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PREFACE

Vasai Virar which is part of Thane district is located at the north of greater Mumbai. **Vasai - Virar Sub-Region** is situated in the north-west corner of the Mumbai Metropolitan Region and covers 380sq.km. (About 9.5% of the area of Mumbai Metropolitan Region) and includes 4 Municipal Councils (virar, Vasai, Nallasopara &Navghar - Munikpur) & 53 villages. The Vasai-Virar Sub-region is separated from Greater Mumbai and Mira-Bhayander by the Vasai Creek. However, due to development of road and rail network, it is strategically linked to Mumbai. It is also linked by road and rail to other major centres in the Mumbai Metropolitan Region, such as, New Mumbai (via Vasai-Diva Railway Line), Panvel, Thane, Bhiwandi and Kalyan.This area which has been identified as one of the growth centers around Mumbai is well connected with the metropolis by suburban commuter rail and Mumbai Ahmadabad National Highway.

Satellite Town of Municipal Corporation of city of Vasai Virar has a significant growth potential due to close proximity to Brihan Mumbai and is experiencing very rapid urban growth. With prohibitive land prices in Mumbai low and middle income households are shifting to the Vasai Virar. Improving the affordable housing stock in VVSR will help reduce the slum pockets in MMR. The people of VVSR have their work places located in Mumbai. About 60% of workers commute to Mumbai in the morning & return in the evening putting pressur on Public Transport system.Secandly the industrialist and builders and devolpers are staying in Mumbai City and carring their business in VVSR. VVSR presently serves as a growing dormitory town to the Mumbai city. The concentration of economic activities and population growth in Mumbai has put tremendous strain on the delivery of infrastructure services. At the same time there has been growing realization that there is a need for decentralization of activities so as to reduce the burden on Mumbai.Considering these aspects the GOI has selected the city of Vasai virar for funding for the infrastructure development under setallite towns.

Vasai Virar region has great potential for uranisation and keeping in view the state govt has stationed the development plan for this area admeasering 380 sq km. Out of which 8324 ha area is proposed for urbanization.Tourism with its Heritage installations & scienic beauty available in the area will improve the Tourism potential of the region by developing the infrastructure facilities. Tourist amenities will not only improve economic status of VVSR but also reduce strain on adjacent highly urbanized areas like Mumbai and Thane. The local people as well as residents of nearby areas will have weekend outing place available very close at hand in VVSR.There is good scope for industrialization of VVSR with availability of land and proximity of market for the products.It offers excellent opportunities for service industry & small scale industry as ancilliary to industries in MMR.

The Government of India (GOI) has initiated Scheme of Urban Infrastructure Development In Satellite Towns / Counter Magnets Of Million Plus Cities, for accelerating the pace of urban infrastructure development in new township / satellite towns around million plus / large cities. In the light of above it is proposed to cover VVSR under this Scheme. The preparation of City Development Plan is an obligatory function for accessing the grant under various government funds. For MCCVV, GOI and GOM grants will fund 90% of the total plan and it will therefore need to generate the remaining 10% of the funds, which it proposes to fund through borrowings.

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Tables

1 INTRODUCTION

1.1 Background:

With the City Development Plan under Scheme of Urban Infrastructure Development in Satellite Towns / Counter Magnets of Million plus Cities coming into existence every city had preparation of City Development Plan as an obligatory function for accessing the grant under various government funds. City and Industrial Development Corporation of Maharashtra Ltd being Special Planning Authority for area work of preparation of city development plan was entrusted to CIDCO by GoM.

MCCVV is the local body responsible for providing a host of civic services and infrastructure to the citizens in the Sub Region. It is governed by the Bombay Provincial Municipal Corporation Act, 1949 (BPMC Act, 1949). CIDCO has been appointed as a special planning authority in Vasai Virar Sub Region by GoM vide notification dated 14.05.1990. GoM, MCCVV and CIDCO (till it exists as SPA) shall be jointly responsible for financing and implementing most of the projects conceived under a City Development Plan (CDP) as part of Scheme of Urban Infrastructure Development In Satellite Towns / Counter Magnets Of Million Plus Cities, a scheme initiated by the Government of India (GOI) for accelerating the pace of urban infrastructure development in new township / satellite towns around million plus / large cities. For MCCVV, GOI and GOM grants will fund 90% of the total plan: MCCVV & CIDCO will therefore need to generate the remaining 10% of the funds, which it proposes to fund through borrowings.

With this objective in mind, CIDCO formulated various teams as per the guidelines for preparation of CDP under able leader ship of Shri. G.S.Gill (IAS) Vice-Chairman & Managing Director, Shri. K. A. Shinde, (Additional chief planner) was responsible for coordination between various teams Shri B.H. Gandhi, (administrator, Vasai Virar) and Shri Y.S. Reddy (Town planning officer) were coordinator with Municipal Corporation of Vasai Virar and other Parastatals agencies. Municipal Corporation of the city of Vasai Virar was represented was lead by Shri K. H. Borde (officer-In-Charge) Administrator/ commissioner MCCVV and his deputy commissioners. Shri Sanjay M. Jagtap Municipal Engineer MCCVV was coordinator for the Scheme. Further City and Industrial Development Corporation of Maharashtra Ltd (CIDCO) has appointed M/s Tandon & Associates, Mumbai as consultant for preparing the City Development Plan and City Investment Plan for Vasai-Virar. All India Institute of Local Self Government being a hand

holding agency has extended enormous co-operation in bringing this CDP in present form.

1.2 Introduction

1.2.1 Vasai-Virar

Vasai Virar which is part of Thane district is located at the north of greater Mumbai. **Vasai - Virar Sub-Region** is situated in the north-west corner of the Mumbai Metropolitan Region and covers 380sq.km. (About 9.5% of the area of Mumbai Metropolitan Region) and was included 4 Municipal Councils (virar, Vasai, Nallasopara &Navghar - Munikpur) & 53 villages. The Vasai-Virar Sub-region is separated from Greater Mumbai and Mira-Bhayander by the Vasai Creek. However, due to development of road and rail network, it is strategically linked to Mumbai. It is also linked by road and rail to other major centres in the Mumbai Metropolitan Region, such as, Navi Mumbai (via Vasai-Diva Railway Line), Panvel, Thane, Bhiwandi and Kalyan.

This area which has been identified as one of the growth centers around Mumbai is well connected with the metropolis by suburban commuter rail and Mumbai Ahmadabad National Highway.

Vasai Virar area is located on the north-western periphery of Mumbai under Thane district and is located between 19°28'N – 19°47'N latitude and 72° 48'E – 72° 8'E longitude Vasai Virar Municipal Corporation with an area of 380 sq km served by Western Railway suburban service has a significant growth potential. Due to close proximity to Brihan Mumbai, the Vasai Virar Municipal Corporation is experiencing very rapid urban growth. With prohibitive land prices in Mumbai low and middle income households are shifting to the Vasai Virar. Thus, it is presently serves as a growing dormitory town to the Mumbai city.

1.2.2 Institutional and Legal Framework

The 74th Constitutional Amendment Act, 1992, gives Indian local bodies a constitutional status and assigns to them a large number of functions. Among other things this means that the revenue sharing arrangement between urban local bodies (ULB's) and their state government have constitutional status: before, such relationships were, in theory, subject to the state governments 'wishes. Section 63, Chapter VI of the BPMC Act, 1949 list the obligatory duties of MCCVV. These include:

- Planning for social and economic development;
- The watering, scavenging and cleansing of all public streets and places in the city and the removal of all sweepings there from;
- The collection, removal, treatment and disposal of sewage, offensive matter and rubbish and, if so required by the (state) government, the preparation of compost manure from such sewage, offensive matter and rubbish;

- The construction, maintenance and cleansing of drains and drainage works and of public latrines, water-closets, urinals and similar conveniences;
- Supplying a fire-bridge equipped with suitable appliances for the extinction of fires and the protection of life and property against fire;
- The lighting of public streets. Municipal markets and public buildings vested in the corporation;
- The regulation and abetment of offensive and dangerous trades or practice;
- The maintenance change and regulation of places for the disposal of the dead and the provision of new places for the said purpose and disposing of unclaimed dead bodies;
- The reclamation of the unhealthy localities, the removal of noxious vegetation and generally the abatement of all nuisances;
- The registration of births and deaths;
- The construction maintenance, alteration and improvement of public streets, bridges, sub-ways, culverts, cause-ways and the like;
- The management and maintenance of all municipal water works and the construction or acquisition of new works necessary for a sufficient supply of water for public and private purposes;
- Preventing and checking the spread of dangerous diseases;
- The securing or removal dangerous buildings and places;
- Fulfillment of any obligation imposed by or under the BPMC Act or any other law in force;
- Subject to adequate provision being made for the matters specified above, the provision of relief to destitute persons in the city in times of famine and scarcity and the establishment and maintenance of relief works in such times; and
- To provide for anti-rabic treatment.

MCCVV may, at its discretion, provide from time to time, either wholly or partly for all or any of the following matters (Section 66, Chapter VI of BPMC Act, 1949), such as:

- The organisation, maintenance or management of maternity and infant welfare homes or centres;
- The provision of milk to expectant or nursing mother or infant or school children;
- The construction and maintenance of public streets, or places of drinking fountains for human being and water thought for animal;
- The planting and maintenance of trees on road side and elsewhere;
- The provision of public. Parks, gardens, play-grounds and recreation grounds;
- The holding of exhibition, sporting events or games;
- The construction establishment and maintenance of theatres, rest-houses, and other public buildings;
- The grant of loans for building purposes to municipal servants on such terms and subject to such conditions as may be prescribed by the corporation;
- Any other measures for the welfare of municipal servants or any class of them;

- The furtherance of educational objects other than those mentioned in clause (15) of section 63 and making grants to educational institution.
- Contributions towards any public fund raised for the relief of human suffering within the city or for the public welfare;
- The registration of marriages;
- Granting rewards for Information regarding the Infringement any provisions of this Act, or of the rules byelaws regulation or standing orders;
- The building or purchase and maintenance of suitable dwelling for the poor and Working classes or the grant of loans or other facilities to any person, society or Institution Interested in the provision of such dwelling:
- The provision of shelter to destitute or homeless persons and any form of poor relief:
- Surveys of buildings or lands; and
- Any other measures likely to promote public safety, health, convenience of instruction.

1.2.3 Administration

Municipal Corporation of the city of Vasai Virar will be governed by a ''house'' or council comprising of elected councilors and nominated councilors, having special knowledge or experience in municipal administration. The latter enjoy all rights equivalent to that of elected councilors, but they neither can vote for any proposition nor can get elected as Mayor / Deputy Mayor / Chairperson of any Committee. The following authorities are charged with the carrying out the provisions of the BPMC Act:

- A Corporation :
- A Standing Committee :
- Ward Committee ; and
- A Municipal Commissioner

The Corporation, so formed, continues for a period of five years from the date appointed for its first meeting. The term of office of the councilors is conterminous with the corporation. The electoral wing is headed by the Mayor of Municipal Corporation of the city of Vasai Virar. The Office of Mayor combines a functional role of chairing the Corporation meeting as well as the ceremonial role. Besides the Mayor, a Deputy Mayor is appointed by the Corporation (the two being elected from amongst the elected councilors). The Mayor and the Deputy Mayor hold office until a new Mayor and a new Deputy Mayor are elected. The tenure of the Mayor and Deputy Mayor shall be of two and a half year (Section 19, sub-section 1 of BPMC Act, 1949). Next in hierarchy are the Leader of House (Section 19-1A of BPMC Act, 1949) and the leader of Opposition Leader (Section 19-1AA of BPMC Act, 1949). The Deputy Mayor may resign office at any time by notice in writing to the Mayor and the Mayor may resign office at any time by notice in writing to the Corporation (Section 19, sub-section 4 of BPMC Act, 1949).

Presently GOM has appointed Shri Kishore Hiraji Borde, Chief Officer (Group–A) as an Officer-in charge to exercise all the powers and duties of the Municipal Corporation of the city of Vasai-Virar. The Council comprising of Councilors is yet to be formed and Mayor & Deputy Mayor is yet to be appointed.

The general body (GB) is the highest decision-making body of the corporation and all elected and nominated councilors are members of GB.

Municipal Corporation of the city of Vasai Virar is yet to appoint four statutory committees – standing committee (SC), transport committee (TC), women and child welfare committee (WCWC) and ward committee. These committees will be formed as per Section 20, 25, 30 and 29 A of the BPMC Act, 1949.

SC has councilors appointed by corporation in Proportion to the number of elected member or political parties. Half of the members of the SC retire every Succeeding year. Any councilor who ceases to be a member of the SC shall be eligible for re-appointment (section 20, sub-section 6 of BPMC Act. 1949). The SC appoints one of its own members to be the chairman for a period of one year. Standing committee meets at least once every week. Except for the first meeting, the day, time and place of the meeting is fixed by the chairman. The meeting of standing committee is presided over by the chairman. In the absence of the chairman committee members select one of its members to preside over the meeting, The notice of the meeting specifying the time and the place at which the meeting will be held and the business to be transacted in the meeting Is given by the municipal secretary and sent to the standing committee members by ordinary post. The proposal before the standing committee is decided by a majority of Vote of the member present. When votes are equally split, the presiding authority has a right of a Second or casting vote. The minutes of the names of members present and the proceedings of every meeting are drawn up and kept by the municipal Secretary. The commissioner has a right to remain present in the meeting of the standing committee and to take part in the discussion but he has no right to vote upon to make any proposition in the meeting.

The TC consist 13 members, of whom 12 members are appointed by the corporation (section 25, subsection 1 and 2 of BPMC Act, 1949). The chairman of SC is the ex-officio member of TC (section 25, subsection 4 of BPMC Act, 1949). Half of the members of the TC retire every second year (section 25, sub-section 5 of BPMC Act, 1949.) The TC appoints one of its own members to be the chairman. The tenure of chairman of TC is one year (section 27, sub-section 1 of BPMC Act, 1949.) The chairman shall hold office unit his successor has been appointed under section 27, subsection 1, but shall be eligible re-appointment (section 27, sub-section 2 of BPMC Act, 1949).

The TC meets at least once in fortnight. Except for the first meeting, the day, Time and place of the meeting is fixed by the chairman. The meetings of TC are presided over by the chairman. In the absence of the chairman, committee member select one of its members to preside over the meeting. The notice of the meeting specifying the time and the place at which the meeting will be held and the business to be transacted in the meeting is given by the municipal secretary and sent to the TC members by ordinary post.

The proposals before the TC are decided by a majority of Vote of the members present when votes are equally split; the presiding Authority has a right of a second or casting vote. The minutes of the names of members present and the proceedings of every meeting are drawn up and kept by the municipal secretary. The transport manager (a post created under BPMC Act, 1949) has a right to remain present in the meetings of the TC and to take part in the discussion but has no right to vote upon or to make any proposition in the meeting.

The WC consists of the councilors representing the electoral wards within the territorial area of the WC, the Ward Officer and not more than three nominated member by the Councilors, the elected councilors of WC elect one of its own councilor's to be the Chairperson. The tenure of the chairperson or a WC is one year (section 1929, sub-section -4 of BPMC Act, 1949.)

The WC meets at least once in every month. Except for the first meeting, the day, time and place of the meeting is fixed by the chairman. The meetings of WC are presided over by the chairman. Committee member selects a person to preside over the meeting in the absence or the chairman. The notice of the meeting specifying the time and the place at which the meeting will be held and the business to be transacted in the meeting is given by the municipal secretary and sent to the WC members by ordinary post. The proposal before the committee is decided by majority of vote of the councilors present. When votes are equally split the presiding authority has a right of a second or casting vote. The minutes of the names of councilors present and the proceedings of every meeting are drawn up and kept by the municipal secretary.

The WCWC is special committee of the corporation. On WCWC not less than 75% of the members shall be from amongst women councilors (section 30, sub-section 1 A of BPMC Act., 1949). Any matter related to women's and children's welfare shall in the first instance be placed before the WCWC and shall be submitted to the corporation with its recommendations. The corporation by specific resolution passed by the vote of at least two-third of the councilors present and voting may also delegate any of its power and duties related to women's and children's welfare to WCWC (section 30, sub-section 2 of BPMC Act, 1949).

Administrative structure of MCCVV

Source: Data provided By MCCVV

The city's staffs are municipal employees, apart from those on deputation from GOM: the municipal commissioner; DMCs; chief auditor; assistant director (town planning); city medical health officer; and administrative officer (education).The following Table 1.1 shows the present staff pattern in four Municipal Councils in the area.

Table 1.1 – Municipal Staff

Item	Class 1 staff	Class II Staff	Class III staff	Class IV staff	Total
Total staff in the Corporation/ ULB	24	29	269	530	852
Permanent/Regular posts	24	29	269	530	852
Occupied posts	6	9	269	530	814
Temporary staff				14	14
Technical staff	1	8	28	0	37
Non technical staff	23	21	241	530	815
Vacant posts	19	19	0	0	38

Source: MCCVV

Department wise Municipal Staff of MCCVV

Municipal Council	Water Supply		Solid Waste Management		Waste Water & SWD	
	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary
Nallasopara	10	11	49	-	--	--
Navghar & Manikpur	125	--	3	--	140	--
Virar	4	125	70	--	--	--

The commissioner has administrative and tendering power to sanction projects up to INR 10 lakhs. Administrative power of sanctioning projects in the INR 10 lakhs-INR 50 lakhs range is with SC, and GB has administrative sanctioning power of projects in excess of INR 50 lakhs. However SC has tender sanctioning power of any project in excess of INR 10 lakhs.

1.2.4 Other Parastatal Agencies in Vasai-Virar

The onus of providing urban basic services in Vasai-Virar area is on Municipal Corporation of the city of Vasai Virar. Since CIDCO has been appointed as Special Planning Authority for VVSR technical support is extended to Municipal Corporation of the city of Vasai Virar for preparation of CDP and DPR. In VVSR area MCCVV will bring funds for urban development from GoI and GoM under various schemes and has to interact with the respective agencies that operate in the region. Apart from these funds CIDCO as SPA has collected Development Charges since 1992 and these will be used for development of infrastructure in VVSR.

Although assisted with 74th Constitution Amendment Act, 1992 on Municipalities, the Urban Local Bodies are facing alarming shortage of resources and capacity to cater to the demand for civic amenities and services. Basic indicators for urban development viz. household piped water connection, sewer connections, are found far below the normally accepted standards for urban centers. Even the BPL populations, forming a significant portion of the total population, have inadequate access to housing and sanitation facilities.

For most of the Municipalities, the paucity of resources is more due to ineffectiveness in revenue collection, particularly in property tax and water & sewerage user charges. Although inter-Government fiscal relationship has changed over the years, but not to the extent of creating negative impact of Municipal finances. At the same time, certain laws & systems are found to be hampering further utilization of urban land. Apart from the rationalization of tax rates and user charges for availing civic amenities, Municipalities are also found to lack adequate capacity to deliver responsive services and manage their own organizational affairs, like undertaking planning, execution, public disclosure functions, efficiently.

It is necessary for a civic authority to have proper estimate of the land requirements for the various aspects of the city development for efficient ultimate development and management of the developmental activities and other urban affairs. Thus it becomes obligatory to propose a city development plan for Vasai Virar. With this in view, as directed by State Government the Municipal Corporation of the city of Vasai Virar has decided to prepare a CDP for a period of 30 years from 2011-41 and for this CIDCO as SPA for VVSR has been assigned to work as Nodal Agency. However, keeping in mind the funding pattern under the JnNURM, the City Investment Plan has been prepared for a period of twenty years from 2011-31.
The problems need to be collectively analyzed with public participation, prioritized and addressed with a long term perspective for economic growth and sustaining improved urban life.

2 SCHEME OF URBAN INFRASTRUCTURE DEVELOPMENT IN SATELLITE TOWNS / COUNTER MAGNETS OF MILLION PLUS CITIES

The City Development Plan under Scheme of Urban Infrastructure Development in Satellite Towns / Counter Magnets of Million Plus Cities

2.1 Background

2.1.1 As per 2001 Census, the urban population of the country was 286.11 million, which Constituted 27.8% of the total population. The 35million plus cities contained more than one-third (37.85%) of the total urban population. During the last (1991-2001) decade, the number of million plus cities increased from 23 to 35 and this number is likely to increase to 50 by 2011. It has been estimated that there would be an increase of additional 78 million to the total urban population by 2011. Similarly, assuming that a projected increase of 39 million in the population occurs in about 50 million plus cities, (45%-50% of total urban population by 2011), the average increase in population per million plus city would be of the order of 1.2 million during 2001-2011. This magnitude is bound to lead to massive problems in managing already over strained mega / million plus cities.

2.1.2 Excessive concentration of population in these cities and unprecedented increase in the demand for infrastructure / facilities and amenities has led to problems of land shortage, housing shortfall, inadequate transportation etc. Management of essential infrastructure like water supply, sewerage, drainage, solid waste disposal has become more challenging. The concentration of economic activities and population in some of the mega cities like Mumbai, Kolkata, Delhi, Chennai, Hyderabad, Bangalore and Ahmedabad has put tremendous strain on the delivery of services. At the same time there has been growing realization that there is a need for decentralization of activities so as to reduce the burden on these cities.

2.1.3 Taking into account, the existing scenario and the urgency to augment urban infrastructure backed by strengthening of urban governance of the cities / towns, the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was launched by Ministry of Urban Development in December, 2005 for implementation of urban infrastructure improvement programme in a time bound manner in 63selected cities. The Mission aims at creating economically productive, efficient, equitable and responsive cities in an integrated framework with focus on economic and social infrastructure, basic services to urban poor, urban sector reforms and strengthening Municipal Governments and their functioning. While the JNNURM has been envisaged to cater to the infrastructure requirements of these 63 cities, there is an imperative need to plan for development of new township / satellite towns around million plus / large cities. The satellite towns/ counter magnets should be spatially separated from the mother city.

2.1.4 The development of satellite cities / townships has shown good results in countries like USA, France and UK during the sixties and seventies. The development of satellite cities around 35 million plus cities will help in achieving greater efficiency in the overall hierarchy of human settlements both at national and regional level.

2.2 The Scheme of Urban Infrastructure Development in Satellite Towns / Counter Magnets of Million Plus Cities focus primarily on –

1. Amelioration of population pressure on metropolitan towns.
2. Improved financial management in urban local bodies.
3. Improvement in basic infrastructure and service delivery related to water supply, sanitation and solid waste management.
4. Improved urban planning
5. Capacity Building of Urban Local Bodies
6. Improved urban environment
7. Improved services to urban poor
8. Implementation of public – private partnership projects for mobilizing investments and efficiency gains.

2.3 Aims and objectives:

AIMS: Developing Cities Aligned With Citizens' Interests

Objectives

The objectives of the scheme are as follows:

i. To develop urban infrastructure facilities such as transport, drinking water, sewerage, drainage and solid waste management etc. at satellite towns / counter magnets around million plus urban agglomeration (UAs) covered under Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and to channelize their future growth so as to reduce pressure on million plus UAs.

ii. To enhance the sustainability of urban infrastructure facilities by implementing reforms such as energy audit, water audit, introduction of cost effective technologies, capacity enhancement for improved Operation & Maintenance etc.

iii. To adopt innovative public – private partnerships models for development of satellite towns.

iv. Earmarking 10-15% of housing sites for the urban poor. The National Urban Housing & Habitat Policy, 2007 provides that 10 to 15 percent of land in every new public / private housing projects or 20 to 25 percent of FAR (Floor Area Ratio)/ FSI (Floor Space Index) whichever is greater will be reserved for Economically Weaker Sections (EWS) / Low Income Group (LIG) housing through appropriate legal stipulations and spatial incentives.

v. To promote the following Urban Local Bodies (ULB) level reforms:

The Scheme of Urban Infrastructure Development in Satellite Towns / Counter Magnets of Million plus Cities provides both incentive as well as support for undertaking reforms at State and Cities level, thus creating right development framework for enhancing creditworthiness of Municipal Governments and equitable distribution of resources for Urban Society at large.

Table 2.1: Reform commitments envisaged:

Desired Outcome	ULB Responsibilities	State Responsibilities
Financially self-sustainable cities	• Adoption of accrual based double entry accounting system • Property Tax reforms • E Governance • Levy user charges to achieve full cost recovery • Provision of basic services to urban poor	• Devolve revenue sources • Transparent, framework for transfers of grants • Explore VRS scheme to reduce establishment cost
Well functioning, efficient and equitable urban land market	• Professionalize property mgmt • Simplify rezoning, construction • Computerize land titles • Earmark 20-25% land for EWS and LIG	• Repeal ULCRA(Urban land ceiling and regulation act) • Reform Rent Control Act • Rationalize stamp duty • Adoption of water conservation Measures/rain water harvesting provisions for disaster management, .
Transparent accountable governance and service delivery	• Introduce Area Sabhas and Ward Committees • Publish Performance Reports • Introduce service scorecards • Structural reforms	• Public disclosure law • Community participation law • Integrate all civic infrastructure agencies under ULB

2.4 Scope and Coverage

The satellite towns may be developed in the future development area of the million plus Urban Agglomerations (UAs) covered under Scheme of Urban Infrastructure Development in Satellite Towns / Counter Magnets of Million Plus Cities The towns may be planned for a population of 3-5 lakh in case of million plus cities and 5-10 lakh in case of Mega cities (4 million plus cities).

2.5 City Development Plan for Satellite Town

For this purpose, will need to prepare a City Development Plan (CDP) and formulate Detailed Project Reports for projects for which assistance is sought. The CDP will set a “vision” for the future development of the city. A set of objectives and goals which the city aims to achieve and will identify thrust areas in various sectors which need were addressed on a priority basis in order to achieve the objectives and the vision. It thus provides the overall framework within which projects will be identified and put forward in a City Investment Plan.

A City Development Plan (CDP) is both, a perspective and a vision for the future development of a city on the concept of continuity, compactness and self – containment. It also suggests ways to make each part of the township self-sufficient in itself while forming an integral part of the town as a whole having clear functional linkages with the mother city and other urban centers in the respective region. It also suggests alternative routes, strategies, and interventions for bringing about the change – what interventions do we make in order to attain the vision? It provides a framework and vision within which projects need to be identified and implemented. It establishes a logical and consistent framework for evaluation of investment decisions.

In order to rectify the prevailing state of affairs of Municipal Corporation, **the Scheme of Urban Infrastructure Development in Satellite Towns / Counter Magnets of million plus cities** under the **Jawaharlal Nehru National Urban Renewal Mission** (**JNNURM**) has been programmed with an aim at creating economically productive, efficient, equitable and responsive Cities. The planning of satellite town may adopt different kind of development i.e. low-rise and low-density development/high rise medium density or high-rise and high-density development depending on the local and felt demand.

2.6 Preparation of City Region Plan

It will also need to prepare a City Region Plan, which should contain:
a. Delineation of area based on physical and socioeconomic linkages,
b. Settlement structure,
c. Land use and network,
d. Environmentally sensitive zones.
e. Heritage precincts,
f. Addressing prominent concerns of major sectors of the economy, etc.

The City Region Plan will address the overall urban development scenario in order that Satellite towns/Counter Magnets come up as self sustaining entities and promote sustainable development in long run so as to reduce the burden on the mother city in terms of location of economic activities, housing, transport, basic infrastructure and services.

2.7 Financing Pattern

The financing pattern for the development of satellite townships shall be as under:

Table 2.2: Financial support from centre & state:

Category of Cities & Towns	Grant %		ULB / Parastatal Share / Loan from Financial Institution
	Centre	State	
Satellite Township around the seven mega-cities i.e Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad and Ahmedabad.	80	10	10

Source: scheme of UID in Satellite Towns

States/ ULBs shall be encouraged to explore innovative financing option such as PPP before forwarding proposals. Rigorous financial appraisal will be carried out by MoUD to assess the maximum amount of central assistance that will be admissible in each case. Thus, the Central assistance, as mentioned above shall be indicative of the maximum assistance available under the Scheme. External assistance if any can be used for meeting the contribution of the State/ULB.

If necessary, internal resources of implementing agencies, Member of Parliament / Local Area Development and Member of Legislative Assembly Local Area Development funds may be substituted for ULB share.

In order to prepare City Development Plan (CDP), Detailed Project Reports (DPRs), training & capacity building, community participation, information, education and communication (IEC), a provision of 5% of the Central grant or the actual requirement, whichever is less, may be kept for sanction to ULB concerned as an added incentive.

2.8 The CDP is a necessary step for accessing funds under Scheme of UID in Satellite Towns

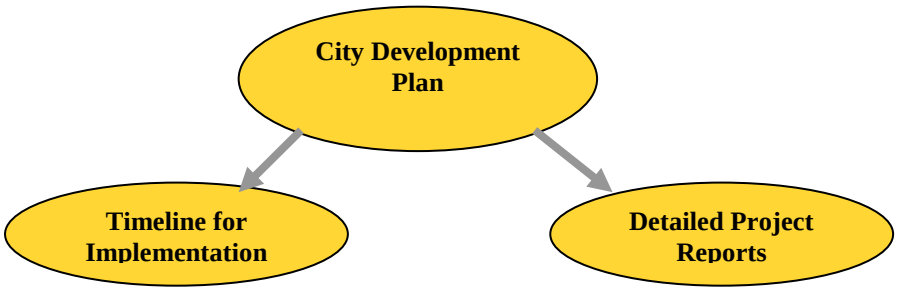


Figure 2.1: The CDP is a necessary step for accessing funds under Scheme of UID in

2.8.1 Formulating a City Development Plan

1. **City assessment**
   - Opportunities
   - Strengths
   - Risks
   - Weakness
   - Unmet demand/gap
2. **Future perspective and vision**
   - Direction of change and expectation
   - Economic Vision
   - Services Vision
3. **Strategies for development**
   - Options and strategies
   - Link with reform agenda
   - Criteria for prioritization

4. **City Investment Plan**
    - Estimate level of investment
    - Financing options

2.8.2 Vision

Vision helps in assessing the present situation and where it would like to be at a particular period.

