas
- Development of Green street network implemented along with Complete Streets
- Lake front, Riverfront and Canalfront development
- Development of Urban groves to increase green cover
- Utilization of underutilized spaces such as bridge underspace

Social Infrastructure

- Development of Fire Stations
- Proposal for Sports Center in the Eastern Area
- Proposal of City Center in the Eastern Area
- IT Zone along Kuvadava road in the Eastern Area
- Knowledge and Education zone along Bhavnagar road in the Eastern Area

Physical Infrastructure

- Upgradation and provision of new water treatment plants (WTPs)
- Provision of New Water Distribution Stations (WDS) and OHTs
- Upgradation and development of new water supply network
- Upgradation and provision of New Sewage Treatment Plants (STP)
- Provision of New Sewage Pumping Station (SPS)
- Expansion of new sewerage network
- Enhancement of Storm water drainage network coverage
- Lake linkages for managing storm water and ground water recharge

13.2.3 PROPOSALS

Following are the proposals to be implemented as identified in the Second Revised draft Development Plan 2031

Zoning

- Re-densification of existing zoned areas
- Densification along transit corridors through Transit Oriented Zone (TOZ)
- Development around existing zoned area to incentivize affordable housing
- Development in Growth Centers
- Development around village Gamtals
- Special Planned Development zones (SPD)

Reservation: In line with the projected population of 2031, a huge requirement of public utilities like: water supply, sewerage, Fire, Health, Recreation, Transport, Local Commercial etc. has arisen, for which a large number of land pockets would be needed. In line with the Chief Minister's Affordable Housing scheme, a large number of land pockets for Affordable Housing shall also be needed. To cop up with these requirements, it has been decided to propose various new reservations for the specified purposes, for which, after detailed discussions, it was decided to use the locations as proposed in existing Development plan for various reservations as New reservations for specific purposes for RMC and RUDA. Thus following typologies of reservations are proposed For:

- Public Housing
- Local Commercial Centers
- Sewage Treatment Plant
- City Center
- New Race Course
- Educational Purpose
- Other Public Purposes

Housing

- Provision of land for EWS housing by Authority
- Increasing supply of affordable housing through RAH zone

Social Infrastructure

- Encourage development of educational and research facilities through provision of Knowledge and Institution Zone
- Provision of land for educational facilities through Town Planning Mechanism
- Provision of land for fire and emergency services through Town Planning Mechanism
- Provision of land for recreational facility through Town Planning Mechanism

Economic Development

- Organize informal sector
- Enable and support industrial growth centers and corridors
- Support rural economy
- Organize employment centers and corridors for sustainable economic development

13.2.4 Detailed Plans, Studies and other improvements

Following are some of the recommended plans, studies and other improvements proposed to be conducted by the Authority's Resource Cell for effective implementation of the proposals identified

[A] Plans and studies

- **Zoning**
  - Guidelines for Network Road Planning
  - Polycentric Nodes, Knowledge and Institutional Zone, IT and Technology zone, Gamtal Extension Zone, Transit Oriented zone, etc

- **Transportation and Mobility**
  - Comprehensive set of guidelines for designing and implementing a 'Complete Street'
  - Parking Management Plan and individual Parking Zone Plans
  - Trip General manual for Rajkot
  - Paring generation manual for Rajkot
  - Bicycle and Pedestrian Network Plan
  - Signage and Way finding plan
  - Comprehensive freight management plan
- **Green Network**
  - Green Network Plan including planning of Vistas
  - Comprehensive Lake Development Plan
  - Lakefront Development Plans (for individual lakes)
- **Housing**
  - Housing Demand and Supply Assessment Study
  - Comprehensive slum networking, redevelopment and rehabilitation plan for RMC and RUDA areas
  - Public Land Study & Inventory Assessment
  - Housing units survey and preparation of database by various types
- **Physical Infrastructure**
  - Physical Infrastructure Development and Management Plans
  - GIS database for physical Infrastructure
- **Economic Development**
  - Plan to organize and manage informal sector
  - Prepare and maintain database of existing employment by various categories and location to assess job-housing balance, travel demand and infrastructure demand
- **Heritage**
  - Heritage Conservation Plan including listing of heritage structures and precincts, regulations for the heritage structure influence zones and heritage precincts, TDR mechanism to incentivize conservation, design guidelines for controlling visual and physical character etc.
  - Specific Paring Management Plan for Old City to support GDCR

[B] Procedural changes

- Improvements in building permission records database to include additional information
- Online database for all sanctioned building plans

[C] Interdepartmental programs

- Urban environment monitoring program to monitors air quality, water quality, noise level and heat island

13.2.5 Creation of Resource Cell

The proposals in the Second Revised Draft Development Plan 2031 have been formulated considering 20 years horizon. However, to evaluate the progress made towards achieving the vision, a Resource Cell shall be set up to enhance and implement the proposals and projects. It will be responsible for coordinating and integrating various projects and proposals and for creating a coherent, livable urban environment. It shall comprise of a Planning and Research Unit and an Implementation Monitoring Unit.

[A] Planning and Research Unit:

Planning and Research unit shall be equipped with modern data processing facilities, software, modern surveying equipment such as GPS etc. It shall comprise of a team of engineers, planners, administrative officials and other relevant professionals. It shall also prepare various plans and conduct studies, research and consultancy. It shall identify various projects to be implemented and empanel professional organizations which shall further assist the Resource Cell in carrying out various studies for the projects identified.

[B] Monitoring Unit:

Monitoring unit shall be set up for monitoring the progress and implementation of various projects. For this, measurable indicators need to be identified to monitor the physical and socio-economic changes made. Monitoring shall be done in two phases of 5 years each. At the end of the first phase, implementation of the plan shall be reviewed, growth rates and economic conditions be assessed and necessary recommendations made for any modifications or revisions.

13.3 Implementation Mechanisms

Below are the mechanisms that can be deployed to implement various aspects of the Development Plan.

[A] Implementation mechanism for construction and development projects

a. By authority

b. Joint Ventures/Public Private Partnership (PPP)

[B] Implementation mechanism for zoning and land development proposals

a. Town Planning Schemes (T.P. Schemes)

b. Network Road Planning

c. General Development Regulations

[C] Implementation mechanism for plans and studies and other improvements

SECTION 14: COSTING AND RESOURCE MOBILIZATION

14.1 COST ESTIMATION

Implementation of projects, proposals, plans, studies and improvements identified in the Second Revised Draft Development Plan 2031 will require resources and funds for implementation. Below is a broad estimate of costs for implementation of this Development Plan broken down into four broad components.

- Implementation of projects
- Implementation of proposals
- Preparation of Detailed Plans, Studies and other Improvements (database preparation, procedural changes, interdepartmental changes)
- Creation of Resource Cell
- Each of these components has been detailed out in this section.

14.1.1 IMPLEMENTATION OF PROJECTS (CONSTRUCTION AND DEVELOPMENT)

Due to the rapid growth of population within the city and the expansion of developed areas there is a need for constant upgradation and expansion of the infrastructure facilities. The expansion area of RUDA needs to be provided with organized infrastructure i.e. roads, water supply, sewerage, storm water, parks, open spaces etc. Therefore, the Second Revised Draft Development Plan 2031 introduces several plans, proposals and recommendations taking into consideration the future population growth for improvement in transportation, physical infrastructure and green network.

The cost of implementation of projects has been calculated considering the following components which have been detailed further in this section

[A] Transportation
[B] Green Network
[C] Physical infrastructure
[D] Housing

[A] Transportation

Various proposals have been developed to help address existing transportation issues impacting mobility and for improving future conditions by improving the network, setting priorities right, and managing travel demand. The transportation cost includes the following cost components

- Construction of Roads
- Construction of bridges
- Provision of street light
- Implementation of On-street Parking System for Parking Zones

The cost breakup for each of the above mentioned component has been detailed out in the tables below

Table 11: Cost break up for Construction of Roads (Approx.)