Broadly a city will envision the following:

1. Distinctive identity
2. Strong sense of community
3. Financial self sufficiency
4. Integrated natural and functional systems
5. Expanded recreational opportunities

A perspective and vision for the future development of the city

1. Where are we now?
2. Where do we want to go
3. What are priority needs?
4. What strategies are required?

2.8.3 Methodology:

1. Based on the vision the SWOT analysis of the city will be carried out.
2. The analysis will focus on the availability of the infrastructure and also the service standards of the delivery system pertaining to the following areas:
3. Water supply
4. Sanitation
5. Solid waste management
6. Roads
7. Mass transportation system
8. Proposal for urban reformation
9. Cost estimates
10. Financial plan for implementation

3 PROFILE OF VASAI VIRAR REGION

3.1 Brief History of Vasai Virar Region

Vasai Virar is a historical city and an important business port. The history of Vasai comes from ancient ages. One version of the origin of the name derived from Sanskrit word which means 'waas' or residence. The Portuguese influence is especially noticeable in Vasai & Virar. When Marathas invaded and colonized the region, they named it as 'Bajipura' or 'Bajipur'. But it did not stick. When England conquered the region from Marathas in the year 1774, they named it as Bassein region which is now called Vasai. Bassein was an important trading centre of that time. From 15th century it was ruled by Portuguese, followed by Diu and British This region has many Heritage installations.. The Bassein fort was initially built by Bahadurshah of Gujarat and further developed by Portuguese.

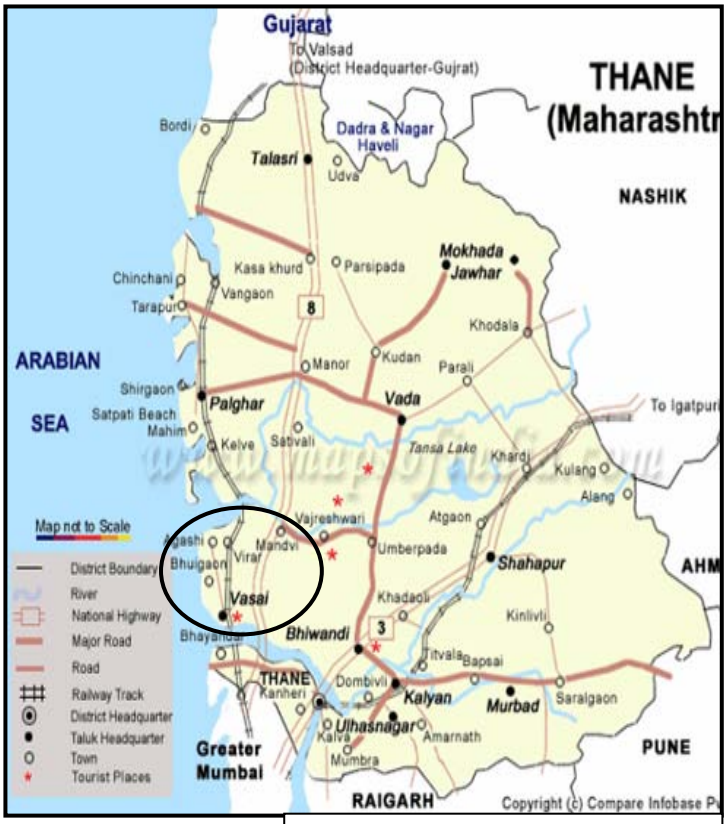
Vasai-Virar (Marathi: वसई विरार) is a city in Maharashtra state in western India. It is located in Thane District, 50 km north of Mumbai. The city is located on the north bank of Vasai Creek, part of the estuary of the Ulhas River. The newly formed Vasai Virar Municipal Corporation (VVMC) is the civic body that governs the city. Vasai-Virar is an agglomeration of several formerly separate towns, which includes Vasai, Virar, Navghar-Manikpur and Nala Sopara. The area covered by the city roughly corresponds to the ancient city of Sopara.

Sopara was known as Shurparaka in ancient time. Sopara was a big trading centre and the harbour was in today's Gass village. It was known as Ophir and some of the trading which took place in the 3rd century with Middle East (now Israel) the wood (especially Teak Wood) supplied in Middle East was used in the Church of the Nativity in Bethlehem. It is still there in that Church. Vasai-Virar has four stations Naigaon, Vasai Road, Nala Sopara, and Virar on the Mumbai suburban railway's Western Railway line.

The town of Sopara (Ophir) (the present-day Gass) was a centre of the Indian Ocean trade going in Roman times, but later when its harbour was since silted up, trade shifted to Vasai, which traded in horses, fish, salt, timber, and quarried basalt and granite, and was a shipbuilding centre. Vasai came under the control of the Gujarat Sultanate in the 15th century.

3.2 Location

Geographically the city falls in the Deccan lava terrain. The project area is situated within limits of Vasai Virar Municipal Corporation [VVMC] area. Vasai Virar area is located on the north-western periphery of Mumbai under Thane district and is located between 19°28'N – 19°47'N latitude and 72° 48'E – 72° 8'E longitude. The Vasai-Virar Sub-region is separated from Greater Mumbai and Mira-Bhayander by the Vasai Creek. However, due to development of road and rail network, it is strategically linked to Mumbai. It is also linked by road and rail to other major centres in the Mumbai Metropolitan Region, such as, New Mumbai (via Vasai-Diva Railway Line), Panvel, Thane, Bhiwandi and Kalyan. With increasing land prices in and around Mumbai, low and middle income households are shifting to this sub-region. Thus, it can be presently termed as the dormitory of Mumbai, resulting into unidirectional commuting during the peak hours.



Source: View of Google Map

3.3 Accessibility:

1. Town located on the western railway and includes Virar, Nallasopara, Vasai Road and Naigaon railway stations which are at a distance of 64 km, 56 km, 52 km and 48 km from Churchgate railway station respectively.

2. Approachable by road through western express highway

3. Virar, Nallasopara, Vasai Road and Naigaon railway stations are connected to the National Highway and to the coastal villages, by separate roads running in the east-west direction. All the coastal villages are well connected by the Vasai-Agashi road which runs north-south parallel to the coast almost through the wadies i.e. orchards, vegetable farms and horticultural lands where traditional houses as well as modern well-designed bungalows of local people could be seen on its both sides. These settlements in the form of small gaothans are oldest development in the Sub-Region.

4. The impetus for development was created by the suburban railway which has a terminal at Virar. This Virar Railway Station is also now functioning as terminus for Gujarat-bound shuttle trains like Virar - Vapi, Virar - Balsad and Virar - Surat trains. Railway link from Vasai to Diva connects Western Railway to the Central and Konkan Railways via Bhiwandi.

3.4 Topography

The Vasai-Virar Sub-region (VVSR) is bounded on the north by the Vaitarna River, on the south by the Vasai creek and on the west by the Arabian Sea. The eastern boundary is the hill ranges of Tungar full of forest extending from village Sasunavghar upto village Chandip. A number of hillocks and isolated peaks dot the region in the east.

The region on the whole, is low-lying mainly in the southern part along both sides of Western Railway line. The old village settlements in the coastal belt are slightly on higher level and moderately plain. The average elevation of the area above sea level is 1.5 to 2 m. There are many local variations caused by small hillocks scattered in the eastern and north-eastern part of the region. The area lying to the east of the National Highway is hilly and covered mostly by thick forests. The hill ranges of the Tungar and the above two creeks create a natural barrier separating the sub-region from the rest of the Mumbai Metropolitan Region. The Chinchoti fall, Tungareshwar Temple and thick forest offer good tourism potential to this eastern part. The low-lying lands along the coast and along two creeks are marshy, khazan lands and some of them mainly to the south of Nallasopara Railway Station are still used for salt cultivation.

Vaitarna and Vasai Creeks are the most important creeks passing through the northern and southern edges of the sub-region. Along the coast there are many small creek-lets. The coastal belt of the Sub-region is full of plantation with traditional villages maintaining peculiar Konkan-type character and offers beauty to the Sub-Region.

Geologically, the sub-region falls in the Deccan Lava plateau. Traces of Bauxite have been found in the Tungar Hill ranges over an area of 80 sq.kms. and have a mineral content of 30-35%. There are few stone quarries in Rajawali area. The sand is also extracted through the Vaitarna Creek as building material by dredging which helps the creek to remain desilted every year.

3.5 Climate

The climate of the Vasai Virar Sub-region can be described as hot-humid with moderate seasonal fluctuations of temperature. Due to a long coast-line and high relative humidity the variations are not significant. There are basically three seasons, with a transitional period of about 15 days between each season.

a) Winter:

   This extends from October to January with the mean maximum temperature of about 28 deg. C. and the mean minimum temperature of about 16 deg. C. with relative humidity of about 77-85%.

b) Summer:

   This extends from February to May with the mean maximum temperature of about 34 deg. C. and the mean minimum temperature of about 26 deg. C. with relative humidity of about 60%.

c) Monsoon:

   This extends from June to September. The south-west monsoon begins in the first week of June. 95% of the annual rainfall is recorded during this period. The annual average rainfall is about 2200 mm. During this season, the mean maximum temperature is about 30 deg. C. and the mean minimum temperature is about 24 deg. C. with relative humidity hovering around 80-85%.

   The wind direction and speed are determined by temperature and pressure conditions over land and sea. Predominant wind direction is north-west or west. During the monsoon season, the wind direction is north-east or east with a high velocity.

3.5.1 Rainfall

The rainfall is usually experienced from the beginning of June to the end of September with annual mean rainfall of 2200-2500 mm. The maximum rainfall is in the month of July averaging to 800 mm.

3.5.2 Humidity

The humidity ranges from 49% to 85% with the highest humidity in the month of July.

3.5.3 Wind Direction

The wind direction is predominately from, west and southwest for a major period of the year. The mean wind speed is 16.52 km/hr. The maximum speed varies from 15 to 19 km/hr from June to August. However, the velocity gradually increases reaching its peak in the month of July with directions from the southwest and west.

3.6 Agriculture and Forests

Settlement pattern of this sub-region is such that larger villages are located along the coastal belt to the west of the railway line. The villages in this belt have good agricultural, horticultural and fishing base and therefore, they are distinct from the villages in the eastern part of railway line situated along and near the National Highway. Population in coastal belt is mainly engaged in agriculture, horticulture and fishing activities i.e. in primary sector, whereas, that residing near the suburban railway stations viz. Virar, Vasai-Road and Nallasopara is mainly engaged in tertiary sector.

The Vasai Virar Region is a narrow coastal belt fringed with dense thickets of cocoanut groves with a near pastoral ambience. Although on Arabian coast this land known as ‘uthalpat’to the locals in richly fertile with fresh, sweet water sources. This area is famous for Bananas & beetle leaves. Strip of land along Arabian Sea coast known as ‘Kharpat’ runs from Chikkal-Dongri in North to Naigaon in the south. Railway line divides this belt which is hardly 3 to 4 Ft. above sea level. Further east is ‘Junglepat’ the rising hills of the Western Ghats with two thirds of the area covered by Forest and inhabited by tribals.

3.7 Industries

Due to the industrial location policy for the MMR, there are few small scale industries located in this sub-region mainly in Valiv-Gokhivare area. Vasai Municipal Council has also developed its own small -scale industrial estate. In addition to this, few small-scale industries have come up to the east of Vasai-Road Railway Station and on Shirsat Road in Virar Town. The MMRDA had prepared a plan for Waliv - Gokhivare - Sativali Industrial Complex. The industrial activities at Waliv - Gokhivare are coming up for many small scale and medium scale industries which provide some employment to the sub-region.

4 MUNICIPAL CORPORATION OF CITY OF VASAI VIRAR

4.1 The History

Vasai Virar is a historical city and an important business port. The history of Vasai comes from ancient ages. One version of the origin of the name derived from Sanskrit word which means 'waas' or residence. The Portuguese influence is especially noticeable in Vasai & Virar. When Marathas invaded and colonized the region, they named it as 'Bajipura' or 'Bajipur'. But it did not stick. When England conquered the region from Marathas in the year 1774, they named it as Bassein region which is now called Vasai. Bassein was an important trading centre of that time. From 15th century it was ruled by Portuguese, followed by Diu and British This region has many Heritage installations.. The Bassein fort was initially built by Bahadurshah of Gujarat and further developed by Portuguese.

4.2 Municipal Corporation

Municipal Corporation of the city of Vasai Virar came into existence in the present form in 3rd July 2009 vide Maharashtra State Government Notification, Urban Development Department No. MIS.-2306/412/CR-223/2006/UD-24.

The Govt. of Maharashtra having regard to the factors mentioned in clause (2) of article 243-Q of the Constitution of India considered it expedient to issue a draft Notification specifying the larger urban area of Vasai- Virar for which the Municipal Corporation of the City of Vasai-Virar would be constituted. The Govt. Of Maharashtra invited objections and suggestions to this proposal specifying the larger urban area of Vasai Virar for which the Municipal Corporation of the City of Vasai-Virar would be constituted. After considering the objections & suggestions received pursuant to the said draft Notification, the say of persons appearing for the Hearing of the matter before the Govt. on 4th February, 2008, resolutions of the Vasai Municipal Council, Navghar-Manikpur Municipal Council, Nalasopara Municipal Council, Virar Municipal Council and views of other local authorities, the GOM specified the area mentioned in the Schedule appended to the Notification dated 3rd July 2009 to be a larger urban area for which the Municipal Corporation of the City of Vasai-Virar would be constituted. The GOM specified the 3rd July 2009 to be the date from which the whole of the Vasai Municipal Council, Navghar-Manikpur Municipal Council, Nalasopara Municipal Council, Virar Municipal Council smaller area and 53 villages, District Thane shall be larger urban area, which shall form a city having a Corporation by the name "Municipal Corporation of the City of Vasai-Virar."

The sub-region covers 380 sq.km. (about 9.5% of the area of Mumbai Metropolitan Region). The Municipal Corporation of the city of Vasai Virar area comprises of 4

Municipal Councils (virar, Vasai, Nallasopara & Navghar - Munikpur) & 53 villages. The area is divided into U Zone, Plantation zone (P zone), Green Zone (G zone). The list of villages in each zone is as follows:

Sr. No.	Villages in U Zone	Villages in U/P Zone	Villages in P Zone	Villages in U /G Zone	Villages in G Zone
1	Gas Kopri	Agashi	Vatar	Kasrali	Dahisar
2	Karmale	Bolinj	Rajodi	Shirgaon	Koshimbe
3	Umele	Kofrad	Nale	Chandansar	Kashidkopar
4	Naigaon	Gas	Wagholi	Bilalpada	Kaner
5		Sador	Mardes	Gokhivare	Shirsad
6		Chobare	Umrale	Waliv	Mandvi
7		Mulgaon	Navale	Pelhar	Chandip
8			Nirmal	Sativali	Kolhi
9			Girij	Rajavali	Deodal
10			Bhuigaon Kh	Juchandra	Kaman
11			Bhuigaon Bh	Bapane	Sasunavghar
12			Kaular Kh		Chikaldongre
13			Kaular Bh		Dhaniv
14			Saloli		Chinchoti
15			Kiraravali		
16			Kardi		
17			Wadavali		
Total	**4**	**7**	**17**	**11**	**14**

Source: GR of MCCVV

Vaitarna and Vasai Creeks are the most important creeks passing through the northern and southern edges of the sub-region. Along the coast there are many small creek-lets. The coastal belt of the Sub-region is full of plantation with traditional villages maintaining peculiar Konkan-type character and offers beauty to the Sub-Region.

4.3 Civic administration

The Vasai Virar Municipal Corporation has been constituted only on 3rd July 2009. Presently GOM has appointed Shri Kishore Hiraji Borde, Chief Officer (Group–A) as an Officer-in charge to exercise all the powers and duties of the Municipal Corporation of the city of Vasai-Virar. The Council comprising of Councilors is yet to be formed and Mayor & Deputy Mayor is yet to be elected. The formation of electoral wards is under process.

4.4 Past Planning Efforts

The first regional plan for the Mumbai Metropolitan Region (1970 - 1991) was sanctioned by the Govt. in August 1973. From the entire M.M.R. an area admeasuring 380 sq.km. has been carved out in August 1988 as Vasai-Virar sub-region. This was based on the suggestion made by the Town Planning & Valuation Deptt. Seeking modification to the regional plan for certain areas in Vasai Taluka to be converted from G Zone to U Zone. The balance area was to continue in the Green Zone. The Govt. had earlier asked the Town Planning Deptt. to prepare dormitory plans for small areas near the 3 suburban railway stations. It was expected that the dormitory plans would help the Collector in examining the N.A. proposals. Instead, the Deptt. recommended the Govt. to make an appropriate modification to the regional plan as mentioned above. The State Govt. then made an appropriate modification under Sec.20 (4) of the M.R. & T.P. Act and carved out an area along the western railway and the Diva-Vasai railway to be converted into urbanizable zone.

The State Govt. had initially proposed urbanizable zone in Vasai-Virar sub-region of about 8578 hectares of land vide notice published in August 1988. The M.M.R.D.A. was then appointed in December 1988 as a Special Planning Authority. In May 1990 while approving modification to the regional plan, an additional area of 2000 hectares spread over 9 pockets was added to the initially proposed and published urbanizable zone. There were large-scale objections to the increase in the U Zone. The Govt. then published details of its additionally proposed U Zone seeking suggestions and objections and thereafter while finalising the modification to the regional plan, this additional area was deleted from U zone and it was amalgamated in the Green Zone except for the land restricted to 3 pockets. The Govt. had decided that land falling within the 1.5 km. radius from the railway station and 1 km. from the gaothan of Rajawali village should be included in the urbanizable zone. Thus, the total area under urbanizable zone came to be 9355 hectares. The areas of 4 Municipal Councils and another 11 villages are fully covered in U Zone, another 28 villages are partially covered under U zone and balance 28 villages are fully covered in Green Zone. The modification made by the Govt. came to be challenged in the Court of Law. But the interim orders issued by the Hon'ble Court allowed preparation of the development plan for the sub-region. In May1990, Govt. appointed CIDCO as a Special Planning Authority for this area on 14 May 1990 for notified area of 380 sq. Km. The area consists of 4 Municipalities and 53 Gram Panchayats. The CIDCO then commenced the work of preparation of development plan for the entire Vasai-Virar sub-region.

The Functions of CIDCO as SPA are:

1. Development Plan preparation
2. Regulating Development
3. Controlling Unauthorised developments.
4. Implementation.

Chronology of events on preparation of Development Plan

- MMR plan was approved by Govt. in 1973 and it allowed development around Railway stations and accordingly TP Dept prepared Dormitory Plan.

DP of VMC area was sanctioned by Govt. : 1975

- MMRDA was appointed as SPA : 31-08-1988
- CIDCO was appointed as SPA : 14-05-1990
- Interim Development Plan for 'U' zone : 10-09-1992

1st Draft D.P. for entire VVSR published on… : 07-09-1995

- Modified Draft Dev. Plan submitted to State govt. : 31-08-1998
- Republished DDP by State Govt. U/S 29 and Appointed Committee U/S 162 of MRTP Act, 1966 : 19-01-2000
- Committee submitted Development plan to govt. : 30-09-2004
- Govt. Sanctioned DCR on… : 16-02-2004
- Govt. Sanctions the Development Plan (with 113 EPs) for VVSR on … : 09-02-2007
- Govt. Sanctions the Development Plan (with 5 EPs) for VVSR on … : 13-03-2009
- Govt. Sanctions the Development Plan (with 31 EPs) for VVSR on … : 19-09-2009

4.5 Role of Vasai Virar Subregion in MMR

Virar Sub-region is separated from Greater Mumbai and Mira-Bhayander by the Vasai Creek. However, due to development of road and rail network, it is strategically linked to Mumbai. It is also linked by road and rail to other major centres in the Mumbai Metropolitan Region, such as, Navi Mumbai (via Vasai-Diva Railway Line), Panvel, Thane, Bhiwandi and Kalyan. With increasing land prices in and around Mumbai, low and middle income households are shifting to this sub-region.The concentration of economic activities and population growth in Mumbai has put tremendous strain on the delivery of infrastructure services. At the same time there has been growing realization that there is a need for decentralization of activities so as to reduce the burden on these cities. Improving the affordable housing stock in VVSR will help reduce the slum pockets in MMR. Improving the Tourism potential of the region by developing the infrastructure facilities & Tourist amenities will not only improve economic status of VVSR but also reduce strain on highly urbanized areas like Mumbai, Thane. There is good scope for industrialization of VVSR with availability of land and proximity of market for the products.It offers excellent opportunities for service industry & small scale industry as ancilliary to industries in MMR.

5 Stakeholders & Public Consultations

Process

Several workshops were conducted to inform various stakeholders the objective of the Schemes of urban infrastructure Development in satellite towns / counter magnets of Million plus cities and process of preparing a City Development Plan. The various stakeholders also discussed the city's strengths, current issues, concerns, problems, and areas that need to be focused. In order to reach out the larger and comprehensive cross section of the city verious representatives were attended for the workshop in several meetings.

Group Meetings: The group meetings with stakeholder and especially CIDCO and MCCVV officials were organized. The meetings constituted of Discussion, public responses and presentation of draft plan was attended by officials.

Personal Contact: Important personalities like MPs, MLAs, Presidents of different organization, and Top-level Govt. Officers were contacted by letters, personal meetings. Inception report and progress reports also circulated for comments.

5.1 Stakeholders Consultation Meetings

Source: Institute of Local Self Government

The objective of the consultations with the stakeholders was to motivate the people to get involved in the process of preparation of city development plan & to know the views and concerns of the stakeholders about the city. Their views and suggestions had major

contribution in formulating the vision for the city. Questionnaires in local language (Marathi) and in English were circulated. Suggestions were also invited by letters, emails, faxes etc.

The consultations were held on following dates:

Table 5.1 Stakeholder's consultation meetings

Public Meeting with MLAs, Corporators	09/02/10
Public Meeting	26/02/10
Meeting with officials of CIDCO & MCCVV	27/02/10
Meeting with Director AIILSG ,Commissioner , Dy. Commissioner & officers of MCCVV in the office of AIILSG	06/03/10

Source: Stakeholder's Consultation Meetings at vasai (26/02/2010)

5.2 Analysis of Stakeholders Suggestions

Source: Institute of Local Self Government

Stakeholders' consultation meetings were held in order to take people's consensus on issues concerning the city. People from varied professions and different socio-economic backgrounds attended the public representative meeting. The interaction with the Corporators in the all party's meeting and General body was a very important consultation as it produced some valuable suggestions.

The main concern of the Mr Kshitij Thakur MLA Nallasopara and the Corporators was basic infrastructure lacking in the areas. Mr Thakur suggested that the level of services in quality and quantity in the slum and gaothan areas is not matching to the level in the urban areas so the upgradation of services and infrastructure in the urban blighted area and gaothan areas is to be taken up on priority basis. He also suggested that roads especially near stations shall be developed to reduce congestion.He suggested several reforms including e-goverenace posed under satalite scheme should implementated rigourously in order to ensure efficient service delivery to citizen.Mr Baliram Hire, MP suggested that Water ways to be developed to reduce load on Railways, Heritage monuments like Vasai Fort, Churches, Buddha Stupa to be preserved to develop Tourism. Mr.Tare MLA, Boisar desired that sewerage system in Navghar shall be developed soon. He also pointed out that medical facilities in area is poor and hence big hospital with specialized facility shall be constructed.Mr Vivek Pandit desired that development in Plantation Zone & Green Zone shall be commensurate with the land use and an integrated plan for whole area shall be prepared.

Some important proposals are considered in the city development plan which is the outcome of these consultations with the stakeholders. Proposals in terms of Link Roads, waterways, development of recreational spaces, Nature Park near Papadkhind Dam, Markets, Playground & Sports Complex in four Municipal Council areas, upgradation of services to urban poor, etc are included in the City Development Plan. Many schemes have been proposed for the original inhabitants of the region such as Cold Storage Yards for Fishing & Agro industry, Development of storage & cottage industrial centers of local Products, Vocation Training Schools & Institutes with courses for Hospitality Management, Horticultural & Fisheries institutes

5.3 PUBLIC AWARENESS & PUBLIC PARTICIPATION

The citizens of Vasai Virar are very much aware of the Preparation of City Development plan for Scheme of Urban infrastructure Development in satellite towns / counter magnets of Million plus cities. The local community was effectively involved in all the stages of the project cycle from conceptualization, to preparation, to finalization, of Draft CDP

The purpose of the public awareness & sensitization strategy of the MCCVV is to develop a participatory approach in development of Vasai Virar. In order to ensure effective delivery of services, a proper development program has been developed only through the participation of key stakeholders and planning partners. The plan has been prepared by involving the stakeholders by following different ways

- Identification of Stakeholders
- Group Meetings

- Personal Contacts
- Citizen's feedback on Draft Plan

Identification of stakeholders: MCCVV has organized a Vasai Virar development strategies workshop during the course of action. Representatives of Major Organizations, Government Departments from the city and the City's community partners were invited to formulate the plan by publishing in news papers.

Launching of Website: To facilitate people of MCCVV and stake holders to view the process of the DPR and send their suggestions. A web site shall be launched very soon.

The Municipal Corporation has also earmarked funds for Vasai Virar City Development plan in the budget of current fiscal year. A special Planning Agency will be appointed to carryout comprehensive study of the Tourism zone under Vasai Virar to prepare detailed master plan for the development of Tourism zone in Vasai Virar. The Agency has to identify, plan, supervise, & implement the activities required for sustainable development of the Tourism zone.

Followings are the views, suggestions and perceptions received in different forms like fax, e-mails, letters and personal talks during the PLAN exercises. It also includes the suggestions received by Vasai Virar Municipal Corporation. Duplicate and similar suggestions arc combined, while irrelevant suggestions are neglected.

WATER SUPPLY; SEWERAGE & STORM WATER DRAIN SERVICES

- Need of good planning of Long-term water supply scheme.
- Independent permanent water source for Surya river
- Need of exploring new sources of water
- Reliable & Economical water supply scheme should be developed which should be long term & reliable as well as close to the city.
- Permanent solution for water-supply schemes and increases the storing capacity of existing dams and supply network.
- Water supply with low pressure requires good planning of distribution.
- Need of designing good house-to-house water supply distribution system instead of stand-posts and tankers.
- City water supply should be only for daily at least for 4 hours.
- Need of providing meters at every Water supply connection.
- Need of increasing the capacity & Beautification of existing lakes.
- Find & Use old wells, which can be used for city water supply
- Make compulsion for bore-recharge system.
- High rise building owners should develop themselves their own water supply
- Provide proper and efficient distribution network system for water supply to avoid water-crisis.
- Provide proper drainage system
- Provide House-connection to the drainage where work is completed.
- Give priority to drainage connection where water supply is more
- Stop disposal of sewage to natural drainage
- Need of providing isolation system of drainage and water supply lines to check no contamination of drinking water.
- Need of establishing good laboratories and instruments for testing of potable water for public purpose.
- Need of exploring the possibility of converting and use of sea-water to potable

water from sea as JNURM is giving extra subsidy on the desalination project.

- To increase water-charges.
- Use of recycling water for garden, construction activity and fire brigade.
- Need of closing stand-posts.
- Establish Vigilance squad for theft of water.
- Increase the water tax.
- Water-pipeline, Drainage lines & telephone cable work should be done at both sides and the roads. There should be no repairing/destructive work done on the roads
- Cleaning of nalla and advanced planning of drainage system in Vasai Virar should be implemented
- Proper local consultation for slope of drainage lines in new areas. Sub-strata for laying lines.
- To provide proper disposal of sewerage water in creek, Enforce and make compulsion of drainage house connection where drainage network is available.
- Allow to connect drainage Connection to industries
- Use and sprinkle DDT powder and use fogging machines to prevent mosquitoes' problems.
- Regular check-up and proper O & M should be done.
- Always keep covers to the nalas & open gutters.
- Proper disposal of sewage water through network. Recycling of the sewage water & use treated water for farming.
- Need of regular cleaning of nalas to drain the rain-water speedily.
- Prepare a project of "storm water drainage system" to drain rain-water.

- SOLID WASTE MANAGEMENT & HEALTH COMPONENTS
- Sufficient staff is required for street sweeping.
- Garden waste can be used as fertilizer
- Need of more Privatization of solid waste services
- It is required to provide close container instead of open container.
- Need of change of sweepers' duty timings and rotation of duties.
- Use proper and efficient modern instruments for SWM.
- Put small dustbins at closer distance instead of big containers at longer distance.
- Remove the construction materials lying on roads.
- Provide dustbins at each Inter-section.
- Strict cleaning of hotels and cinemas.
- Need of providing sufficient & proper of dustbins at Market Places
- Make compulsion to keep dustbin by every shopkeepers

- Rental service of fogging machine should be available.
- Provide domestic incineration for disposal of garbage like plastic bags & leaves of trees etc.
- Need of educating citizens and school children by organizing city level Seminars / road shows from time to time
- Attendance of sweepers must be checked on the street.
- Put the dustbins on all main roads.
- MCCVV should declare every day the disposal of garbage from each ward.
- Increase number of sweepers & pickup vans
- Need of night cleansing of all commercial area suitably after 10 p.m.
- Need of training for segregation of garbage.
- Need of providing Dustbin to each house.
- Need of door to door Collection of garbage by using PPP

- Need of Separate collection and disposal of hospital and hotel waste.
- Make law and enforce it for prevention of throwing garbage on road
- Solid Waste management officer should inspect entire network & implementing.
- Effective solid waste management schemes should be implemented.
- Take legal steps against pollution of industries & vehicles.
- Provide medical facilities ward-wise
- Provide facility of daily checking of children's health and develop new vaccination center.
- Facility of mobile dispensary.