Area	Road area in Ha.	Cost in Cr.
RMC	134.82	**189**
54 Villages	2793.64	**3910**
Total RUDA	**2928.46**	**4099**

TABLE 12: COST BREAK UP FOR CONSTRUCTION OF BRIDGES (APPROX.)

No.	Type	No.		Cost in Cr.		Total Cost in Cr.
		RMC	RUDA	RMC	RUDA	
1	Bridge over River	1	4	08	30	38
2	Bridge over Canal	0	0	00	00	00
3	Flyover	0	8	00	132	132
4	Rail over Bridge	0	4	00	65	65
5	Rail Underpass	0	0	00	00	00
6	**Total**	**1**	**16**	**08**	**227**	**235**

The total cost of transportation infrastructure is estimated to be Rs. 4,395 crores.

[B] Green Network

In order to cater to the needs of the neighborhoods in the city, a various projects have been planned to provide adequate recreational spaces. The Green network cost includes

- Development of Gardens
- Development of Lakes

The overall costing for developing gardens and lakes in RMC and RUDA area is estimated to be Rs. 150 crores.

[C] Physical Infrastructure

The total cost to be incurred for upgradation and provision of physical infrastructure has been calculated taking into account the various cost components of water supply, sewerage system, storm water management and solid waste management.

- **Water supply cost**
  The cost estimate for water supply includes
  - Water treatment plants
  - Water distribution stations
  - Water storage facilities Water distribution network.
- **Sewerage cost**
  The cost estimate for sewage infrastructure includes
  - Sewage treatment plants
  - Intermediate Pumping stations
  - Sewage network

TABLE 13: COST BREAK UP FOR VARIOUS INFRASTRUCTURE DEVELOPMENT (APPROX.)

No.	Particular	Capacity	Total Cost in Cr
A	**Water Supply**		**210**
1	Upgradation of existing WTP	-	135
2	New WTP at Aji – II	100 MLD	50
3	New WTP at Gavridad	50 MLD	25
B	**Sewerage**		**125**
1	Upgradation of existing STP	-	75
2	New STP at Kotharia	100 MLD	50
3	New STP at Raiya	50 MLD	25
4	New STP at Ghaneshwar	100 MLD	50
5	New STP at Gawridad	50 MLD	25

The total cost of physical infrastructure has been estimated at Rs. 335 crores.

[D] Housing

Based population projections and existing demand, total of about 79,288 EWS housing units will be required in the coming decades. The cost of providing this unit is estimated to be about Rs. 3162 crores.

Total cost for Projects:

Considering the various cost components of transportation, physical infrastructure and garden and lake development, the total cost for infrastructure development has been

estimated to be Rs. 8392 crores. The following table gives the breakup of construction infrastructure development.

TABLE 14: COST BREAKUP OF CONSTRUCTION INFRASTRUCTURE DEVELOPMENT

No.	Plan implementation Elements	Cost Estimate in Cr.
1	**Projects**	**8392**
A	Transportation	4395
B	Green Network	150
C	Physical infrastructure	335
D	Housing	3162
2	**Preparation of plans and studies**	**130**
3	**Other improvement**	**35**
4	**Resource cell set up**	**20**
5	**Land Acquisition cost - Reservation**	**1245**
	Total Cost	**17864**

14.1.2 PREPARATION OF DETAILED PLANS AND STUDIES

Implementation of the Second Revised Draft Development Plan will require multiple studies, guidelines and plans to be prepared for effective and successful implementation. Guidelines for preparing Network Road Planning, Design of Complete Streets, Parking Management Plan, Green Network Plan, Traffic Management Plan, Traffic Surveys and Travel Demand Modeling, Lake Development Plans, Heritage Conservation Plan, Pedestrian and bicycle network etc are some examples of such plans and studies.

Total cost of such plans and studies are estimated to be about Rs. 130 crores over the next decade.

14.1.3 DATABASE PREPARATION AND PROCEDURAL CHANGES

Learning from the past, the development plan recommends updating various procedures and creating and maintaining crucial databases. This includes preparing and maintaining housing unit survey and database, GIS database for physical infrastructure including water, sewage, storm water etc, building and maintaining employment database, parking surveys and database etc.

The procedural changes shall include improvements in building permission records database to capture additional information, online database for all sanctioned building plans, enhancement of resources and capacity building of existing units to ensure effective implementation etc.

The total cost of these improvements is estimated to be about Rs. 35 crores over the next decade.

14.1.4 Resource cell

As discussed earlier, a Resource Cell is proposed to be formed for implementation and monitoring of the progress of various projects, preparation of various plans and conducting studies and research as a part of Development Plan. The total cost for Resource cell includes the following components

- **[A] Planning and Research Unit**
  - Infrastructure set up cost
  - Manpower cost (10 years)

- **[B] Implementation monitoring unit**
  - Infrastructure set up cost
  - Manpower cost (10 years)

The total cost for setting up Research cell is Rs. 20 crores.

14.1.5 Total cost for Second Revised Draft Development Plan

Putting all the costs together, the total cost of Second Revised Draft Development Plan 2031 is been estimated to be about Rs. 19,070 crores.

14.2 Resource Mobilization

The implementation of the Development Plan requires long term fiscal planning. Following are some of the modes through which resources could be generated for covering the costs incurred for implementation of the various projects, proposals and improvements identified in the Second Revised Draft Development Plan 2021

14.2.1 Self funding by Authority

- Revenues from Development Fees
- Land Resources / Sale of Public land
- Payment from saleable FSI

- Various fees for urban services such as water supply, drainage, roads etc. (under sec 23 of the Act)
- Development charges from the citizens for development of land (under sec. 99 and 100 of the Act)

14.2.2 Funding from State Government

The funds generated by Authority will be inadequate for major capital projects proposed under Development Plan 2031. Therefore, additional funding shall be required to be sourced by the grants and loans from the state government.

14.2.3 Funding from Central Government

The Government of India has proposed substantial assistance through the JnNURM under which funds shall be provided for proposals that would meet the Mission's requirements. Assistance under JnNURM is additional central assistance, which would be provided as grant to the implementing agencies.

14.2.4 Leveraging funding from other agencies and departments

Apart from the various State and central government financial assistance, Authority can seek funding for proposals from various organizations such as LIC, HUDCO, World Bank etc.

14.2.5 Joint Ventures/Public Private Partnership (PPP)

In order to optimize life cycle costs, private sector efficiencies can be inducted in development, management, implementation and financing of proposals and projects proposed in the Second Revised Draft Development Plan 2031 through Joint Ventures or Public Private Partnership (PPP) arrangements where appropriate.

Private sector involvement may be sought for the following

- Construction of affordable housing,
- Infrastructure development such as construction of roads, public transit systems, logistics parks, parking management
- Garden and Waterfront development
- Physical infrastructure such as water supply, solid waste management etc.

SECTION 15: RECOMMENDED ACTIONS

Following are some of the recommended actions that can be taken up as immediate steps as a part of implementation of the Second Revised Draft Development Plan 2031.

15.1 PROJECTS

Transportation

- Development of Complete streets Network
- Expansion of Road Network
- Network Improvement through construction of all types of bridges

Housing

- Construction of EWS housing
- Slum upgradation
- Improving shelter for homeless through night shelters

Green Network

- Development of regional, city level and neighbourhood level parks and public plazas
- Development of Green street network implemented along with Complete Streets
- Lake front, Riverfront and Canal front development
- Development of Urban groves to increase green cover
- Utilization of underutilized spaces such as bridge under-space

Physical Infrastructure

- Upgradation and provision of new water treatment plants (WTPs)
- Provision of New Water Distribution Stations (WDS) and OHTs
- Upgradation and development of new water supply network
- Upgradation and provision of New Sewage Treatment Plants (STP)
- Provision of New Sewage Pumping Station (SPS)
- Expansion of new sewerage network
- Enhancement of Storm water drainage network coverage
- New solid waste management equipment
- New landfill site
- New MSW processing unit

Social Infrastructure

- Development of Fire Stations

15.2 IMPLEMENTATION OF PROPOSALS

Following are the proposals to be implemented as identified in the Second Revised draft Development Plan 2031