- Road, Bridges, Streetlights & Traffic Components

- Entrance to city provides the first image of city development hence: all roads entering the city should be aesthetically developed.

- New development of roads with good drainage, road divider.
- Pipelines & MTNL cable Duct at side with street light in new areas should be made.
- Roads should be constructed with 10 -years guarantee as contract condition.
- Road facility for Roads should be constructed with providing service ducting.
- Need of co-ordination between different departments like, Telephone, REL, Water supply. Drainage etc. for better planning of roads and least excavation of roads
- Space and design allocation to road side hawkers.
- Construction of new roads with metaling and asphalting
- Proper and unique and similar design of road divider strips.
- Need for Road side storm water drainage.
- All major roads should declared and widen for Six-lanes or a service road parallel to main road on both the sides and all kinds of encroachment should be periodically removed.
- Expedite the road widening proposal of TP roads
- Plan & Complete the construction of ring road immediately which can solve the traffic congestion at large.
- In future, when any road or area is developed electric poles should be erected with precise planning so that it won't obstruct in future.
- Fix-up the clear road boundary.
- Need of standardization of foot path design.
- Over-bridge/under-bridge at all railway crossings.
- Construct Parking Complex near the Railway stations.
- Provide Markets near the Railway stations
- Strict Implementation of compulsory parking for commercial buildings.
- Remove the road side encroachments.
- Improve the traffic-islands.
- Need of providing auto-rickshaw charges from various place form railway stations and S T stand to facilitate the passengers.
- Need of often painting of zebra-crossing.
- Open nallas should be redeveloped for parking on lease.
- Need of providing uniform sign-board in entire city.
- Prepare tourist map of city and should be display at different important places in the city.
- Need of fixing the stands for rickshaws & taxis.
- Provide automatic traffic signals at all chowks
- Need to educate people for traffic through different media like news paper, seminars and cable TV.

- Need of extending Mumbai metro train in city for better public transportation system.
- Need of Proper maintenance of traffic signals and traffic timers at all traffic signals.
- Agriculture land shall not be used for development

- **SOCIAL INFRASTRUCTURE, EDUCATION, CULTURAL & COMPONENTS**

- More plantations of trees, a systematic planning & execution of avenue plantation should be done along all roads.
- More gardens should be developed at all reserved plots on Private sponsorship basis.

- **RECREATION**

- Construct garden at TP reserve plot
- Develop Nature Park / Eco Park to conserve ecology
- Develop Gardens and undertake aforestation on the sides of creek
- Develop jetty/ marina for fishermen / recreation
- Develop jetty / Sea promenade for water transport
- Develop children play ground on TP reservation plots
- Provide facility of garden in each area.
- Need of Scientific system for plantation and made payments for plantations after complete growth of trees
- Need of regular trimming of road side trees and objectionable branches
- Need of regular maintenance of children play ground equipments.
- Make compulsion to provide play-ground facility in each school.
- Promote and make campaign for plantation.
- To arrange local management committee for the maintenance of gardens.
- Construct a New stadium in each Municipal Council area.(4 previous councils).

Source: Institute of Local Self Government

6 DEMOGRAPHIC PROFILE

6.1 Demography

Long range comprehensive planning cannot be undertaken in rational and realistic manner unless it bases itself upon the fundamental facts of population growth. The Vasai Virar city has been considered as one of the growth centers in the regional plan for Mumbai metropolitan region. Earlier Vasai Virar sub region was non municipal towns under the functional category of industry as per census of 1971. The population was 194262 during 1971(census1971). The population growth with a decadal growth rate is shown in Table 6.1 below.

Such urbanization process seems to be inevitable and rather desirable because it is a positive factor in the urban development, however, it is to be carefully channelized to minimize its negative effects. As Vasai Virar is advantageously situated in proximity to the Greater Mumbai, it is growing faster. Due to these factors and its demographic characteristics are required to be studied before any population estimation.

Population of Vasai Virar according to 1991 census was 405718. The decadal growth rate of 1971-81 and 1981-91 are 32 and 58 percent respectively.

Table 6.1: Population growth upto 2001

Year	1961	1971	1981	1991	2001
Vasai	26,836	30,594	34,940	39,781	49,337
Virar	9413	12713	23,303	57,600	118,928
Nalasopara	3420	3852	4337	67732	184538
Navghar Manikpur	11770	14320	19358	35112	116723
Total Sub-region population	141899	194262	256320	405718	7,02,723
Growth Rate of subregion		37 %	32 %	58 %	70 %

Source: Census of India

It can be seen from above that there was 70% growth in the decade of 1991 – 2001. This trend is likely to continue in the light of developmental infrastructural projects like Metro rail, Low cost housing project coming up in the region. The MCCVV is proposing to develop the Heritage installations and also create Recreational hubs in the area for Tourism development. This area has good shoreline suitable for water sports

development. Taking this into consideration growth rate is proposed for next decades till 2041.

6.2 Population projections by various agencies:

The population change can occur in three ways (i) by birth (ii) by death and (iii) by migration. Annexation of area can be considered as special form of migration. Population forecasts arefrequently obtained by preparing & summing up of separate but related projections of natural increases and of net migration. The three methods are used for calculating population increase.

a) Arithmatic Increase method

   This method is generally applicable to large & old cities. In this method the increase of population per decade is calculated from the past records and added to the present population to find out population in next decade. This gives a low value and is suitable for well settled and established communities.

b) Incremental Increase method

   In this method the increament in arithmetical increase is determined from the past decades and the average of that increment is added to the average increase.This method increases the figures obtained by the Arithmatical increase method.

c) Geometrical Increase Method

   In this method the percentage increase is assumed to be the rate of growth and the average of the percentage increases is used to find out future increment in population. This method gives much greater value and mostly applicable for growing towns and cities having vast scope for expansion.

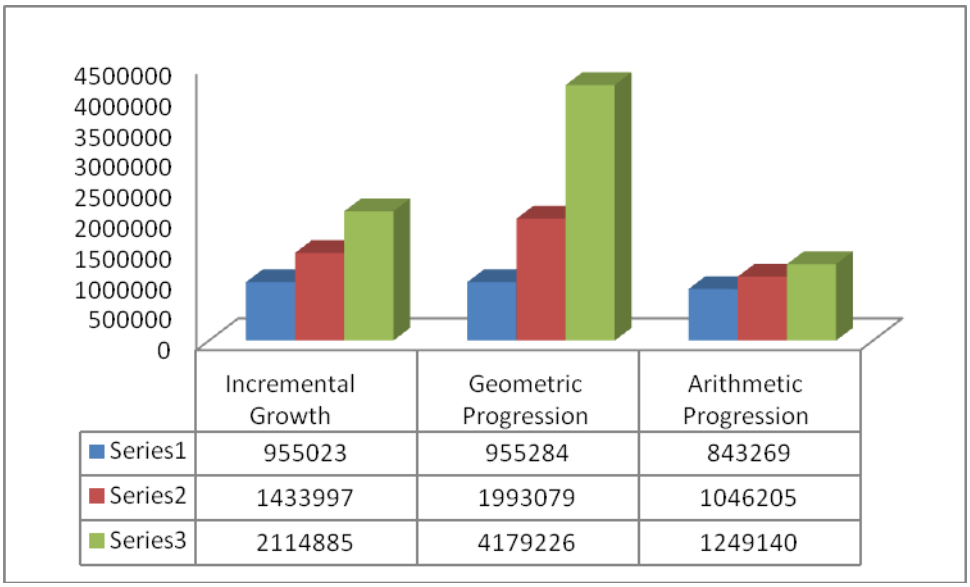
The Vasai Virar region is fast developing considering its nearness to the megacity Mumbai and improvement in its connectivity to Mumbai through many projects proposed for this region. The low cost housing project is also proposed for the urban poor in this area. The MCCVV is proposing to develop the Heritage installations and also create Recreational hubs in the area for Tourism development. This area has good shoreline suitable for water sports development. Considering this Geometrical Increse method has been used in the poplation projections for VVSR. The population projections worked out by scientific methods is as follows:

Table 6.2 population projections by scientific methods

Year	Incremental Growth	Geometric Progression	Arithmetic Progression
2011	955023	955284	843269
2026	1433997	1993079	1046205
2041	2114885	4179226	1249140

Source: Analysis

Figure 6.1 population projections by scientific methods



The **Chitale Committee** appointed by the Maharashtra State to identify the future sources of water for MMR region had carried out the population projections for VVSR using computation methods and using judgement based on the developmental infrastructure projects proposed for the region. The population projections given in Chitale Report are as follows:

Table 6.3 Population Projection by Chitale Committee

SR.NO	REGION /SUBREGION	1991	2001	2011	2021	2031
2.2	VASAI-NAVGHAR SUBREGION	127,975.00	210.07	265,020.00	348,603.00	446,613.00
2.2.1	IN CITY	83,634.00	166,046.00	223,152.00	307,852.00	406,949.00
2.2.2	IN VILLEGE	44,241.00	44,020.00	41,868.00	40,751.00	39,664.00
2.3	NALASOPARA SUBREGION	83,800.00	193,989.00	331,455.00	543,909.00	803,777.00
2.3.1	IN CITY	74,428.00	184,664.00	322,988.00	536,229.00	796,796.00
2.3.2	IN VILLEGE	9,372.00	9,325.00	8,467.00	7,688.00	6,981.00
2.4	VIRAR SUBREGION	77,965.00	139,208.00	226,441.00	363,064.00	538,658.00
2.4.1	IN CITY	57,600.00	118,945.00	208,041.00	5.2	521,675.00
2.4.2	IN VILLEGE	20,365.00	20,363.00	18,400.00	17,677.00	16,983.00
2.5	VASAI-VIRAR SUBREGION	91,304.00	90,849.00	70,529.00	57,981.00	48,948.00
2.6	VASAI-VIRAR VILLEGE SUBREGION	25,906.00	25,080.00	20,078.00	15,936.00	13,554.00
2.7	BALANCE VASAI-VIRAR SUBREGION	14,031.00	13,943.00	11,277.00	9,046.00	7,391.00
		710,621.0	1,006,642.07	1,747,716.	2,248,741.2	3,647,989.
	Growth Rate		1.42	1.74	1.29	1.62

Sourec: Population Projection by Chitale Committee

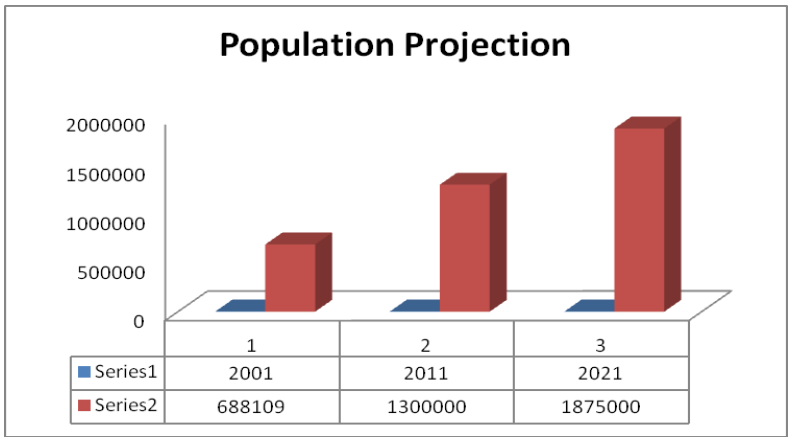
The population projections worked out by **Committee** for VVSR are as follows:

Table 6.4 Population Projection by committee of VVSR

Year	Population Projection
2001	688109
2011	1300000
2021	1875000

Source: Population Projection by committee for VVSR

Figure 6.2 Population Projections by CIDCO



6.3 Projected population 2001-2041

The decadal growth rate in population has been 58% and 70% during the last two decades i.e., 1981-1991 and 1991-2001. As per census 2001, the population of Vasai Virar was 702723. The projected population is 13.07 lakhs and 22.23 lakhs during 2011 and 2021 respectively.

The concentration of economic activities and population in Mumbai has put tremendous strain on the delivery of services. At the same time there has been growing realization that there is a need for decentralization of activities so as to reduce the burden on these cities. Looking into the imperative need to plan for development of new township / satellite towns around million plus / large cities, it is proposed to develop Vasai Virar Municipal Corporation into a Satellite Town/counter magnets spatially separated from the mother city of Mumbai. With improvement in the transport corridors and low cost housing projects for urban poor, extra built-up space which would be generated on account by redevelopment of old properties with higher FSI there will be increase in population of the Region. Assuming this the population of VVSR will reach 41.67 lakhs by 2041. This population has been considered as a base for formulating the proposals of CDP.The following Table 6.5 shows population projections for 2001 to 2041.

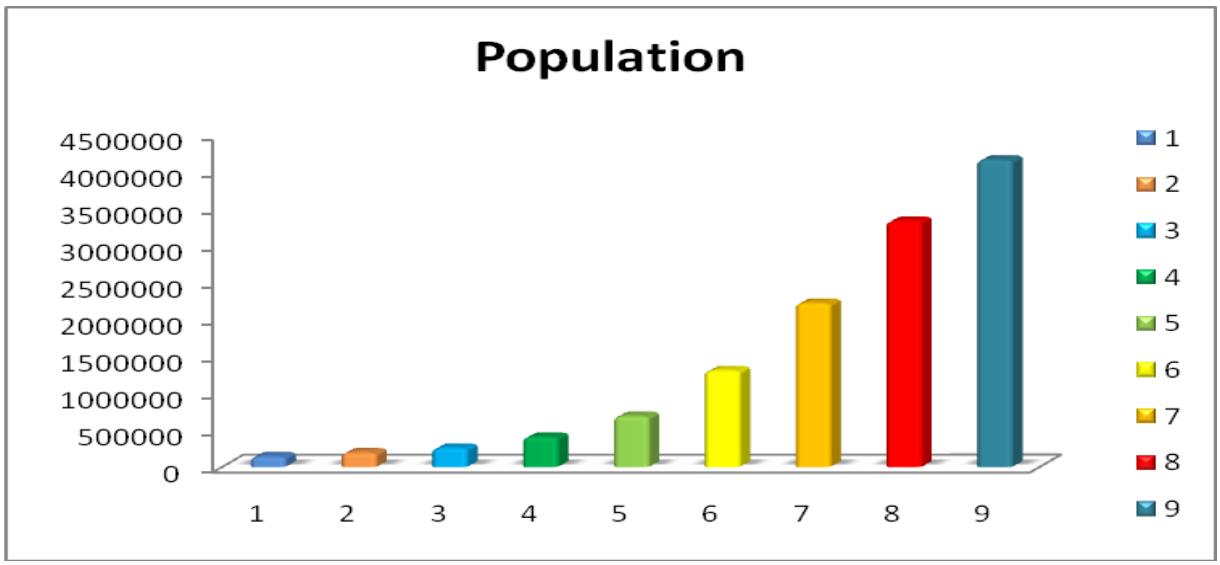
Table 6.5 - Population Projection – 2001-2041

Year	Population (Lakhs)	Decadal Growth Rate
2001	7.02	------
2011	13.07	90%
2021	22.23	66.67%
2031	33.34	50%
2041	41.79	25%

Source: Analysis

These population projections form the basis for working out the infrastructure requirements of the area such as water supply, sewerage system and solid waste generation & disposal area and transportation facilities.

Figure 6.3: Population Growth 1961-2041



Year	1961	1971	1981	1991	2001	2011	2021	2031	2041
Organic growth	**141899**	**194262**	**256320**	**405718**	**7,02,723**	**1307405**	**2222589**	**3333883**	**4179354**
Growth Rate		37%	32%	58%	70%	90%	70%	50%	25%

Source: Analysis

6.4 Sub Region wise population analysis

There are 4 Municipal Councils and 53 Villages, of these 35 villages (49%) had population less than 2000, 22 villages (35%) had population less than 5000 and 10 villages (16%) had a population above 5000 persons. Out of these 53 villages some villages are included in the 4 municipal councils. According to 2001 Census Vasai, Nallasopara and Virar Municipal towns had a population of 49,346, 1,84,664 and 1,18,000 respectively. Navghar-Manikpur Municipal Council has population of 1,16,700 persons. Thus the sub-region now includes 4 municipal councils and 53

villages. The four municipal councils include 20 villages. However, some parts of Sandor and Mulgaon villages from within these are not yet covered under the Vasai Municipal Council. The population of villages lying outside these four municipal councils was 2,34,098 in 2001. Total Sub-Region population was of 6,88,109 persons as per unpublished 2001 Census figures.

The total urban area (four municipal councils and Waliv - Gokhivare Industrial Complex) is 40.90 sq.km. and its 2001 population density was 124 persons per hectare. The rural area is 339.10 sq.km. and 2001 population density was 6 persons per hectare. 26 villages have density of less than 5 persons per hectare (ppha), 16 villages have density between 5-10 ppha, 10 villages have density between 10-20 ppha and 11 villages lying along the coastal belt have density of more than 20 ppha.

Settlement pattern of this sub-region is such that larger villages are located along the coastal belt to the west of the railway line. This coastal belt has a population of 77,739 persons as per 2001 census. The villages in this belt have good agricultural, horticultural and fishing base and therefore, they are distinct from the villages in the eastern part of railway line situated along and near the National Highway. These coastal villages are now more or less stagnant due to recent urban growth taking place near the railway stations as the local trains provide good commuting facilities to Mumbai. The three municipal towns near the railway stations are growing faster due to inward migration mainly of low and middle income group people who have work places in Mumbai. Population in coastal belt is mainly engaged in agriculture, horticulture and fishing activities i.e. in primary sector, whereas, that residing near the suburban railway stations viz. Virar, Vasai-Road and Nallasopara is mainly engaged in tertiary sector.

Due to the industrial location policy for the MMR, there are few small scale industries located in this sub-region mainly in Valiv-Gokhivare area. Vasai Municipal Council has also developed its own small -scale industrial estate. In addition to this, few small-scale industries have come up to the east of Vasai-Road Railway Station and on Shirsat Road in Virar Town. The MMRDA had prepared a plan for Waliv - Gokhivare - Sativali Industrial Complex. The industrial activities at Waliv - Gokhivare are coming up for many small scale and medium scale industries which provide some employment to the sub-region.

Virar

Virar had a population of 118,945. Males constitute 54% of the population and females 46%. Virar has an average literacy rate of 78%, higher than the national average of 59.5%: male literacy is 81%, and female literacy is 74%. In Virar, 13% of the population is under 6 years of age. There are 60% Christian & 39% Hindus. Over a period of time Virar has become a cosmopolitan suburb with approx 70% population being Marathi speaking and the balance mix of other communities. The suburb is fully developed with all the banking facilities and residential infra-structure to accommodate the growing population. 70% of the population is below 30 years and basically the result of migration from Mumbai mainland to this part of the greater city due to ever increasing cost of land.

Vasai

Vasai had a population of 49346. Males constitute 51% of the population and females 49%. Vasai has an average literacy rate of 77%, higher than the national average of 59.5%: male literacy is 81%, and female literacy is 73%. In Vasai, 11% of the population is under 6 years of age. Vasai has 4 major communities Kupari, Christi Vadvals, Vadvals, Samvedic Brahmins Kupari

Naigaon

Naigaon is closely connected to Vasai Road. It mainly consists of Marathi speaking Hindus and Christians. It is divided into east and west. In the east there is a famous temple of Chandika Devi (goddess named Chandika)and the township of Mittal Enclave which is a project being developed by the renowned Mittal Builders. West comprises residential areas like Amol Nagar, Vijay Park, Mariam Nagar, Pali parish, Naigaon Koliwada, Umela village. Umela is the only place where salt is produced on mass scale. Naigaon west is more used.

Nala Sopara

Nala Sopara is a city and a municipal council in Thane district in the Indian state of Maharashtra. It is a town within the Mumbai Conurbation. The town lies in Thane district of Maharashtra state in India. The population of the city is 184,664 (2001 census). It is also the name of a railway station on the Mumbai suburban railway on the Western Railway (India) railway line.

As of 2001 India census, Nala Sopara had a population of 184,664. Males constitute 54% of the population and females 46%. Nala Sopara has an average literacy rate of 79%, higher than the national average of 59.5%: male literacy is 77%, and female literacy is 82%. In Nala Sopara, 13% of the population is under 6 years of age. This place has witnessed very steep rise of population since 1998, due to cheapest property rates in Mumbai suburban railways area, steep rise of property rates in Mumbai and being well connected to Mumbai city by local train services.

Navghar Manikpur

Navghar Manikpur had population of 19358 in 1981 and increased to 35112 in 1991 showing a decadal growth of 35.18%. As per 2001 census the population is 116723 showing a growth rate of 232.43%. Males constitute 53% of the population and females 47%. Navghar-Manikpur has an average literacy rate of 83%, higher than the national average of 59.5%: male literacy is 85%, and female literacy is 81%. In Navghar-Manikpur, 11% of the population is under 6 years of age. MJP has projected the population of 335030 in 2019 and 465500 in 2025 while assessing the water requirements for the area.

6.5 Sex ratio:

Generally the sex ratio is lower for urban population than for rural population and still lower for the cities marching towards rapid urbanization. The sex ratio for urban population of Maharashtra state as per 1991 and 2001 census are 922 and 934 respectively. According to census 2001 the male and female population of Vasai Virar is 3, 64,697 and 3,23,411 respectively. Thus the sex ratio of Vasai Virar is still going down to 887 females per 1000 males. This may be due to the migrated workers population.

6.6 Literacy

Out of total population of 7, 02,723 of census 2001, 5,46,049 persons are literates which give a literacy rate of 79.4% less than Brihan Mumbai (81%). Out of 79.4% total 54% are males and 46% are females in the town.

Table 6.6 : Literacy Data 2001

Sex	Population 2001	Literates	Illiterates
Male	3,64,697	2,95,405	69,292
Female	3,23,411	2,50,644	72,767
Total	**7,02,723**	**5,46,049**	**1,42,059**

Source: As per sanctioned DP

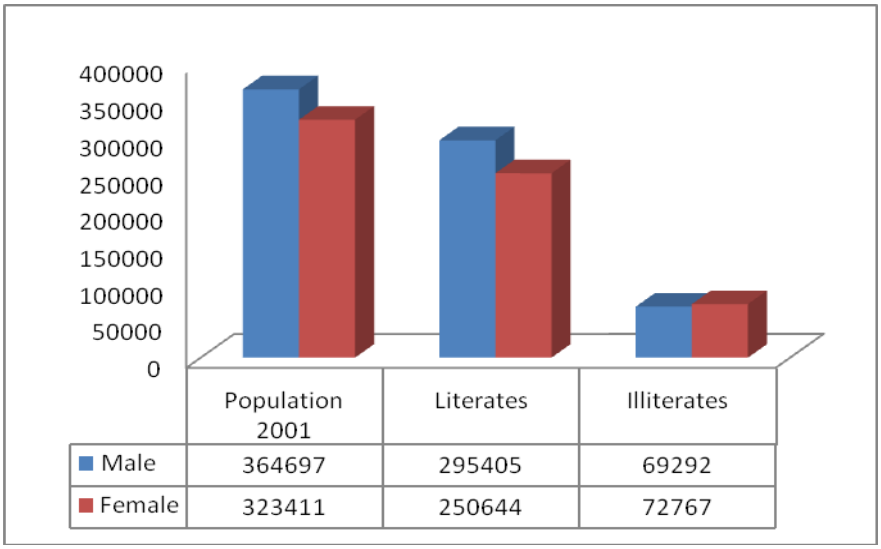


Figure 6.4: Showing Literary Rate

6.7 Employment status

The work participation rate of main and marginal workers was 42.8% in the state in 2001 as against the national average of 39.3%.The work participation ratio of 43% for the year 2001 has been worked out over a population of 4,51,382 which excludes the non-working age group in the 0-6 group. The work participation ratio works out to be 37% over the total population which is normal.

Table 6.7 : Working population data 2001

Sl no	Population	Total	Male	Female
1	Population 2001	7,02,723	3.64,697	3,23,411
2	Working population	1,66,924	1,38,014	28,910
3	Main workers	1,57,304	1,31,736	25,568
4	Marginal workers	9,620	6,278	3,342
Source: Census of India				

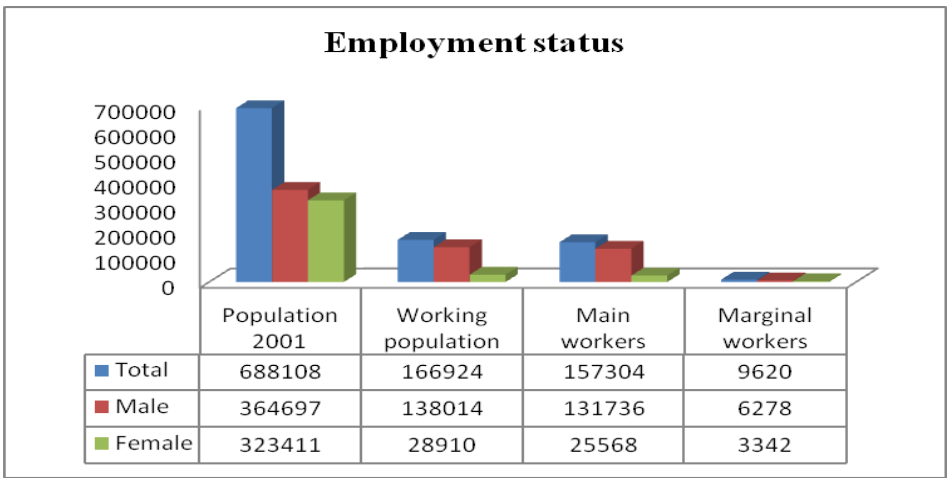


Figure 5.5 Employment Status

6.7.1 working population:

Out of the 1,57,304 main workers negligible percentage (1.034%) come under primary sector which includes agriculture and cultivation. 2.55% come under Household workers and other workers are 1,61,292 which shows the path of urbanization. Large population in this area goes for work in Mumbai in the morning & return in the evening.

Table 6.8: Analysis of working population data 2001

Sl no	Population	Total	Male	Female
1	Working population	1,66,924	1,38,014	28,910
2	Main workers	1,57,304	1,31,736	25,568
3	Primary workers (cultivators & Agriculture labourers)	1627	1072	555
4	Household workers	4,005	2,317	1,688
5	Other workers	1,61,292	1,34,625	26,667
6	Non Workers	3,02,602	1,11,328	1,91,274
Source: Census data of India				

Activities associated with the primary sector which includes agriculture (both subsistence and commercial), mining, forestry, farming, grazing, hunting and gathering, fishing, and quarrying are restricted to Green Zone & Plantation zone, the Non-urbanisable area. As can be seen from above Table that Primary workers form negligible percentage and are not going to increase in present urbanization scenario. The industrial profile of VVSR is mainly service industry in small scale sector & not heavy manufacturing industry. Hence secondary workers are not going to increase.

These above figures show the growth of the city towards the tertiary sector which shows 98% of the working population i.e. the fundamental classification of the city is Tertiary. Large % of the working population have offices in Mumbai & commute to work place by train.Thus, there comes a need for upgradation of the infrastructure facilities in the city.

The informal sector has a crucial role in our economy in terms of employment and its contribution to the National Domestic Product, savings and capital formation. Broadly, the informal sector provides income-earning opportunities for a larger number of workers. The Government has to play a role of facilitator and promoter so that the workers employed in the informal sector are able to get requisite level of skills enabling them to upgrade their capabilities necessary for enhancing the competitiveness of their outputs and thereby raising their income and socio-economic status.

The implementation of Community Participation Law is a mandatory Reform under scheme of Urban Infrastructure Development in Satellite Towns. Considering this a Community Centre is proposed to be established in VVSR which will give guidance to the residents on various aspects.In this Community Centre it is proposed to enlighten the community about various Schemes of Central & State Government under which funding

can be made available for self employment ventures (Individual or Group) or provision of wage employment. The Community Centre will act as a platform for the display and sale of the products made by the beneficiaries under various poverty alleviation programmes.

It is also proposed to take care of the interests of the workers of Vasai Virar Subregion by providing them training, upgrading their skills, and other measures in following sectors to enable them to find new avenue of employment, improve their productivity in the existing employment, necessary to enhance the competitiveness of their product both in terms of quality and cost which would also help in improving their income and thereby raising their socio economic status.

- Tourism improvement through
    - Heritage installations
    - Lake Development
    - Sea promenade & marina for recreation & Fisherman
    - Nature park near Papadkhind
    - Development of Resorts on PPP basis
    - Health Tourism
- Horticultural & Fisheries institutes
- Vocation Training Schools & Institutes with courses for Hospitality Management
- Development of storage & cottage industrial centers of local Product
- Facilities for increasing Fishing & Allied products
- Incentives for increasing Agricultural products by providing cold storages & transport facility

7. SWOT ANALYSIS

On the basis of city assessment as discussed above and the public consultations SWOT analysis has been done.

7.1 Strengths

1. Located at the threshold of greater Mumbai
2. Strong rail and road connectivity with the metropolis
3. Has large tracks of hilly rolling terrain with excellent forest cover and scenic charm
4. Located within one hour traveling distance by MRTS from Mumbai.
5. Has vast capacity for development of Tourism due to presence of heritage installations & natural scenic beauty

7.2 Weakness

1. Has low profile with no identity of its own
2. Areas around railway station are too congested making the evacuation /dispersal of traffic extremely difficult.
3. There is extreme scarcity of drinking water
4. There is no underground sewerage system
5. Lack of employment opportunities
6. Lack of infrastructure availability & planning

7.3 Opportunities

1. Large chunks of open land available for future development
2. Good potential for development of IT park due to the proximity to Mumbai
3. Good potential for water front development for use as water transport, water sports
4. Offers good scope for large space-extensive education social & cultural institutions.
5. Has tremendous potential for development of tourism industry. Resorts, Sports Complex, Nature Park.
6. Scope for organizing and strengthening the existing & proposed ancilliary industry.
7. Vocation Training Schools & Institutes with courses for Hospitality Management
8. Development of storage & cottage industrial centers of local Products, Cold Storage Yards for Fishing & Agro industry

7.4 Threats

1. Illegal and haphazard development may take place on salt pan land
2. Scarcity of drinking water may stunt further growth of city
3. Haphazard industrial development if not controlled may lead to deterioration living conditions in newly areas due to noise and air pollution

8 VISION STATEMENT

Developing a vision for the city is central to the preparation of a City Development Plan (CDP). A Vision is a statement of where the city wishes to go, within a given time frame, and is often expressed in terms of clear expectations. It defines the potential of the city and reflects its unique attribute in terms of comparative and competitive advantages, values and 'preferences of the city residents, relationship of the city to state, national and global economies and of course, the history and physical characteristics of the city. A vision aligns stakeholders' energies to work cohesively for the development of the city. Cities need to systematically consider the future, and design strategies to accordingly shape the future. All objectives, strategies, programmes and projects must be aligned with the vision of the city.

8.1 Formulating Vision & Strategy for Municipal Corporation of City of Vasai Virar (MCCVV)

- Satellite Town having Net-Zero Energy Community consuming substantially low energy and producing at least as much renewable energy as it uses in a year with very efficiently planned and operated sectors
- Transition from dormitory town to Self sustainable City with polycentric development.
- to strive for holistic slum development with a healthy and enabling urban environment by providing adequate shelter and basic infrastructure facilities to the slum dwellers of the identified urban areas.
- Satellite Township attracting Investment in form of IT back offices / BPOs and KPOs.
- Transit Hub providing linkage between Western India and Southern Coastal region.
- Recreational Hub of Mumbai Metropolitan Region.

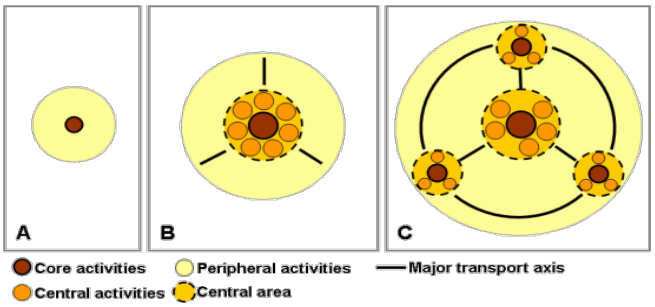
To translate this broad vision into practice it is further classified and strategies are proposed for implementation

Vision 1

Identify a suitable settlement structure to create a functional hierarchy, so as to provide services and facilities in planned manner.

Strategies

- Develop primary urban centre with administrative and service function, extended as an urban agglomeration,
- Develop Industrial Townships with housing for workers
- Develop satellite towns
- Develop the existing tourism zones



Vision 2

Develop a balanced and complete community in terms of land use distribution and densities, housing types and styles, economic development and job opportunities and opportunities for social and cultural expression, with due considerations to environmental control.

Strategies

- Distribution of facilities and services equitably
- Designing of public & private development to improve existing neighborhoods
- Including neighborhood interaction places
- Encouraging social, economic and housing mix in all neighborhoods
- Encouraging business and industry to provide job opportunities
- Exercise environmental control to ensure compatibility of land-uses

OVERALL VISION STATEMENT

"Vasai-Virar Sub-Region is an Urban Area that adopts the following approach:

- ✓ The principles of a Green City having a continuum of green corridors of open spaces / streetscape / infrastructure network
- ✓ The principles of compact & Mixed use development incorporating Renewable Energy Preferencial Areas and siting options based on potential
- ✓ All the area under habitation is considered for the purpose of urban development with appropriate infrastructure with due considerations to aspects of:
  - equitable distribution (on land),
  - socio-economic mix,
  - Proper accessibility with barrier-free environment and physical compactness of land space for optimal utilization of resources, and
  - Environmental compatibility.

Vision 3

Residential

Provide a high quality living environment in residential neighborhoods and to ensure efficient utilization of lands planned for residential use to maximize the City's housing supply. Design and maintain residential, commercial and public buildings with the highest green building standards.

Strategies

- Residential neighborhoods to be protected from incompatible activities
- Residential developments to include open spaces for healthy living environment

- Utilization of urban standards for residential developments in whole of Planning Area
- Large non-residential/institutional uses not to be located close to one another in residentially designated areas
- Density ranges to support pattern of residential livability with the higher densities near nodes of major road transit corridors with intense economic activities

Vision 4

Commercial

Provide a pattern of commercial development which is inclusive of Informal sector needs to best serve community needs

Strategies

- Maximize community accessibility to retail & commercial outlets and services separately in residential zones, but still minimize the need for automobile travel
- Commercial development should be compatible with the residential development and serve neighborhood, while accessible from a street of desirable width /parking capacity
- Isolated large commercial development should be encouraged only if they have an appropriate activity mix to engage community residents after office hours, thus avoiding these areas to become dead at night.
- The streetscape near such uses should create a pedestrian/biking friendly environment and a proper continuum of green corridors shall be ensured
- Large-scale entertainment uses should not be located within close proximity of habitation
- Sufficient parking needs for commercial users and visitors and community parking areas can be developed for large scale commercial development with proper on-street parking controls / pedestrianized precincts
- Roads, buildings and landscaping should be designed to maximize energy conservation benefits
- Mixed landuse may be permitted based on suitable accessibility/parking requirements and promoting mixed-use type traditional character of living-cum-work areas/lesser commute in controlled manner

Vision 5

Industrial Land Use

Provide land for a various industries within industrial zone, to encourage optimum commute access and to promote balanced distribution of jobs and housing to reduce traffic congestion and air pollution.

Strategies

- Encourage capital/technology intensive green industries that can be supported through locally trained labour, and may also have less water requirements. Agro-processing based and agro-cum-tourism based industrial activity may be encouraged for benefits to local economy.
- Industrial development should incorporate measures to minimize / mitigate any negative impacts on nearby land uses
- Ensuring absorption of land identified exclusively for industrial uses and ensure a balanced supply of available land for all supporting sectors (industrial housing/commercial) when consolidating spatial pattern

- Wherever feasible, industrial townships shall be encouraged as part of compact development planning process with minimal commute to meet needs of work / recreation / social amenities / other conveniences.
- Supportive and compatible commercial and office uses are encouraged in the industrial areas designated with the Mixed Industrial overlay and only limited commercial uses may be permitted In areas reserved exclusively for industrial use
- New large-scale land uses that may restrict development of land reserved exclusively for industrial uses should not be allowed
- For expansion of industries located in areas designated for industrial use and where space is fully developed, in-situ extension shall only be permitted only if technically justifiable and found inevitable
- Roads, buildings and landscaping for new industrial projects should be designed and oriented to maximize energy conservation benefits to the extent feasible. Reduce the energy intensity of industrial production by 30-50% with the help of advanced technologies
- New industrial development should create a pedestrian/biking friendly environment and a proper continuum of green corridors shall be ensured
- Promote industrial symbiosis within the satellite town based industries as well as at regional level for inter-industry/sector integration/cogeneration/reuse of various resources and byproducts

Vision 6
Economic Development

Overall the planned development should facilitate job opportunities for existing residents to improve the balance between jobs and resident workers housing, and thus to support in increase in housing economy and related expenditure opportunities.

Strategies

- Encourage provision of job training programs which will enable the unemployed and under-employed labor force by cooperating with educational, industrial, and business institutions to meet the needs of business/industry.
- Address urban poverty alleviation through gainful employment to the urban unemployed or underemployed poor with an effort to increase employability.
- Empowering the community to tackle the issues of urban poverty through suitable selfmanaged community structures and capacity building programmes
- Encouraging a mix of landuses in the appropriate locations which contribute to a balanced economic base, including industrial suppliers and services & commercial support services, "green industries" (industries related to recycling etc.) as well as high technology manufacturers and other related industries, agro-based processing and agro-cum-tourism based industrial activities
- To strive for any mineral exploration possibilities

URBANIZATION AND URBAN GROWTH

VISION 7:
Promote environmentally sustainable development in locations where the VVSR can most efficiently provide urban services (including as extensions of current urban areas or clustered services in new urban areas).

VISION 8:
Preserve substantial areas of the surrounding hillsides, watershed, and other lands, as open space both to conserve the valuable natural resources contained on these lands and

to foster growth on such resources. Retain and restore tree cover, wetlands, critical slopes, flood plains and habitat for species.

VISION 9:
Encourage options for the optimal utilization of lands available for future urban growth.

STRATEGIES:

- Utilise total urbanizable zone as provisioned in Development Plan for planned urban development with no restrictions on the government or the private sector to develop the same in terms of a time-frame
- To provide for optimal utilization of infrastructure / services urban development to be planned on sectored/modular basis, so that either government can extend the service or private developer can develop the infrastructure module on its own (PPP basis)
- Lands located greater than 15 percent slope line deemed potentially unsuitable for future urban development
- No expansion of the urbanizable zone shall be permitted outside the urbanizable zone boundaries, so defined in the Development Plan

URBAN DESIGN / FORM

VISION 10:

Promote the highest standards of architectural and site design, and encourage the use of "Green Building" and “Green Infrastructure” techniques for all development projects both public and private, by referring best practices nationally and internationally.

Strategies

- Streetscape integration for a proper continuum of green corridors shall be ensured
- Design solutions to address security, aesthetics and public safety
- Preservation of existing trees, hill features and other significant features to be encouraged.
- Natural character of the hills to be preserved, whenever possible
- New urban development designed to minimize impacts in rural or semi-rural areas interspersed with lot of natural resources
- Industrial facilities to have a buffer of green zone
- Green building / infrastructure technologies, rain water harvesting to be encouraged
- Riparian corridors preservation / suitable riverfront development to be given due consideration including suitable buffer

Vision 11

HILLSIDE DEVELOPMENT

Preserve the valuable natural resources of the hillsides and develop them sustainably to promote tourism without altering their scenic beauty/character

Strategies

- To evolve strong architectural and site design controls on hillside development, with minimal potential adverse visual impact

- To encourage compact and low density development on the hillsides
- Explore tourism potential at all waterfronts
- Adventure/Rural Tourism-based potential to meet recreational needs & benefits to local economy

Vision 12

HOUSING

Promote the cooperation of public and private sectors of the economy to expand housing opportunities and to provide housing which:

Strategies

- Is within the economic means of the households who occupy it.
- Is situated in an environment which does not endanger the health, safety or well-being of its occupants.
- Provides convenient access to employment as well as to adequate services and facilities.
- Is reasonably of a design that supports energy efficiency not only in the building but in the overall housing premises.
- To encourage variety and mix in housing types to provide adequate choices for housing to persons of all income levels
- Transition housing, in the form of single/multi-room tenements, targeted at migrant population should be encouraged at locations having industrial development
- VVSR should stimulate the production of very low-, low- and moderate-income housing by appropriately utilizing incentive based (land management, extra FSI, etc.) or capital grant based schemes
- In line with National Housing & Habitat Policy - 2005, VVSR should promote the production of rental housing fostered by incentives, so that suitable housing choices are available and slum like developments can be minimized

Vision 13

SERVICES AND FACILITIES

Provide a full range of services to the community at service levels consistent with a safe, convenient, sustainable and pleasant place to live, work, learn and play, and distributed equitably corresponding to relevant norms of UDPFI Guidelines, CPHEEO Manual, etc.

Strategies

- Consolidation of overlapping services between governmental jurisdictions to increase efficiency and quality of service delivery
- Minimum overall performance of Roads during peak travel periods should be level of service LOS-"D".
- To provide as per maximum desirable level of UDPFI standard and to achieve a 100% water supply coverage
- To encourage use of on-site latrines in current rural areas with sparse habitation, and otherwise develop sewerage system in urban areas
- Space for parks/recreation be provided as per UDPFI standards (which is equiv. to international standards) considering vision of “Green Image” of VVSR Planning Area
- For solid waste disposal, UDPFI standards to be customized & applied

Transportation

Vision14

Provide a safe, efficient, and environmentally sensitive transportation system for the movement of people and goods.

Vision 15

Develop a continuous, safe, accessible, interconnected high quality pedestrian/biking environment that promotes walking and bicycles as a desirable mode of transportation.

Strategies

- designed to discourage through traffic / unsafe speeds
- Inter-neighborhood movement should occur on arterial roads
- Develop public transit system especially in current rural areas to avail benefits.
- Industrial/commercial related truck movement in residential streets to be limited
- Freight loading and unloading to be designed so its avoided on public streets
- Capacity bottlenecks to be avoided on transportation networks (bypass, junction improvements, terminus needs etc.)
- Development of street ROWs as “complete streets”, as a policy

VISION 16:

SCENIC ROUTES
Preserve and enhance the visual access to scenic resources of VVSR and its environs through a system of scenic routes, which in turn also facilitates tourism with the “Green Image” of VVSR Planning Area.

Strategies

- Development within the designated Scenic Corridors and along designated landscaped roads with due consideration to native landscaping methods
- Planning of Rural Scenic Corridors taking into consideration the potential for providing access to public facilities related to recreation/cultural attractions

VISION 17:

NATURAL RESOURCES

VVSR should balance resource conservation and urban development to maximize achievement of environmental, economic and social objectives.

STRATEGIES:

- To continue efforts for natural resource conservation
- To reduce load on natural resources and maintain green zones
- Attempt to harvest rain water through small irrigation tanks
- To improve agricultural economy through irrigation / commercial


8.2 Formulating City Development Plan

The process of preparation of City Development Plan has just begun with initiation of series of consultations. The outcome of these consultations was synthesized to form a City Development Strategy in March 2010.

The Plan is an iterative process and focuses on the key services as identified in the Visioning exercise. As envisaged, the plan is anchored on the Scheme of urban infrastructure Development in satellite towns / counter magnets of Million plus cities goal of creating economically productive, efficient equitable and responsive cities.

The aim of the Vasai Virar City Development Plan is to develop a participatory approach in delivery of services to the people of the city and uplift the quality of life. In order to ensure effective delivery of services, a proper urban management program could be developed only through the participation of key stakeholder and planning partners. The plan is prepared by involving stakeholders end by following different ways

- Identification of Stakeholders
- Group Meetings
- Personal Contacts
- City level Exhibitions
- Citizen's feedback on Draft Plan

City's community partners were invited and formulated working groups. These all were selected as stakeholders and they were contacted individually, by letters and by appeal in newspaper.
The vision for Vasai Virar was formulated by study of existing situation of the city along with the SWOT (Strength Weakness Opportunities Threats) analysis. Also the stakeholder's participation had a major contribution in developing vision for the city.

8.3 Approach

The City Development Plan is the Municipal Corporation's strategy that outlines the vision for growth of the city and details how the Corporation together with stakeholders, intends to achieve its long-term vision. The CDP leads to translation of missions into actions and actions into outcomes.

In this context, several stakeholder consultations will be held before finalizing the CDP. The consultations will held at organizational and individual levels, in groups belonging to particular sectors, and finally in the form of workshops. The objective is to bring all stakeholders on one platform and enable them to voice their opinion and come to consensus on strategies and actions for each of the identified priority sectors

The stakeholders will be comprised of NGOs, industry associations, educationists, environmentalists, and representatives from Corporation, of the informal sector and of Mohalla Committees. The stakeholder consultations also involve people from Department of Town Planning, Central Institute of Road Transport, Municipal Union, and Municipal Transport.

8.4 Expectation from the City Development Plan

As discussed, a City Development Plan is a perspective of and a vision for the future development of a city. Essentially it addresses following questions:

- Where are we now?
- Where do we want to go?
- What do we need to address on priority basis?
- What interventions do we make in order to attain the vision?

As discussed above, strategic planning has to be action oriented and linked to tactical and operation planning in order to be effective. Thus a medium-term plan commonly known as City Development Plan is to be prepared for the initial 5 to 7 years. The plan will set out in detail the priority projects, outline the tasks to be undertaken and give investment options ahead based on stockholder's expectations and need to change for direction.

Views and priorities from stakeholders were asked. MCCVV got more than 150 suggestions, which gives the idea of people's perception, views, and expectations. All are analyzed.
These priorities can be listed as under:

1. Drainage
2. Water Supply
3. Solid Waste Management
4. Roads & Traffic net work

More than 150 suggestions frame proprieties and directions for the plan with highest priority to sewerage system & water supply by the people
5. Strom Water Drain
6. Slum Improvement Program
7. Lake Redevelopment
8. Nature Park & Environment Improvement
9. Urban Renewal
10. Urban Governance

All these can be summarized to form VISION, outcomes and focus for the plan.

8.5 Our vision

Vasai-Virar City has been experiencing a very high rate of growth in terms of its population. This is obviously due to its closeness to Mumbai with excellent road and rail connectivity and relatively low real estate price. With real estate prices going up in neighboring Mumbai which are becoming increasingly unaffordable, this trend of high growth of Vasai-Virar is bound to continue.

To counter the population pressure, it is envisioned to promote and develop Vasai-Virar area as a clean, livable and eco-friendly Satellite Town with quality physical and social infrastructure and urban services. It is also aimed to converts its large tracks of areas with its natural charm into, tourists paradise to attract people from the neighboring over crowded city.

Commensurate with the aforesaid vision discussed in detail at 8.1 above, investment plan has been formulated in the areas of roads and storm water drains, water supply and sewerage, solid waste management, Link roads and waterways. It is aimed to achieve 50% coverage of urban curium in the next 2 years (2012) and 100% coverage in further 5 years (2016) Augmentation of social infrastructure and Environmental improvement measures would be taken-up in subsequent years.

Table 8.1Vision & Goals Infrastructure

Vision & Goals			
	2012	**2017**	**2021**
Sectoral Agenda			
Water Supply	75% coverage	100% coverage	100% coverage
Sewerage	50% coverage	75% coverage	100% coverage
Sanitation	50% coverage	75% coverage	100% coverage
Solid waste Management	75% coverage	100% coverage	100% coverage
Drainage/storm water drain	75% coverage	100% coverage	100% coverage

Urban Transport	75% coverage	100% coverage	100% coverage
Heritage	50% coverage	75% coverage	100% coverage

Source: Data provided by the MCCVV

The above actions would turn the dormitory town of Vasai-Virar into truly clean, livable and environmentally friendly Satellite Town.

City will have these specific visions for infrastructure sector

WATER SUPPLY AND SEWERAGE

- To develop an efficient, cost effective and environmentally sustainable service, with an aim to facilitate social and economic progress in the region of MMR in a framework of managed infrastructure development and preservation of ecological elements.

SOLID WASTE MANAGEMENT & I'UBLIC HEALTH

- Clean City is Healthy City.

ROADS, BRIDGES, STRTEET LIGHTS & TRAFFIC

- To make Vasai Virar a model city in terms of linkages and traffic management.

SOCIAL, CULTURAL AND EDUCATION

- To make Vasai Virar a model Town in terms of social, cultural and educational activities in the Mumbai Metropolitan Region.

The VISION is finalized by the working group as **"By ensuring ,optimum use of resources and sustainability of Urban Environment to provide efficient and cost-effective basic services to each and every citizen of Vasai Virar and facilitating economic, social, cultural and educational development."**

8.6 Reforms

Vasai Virar Municipal Corporation will be implementing reforms as suggested in Scheme of Urban infrastructure Development in satellite towns / counter magnets of Million plus cities guidelines.

Mandatory Reforms

Scheme of UID in Satellite Towns/ counter magnets of Million Plus cities suggests nine mandatory reforms.

1. Adoption of a modern, accrual based, double entry system of accounting;
2. Introduction of a system of e-governance using IT applications, Geographical Information Systems (GIS) and Management Information Systems (MIS) for various urban services and establishment of citizens facilitation centres.

3. Reform of property tax with Geographical Information System (GIS) and arrangements for its effective implementation so as to raise collection efficiency to 85 per cent.
4. Levy of reasonable user charges, with the objective that full cost of operation and maintenance is collected within seven years.
5. Internal earmarking of budgets for basic services to the urban poor;
6. Earmarking of housing sites for the urban poor;
7. Formulating bye laws which shall incorporate provisions for disaster management, rainwater harvesting, reuse and recycle of waste water, barrier free environment and structural safety and shall also be in strict compliance with the National Building code;
8. Implementation of Public Disclosure Law;
9. Implementation of Community Participation Law

Within the frame work of reforms for Scheme of Urban infrastructure Development in satellite towns / counter magnets of Million plus cities and looking to the people's perception and exiting strength of Municipal Corporation of City of Vasai Virar, Vasai Virar City Development Plan is formed. The Plan sets goals & vision of achieving the Reforms by 2016. This is also an essential exercise for development of various Strategies.

9. LANDUSE

9.1 Introduction

Urban lands are subjected to multifarious land uses which form intricate and complicated mixture in city. For the purpose of study, the land uses have been classified into residential, commercial, industrial, public semi- public, transport and communication, public utilities, recreation, cremation and agricultural with allied activities.

An understanding of the use of the land, and the management practices within a land use category, provides valuable information about the reasons for change in the condition of our natural resources. Urban land use comprises two elements: *the nature of land use* which relates to what activities are taking place where, and the *level of spatial accumulation*, which indicates their intensity and concentration.

These functions take place at specific locations and are part of an activity system. Activities have a spatial imprint, therefore. Some are routine activities, because they occur regularly and are thus predictable. The behavioral patterns of individuals, institutions and firms have an imprint on land use.

9.2 Profile of past Development

Due to Green Zone restrictions of the earlier Mumbai Metropolitan Regional Plan, urban development was permitted only within the dormitory townships prepared by the Town Planning Department. In outer areas of Green Zone the development was permissible as per para 5.2.62 of the report on the earlier MMR Plan (1970-91). This practice is still being adopted due to High Court stay-order.

9.3 Existing Land Use Pattern

In the Green Zone which surrounds the urbanisable area, the development is scattered. Along the road side, amenities like fuel pumps, restaurants, convenience shops, garages for repairs of vehicles are seen. Similarly along the National Highway, there are few holiday resorts. In some parts of the Green Zone, quarrying activity is also going on mainly to the east of railway line. The Green zone at east is characterised by grass lands and forest. The plantation of bananas, vegetables, floriculture, horticulture, fishing and other marine based activities are mainly in Green Zone situated along the sea coast. The existing land use pattern of the non-urbanisable area of VVSR was as given below:

Table 9.1Existing Land Use for Non-Urbanisable Area (NU Zone)

Sr.No	Land Use	Area (Ha.)	Percentage with NU Zone area
1.	Existing Settlements and Gaothans	105.65	0.3688
2.	Roads	171.48	0.5961
3.	Railways	2.10	0.0053
4.	Water Bodies	123.15	0.4279
5.	Cattle Sheds	14.60	0.0576
6.	Forest	8626.26	30.1124
7.	Agriculture/Cattle and Grazing	19603.55	68.4319
	Total Area of N-U Zone	28,646.79	100.0000

Source: As per sanctioned DP

Existing land use pattern of the urbanisable area of VVSR was as given below:

Table No. 9.2 Existing Land Use of the Urbanisable Area (U-Zone) of VVSR

Sr.No	Land Use	Area (Ha.)	Percentage with 'U' Zone area
1.	Residential	1550.25	16.574
2.	Commercial	73.50	0.785
3.	Industrial	155.40	1.661
4.	Social Facilities	144.10	1.541
5.	Public Utilities	11.80	0.126
6.	Recreational	97.77	1.045

Sr.No	Land Use	Area (Ha.)	Percentage with 'U' Zone area
7.	Forest	183.61	1.963
8.	Transport & Roads	346.50	3.705
9.	Railways	55.00	0.588
10.	Water Bodies	233.22	2.493
11.	Salt Pans	1065.00	11.386
12.	Agriculture	5437.06	58.133
	Total Area of U Zone	9353.21	100.000

Source: As per sanctioned DP

It can be seen from the above table regarding ELU of urbanisable area of sub-region that about 1550.25 ha. (16.57%) area is under residential use. Another 401.50 ha. (4.29%) is under Transportation Land Use, 155.40 ha. (1.66%) land is occupied by industries and only 144.10 ha. (1.54%) land is available for social facilities. Gaothan areas are characterised by dense housing with small shops along the approach roads to villages. There are few social facilities like schools, post offices, gram panchayat offices, police chowkis, etc. in these villages. Thus, the Gaothan area is a composite mix of residential use and other basic facilities. However it is noticeable thing that in the Green Zone between Vasai town and Agashi Village, few well planned and well maintained educational facilities were existing, mainly of English medium which are still having good standards.

The residential area of 1550.25 ha. is holding 2001 Census population of 7,02,723 persons. The gross residential density is about 443.9 ppha. As much as over 300 ha. of area is committed for residential use by way of development permissions granted either by MMRDA or by CIDCO.

9.4 Land use as per Final Development Plan (2007)

The total area in Vasai Virar municipal limits is about 380 sq. km. According to final development plan existing land use 78.09% of the total area is non-developable and is covered by forest, agriculture land, hills, salt pans, water bodies and vacant lands etc. The developable area is nearly 21.91%, out of which nearly 9.59% is under residential use and 5.52% is under transport and communication. The industry occupies 2.42% of the total area, 1.11% denotes organized open spaces, play fields etc. and 2.46% is under public and semi public use, area covered under commercial is 0.31%.

Distribution of Land use (As per sanctioned DP 2007):

Table 9.3: Proposed Distribution of Land use (as per sanctioned DP)

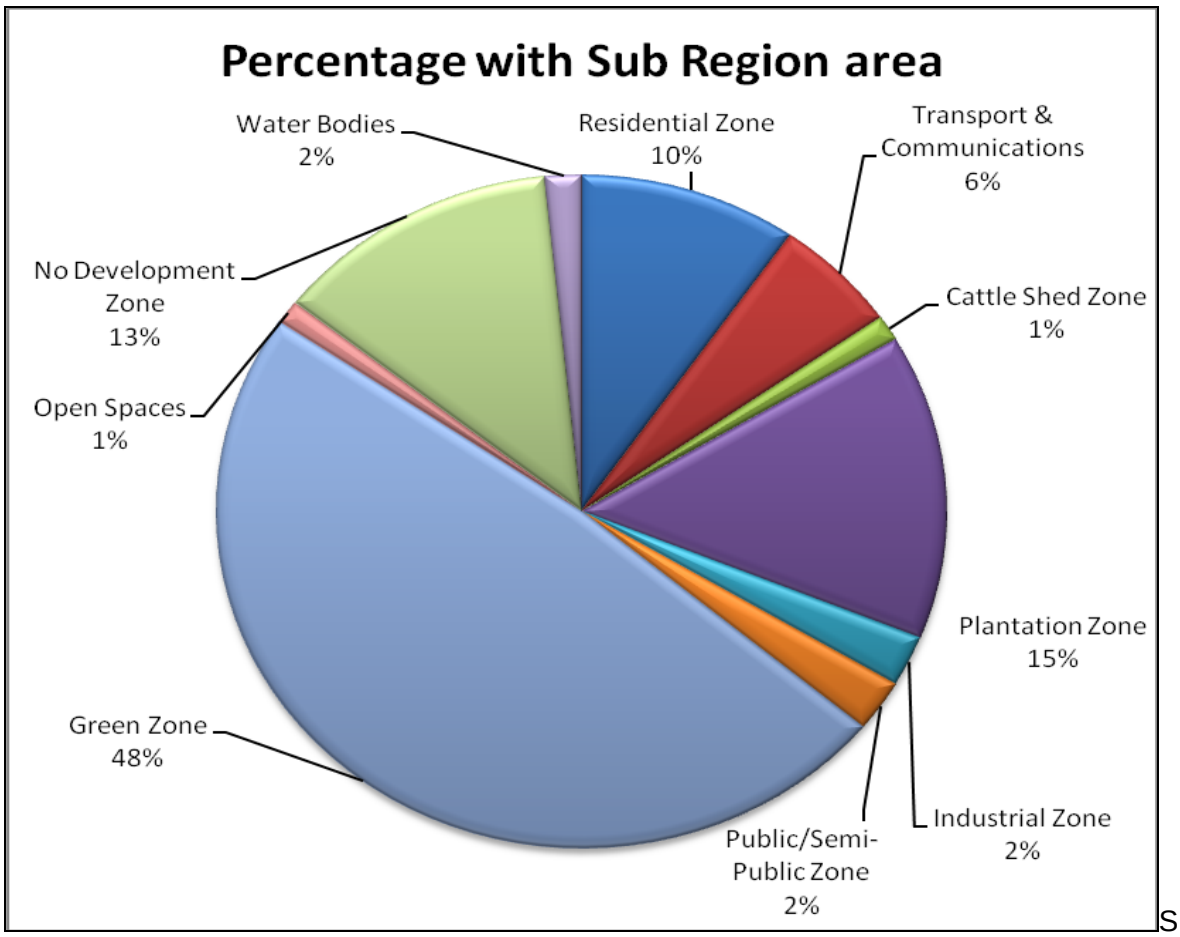
Sr No.	Land Use	Area	Percentage with developable area	Percentage with Sub Region area
1	Residential Zone	3642.50	43.76	9.59
2	Public/Semi-Public Zone	935.00	11.23	2.46
3	Commercial Zone	116.50	1.40	0.31
4	Industrial Zone	922.00	11.08	2.42
5	Public Utilities	189.00	2.27	0.50
6	Transport & Communications	2096.00	25.18	5.52
7	Open Spaces	423.00	5.08	1.11
	Total area considered for development	8324.00	100.00	**21.91**
8	Plantation Zone	5520.50		14.53
9	Green Zone	18277.00		48.09
10	No Development Zone	4802.00		12.64
11	Cattle Shed Zone	465.00		1.22
12	Water Bodies	611.50		1.61
	Total area of restricted and No Development Zones	29676.00		**78.09**
	GROSS AREA	38000.00		**100.00**

Source: As per sanctioned DP

As shown in area statement, much of the land in Vasai Virar is the Non Developable land, almost 78% of the total land. The Non Developable land can be credit to three major land use distributions:

1. Forest and Hills
2. Plantation zone on west coast
3. Marshy Land and Salt Pan
4. Water Bodies

The green zone which comprises of forest area forms 48% of non developable land. The Plantation zone which is famous for cocoanut & Banana plantations contributes to next higher percentage of 14.5% land in non developable category. More so being a topographical region, large chunk of land has gone in as hilly region and forest area.