Zoning

- Re-densification of existing zoned areas
- Densification along transit corridors through Transit Oriented Zone
- Development around existing zoned area to incentivize affordable housing
- Development in Growth Centers
- Development around village Gamtals
- IT and Knowledge zone

Housing

- Provision of land for EWS housing by Authority
- Increasing supply of affordable housing through RAH zone

Social Infrastructure

- Encourage development of educational and research facilities through provision of Knowledge and Institution Zone
- Provision of land for educational facilities through Town Planning Mechanism
- Provision of land for fire and emergency services through Town Planning Mechanism
- Provision of land for recreational facility through Town Planning Mechanism

Economic Development

- Organize informal sector
- Enable and support industrial growth centers and corridors
- Support rural economy
- Organize employment centers and corridors for sustainable economic development

15.3 PREPARATION OF DETAILED PLANS, STUDIES AND OTHER IMPROVEMENTS

Following are some of the recommended plans, studies and other improvements proposed to be conducted by the Authority's Resource Cell for effective implementation of the proposals identified

[A] Plans and studies

- **Zoning**
  - Guidelines for Network Road Planning

- Polycentric Node, Knowledge and Institution Zone, Info. And Technology Zone, Gamtal Extension Zone, Transit Oriented Zone, etc.
- Guidelines for new TP schemes

- **Transportation and Mobility**
  - Comprehensive set of guidelines for designing and implementing a 'Complete Street'
  - Parking Management Plan and individual Parking Zone Plans
  - Trip General manual for Rajkot
  - Paring generation manual for Rajkot
  - Bicycle and Pedestrian Network Plan
  - Signage and Way finding plan
  - Comprehensive freight management plan

- **Green Network**
  - Green Network Plan including planning of Vistas
  - Comprehensive Lake Development Plan
  - Lakefront Development Plans (for individual lakes)

- **Housing**
  - Housing Demand and Supply Assessment Study
  - Comprehensive slum networking, redevelopment and rehabilitation plan for RMC and RUDA areas
  - Public Land Study & Inventory Assessment
  - Housing units survey and preparation of database by various types

- **Physical Infrastructure**
  - Physical Infrastructure Development and Management Plans
  - GIS database for physical Infrastructure

- **Economic Development**
  - Plan to organize and manage informal sector
  - Prepare and maintain database of existing employment by various categories and location to assess job-housing
  - balance, travel demand and infrastructure demand

- **Heritage**
  - Heritage Conservation Plan including listing of heritage structures and precincts, regulations for the heritage structure influence zones and heritage precincts, TDR mechanism to incentivize conservation, design guidelines for controlling visual and physical character etc.

- Specific Paring Management Plan for walled city to support GDCR

[B] Procedural changes (in record keeping systems (digital & manual forms), fees etc)

- Improvements in building permission records database to include additional information
- Online database for all sanctioned building plans

[C] Interdepartmental programs (monitoring programs etc.)

- Urban environment monitoring program to monitors air quality, water quality, noise level and heat island effects in the urban areas on regular intervals.

15.4 Creation of Resource Cell

- For monitoring plan implementation
- Coordinating between various dept and authorities for implementation of DP
- Carrying out various studies and planning exercises
- Implementing procedural and other improvements etc

APPENDIX

APPENDIX 1.A – BASIS FOR POPULATION PROJECTIONS

PROJECTION METHODOLOGY

Considering the trends of population growth during the past four decades, the future profile of the city in terms of population has been worked out. The development Plan is for the period of 10 years, for the consideration of the projects a time period of 20 years is considered thus the population projects is done for a period of 10 and 20 years respectively for the years of 2021 and 2031. In order to be more realistic in terms of estimating the future population of the town, 3 different methods have been used. The methods used for the population projections are:

a) Arithmetical progression method
b) Geometrical progression method
c) Incremental increase method

Considering the large variations of population arrived at by these methods, average of the figures are proposed to be adopted for working out the population distribution, land use planning, infrastructure requirement and transportation network required to serve the population.