Source: as per sanctioned DP

Figure 9.1 Present Land Use

9.4.1 Residential areas:

Generally major part of the developed land is for residential purpose in a city. Vasai Virar covers an area of 43.76% of developable areafor residential purpose, as it is rapidly developing into an important growth center in Mumbai Metropolitan Region. For commuters going from Brihan Mumbai, it functions as a suburban dormitory town. Map of the Residential zone is as given in Figure 10.3

The population of 7,02,723 (census 2001) in Vasai Virar is accommodated in total residential area of 3642.50 hectares giving a net density of population of 188.9 persons per hectare, the gross density is 240 persons / hectare.

9.4.2 Commercial use:

The shops commercial establishments, eating houses and all such users which are found to occupy frontage of busy streets are included in above categories. This user occupies about 116.5 hectares land which comes to 1.4% of the total developed area and 0.31% of the total area. . Map of the commercial zone is as given in Figure 9.4.

Commercial activities are located mainly near the four Railway stations. Shopping activities catering day to day needs of the residents have also come up on the ground floor in large housing complexes.

9.4.3 Industrial area:

This user covers an area of 922 hectares which comes out to be 2.42% of the total area and 11.08% of the total developed area. . Map of the Industrial Zone is as given in Figure 9.5

9.4.4 Land under public and semi public:

The area under this user covers 935 hectares which comes out to be 2.46% of the total area and 11.23% of the developed area. This user is covered by educational institutions, religious places, government and semi government offices .Map of the Public and the semi public zone is as given in Figure 9.6

9.4.5 Land under open spaces:

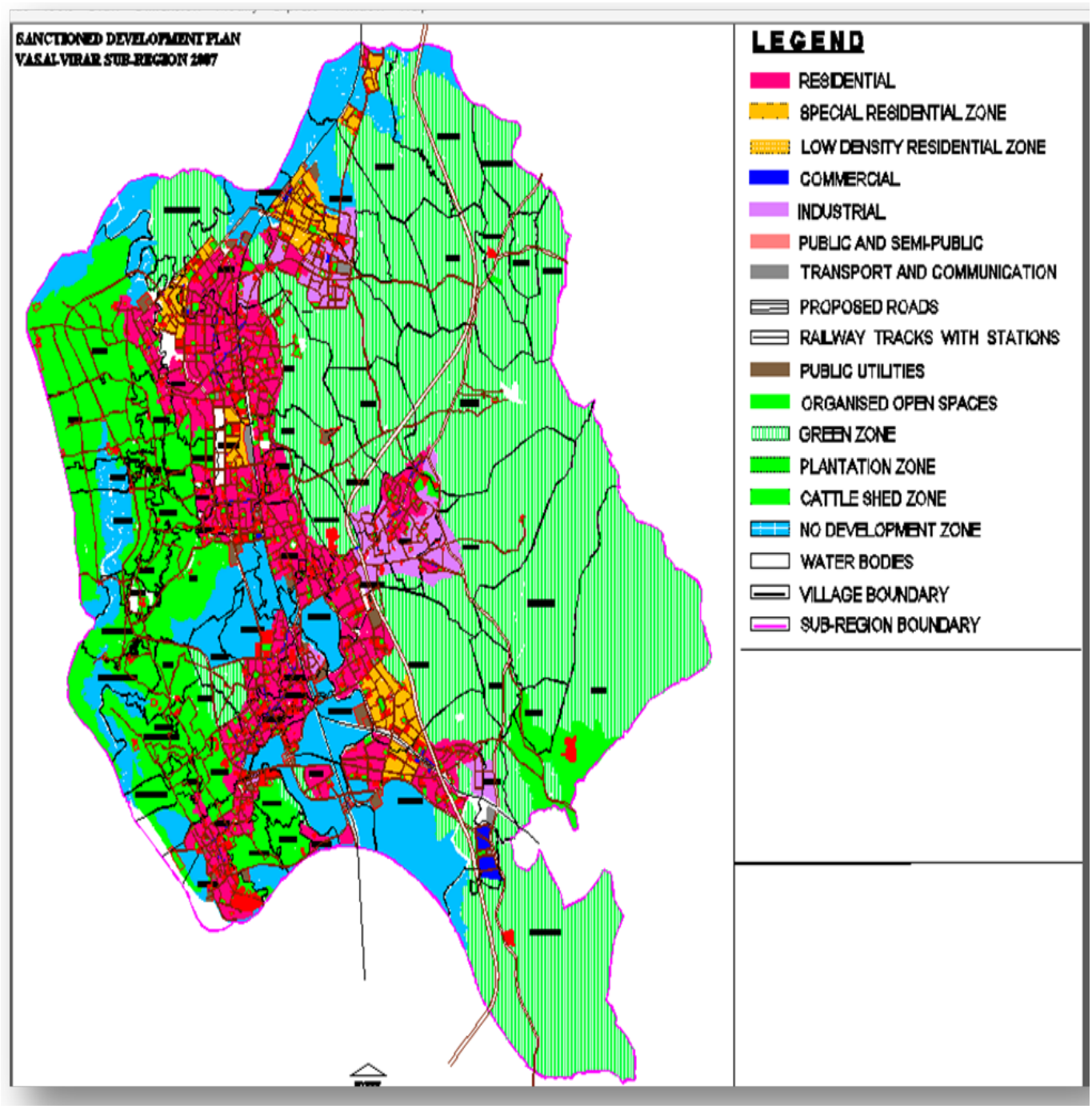
The open spaces or green spaces or recreational grounds area the lungs of the town and they cater active and passive recreation need of the cities. The area under open spaces, gardens, and play fields in the town is 423 hectares which is 5.08% of the developed area and 1.11% of the total area. i.e. 0.615 ha/ 1000 population which is bare minimum for the present population of 6.88 lakhs Map of the Open Space is as given in Figure 9.7

9.4.6 Need to revise Final DP

Since the present day population of Vasai Virar has exceeded the projected population as per sanctioned Development Plan-2007, the Municipal Corporation should undertake a revision of the DP.

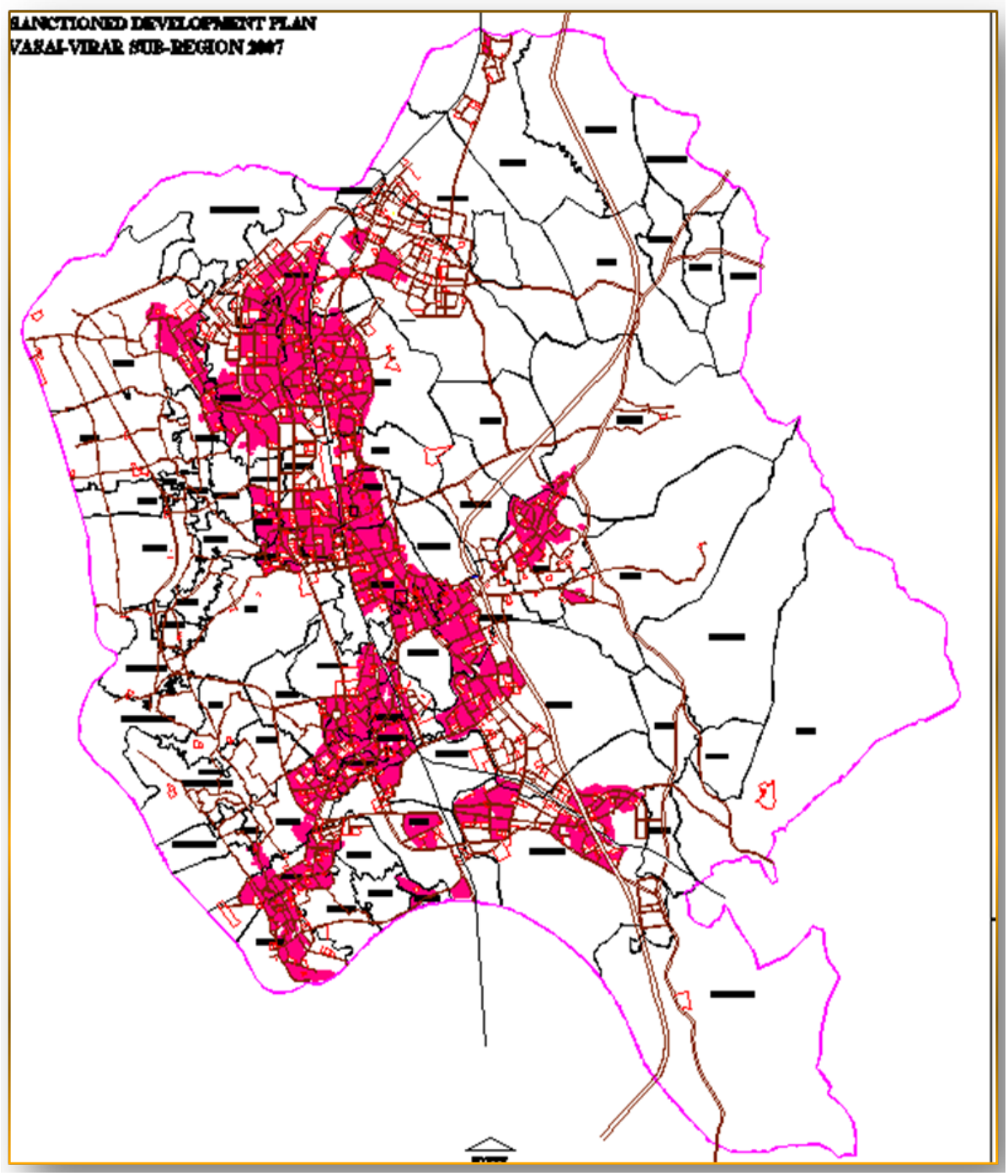
9.5 Land use map

Figure 9.2 : Proposed Land Use Map (as per sanctioned DP 1997)



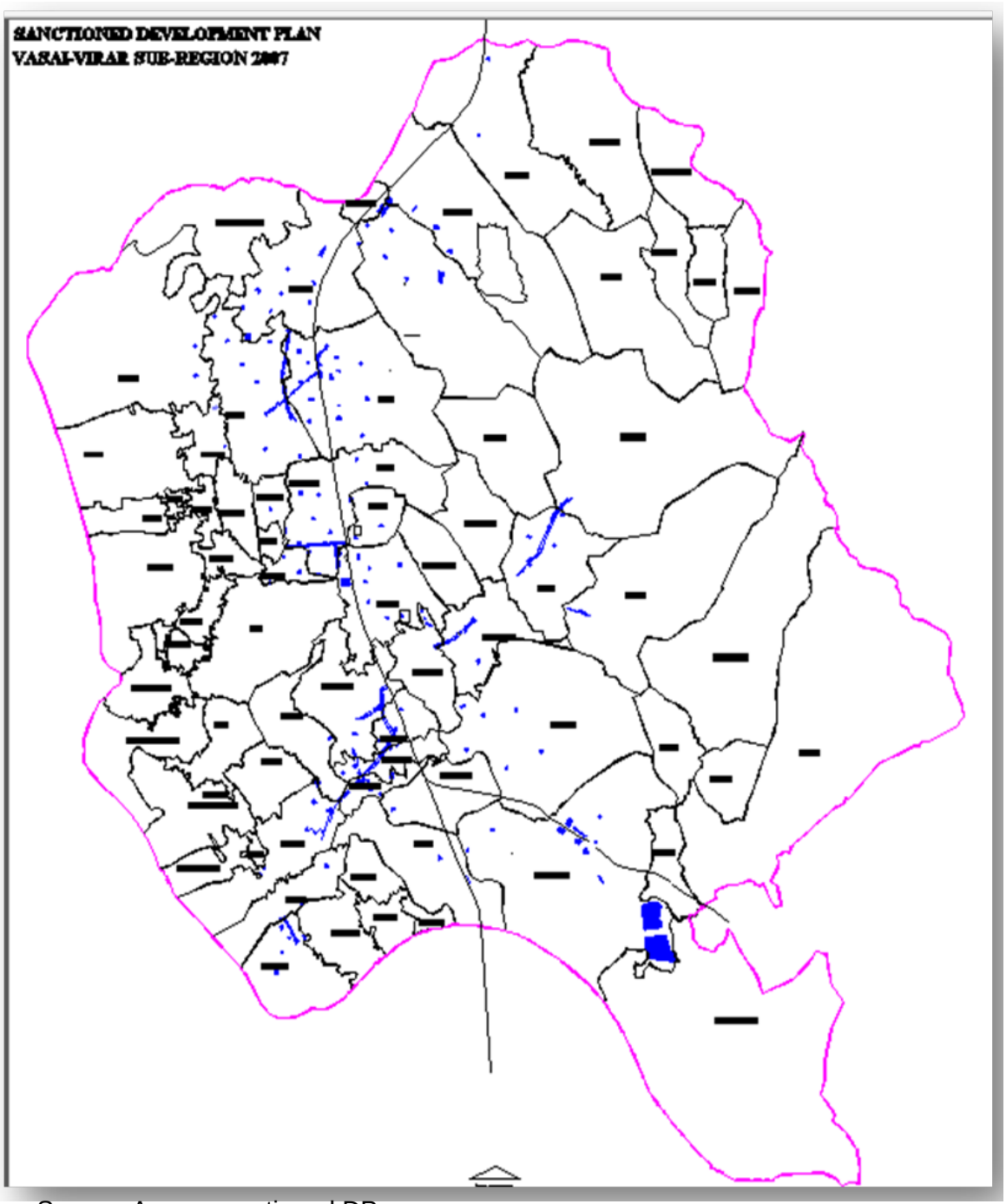
Source: As per sanctioned DP

Figure 9.3: Map Showing Residential Zone



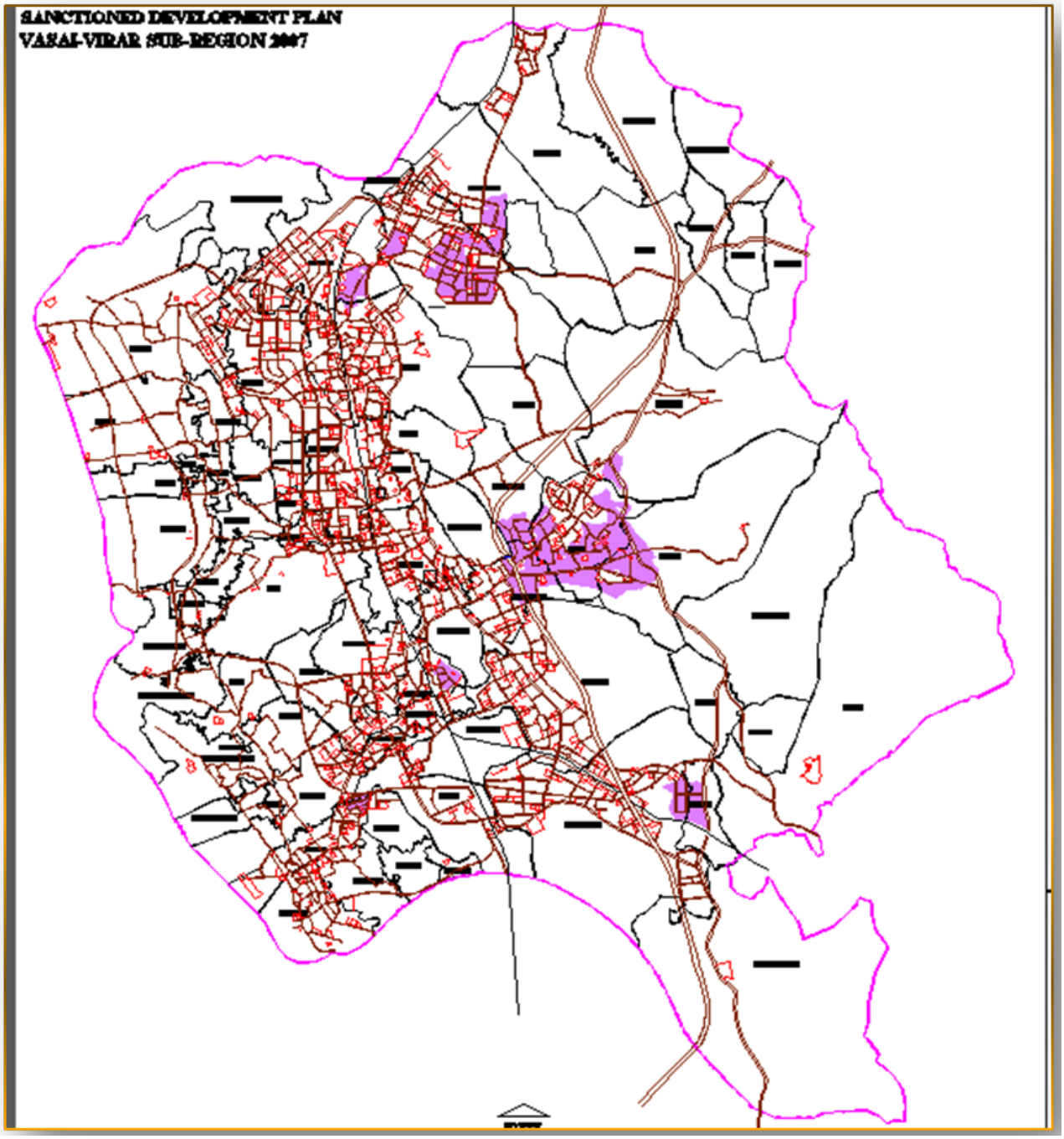
Source: As per sanctioned DP

Figure 9.4: Map Showing the Commercial Zone



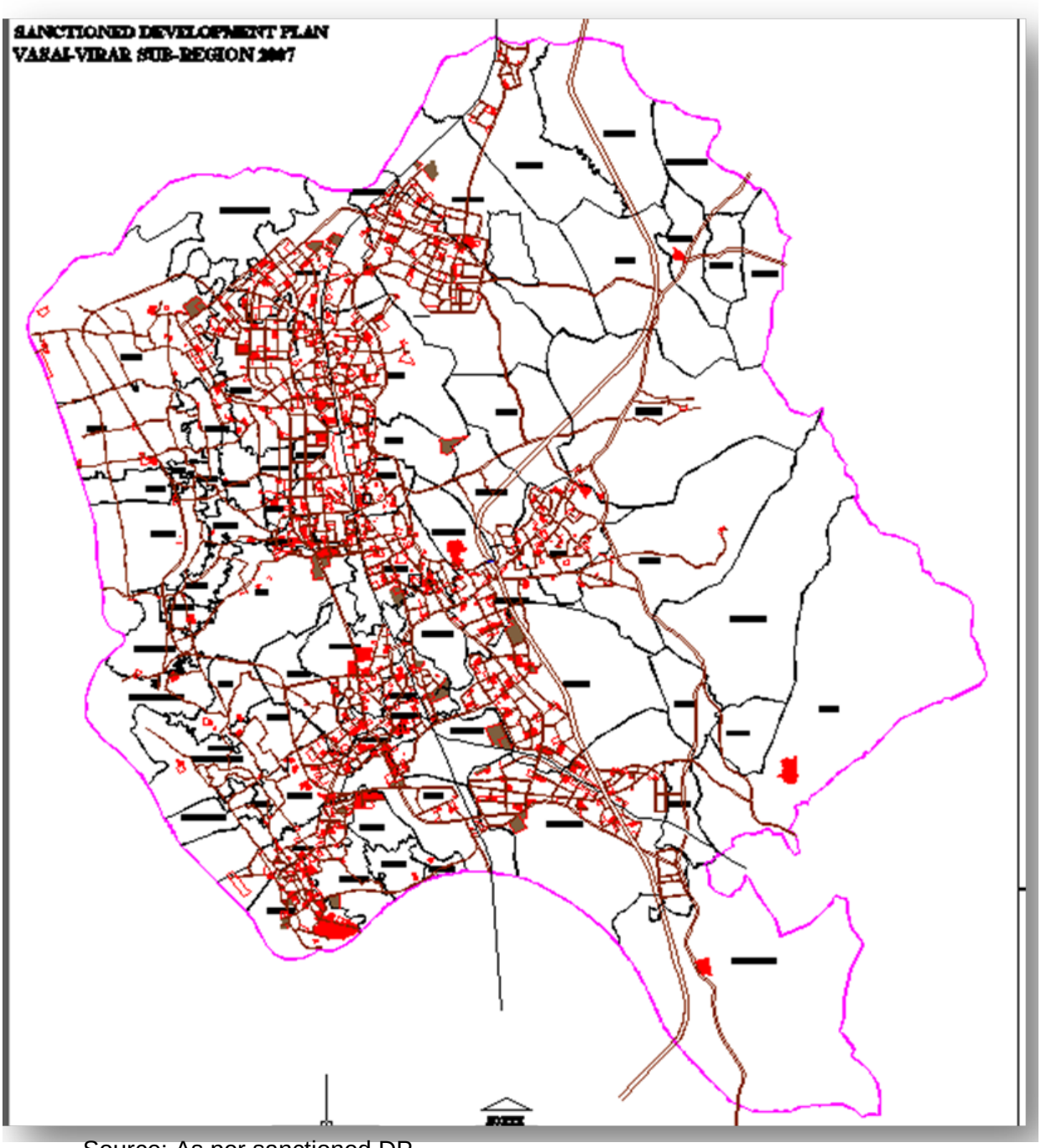
Source: As per sanctioned DP

Figure 9.5: Map Showing the Industrial Zone



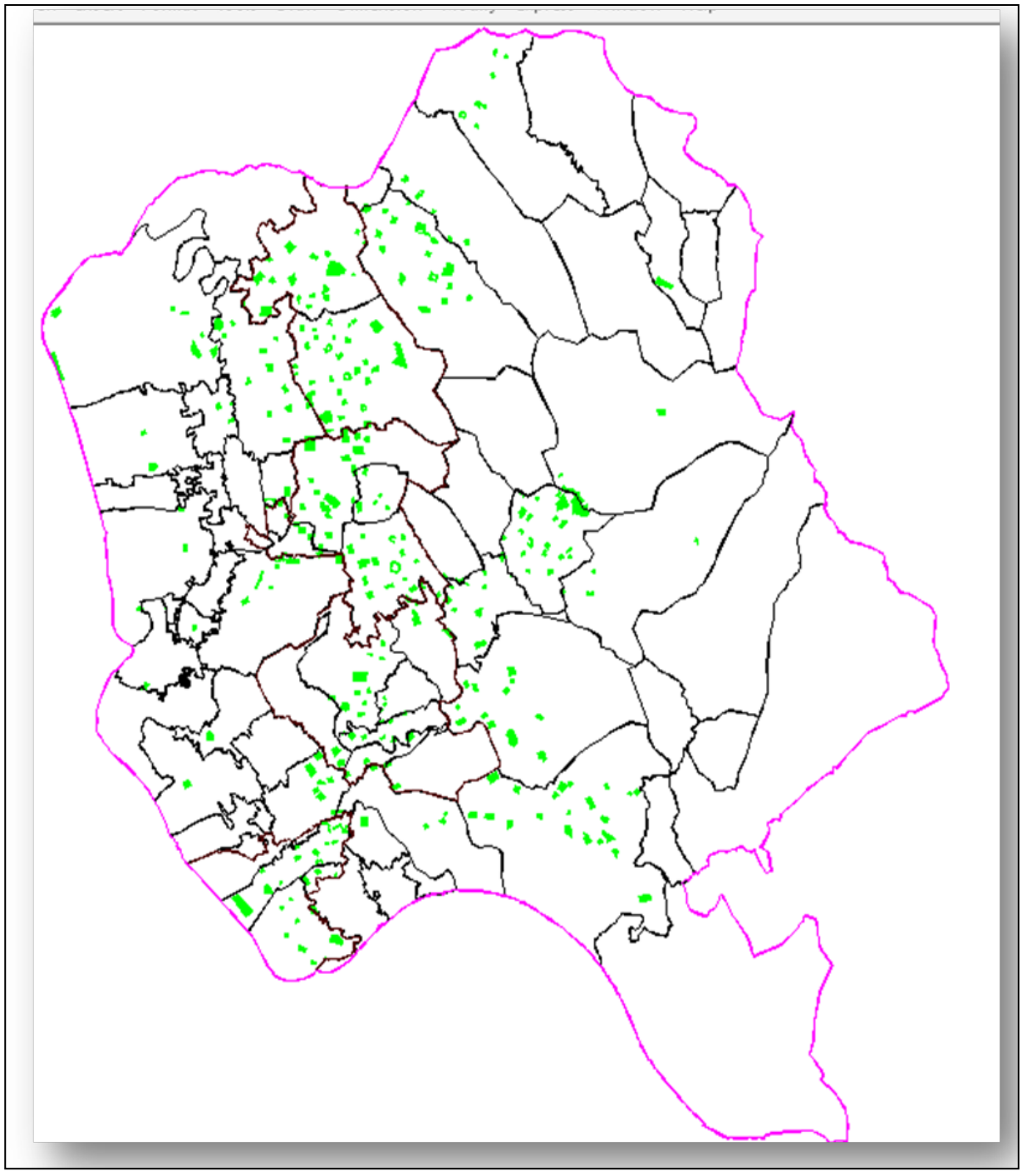
Source: As per sanctioned DP

Figure 9.6: Map Showing the Public Zone



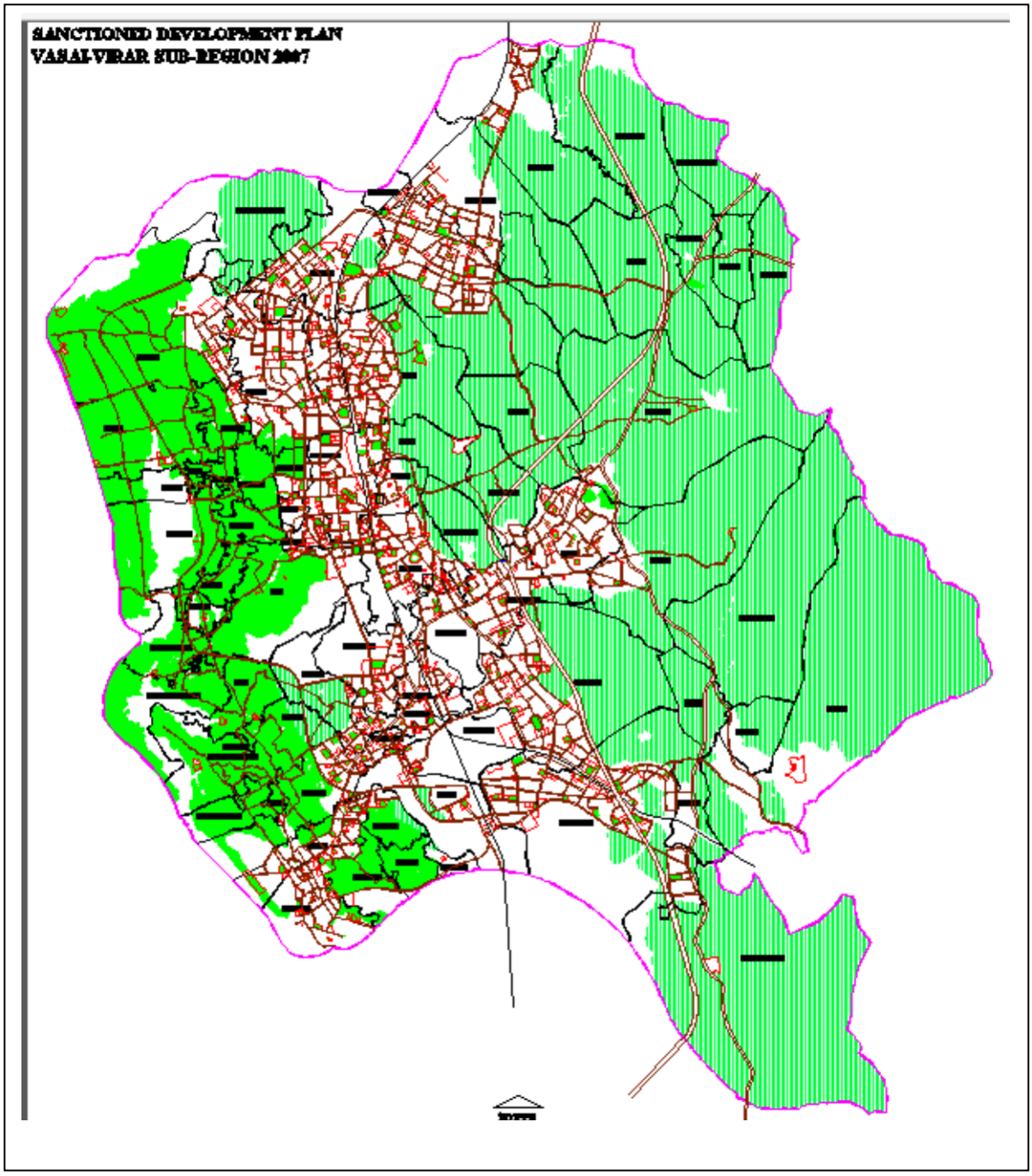
Source: As per sanctioned DP

Figure 9.7 : Map Showing the Open Spaces



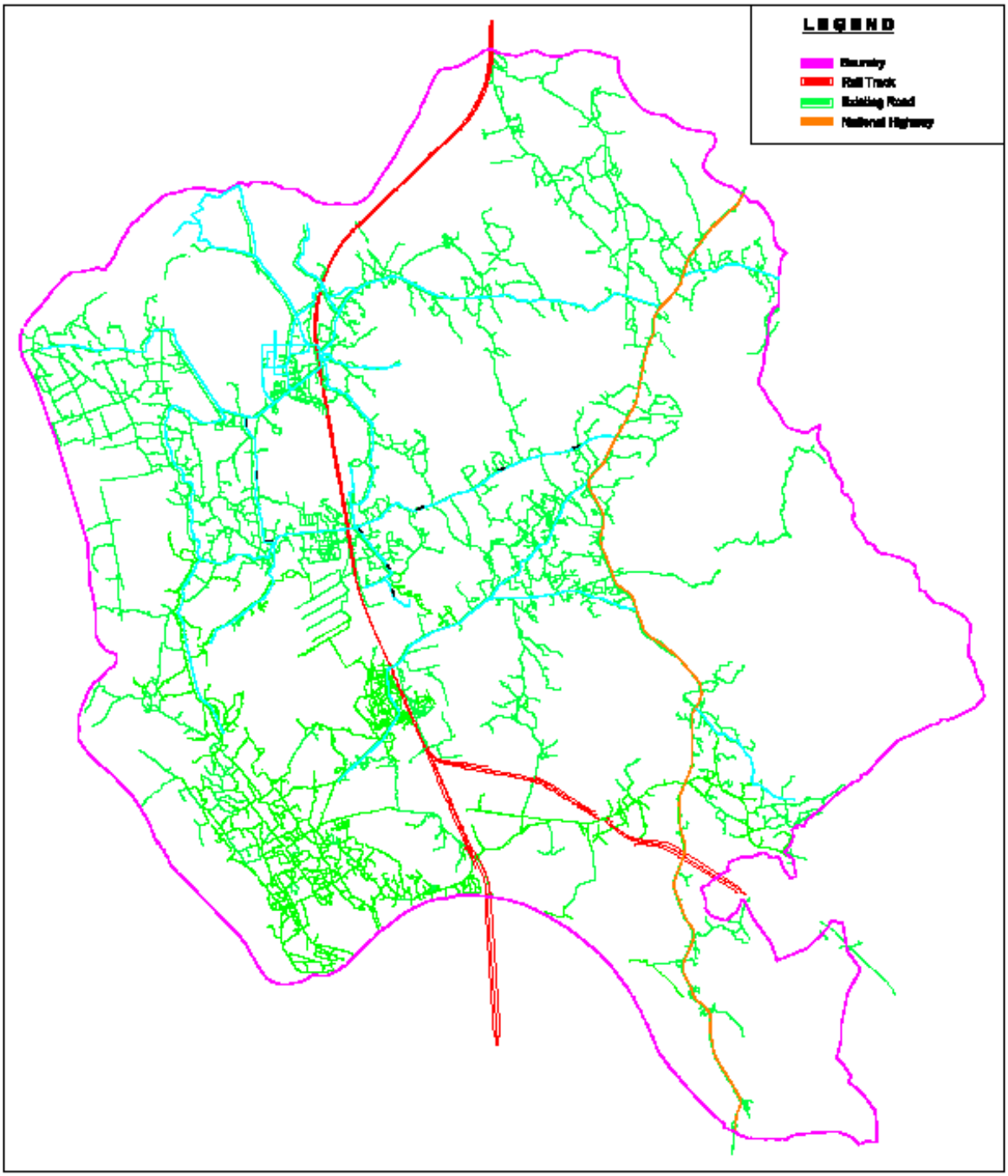
Source: As per sanctioned DP

Figure 9.8: Map Showing the plantation and green zone



Source: As per sanctioned DP

Figure 9.9: Map Showing the Existing Road



Source: As per sanctioned DP

10 TRANSPORT INFRASTRUCTURE

10.1 General

Urban growth both spatially and population wise puts heavy pressure on infrastructure, particularly water supply, sewerage, solid waste, sanitation, road network, traffic and transportation etc., unless infrastructure is improved, quality of life suffers. Most importantly, it impacts economic development of the city and investment climate. In this chapter, therefore, present status of infrastructure, gaps and future requirements strategies and investment requirements in the areas of water supply, sewerage, solid waste management, traffic and transportation are discussed.

10.2 Roads

Total length of road 1275.37 km includes 669.33 km of road length and 606.04 km of DP roads. The existing roads of Vasai Virar cover NH 8, arterial roads and minor roads including internal roads

Table 10.1- ROADS in MCCVV

Total length of roads in DP	**332.6 km**
Total Developed **Bitumen Roads**	**173.4 km**
Developed Arterial roads	**10.7 km**
Developed Minor & Internal roads	**162.7 km**
Undeveloped DP Roads	**159.2 km**

Source: As per Analysis

Existing road network was poor, insufficient and badly maintained. Hence, CIDCO and municipal councils have improved the status and serviceability of few traffic roads. However, no proper attempts are made by CIDCO or by any of the municipal councils in this respect. Recently the State Government has widened the National Highway No.8 (Mumbai - Ahmedabad Highway) upto four lanes with divider etc. and this has now removed the congestion as well as frequent accidents occurring on this N.H. - 8 particularly in VVSR area. The connections to National Highway No.8 from Virar, Nallasopara, Vasai-Road and Naigaon Railway Stations are with separate four east-west roads. Out of these roads, CIDCO has widened the road connecting Virar recently.

Considering the entire development factors transport network will play a vital role in the sustainable development of city. At present the road net work occupies only 21.38% of the developed area of the city. According to the UDPFI norms for the medium city the road network shall constitute around 17 to 20% of the total town area.

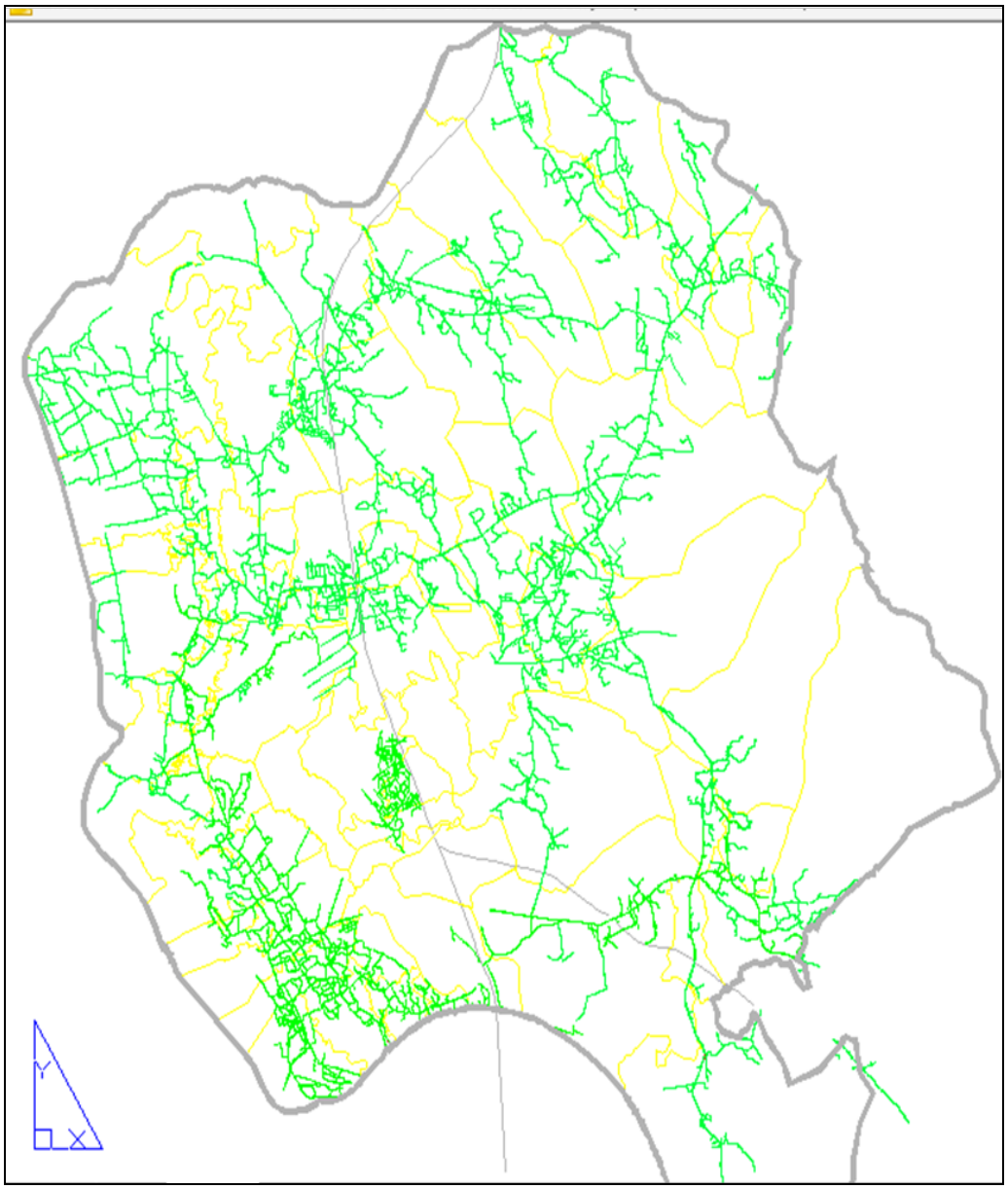
In case of Vasai Virar, it would be necessary to augment road infrastructure in terms of new roads, up-gradation of existing roads widening of interior roads, improvement of junctions, creation of parking spaces, construction of flyovers, roads for easy circulation and to minimize traffic congestion. Upgradation & new links for 125 Kms. of Arterial Roads has been proposed at a cost of Rs. 7801.4 crores.

10.2.1 Key Issues

1. Inadequate road space
2. Heavy congestion of roads in inner areas
3. Lack of parking spaces along the roads in city and near the railway station
4. Lack of footpaths of adequate width in the congested area
5. Street hawkers causing vehicular traffic problem
6. Inadequate cross-over points, across railway line

View of Bus

Present road map



Source: As per sanctioned DP

Figure 10.1: Present Road Map

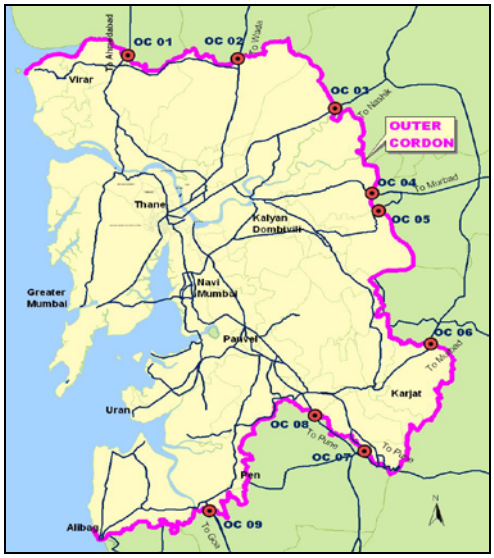
10.2.2 Comprehensive Transportation Study

MMRDA with technical assistance from World Bank under Mumbai Urban Transport Project embarked on the **Comprehensive Transportation Study** for MMR with prime objective of identifying travel pattern of residents in MMR and recommending long term comprehensive transportation strategy for MMR up to 2031. The Comprehensive Transportation Study for the Mumbai Metropolitan Region carried out by M/s Lea & Associates is given the acronym TRANSFORM or Transportation Study for Mumbai. Vasai Virar region being part of MMR was covered under this study.

The Comprehensive Transport Study for MMR was conducted in 2008 with objective to ensure adequate levels of accessibility in the expanding urban areas and to assist the economic development of the region. The transit and highway networks for horizon year 2031 and beyond has been defined and assessed keeping in view the goals & objectives

set for the future MMR. The networks build on the strengths and functions of the existing transport networks and planned, or committed, highway, suburban rail and metro corridors proposed by various planning organizations. The concept plans extend the both road and rail networks into the mainland greenfield areas and improving the connectivity to the many expanding existing urban clusters of the region. The key ingredient of the plans is regional inter-connectivity since currently and in the future the whole of the MMR will largely function as an economically integrated region. While planning strategies in other large metropolitan regions across the world have attempted to contain the growth of the 'Mother City" and develop largely autominous peripheral cities.

Classified volume count at outer cordon locations: The external travel for the base year (2005) has been assessed from the classified traffic count survey, occupancy survey and OD survey carried out at 9 outer cordon locations (**Error! Reference source not found.**) for 24 hours. It was found that About 48,000 vehicles enter Mumbai everyday and almost same number leaves. About 90% of this traffic is from north and south side of the region with very little from the east side. Out of total MMR traffic, the traffic moving in the northern direction is around 40,000 vehicles, eastern direction 8,600 vehicles and southern direction is 45,200 vehicles. The major traffic handling corridors are NH8 (29.7%), Mumbai-Pune Expressway (20.2%), NH17 (13.5%) and NH4 (11.6%).

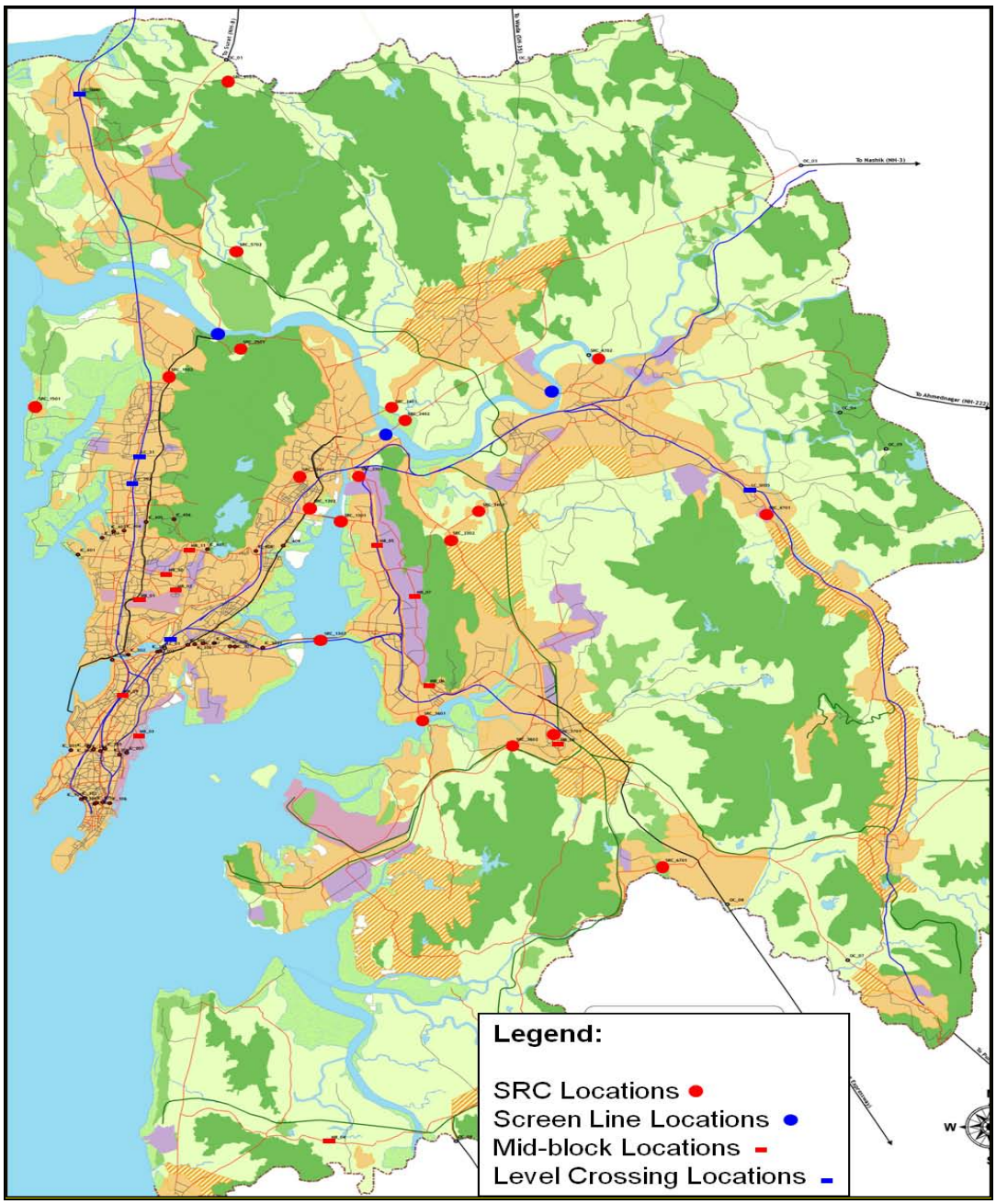


External Cordon Counts

1. **Classified volume count at sub regional cordon locations:** Traffic counts at sub-regional cordons, inner cordons and screenlines were undertaken for validation of the travel demand models and matrices assessed from HIS analysis. In addition, classified traffic volume counts were carried out at mid-block and level crossing locations. The survey locations are presented in Error! Reference source not found.10.2.

Table 10.2: Traffic Survey Locations

Description	24 hours		16 hours		Total survey points
	Traffic Count points	RSI points	Traffic count points	RSI points	
Sub-Regional Cordon	20	20	-	-	20
Screen Line	3		-	-	3
Inner Cordon	6		27	3	33
Other roads			11		11
Level Crossing			5		5



Traffic Analysis

Table 10.3 : Zone Coding: Detailed Level-1030 Zones

S.No	Name of area	Number of TAZ	Zone Coding	Provision for additional zones
1	Greater Mumbai	577	1-577	1- 1000
	Island City	232		
	Western Suburb	228		
	Eastern Suburb	117		
2	Mira-Bhayandar	26	1001-1026	1001-1050
3	Thane	95	1201-1295	1201-1400
4	Nallasopara	13	1126-1138	1126-1150
5	Navgarh-Manikpur	6	1101-1106	1101-1125
6	Vasai	21	1051-1071	1051-1100
7	Virar	27	1151-1177	1151-1200

Table 10.4 : Zone Coding: Strategic Level or FAZ- 171 Zones

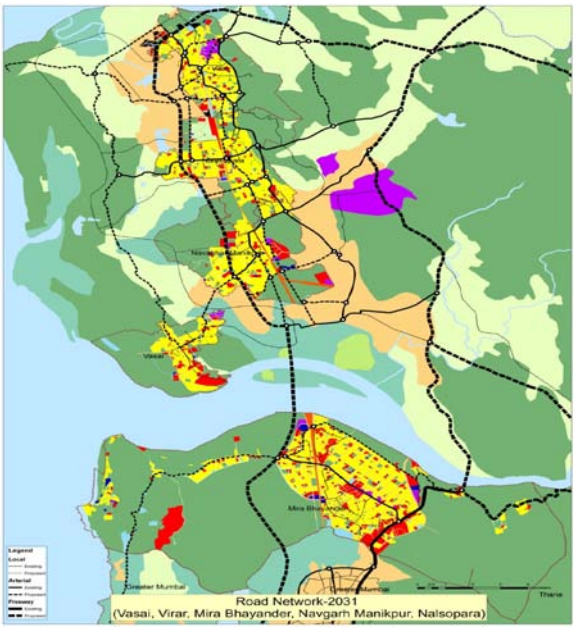
S.No	Name of Area	Finer level TAZ	Grouped FAZ	Zone Coding for FAZs
1	Greater Mumbai	577	87	1 – 100
2	Mira-Bhayandar	26	6	101 - 106
3	Thane	95	11	107 – 117
4	Nallasopara	13	2	118 - 119
5	Navgarh - Manikpur	6	2	120 – 121
6	Vasai	21	1	122
7	Virar	27	2	123 – 124

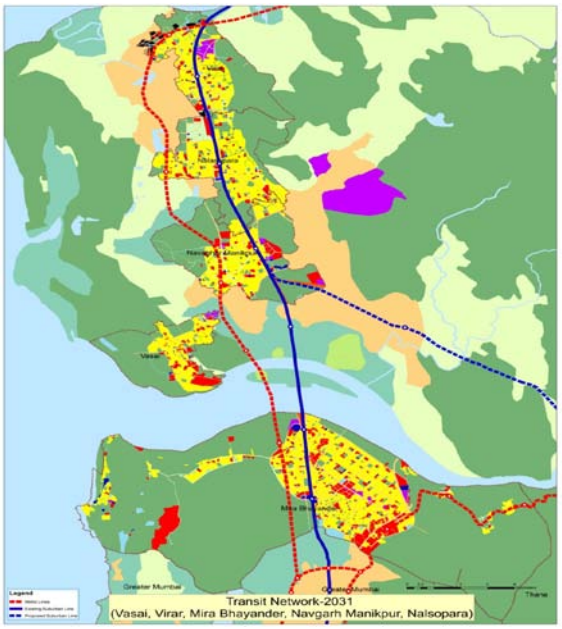
Table 10.5: Zone Coding: Coarse Level-71 Zones

S.No	Name of Area	Finer level TAZ	Grouped TAZ	Zone Coding for Group zones
1	Greater Mumbai	577	33	1-33
2	Mira-Bhayandar	26	1	34
3	Thane	95	3	37-39
4	Nallasopara	13	1	36
5	Navgarh - Manikpur	6	1	35
6	Vasai	21	1	35
7	Virar	27	1	36

Table 10.6 Node Numbering for Highway Nodes

Area	High way Node Numbering	
	Reserved series	Total available nodes
Greater Mumbai (Highway Nodes)	10000 - 19999	10000
Greater Mumbai (Freeway Nodes)	13000-13999	999
Mira Bhayandar	20000 - 24999	5000
Vasai	25000 - 25999	1000
Navgarh Manikpur	26000 - 26999	1000
Nalasopara	27000 - 27999	1000
Virar	28000 - 29999	2000





Vasai/Virar/Mira Bhayander/Navgarth/Manikpur/Nalsopara Cluster
2031 Road & Rail Transit Networks

Table 10.7 Goals & Service for Public Transport Facilities

Goal	Current Status	2011	2016	2021	2026
Presence of Organized Public Transport System in Urban Area (%)	<20	< 20	20 -40	40- 60	> = 60
Extent of Supply Availability of Public Transport	< 0.2	< 0.2	0.2 – 0.4	0.4 – 0.6	> = 0.6
Service Coverage of Public Transport in the city	< 0.3	< 0.3	0.3 – 0.7	0.7 – 1.0	>= 1
Average waiting time for Public Transport users	> 10	> 10	6 -10	4 – 6	< = 4
Level of Comfort in Public Transport	> 2.5	> 2.5	2.0 – 2.5	1.5 – 2.0	< = 1.5
% of Fleet as per Urban Bus Specification	< = 25	< = 25	25 - 50	50 - 75	75 - 100
Level of Service	4	4	3	2	1

Source: Service Level Benchmarking

10.2.3 Proposed Projects:

Based on the travel damand analysis done and the Long Term Transport strategies, M/s Lea Associates suggested following inftrstructure projects to be undertaken in VVSR. These projects are being undertaken by MMRDA under Mumbai Infrastructure Project.

Table 10.8-Projects Proposed under MUIP by MMRDA in MCCVV

1	Naigaon Juichandra Bopane State Highway (Juichandra fata to Naigaon Rly.station)
2	Vasai Satwali – i) Vasai to Chinchoti fata
	ii) Gokhiware to Pelhar fata
3	Arnalla-Virar-Shirshad-Ambadi- (Virarfata to Arnalla)

Table 10.9: Proposed Transport Projects by MMRDA in MCCVV

Sl No	Project Name	Estimate Cost In Crores	Length
1	Metro Line from Dahisar-Mira Road – Manikpur - Virar	4321	23Kms
2	Suburban Line – Diva to Vasai Road	480	8 km
3	Widending-1 (NH-8)	561	26.00
4	Western Sea Link North Extn (Bandra - Dahisar - Virar)	7200	30.00
	Total	Rs 12562	

CIDCO as special planning authority for VVSR have proposed following road projects in DP sanctioned in 2007.

Table 10.10: Proposed Projects of SPA CIDCO for road infrastructure *(as per sanctioned DP) 2009-10 in MCCVV*

Sl No	Project Name	Estimate Cost in crores	Present status
1	Widening and Strengthening of existing road from Deotalav to Babhola Naka in VVSR.	177.70 (Awarded Value)	Work in progress.
2	Widening and Strengthening of existing road from Bolini to Umrale Sopara in VVSR.	278.00 (Awarded Value)	Work in progress.
3	Widening and Strengthening of existing road from Gaas to Bhuigaon in VVSR.	315.00 (Awarded Value)	Work in progress.
4	Virat Nagar in Virar (W) to	547.00 (Awarded	Embankment work in process.

Sl No	Project Name	Estimate Cost in crores	Present status
	Shreeprastha Nagar in Nallasopara (W) in VVSR. (4.0 Kms. 30 mtrs. D.P.Road)	Value)	
5	Resurfacing of existing road from Babhola Naka to S.T.stand.	300.00 (Awarded Value)	Work in progress
6	Resurfacing of existing road from S.T.stand to Tahsildar Office		
7	Construction of Road from Central Park in Nallasopara (E) to Giri Vihar (E) in VVSR (2.8 Kms. 20/30 mtrs. D.P. road	977.70 (Awarded Value)	Work in progress
8	Achole to Nallasopara Station (East). (2.7 Kms. 20 mtrs. D.P. Road)	427 (Awarded Value)	Work recently awarded
9	Survey, Soil Investigation &Demarcation of road from Bhoida Pada to Juchandra at Naigaon (E) in VVSR.	10.00 (Awarded Value)	Work recently awarded
10	Construction of 30 m.wide D.P.road from carshed upto Holding Pond in Nalasopara	870	Estimation in process.
11	Nallasopara (W) to Vasai (W). (6.0 kms. 40 mtrs. D.P. Road)	2016	Road passes through C.R.Z. Proposal for Environmental Clearance is in process
12	Vasai (W) to Naigaon (W). (3.6 kms. 40 mtrs. D.P. Road)	1296	Estimation in process
13	Construction of 30 m DP road Virar MC office	537 (Estimated Value)	Estimation in progress.
14	DP Roads in Virar (E)	50 (Estimated Value)	Estimation in progress.

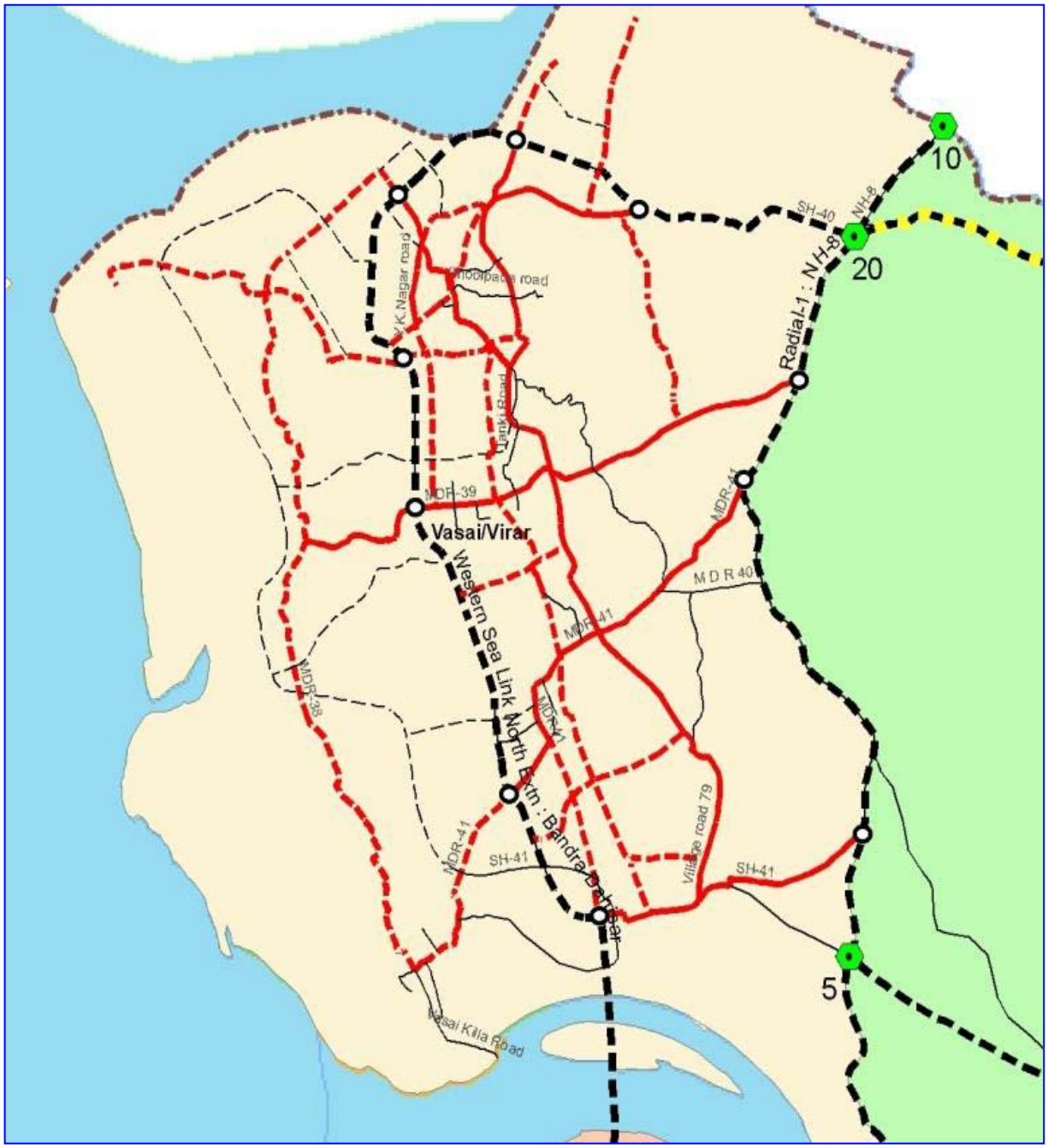
Source: Engineering Dept. CIDCO, VVRS.