Population Projection through Arithmetical Progression Method:

The increment in the population per decade is averaged out and it is multiplied with the number of decades for which the projection is required to be done, this averaged increment is applied to the population of base year i.e. 2001 and the projection for the year 2011, 2021 and 2031 is calculated.

Projected Population for year 2011 =
Population in 2001+ (1 x average increase per decade)

Projected Population for year 2021 =
Population in 2001+ (2 x average increase per decade)

Projected Population for year 2031 =
Population in 2001+ (3 x average increase per decade)

Population Projection through Geometrical Progression Method:

For projecting the population through Geometric Progression Method, a Geometric mean of the past growth rates is derived, now assuming that the future growth for the decades of 2011, 2021 and 2031 follows the geometric mean. Taking the population of the year 2001

as the base year the geometric mean is applied to the population of the base year and the population is projected for the upcoming
3 decades.

Geometric mean, r_g = (Growth rate of 1st and 2nd decade x Growth Rate 2nd and 3rd decade x Growth rate of 2nd and 3rd decade)^(1/3)

Projected Population for year 2011 = Population in 2001 X (1 + rg) ^ 1
Projected Population for year 2021 = Population in 2001 X (1 + rg) ^ 2
Projection Population for year 2031 = Population in 2001 X (1 + rg) ^ 3

Population Projection through Incremental Increase Method:
For projecting the population through Incremental Increase Method, the difference between the increments is calculated which is called the incremental increase, which is then averaged out and applied to the Base year of 2001 and the projection for the year 2011, 2021 and 2031 are calculated.

Incremental Increase Pn = P1 + nX + n(n+1) Y/2

Where,
Pn is the Projected Population for that particular decade
P1 is the population for the base year i.e. 2001
n is the decade for which the population projection is to be done
X is the average increase in population per decade
Y is the average incremental increase of the decades

APPENDIX 3.2. A – NETWORK ROAD PLANNING

A Development Plan consists of a broad framework of overall vision, policies, proposals and regulations for the urban area of Rajkot for future development up to next 20 years. This development Plan is implemented on ground through various tools. Historically, these tools have included T.P. schemes and development control regulations (GDCR) specified for various zones. These tools primarily are focused on guiding new developments. However, there is a significant need to do micro level planning for improving existing developed areas.

Network Road Planning is proposed to be one such micro level planning tool that will help implement the vision of Development Plan on plot to plot basis taking into account the needs of the existing ward/ neighborhood or any area within RUDA. This shall be achieved by instantaneous proposal of a Public road at the time of receiving Development Permission, after thoroughly studying existing Network, demand etc. However, ideally, it is intended to have a Town Planning Scheme for development of this area, but in absence of

any proposal of Town Planning Scheme, the mechanism of Network Planning shall continue, with a minimum width of Public road, so proposed to be wider than 15 mts.

The Network Road Planning shall also help support the Development Plan's vision of compact growth, and densification within the existing zoned areas along transit corridors. The objective of Network Road Planning is comprehensive improvement of the area, including improvement in overall mobility, pedestrian accessibility, public transportation, gardens, open space, amenities, infrastructure and enhancement of overall neighborhood character, so that the city can be better equipped to accommodate future growth in a sustainable and livable manner.

What will it include?

A Network Road Planning shall help improving the connectivity of individual plots with Public roads, thereby generating new grids of interconnecting roads, thus this shall provide comprehensive guidance to enhance livability of the area through coordinated improvements in transport, physical and social infrastructure taking into account the existing character, land uses and activities taking place in the area.

As Network Road Planning is intended for better connectivity and proviso of Infrastructure, It is deemed to have a proposal of Draft Town Planning Scheme in the area of TOZ, however in absence of T. P. Schemes, Network Road Planning may include:

a) Study of
    a. exiting areas, its built form, development character and activity patterns
    b. Streets network and public transportation infrastructure
    c. Parks, Gardens, Plazas and public spaces
    d. Physical infrastructure
b) Proposal of Network roads which shall also include the proviso of following physical Infrastructure:
    - Water supply
    - Sewerage
    - Solid waste
    - Storm water
    - Street light

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