In the light of the development of the recommended metro corridors/ lines, suburban rail corridors/lines and highway corridors in the North South direction it is also necessary to provide connectivity between these with the objective of strengthening and augmenting the capacity of the existing road network, mainly in the interior, where the congestion levels and intensity of traffic demands had increased significantly. Considering this following road projects are suggested in City Development Plan

Table 10.11 – Additional Road Projects Proposed

Sr. No.	Project
1	Inner Ring Road
2	Outer Ring Road
3	Connectors to National Highway no. 8 i) Nirmal to Nallasopara to Pelhar

Source: MMRDA



Augmentation of road infrastructure

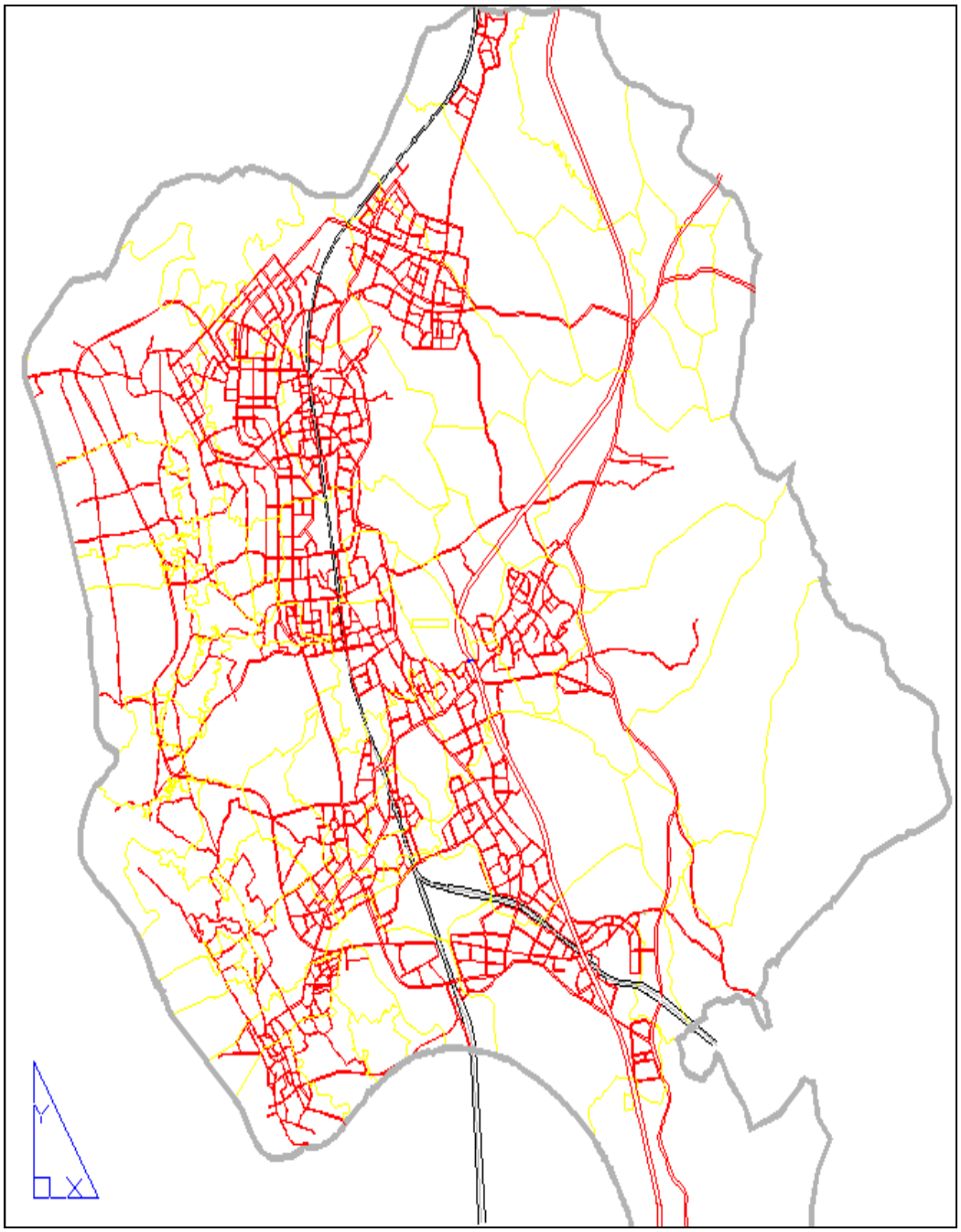


Figure 10.2: Development Plan Road Map

The following issues are to be looked into:

1. Where ever road is to be widened in congested area proper footpath has to be provided for easy pedestrian movement.
2. Hawkers on roads and footpaths are to be relocated elsewhere for easy free flow of vehicles and pedestrian movement.

3. All the parking plots in sanctioned Development Plan should be developed on priority.
4. Rehabilitation & Resettlement issues have been addressed & adequate provision of R&R houses has been acquired & are been acquired from private parties under accommodation reservation and the reservation for project affected people in the city.
5. Environment management plan & traffic diversion plan has been prepared for implementation during construction period, the cost of which has been considered in the project cost.

10.2.4 Impacts

The improvement in road network will bring the Megacity of Mumbai closer to VVSR where the agriculture, fisheries are the primary occupation of the residents and will help develop market for the perishable food items like fruits, vegetables, fish which are produced in VVSR. This will help economical growth of the area.

Increase in the number of two wheelers like motorcycles, scooters, etc. three wheelers like rickshaws and four wheelers like cars, vans, etc., is affecting the public transport usage. Buses are the most important form of public transport in most urban areas.

The growth of motor vehicles, both in number and usage, has taken its toll, on the environment in many ways, not just through road congestion, noise pollution or emissions, but also through road accidents. Road accidents cause major losses, both monetarily and in human terms.

10.2.5 Congestion

More and more traffic, increase in population, badly maintained roads, all leads to road congestion, which increases air pollution, global warming, etc. Congestion on inter urban roads is being tackled by the provision of an expanded road program, which emphasizes the widening of existing major roads, to maximize the ease of movement.
The main causes for traffic congestion in a Vasai-Virar are given below.

1. Traffic growth in the Vasai-Virar area has been rapidly increasing per annum due to the land availability for development, which is a major factor influencing the population growth.
2. Flow of goods traffic has increased, due to the development of industrial and job oriented activities in Vasai-Virar city.
3. Two wheeler traffic flows has risen sharply in the city because of the rapid development of suburbs, inability of the public mass transport system to meet the rising demands and un-affordability of cars by most of the residents.
4. Bicycle traffic has significantly declined and auto rickshaws are used more than cars.

Much of the city traffic can be attributed to the outflow of resident workers for office and service jobs in south and central Mumbai and the inflow of non - resident workers to factories, trade and service centers in industrial complex areas.

10.2.6 Pollution

Noise from vehicles disturbs sleep, impairs job performances, impedes teaching (incase of schools closer to roads), hinders social activity and verbal communications and effects the health through stress generated by lack of sleep and cause a general deterioration in the quality of life.
The main emissions from motor vehicles are carbon dioxide, carbon monoxide, nitrogen oxides, sulphur oxides, hydrocarbons and lead. Two major concerns rising from vehicle emissions are their impacts on human health and global warming.

10.2.7 Planning

Transportation planning aims at providing coordinated traffic plans for inter urban and intra urban traffic, transportation movements and strengthening of existing physical linkages between settlements. This takes into account the future growth in population, vehicle ownership, employment and transformation of economic and social conditions in the study area.
A comprehensive traffic plan, however, requires various surveys such as

1. Traffic volume counts on important routes. Average speed and delay
2. Origin and destination.
3. Volume counts at intersections
4. Household survey.
5. Collection of secondary data's, like, accident data's, frequent accident spots, parking locations, inventory of communication routes, work places, existing mass transportation systems, traffic generators, Octroi collection data, previousdevelopment plan and socio-economic data influence in .the study area.

As mentioned above, the Comprehensive Transport Study for MMR by M/s Lea & Associates has already been conducted in 2008 with objective to ensure adequate levels of accessibility in the expanding urban areas and to assist the economic development of the region. The transit and highway networks for horizon year 2031 and beyond has been defined and assessed keeping in view the goals & objectives set for the future MMR. The networks build on the strengths and functions of the existing transport networks and planned, or committed, highway, suburban rail and metro corridors proposed by various planning organizations.Vasai Virar being part of MMR has been included in the study.The recommendations of M/s Lea & Associates have been considered in formulating the Transport projects in the CDP.

10.2.8 *Proposed Water Transport Projects:*

The VVSR has good coast line and can be used for development of water transport.With a view to augment the Road transport system Water Transport facilities are proposed to be developed on the lines of facility presently available at Gateway of India.

- Ferry Warf at
  - Arnala
  - Vasai fort

- Kalamb
- Services to
  - Nariman point
  - Gorai
  - Andheri
  - Belapur
  - Uran

10.2.9 Bus Service

Local as well as inter-city bus services in this area are provided by MSRTC. It has three S.T. Depots each in the area, viz. at Vasai, Arnala and Nallasopara. MSRTC buses provide regular services to the 3 railway stations viz. Virar, Nallasopara and Vasai-road with a frequency of about 10 minutes.

It is necessary to improve the Bus service for internal travel of the residents. This will improve connectivity between their residence and railway station, Rental Housing project, Bus Depot, water transport sites, place of work, Recreational sites, Heritage sites etc. Some of the transit corridors and higher order artirial corridors should be planned as multi-modal transport corridors i.e. transit and artirial roads sharing the same right of way (ROW). The transit corridor can be either placed centrally or on either side of the artirial corridor. Multi-modal corridors can accommodate either metro, LRT or BRTS. Implementation of transit lines (LRT, or BRT) over the existing roads can be very costly due to non-availability of sufficient ROW to place the transit lines at-grade, huge refurbishment costs and property impacts.with in distance of five hundred meters from the existing railway station sutaible sites for BRTS Stands along with auto riksha & public taxi stand be provided. These sites can be connected to existing railway station area by skywalk at suitable locations.

MMRDA is currently in the process of inviting proposals to implement above grade monorail lines in vvsr on designated road links which could act as feeder lines to the suburban rail and metro stations.

It is also proposed to set up Bus Authority to look after the Bus service. Bus Terminals and Bus depots will be created in suitable places and Bus Fleet will be purchased. Following Bus services are proposed from this point of view.
Bus services from Jetties to Residential area

- Intra City Bus Transport
- Inter city Bus Transport

10.2.10 Railway:

Most of the recent growth in the residential areas in the Sub-Region is mainly due to the availability of suburban rail system which provides cheap transport and efficient connections to job centres in Mumbai. Western Railway runs more than 150 (trips) suburban train services daily for commuters. In addition, some shuttle services and long distance trains halt at the railway stations at Vasai-Road and Virar. Yet during peak hours, trains are so overcrowded that the commuters have nightmarish experiences. Adequate

facilities for parking near these stations are lacking. Moreover, the haphazard development of commercial activity which has taken place in and around the stations has also made movement of pedestrians and vehicles extremely difficult. As a result there is great congestion near the stations.

Under the Mumbai Urban Transport Project (MUTP) undertaken by MMRDA with financial assistance from World Bank Additional pair of tracks 26 kms have been laid from Borivali to Virar and EMU maintenance shed has been set up at Virar at a cost of Rs. 509 crores with Virar Dahanu Road track centre work. This will benefit the commuters as carrying capacity during peak hours in Virar - Borivali section, which is the second heaviest section in Mumbai suburban network, will be almost doubled.

10.2.11 Connectivity to Metro Rail System

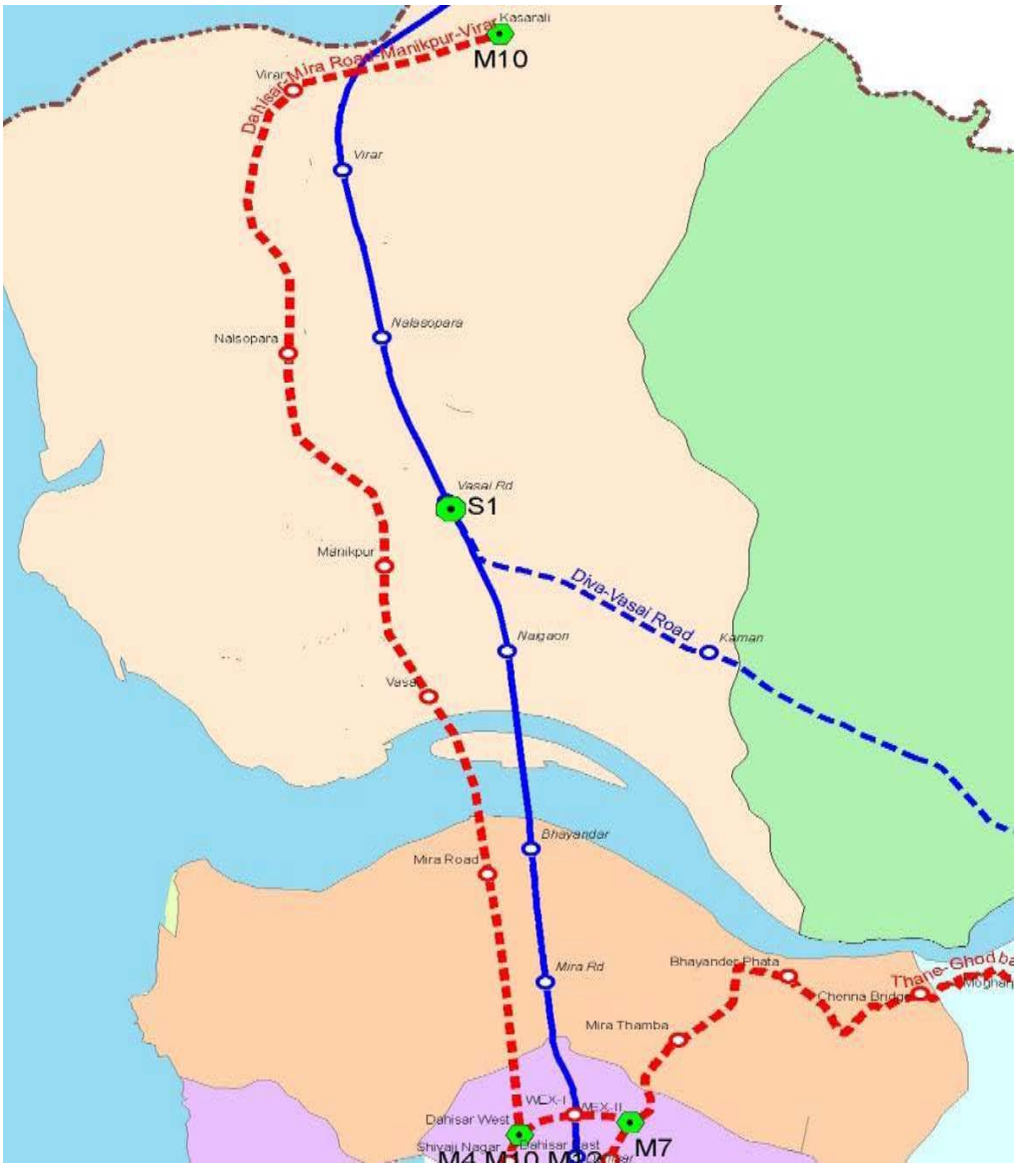
The existing Master Plan for Metro System covers only Greater Mumbai Area of MMR. As per this plan, 9th corridor of Metro Rail has been proposed including Andheri (E) – Dahisar (E). There is corridor no. 10 proposed for Dahisar - Mira Road – Manikpur – Virar Corridor. This is with a view of increasing the carrying capacity of Railway System in order to increase or at least maintain the model split in favour of public transport to contain congestion on roads. The cost of extending the Metro Rail from Dahisar to Virar (Length of 23 Kms) is Rs. 4321 crores.

Vasai-Virar area, though territorially falls outside Greater Mumbai area, is virtually an extended suburb of the Metropolis. The existing suburban railway service which connects Vasai-Virar with Mumbai is already over saturated although the Borivali Virar Western Railway has been made 4 lanes under MUTP. The only road link-NH-8 is also highly congested due to heavy local and through traffic. In such a scenario and with the population of Vasai-Virar expected to grow from present 13.07 lakhs to 33.34 lakhs by 2031, it is absolutely necessary to extend the Metro Rail System to this area. The probable corridor could take-off from Dahisar (E) Station on Dahisar (E) – Virar Corridor, and follow the route along NH-8 till the junction of NH -8 and Kashi Vasai-Virar road and further along the KashiVasai-Virar road. The MRTS, after crossing the western railway can terminate near Virar. This main corridor also have cross corridor to serve the inner areas of the city.

The existing suburban railway service which connects Vasai-Virar with Mumbai is already over saturated. Although Borivali–Virar Rail link is being quadrapulated under the MUTP, considering the projected population of 34 lakhs of Vasai-Virar Region and another 22 lakhs of Mira-Bhayander Region, the extended capacity of the suburban railway may not fully meet the future needs of the commuting people from these regions. Besides, the suburban railway does not serve the far-flung areas of MCCVV which has tremendous potential to develop as Regional Recreational Centre.

The Plan showing the alignment of above two MRTS corridors is given below:

The above project must be included in the current projects of Metro Rail of Greater Mumbai.


Kasarali
M10
Dahisar
Mira Road
Manikpur-Virar
Virar
Nalasopara
Vasai Rd
S1
Manikpur
Diva-Vasai Road
Kaman
Naigaon
Vasai
Bhayander
Mira Road
Mira Rd
Bhayander Phata
Thane-Ghod
Mira Thamba
WEX-I
WEX-II
Dahisar West
Shivaji Nagar
Dahisar East
M7

11. MUNICIPAL INFRASTRUCTURE

General

Urban growth both spatially and population wise puts heavy pressure on infrastructure, particularly the basic urban services like water supply, sewerage, solid waste, sanitation, road network, traffic and transportation etc., unless infrastructure is improved, quality of life suffers. Most importantly, it impacts economic development of the city and investment plan. In this chapter, therefore, present status of infrastructure, gaps and future requirements strategies and investment requirements in the areas of water supply, sewerage, solid waste management are elborated.

The four basic urban infrastructure services covered are –

a) water supply
b) Sewerage
c) Solid Waste Management
d) Storm water Drainage

11.1 Water supply

Mumbai metropolitan region covers an area of about 4350 Sq.Km. comprising of Municipal Corporation of greater Mumbai, 13 municipal town and 1500 villages with a 1970 census population of 7.793 million people. For the purpose of planning water resources and hydrometric study, the Mumbai metropolitan region is divided into six zones. Vasai Virar comes under zone two. Fast increase in urban population in Vasai Virar has lead to tremendous scarcity of drinking water in this area. Most population is dependent on tanker fed water supply.

Vasai Virar city is adjacent to the Mumbai municipal corporation limits. The population of Vasai Virar in 1981 was 2,56,320. At present water is supplied to the four Municipal areas nearly of 33.00 MLD from the Usgaon Scheme (26 Km from city), Papadkhind dam and 0.9 MLD from Pelhar Dam (12 kms from city). The rural area gets water supply of 7.00 mld from Pelhar Dam. Water supply of nearly of 30.00 mld. is being supplied through tankers from various sources to the sub-region population (15.00 mld to four Municipal areas) which include wells, tanks and bore wells. There are 34 tube wells at Vasai and 15 tube wells at Virar. In addition, there are 275 bore wells at Vasai. Besides, there are about 20 private tube wells (10 to 35 m. deep) at Vasai and around 220 private tube wells at Virar. The over drawal of water from underground is resulting into the ingress of salinity over the years. As a result potability of water is adversely affected. Area wise details are given in following **Table.12.1** Now Vasai Virar municipal corporation limit covers around 380 sq km and occupies 7,02,723 lakhs of people (census 2001).

11.1.1 Total water supply source

Table 11.1 - Present Source of water supply

Area	Usgaon Scheme	Pelhar Dam	PapadKhind Dam	Surya Dam	Well/Tanker Water Supply.
Vasai Town.	2.50 mld	-	-	10	-
Navghar-Manikpur Municipal Area.	4.00 mld	3.50 mld	-	25	6.00 mld
Nallasopara Municipal Area	4.00 mld	3.50 mld	-	35	9.00 mld
Virar Municipal Area.	14.00 mld	-	1.50 mld	30 mld	-
Green Zone (East) (Rural)	-	7.00 mld	-		2.00 mld
Green Zone (West) (rural)	-	-	-		13.00 mld
Total existing water supply	24.50 mld	14.00 mld	1.50 mld	100 mld	30.00 mld.

Source: Development Plan of VVSR approved by G.O.M. 2007.

11.1.2 Other sources

There are 34 tube wells at Vasai and 15 tube wells at Virar. In addition, there are 275 bore wells at Vasai. Besides, there are about 20 private tube wells (10 to 35 m. deep) at Vasai and around 220 private tube wells at Virar.

11.1.3 Water supply tanks

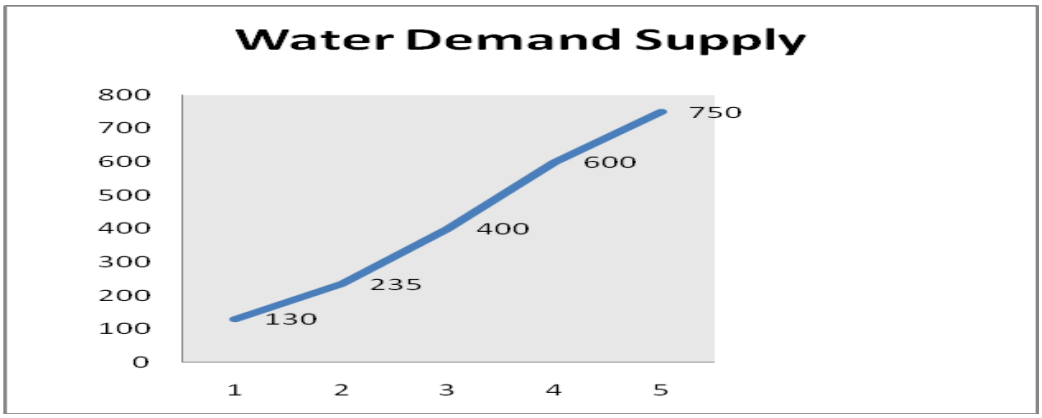
Water supply of nearly of 30.00 mld. is being supplied through well and tankers from various sources to the sub-region population (15.00 mld to four Municipal areas) which include wells, tanks and bore wells.

11.1.4 Water demand as per population Projection

Table 11.2: Projected water demand 2001-2041

Year	Population (Lakhs)	Present Water Supply (MLD)	Water demand in MLD	Demand Supply Gap	Water Scheme suggested
2001	7.02	130			
2011	13.07	130	235	105	Surya
2021	22.23		400	270	Wandri, Ghateghar
2031	33.34		600	470	Kaman, Kholsapada, Rajiwali– Sativali
2041	41.67		750	620	Pinjal

Source: Analysis



The current water supply demand for Vasai Virar is 235 Mld@ 150 lpcd. As per population projection it will be increasing to 750 Mld in year 2041. Demand and supply gap shall increase from 105Mld to 620 Mld.

11.1.5 Existing Level of service

Water Distribution System

i) Nalasopara

There is water treatment plant at Pelhar (chlorination & filtration) existing from 29 years with capacity of 10 MLD supplying water to Navghar Manikpur & Nalla Sopara. There are two more treatment plants, one at Parol (for Usgaon) with capacity of 20 MLD existing from 13 years and Dhuktan (for Surya) with capacity of 100Mld existing for 3 years. In **Nalasopara** there is MBR at Highway junction and Chckreshwar lake from where water is supplied to ESR and sump at Pelhar Joint with total capacity of 16 MLD.The water is supplied partially to 6 wards and fully to 42 wards covering all the population of 184538.The total length of Trunk Main is 60 Km, Transmission Main is 38 Kms and length of Distribution network is 75 kms while area under water distribution network is 9.5 sq. kms.The residential connections (½"size) given are 9900 and others (commercial, institutional, municipal & Govrnment agencies) 141. Out of 10041, 28 are exempted from water tax. Estimated total consumption per day for exempted connections/ properties (litres per day per connection) is 4200. Out of 10041, 750 are individual house connections and 9291 connections serving 12 households per connection i.e. 111492 households. The total residential connections given are 111081 and commercial establishments are 15653.

ii) **Navghar Manikpur**

There is water treatment plant at Pelhar (chlorination & filtration) existing from 29 years with capacity of 10 MLD supplying water to Navghar Manikpur & Nalla Sopara. There are

two more treatment plants, one at Parol (for Usgaon) with capacity of 20 MLD existing from 13 years and Dhuktan (for Surya) with capacity of 100Mld existing for 3 years. In **Navghar Manikpur** there are sump & ESRs at six locations with total capacity of 4.45 MLD. The water is supplied partially to 17 wards and fully to 23 wards covering all the population of 174960. The total length of Trunk Main is 7.12 Km, Transmission Main is 3.06 Kms and length of Distribution network is 91.82 kms while area under water distribution network is 16 sq. kms.The connections (½"size) given are residential 5276, Industrial 74 and others (commercial, institutional, municipal & Govrnment agencies) are 191. Out of 5541, 2346 are individual house connections and 2930 connections serving 12 households per connection i.e.35160 households.There is outgrowth of population outside ULB area with population of 62326 where 4 MLD of water is supplied by ULB.

The total residential connections given are 41224 and commercial establishments are 10967.

iii) **Vasai**

There are two more treatment plants, one at Parol (for Usgaon) with capacity of 20 MLD existing from 13 years and Dhuktan (for Surya) with capacity of 100Mld existing for 3 years.In **Vasai** there is sump with ESR at Holi & ESR at Papdi and Municipal Hospital with total capacity of 2.9 MLD. The population covered is 48750 which are about 65% of total population. The total length of Trunk Main is 1.3 Km, Transmission Main is 28 Kms and length of Distribution network is 30.47 kms while area under water distribution network is 7 sq. kms.There are some areas in Municipal Council which are not served by piped water and water is obtained by individual houhold.It is estimated that 65% of population is served.The water is supplied one hour per day at rate of 82 lpcd but in summer the water supply is reduced to 0.5 hrs per day.

There is outgrowth of population outside ULB area with population of 40000 where 2 MLD of water is supplied by ULB through non piped means. The residential connections given are 4053; industrial 25 and others (commercial, institutional, municipal & Govrnment agencies) are 102. Out of 4180, 3562 are ½" connections and 708 are ¾" connections and 21 are 1" connections. Out of 4180, 3 are exempted from water tax. Estimated total consumption per day for exempted connections/ properties (litres per day per connection) is 1333.The total residential structures are 15000 and commercial establishments are 1286.

iv) Virar

There are two more treatment plants, one at Parol (for Usgaon) with capacity of 20 MLD existing from 13 years and Dhuktan (for Surya) with capacity of 100Mld existing for 3

years. In **Virar** there are two MBRs at Kashidkopar and Chandansar of 20 MLD & 2 MLD capacity respectively, from where water is supplied to five ESRs at Virat Nagar, Bolinj, Ram Mandir, Phulpada, Urdu School, and GSR at Sahkar Nagar with total capacity of 5.65 MLD.The water is supplied partially to 4 wards and fully to 5 wards covering all the population of 352415.The total length of Trunk Main is 13 Km, Transmission Main is 8.6 Kms and length of Distribution network is 78 kms while area under water distribution network is 13.7 sq. kms.The residential connections given are 8093 and others (commercial, institutional, municipal & Govrnment agencies) 115. Out of 8208, 4898 are ½" connections and 3310 are ¾" connections. Out of 8208, 25 are exempted from water tax. Estimated total consumption per day for exempted connections/ properties (litres per day per connection) is 2000. There are 2700 individual house connections and 5508 connections serving 12 households per connection i.e. 66096 households. The total residential connections given are 72777 and commercial establishments are 8371.

At present, there is acute shortage of water and as per the present scenario the quantum of water supply is in the range of100 ltrs/capita/day. At present daily 130 MLD water is supplied to MCCVV population of 13.07 lakhs. According to analytical report specified in environmental status report 2004-05, 97% water is found suitable for drinking.

11.1.6 Rates of water:

The quantum of water supply is only in the range of 100 ltrs /capita /day. The present Tariff structure for water supply is Residential Rs 95, Commercial Rs.1185 and Industrial Rs.1542 per tenement per month. The last Tariff revision was made in 2006- 2007. At present there is no metering system and hence the volumetric tariff is not implemented.Therefore the quantity of Non-Revenue Water and Un-accounted for Water can not be assessed. Water Audit is yet to be conducted.

MCCVV will have to introduce telescopic rates & water user cess @ to ensure who consume more pay proportionately more to achieve long term **objectives** of --

1. To achieve of collecting the full cost of O & M.
2. Financing projects like development of own water source & laying of transmission main.
3. To encourage water conservation.

The volumetric Tariff and metering system will increase the revenue from water charges.

11.1.7 Bridging Water Supply Demand gap:

As per present supply made by MJP to the city, residents are receiving 130 MLD. This value after considering the 20% of wastage during the distribution comes up to be 104 MLD, hence the problem of shortage of water in Vasai Virar City. The Surya dam is owned by the Irrigation Department of Govt. of Maharashtra & is situated at about 54 km beyond boundary line of MMR on north side. The MMRDA had financed a 100 MLD water supply scheme for this area on Build, Own, Lease and Transfer (BOLT) basis. The scheme costing Rs. 1000 million included construction of intake works at Maswan on Surya river, treatment plant, transmission lines and master balancing reservoir at Virar. The scheme is leased for a 30 year period to CIDCO, which is a Special Planning Authority for this area. The assets will be transferred to CIDCO after the cost is recovered by MMRDA through lease rent. The MMRDA had engaged the Maharashtra Jeevan Pradhikaran (MJP) for executing this scheme. The present water supply to MCCVV from Surya project is 100MLD and is at a distance of 60 Kms from the city.This water supply from Surya project will be augmented to 200MLD in near future. The second stage is estimated to Rs.73.20 crores and will provide additional water supply of 100.00 mld by 2011. The second stage will include zonal transmission water pipelines to start from MBR at Kashidkopar upto six zonal MBRs one each at Virar and Vasai, two each at Nallasopara and Navghar-Manikpur Municipal areas. Then municipal councils with the help of their ESRs will distribute water to their towns. CIDCO had reserved 12 sites for MBRs (10.95 ha.), 72 sites for ESR (25.33 ha.) and 10 sites for pumping stations. M.J.P. has made clear that no site is required for any pumping station under this scheme. According to MJP, the entire scheme will supply water through gravity and no pumping is required. The four municipal councils have made available all the sites for MBRs and ESRs and a few reservations for ESR/MBR are, therefore, necessary as suggested by the M.J.P.

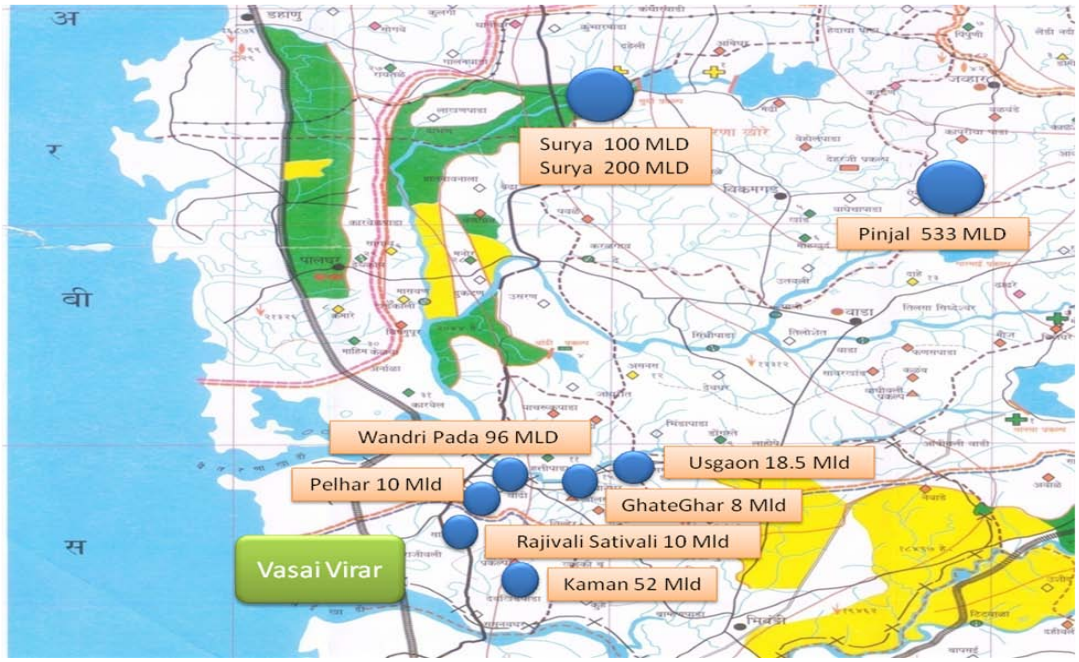
However, simultaneously MCCVV will have to take action to develop its own new water sources by completing small schemes like Wandri, Ghateghar, Kaman, Kholsapada, Rajiwali - Sativali with help of other Agencies like CIDCO, MMRDA to augment the water supply. It is also essential to set up effective water distribution system simultaneously to cover larger area. The reduction of water leakage during transportation & distribution will improve the water supply. Hence Leak detection system and water Audit should be undertaken periodically to achieve optimum use of available water supply. There shall be 100% house connections with metering system to achieve improved revenue collection.

Table 11.3: New water sources and water availability

S. No	Water Scheme	Water (in MLD)	Year recommended
i	Surya	200.00	2013
ii	Wandri Scheme	96.00	2016 - 2021
iii	Ghateghar	8.00	2016 -2021
iv	Kaman	52.00	2023 -2028
v	Kholsapada Scheme	34.55	2023 – 2028
vi	Rajiwali – Sativali Scheme	10.00	2023 – 2028
Vii	Pinjal	533.00	2028 - 2031
	Total	933.55	

Source: Water sources from Development Plan prepared by CIDCO 2007

The location of above water schemes are shown in the following map.



Sl No.	Project Name	Estimate Cost
1	Expansion & rehabilitation of Water Distribution System	600 Cr.
2	Development of Water Sources	1200 Cr.

11.1.8 Conclusions:

Based on the future population estimates, the population of Vasai Virar City would reach up to 41.67 lakhs in the year 2041. The total Water Supply Demand for the year 2041 has been estimated @ 150 lpcd and 20% extra has been added up on account of unavoidable losses through leakages. The demand thus works out to be 750 MLD. Recently water supplies are 130 MLD to the MCCVV.

The goals set for water sector to be achieved within a time horizon are given below.

Table 11.4 Goals & Service outcomes in Water Supply

Goal	Current Status	2012	2017	2021
Network coverage to households	50%	75%	100%	100%
Per Capita Supply	40 lpcd	100	135	135
24/7 Water Supply	Nil	50%	80%	100%
Quality of Water	Good	Potable	Potable	Potable
Non revenue water	50%	30%	20%	10%
Consumer Metering	Nil	50%	80%	100%
Cost Recovery (Percent of Operation & Maintenance)				

Source: Data provided by MCCVV

11.1.9 Suggestions:

It is the prime responsibility to local body to provide water supply to city. The cost involved in creating the facility can be recovered partially from residents of city. The various ways to collect the partial water supply infrastructure cost from residents is by

i. Charging Water Source Development Tax on the new developing property per sq.m, basis which can be collected as one time contribution.
ii. Or fixed charge per cu.m of water requirement to new consumer.
iii. To make water meter compulsory of approved make and quality. It is also necessary to charge for water source development.
iv. Ask the society a Housing Colony to develop infrastructure of water supply as per the plan of Corporation and hand over to corporation for operation in which corporation would not charge the development charges.

11.2 Sewage System:

Underground sewerage system does not exist anywhere in the sub-region. The house owners are dependent on their individual septic tanks. The effluent from these septic tanks is discharged into soak pits. Thus present System comprises of septic tanks and effluent disposal in surface gutters and nallas lead to pollution and unhealthy conditions. The

existing sewerage system is extremely insufficient and is in bad condition which may result in health hazards.

Nala Sopara

The area of Municipal Council is 14.25 sq. kms with population of 184,538 as on 2001 and floating population of 5000.There open drains and closed drains for collection of sullage in areas without piped sewerage system. The length of open drains is 7.5 kms and closed drains are 120 kms. The total area covered under open drain system is 4.1 sq. kms and closed drain system is10.15 sq. km. The sullage is disposed off on land. Total number of households with access to individual toilets is 80000 and total number of households with access to community toilets is 42000.

Navghar Manikpur

The area of Municipal Council is 16.27 sq. kms with population of 116,723 as on 2001 and floating population of 10000.There closed drains for collection of sullage in areas without piped sewerage system. The length of closed drains is 56.66 km. The total area covered under closed drain system is 16 sq. km. The sullage is disposed off in creek. Total number of households with access to individual toilets is 38880. There is no separate storm water drains provided. The storm water flows through surface nallas. There are three low lying areas in Navghar Manikpur, Navyug Nagar, Shastri Nagar & Vishal Nagar where water logging takes place for 4 hrs once a year.

Vasai

The area of Municipal Council is 8 sq. kms with population of 49,346 as on 2001 and floating population of 2000 .There open drains and closed drains for collection of sullage in areas without piped sewerage system. The length of open drains is 5.6 km and closed drains are 22.4 km. 80% of the total area is covered under closed drains.The total area covered under open drain system is 2 sq. kms and closed drain system is 4 sq. km. The sullage is disposed off in Vasai creek. Total number of residential properties with access to individual toilets is 8942.

Virar

The area of Municipal Council is 20 sq. kms with population of 118,928 as on 2001 and floating population of 20,000.There open drains and closed drains for collection of sullage in areas without piped sewerage system. The length of open drains is 30 kms and closed drains are 18 kms. The total area covered under open drain system is 8.57 sq. kms and closed drain system is 5.13 sq. km. The sullage is disposed off in nalla connected to creek. Total number of households with access to individual toilets is 62269 and total number of households with access to community toilets is 8314. The sewage outfall for 29 MLD of untreated waste water is outside city. There is no separate storm water drains provided.There are 5 surface nallas through which the storm water flows. There are three low lying areas in Virar, Mavel Pada, Tarwadi & Virat Nagar where water logging takes place for 6 hrs once a year.

The increase in water supply will increase the sewage generation and will further deteriorate the situation.

11.2.1 Issues

1. Sewerage scheme for City being prepared is in nascent stage
2. Increase in quantum of water supply due to commissioning of augmentation scheme.
3. Present System of disposal comprises of septic tanks and effluent disposal in surface gutters and nallas lead to pollution and unhealthy conditions.
4. Industrial waste for which treatment is essential

11.2.2 Sewerage Network Requirement

By the year 2041 the total amount of sewage to be treated will increase to 600 MLD (i.e.80% of 750 MLD). To meet this demand for year 2041 STP's at various locations of good capacity will be generated, the development will come in phases as per the requirement. And sewerage network will be laid along with water supply network. The squatter settlements may be provided with a facility of 1 toilet for 4 to 5 families based on the concept of low cost and low water consumption. In all there are 1480 public toilets provided. Integrated and holistic approach will be adopted for decentralized sewerage system which takes care of collection treatment and disposal in environmentally sustainable manner.

11.2.3 Projected Sewerage Generation

Table 11.5: Projected sewerage generation

Year	Population (Lakhs)	Water Supply/Demand (MLD)	Sewage
2001	7.02	125	100
2011	13.07	235	188
2021	22.23	400	320
2031	33.34	600	480
2041	41.67	750	600

11.2.4 Proposed Projects

The Vasai Virar Municipal Corporation was formed on 3rd July 2009. Prior to formation of corporation, there were 4 Municipal Councils and 53 villages. CIDCO has been appointed special Planning Authority for Vasai Virar Sub-Region in 1990 before formation of Municipal Corporation. The sewerage pipelines are not yet provided. Until now domestic sewage is treated by providing septic tank provided individually, or by society. Development of sewerage system for Corporation area is under active consideration.

It view of the problem of fast increasing population, it is decided to have underground Sewage System and STP for the City. CIDCO have surveyed and carried out the studies for setting of STP and collection system in earstwhile 4 Municipal Councils. The **M/S**

Kirloskar Consultants Ltd., Pune has prepared the master plan of sewerage system for the city and cost is estimated to Rs. 557.68 crores. The abstract is given below.

Nala Sopara

Proposed Sewerage Project consists of sewerage network covering **entire area of Nala Sopara** to collect the sewage generated, three Pumping Stations with sump and pump houses to store the raw sewage and pump it to the Sewage Treatment Plant and Sewage Treatment Plant to treat the raw sewage. Nala Sopara is divided in to three drainage zones. Each zone consists of one pumping station. The entire sewage generated in Nalasopara (East) will be collected and then pumped to the STP - 1 for the treatment while sewage from Nalasopara (West) is pumped to the STP - 2 for the treatment.The Pumping Machinery and S.T.P. are designed for immediate stage population expected in the year 2026 whereas the sewer lines, rising mains, outfall sewers etc. are designed for ultimate stage population expected in the year 2041.

Navghar Manikpur

Proposed Sewerage Project consists of sewerage network covering **entire area of Navghar-Manikpur** to collect the sewage generated, four Pumping Stations with sump and pump houses to store the raw sewage and pump it to the Sewage Treatment Plant and Sewage Treatment Plant to treat the raw sewage. Navghar-Manikpur is divided in to five drainage zones. Each zone consists of one pumping station. The entire sewage generated in Navghar-Manikpur (East) will be collected and then pumped to the STP - 1 for the treatment while sewage from Navghar-Manikpur (West) is pumped to the STP - 2 for the treatment. The Pumping Machinery and S.T.P. are designed for immediate stage population expected in the year 2026 whereas the sewer lines, rising mains, outfall sewers etc. are designed for ultimate stage population expected in the year 2041.

Virar

Proposed Sewerage Project consists of sewerage network covering **entire area of Virar** to collect the sewage generated, two Pumping Stations with sump and pump houses to store the raw sewage and pump it to the Sewage Treatment Plant and Sewage Treatment Plant to treat the raw sewage. Virar is divided in to four drainage zones. Each pumping station will collect sewage from two zones. The sewage generated in Zone 1 & 4 will be treated in STP 1 and sewage generated in Zone 2 & 3 will be treated in STP 2. The Pumping Machinery and S.T.P. are designed for immediate stage population expected in the year 2026 whereas the sewer lines, rising mains, outfall sewers etc. are designed for ultimate stage population expected in the year 2041.

Vasai

The sewerage system has been designed for the sewage flow from the fixed or permanent population, floating population and flow from infiltration. The ward-wise sewage flows for immediate and ultimate stages have been calculated. The length of the

existing sewers is about 8km. With the data collected of the existing sewers, the good conditioned sewers are marked. The effort is made to utilize the existing sewers, which are in good condition, wherever possible.Single STP has been proposed. The effluent from this STP will be used for irrigation purpose. The sludge from the STP will be used as manure.

VASAI VIRAR SUB REGION

MASTER PLAN OF UNDERGROUND SEWERAGE SYSTEM

SUMMARY OF COST

Sr.No	AREA	ESTIMATED COST (in Rs)
A	**MUNICIPAL COUNCIL**	
1	Navghar Manikpur Municipal Council	689972314.00
2	Nalasopara Municipal Council	1238564752.00
3	Virar Municipal Council	789006798.00
4	Vasai Municipal Council	1068111019.00
	Sub- Total A	**3785654883.00**
B	**VILLAGES**	
1	Bolinj	337461967.00
2	Chandansar	204029760.00
3	Naigaon	78326162.00
4	Sandoor	146166237.00
5	Gokhivare and other five villages	1025178757.00
	Sub- Total B	**1791162883.00**
	GRAND TOTAL (A+B)	**5576817766.00**

VASAI VIRAR SUB REGION
MASTER PLAN OF UNDERGROUND SEWERAGE SYSTEM
SUMMARY OF COST

Sr.No	AREA	ESTIMATED COST	POPULATION		PER CAPITA COST	
			2026	2041	2026	2041
A	**MUNICIPAL COUNCIL**					
1	Navghar Manikpur Municipal Council	689972314.00	247600	391900	2787	1761
2	Nalasopara Municipal Council	1238564752.00	619000	842600	2001	1470
3	Virar Municipal Council	789006798.00	352900	474200	2236	1664
4	Vasai Municipal Council	1068111019.00	98000	127000	10899	8410
	Sub- Total A	**3785654883.00**	**1317500.00**	**1835700.00**		
B	**VILLAGES**					
1	Bolinj	337461967.00	132978	244296	2538	1381
2	Chandansar	204029760.00	40012	73508	5099	2776
3	Naigaon	78326162.00	10403	15420	7529	5080
4	Sandoor	146166237.00	34522	57185	4234	2556
5	Gokhivare and other five villages	1025178757.00	328867	558151	3117	1837
	Sub- Total B	**1791162883.00**	**546782**	**948559**		
	GRAND TOTAL (A+B)	**5576817766.00**				

NOTE :- Estimated cost is based on
MJP DSR, Konkan Region for the year 2009-2010

The goals set for sewerage & Sanitation sector to be achieved within a time horizon are given below.

Table 11.6 Goals & Service outcomes in Sewerage System

Goal	Current Status	2012	2017	2021
Sewer Network coverage to households	20%	50%	75%	100%
Treatment & disposal arrangements against collection	Nil	50%	75%	100%
Recycling & reuse	Nil	Nil	50%	80%
Cost Recovery (Percent of Operation & Maintenance)	Nil			
Safe sanitation facilities	50%	90%	100%	100%

Source: Data provided by MCCVV

11.3 Storm water Drainage

Meandering streams exist in the central parts of the corporation area before emptying into the Vasai and Vaitarna creeks. These play an important role in naturally draining the area. However the rapid development of the region has not only increased the quantity of storm water but also increased the runoff. The runoff in green zone is less than the runoff in developed areas.These developed areas runoff currently flows into an inefficient drainage system consisting of a network of nallahs, which are not properly integrated with these natural streams which are flowing in green zones and meeting to the creeks and sea.

The main roads of the city are provided with open gutters for collecting and carrying sullage water from individual houses. Almost all nallas are provided with gates, which get closed during high tide preventing the sea water from entering the nalla. As the tide recedes the gates get opened releasing water to the creek. Back water during high tide keeps nallas full and the water from city does not flow and remain stagnant.

Vasai Virar Region is in the area of heavy rainfall. The area has average annual rainfall ranging from 1912 mm in Virar to 2600 mm in Nalasopara. High tide level is R.L. 3.25 m. These two factors are likely to favour the occurrence of saturated soil conditions. This leads to water logged areas and mosquito's flies and odour problems. Such situation may cause serious health hazards.There are three low lying areas in Navghar Manikpur, namely Navyug Nagar, Shastri Nagar & Vishal Nagar where water logging takes place for 4 hrs once a year. There are three low lying areas in Virar, Mavel Pada, Tarwadi & Virat Nagar where water logging takes place for 6 hrs once a year.

Presently, the storm water flows through closed drains and open drains. The Municipal Council wise details are given in following **Table 11.7**.

Table 11.7 Present Storm water Drainage System

Municipal Council	Covered drains		Open drains	
	Length in Km.	Area in sq. km.	Length in Km.	Area in sq. km.
Virar	18	5.13	30	8.57
Navghar Manikpur	56.66	16	--	--
Nalasopara	120	10.15	7.5	4.1
Vasai	22.4	4	5.6	2
Total	217.06	35.28	43.1	14.67

These drains are mainly responsible to restrict the storm water from entering the residential areas of the region. There is a need for Storm Water Drainage Rehabilitation Plan which include identification of the flood spots within ULB, assessment of the percentage of open & sealed surfaces in the city,identification of drains & their conditions which need cleaning and desiltation, design and construction of an effective pucca open drainage system and integrating it with the existing natural drainage channels, special maintenance plan and evaluation of new technologies and systems.Maintaining the drainage network by regular cleaning and providing shore stabilization measures at the creeks and the natural water channels have to be taken up.

11.3.1 Issues and Concerns

MCCVV has a network of storm water drains and nallas, but every year during the monsoon period one to two times some low lying areas get flooded which causes heavy losses to the citizen. Following are some areas of concern –

- The major nallas are not scientifically constructed and steep topography results into the flood situation.
- The nallas ultimately discharge into the creeks so during high tide period, back water causes flooding.
- Most of drains and nallas are open and direct disposal of solid waste into the drains obstructs the flow and also reduces the carrying capacity of drains.
- Various services are passing through nalla and crosses near culverts which also obstructs the flow.
- At many places the culverts are of inadequate capacity.

11.3.2 Expansion & Rehabilitation of Storm Water Drains

Considering the present situation the storm water drainage system needs to be updated.The design criteria for the system shall be as follows –

Criteria for Hydraulic Design

All the storm water drainage system shall be designed as per the norms of CPHEEO.

Details are given below-

Return Period

The city is getting urbanized at a very fast pace with mixed nature of development (Commercial & residential). Therefore considering the importance of area, moderate to flat slopes and presence of creek, the return period of 2 years shall be adopted.

Estimation of Storm water Runoff-

Rational Method

The entire precipitation over drainage district does not reach the draining sewer. The characteristics of drainage district such as imperviousness, topography including depressions and duration of precipitation etc, from which fraction of the total precipitation, which will reach to the sewer, has to be determined. This fraction is known as co-efficient of run off which will be determined for each drainage district depending on its characteristic.

Storm Frequency

As per Clause 3.3.1.2 on page 41 of CPHEEO manual, the frequency of storm for which drains are to be designed depends on the importance of the drainage area.

(a)	Residential Area	
	Peripheral Area	- Twice a year
	Central and Comparatively High Priced Area	- Once a year
(b)	Commercial and High Priced Area	- Once in two years

As the newly developing area is high priced one, frequency of once in two years shall be adopted.

Intensity of Precipitation

As per Clause 3.3.1.3 of CPHEEO manual, the intensity of rainfall decreases with duration. Analysis of the observed data on intensity duration of rainfall of past records over a period of 50 years in the area is necessary to arrive at a fair estimate of intensity duration for given frequencies.

Time of Concentration

Time of Concentration is the time required for rainwater to flow over the ground surface from extreme point of the drainage basin and reach to the point under consideration.

Imperviousness

The portion of the rainfall reaching the drains is dependent on the imperviousness and the shape of the tributary area.

As per Clause 3.3.1.5 on page 43 of CPHEEO Manual provides the following

Drain Type	Description	Manning's n
1	Natural drain, meandering-with vegetation	0.035
2	Natural drain, largely straight-without vegetation	0.03
3	BB/Stone masonry walls natural bed	0.025
4	BB/Stone masonry walls with pointing and stone paving bed	0.02
5	BB/Stone masonry walls-concrete bed or concrete walls with stone paving bed	0.018
6	PCC/RCC walls, concrete bed	0.015
7	RCC pipe drain	0.013

criteria for adoption of percentage of Imperviousness:

SL. No.	Type of Area	Percentage of Imperviousness
1.	Commercial and Industrial	70 to 90
2.	Residential (a) High Density	60 to 75
	(b) Low Density	35 to 60
3.	Parks and Undeveloped Area	10 to 20

Considering the speed of development, the higher values will be adopted.

Design of Surface Drains – Sections

Carrying capacity of the nallahs at different chainages and sections are calculated using Manning's Flow-Friction formulae given in para 3.4.2 of CPHEEO Manual on Sewerage & Sewage treatment, shall be adopted:

Permissible Velocities

The minimum velocity in the drains shall generally be as 0.90 m/sec and the maximum permissible velocity for RCC and/or masonry drains with concrete bed up to 3 m/sec per second is proposed as per CPHEEO.

11.4 Solid waste management

Urban solid waste management continues to remain as one of the most neglected area of urban development in the country. The financial and infrastructural constraints, including non availability of land for safe disposal of waste, lack of awareness and apathy at all levels have resulted in safe management practices being ignored. Unplanned landfills have caused an environmental disaster posing health hazards both to workers and to general population.

11.4.1 Municipal Solid Waste Management

One of the important duties of the Municipal Corporation is the Solid Waste Management. The duty includes cleaning of roads, gutters and disposing off the solid wastes.

11.4.2 Present Solid waste generation

The approximate solid waste generation of the city with a population of 13 lakhs, the average domestic solid waste generation rate is assumed to be 0.45 kg / capita / day, which work out to be 588 MT / day. Hospital waste generated is being collected and treated by private agency.There is door to door collection of solid waste and taken by trucks & tractor trailers to dumping sites.

11.4.3 Projected Solid waste generation

Major quantity of the waste is collected through building to building collection every day. There is no segregation of the waste done at any level; it is collected in mixed form. Per capita waste generation per day is about 450 gms. Thus with a population of 33.34 lakhs *(projected population for 2031)* the solid waste generation is expected to go up to 1500 MT. Estimated projected solid waste generation is given following Table no. 11.13

The domestic solid waste consists of mainly kitchen wastes, papers, plastics, glass, metals, rubber etc. At present solid waste from Virar is dumped at site of 10.6 Ha. located at Chikhal Dongri, Virar West at 2km from the city, solid waste from Nalasopara is dumped at Gogate Salt Pan Area of 2.5 Ha. 0.5 kms from Nalasopara, solid waste from Navghar is dumped at Navghar dumping site of 1Ha. 1km from Navghar and solid waste from vasai is dumped at site of 4 Ha. located at Pachubander 1.5 km from Vasai. Apart from the given quantity of solid waste, there is generation of inert waste from repair of houses, construction activities, silt generated out of cleaning of gutters and nallas. The quantity of inert waste varies, it is to be collected and transported to land fill sites.

Table No. 11.8: Projected solid waste generation in MCCVV

Year	Population (Lakhs)	Solid waste generated per person	Total solid waste generated
2001	7.02	0.45 kg	310 MT
2011	13.07	0.45 kg	588 MT
2021	22.23	0.45 kg	1000MT
2031	33.33	0.45 kg	1500 MT
2041	41.67	0.45kg	1875 MT

Source: Analysis

11.4.4 Collection and transportation

The solid waste collected from the residential areas, street sweeping, markets, commercial establishments, etc is collected and transported in vehicles called “ghanta gaadis”. To avoid littering of the waste, the vehicles are covered with tarpaulin sheets.

Hospital waste collection, transportation & treatment has been carried out in Nala Sopara through private party (Enviro Vigil, Dist. Thane) and treated & disposed at common facilities outside Corporation area.

11.4.5 Landfill

Town garbage is collected and dumped in the land at sites mentioned above. There is a need of trenching for disposal of city garbage. There is proposal to establish new sanitary landfill site for 4 Municipal Council areas on BOT basis through M/s Hanjer Biotech Energy Vasai Pvt. Ltd (HBEL).

11.4.6 Disposal and treatment

To prevent the emission of the foul smell or any kind of inconveniences to the public there is a need for the treatment of this collected waste. House to house segregation of wastes at source level is required. This will facilitate treatment of biodegradable waste by vermi composting. The compost can be reused in gardens & farms. This will reduce the load on the new scientific dumping ground to be developed. The recyclables & reusables to be collected at transfer points in each Municipal Council for reuse.The inert construction waste can be used for filling low lying areas.The transfer stations shall also be created in Green Zone areas so that these areas will also served by the new SWM project.

Table No 11.9 Tariff Structure for Sewerage & Solid Waste Management

Municipal Council	Residential	Commercial	Hospital
Virar	180	360	500
Vasai	80	75	75
Nalla Sopara	180	300	----
Navghar Manikpur	1% of Property tax (commercial)		

Source: Data provided by MCCVV

11.4.7 Integrated MSW management for Navghar Manickpur-Vasai-Nalasopara-Virar Cluster

1. All 4 ULBs have agreed to Develop and utilize common waste processing and sanitary Land fill facilities vide their Council resolutions in Aug & Sept 2007.

2. The processing and disposal facility is being set up under the control and supervision of Navghar Manickpur Parishad at **Gokhivare site**. The private sector participation has been worked out with M/S Hanjer Biotech Energies Vasai Pvt Ltd (HBEL).

3. The HBEL will be processing between 150 to 200 tpd MSW received from Navghar Manickpur, Vasai, Nalasopara and Virar in the Phase I. The facility will be expanded as per Projected MSW quantity during 2012 and 2017.

4. The quantity reduced through segregation at source, disposal of re-usables and recyclables at the transfer stations as well as separate handling of debris by each ULB, processable MSW will be delivered at Gokhivare site. Since waste will be transported from Navghar Manickpur, Vasai and Nalasopara with average distance of 7 to 10 km and from Virar with average distance of 18-25 km, these vehicles will be of compactor type, tipper type and higher carriage capacity.

5. The biodegradable waste will be composted at Landfill site proposed at Gokhivare for four Municipal Councils and compost reused. The re-usables and recyclables collected at the transfer stations set up in each Municipal Council will be recirculated & reused thus reducing burden on disposal facility.

6. The Gokhivare site measuring **19.33 hectare** will take care of processing facilities for entire period of 30 years with possible extension. Space for Sanitary landfill is available only for 10 to 15 years. Hence after 12 years additional 10 Ha area needs to be acquired. Due to double digit growth rate of population and large number of migrants, the capacity for MSW processing has to be doubled every 7 years.

7. The door to door collection system is proposed through a combination of NGOs, self help group and Entrepreneurs. The successful implementation of this system will also result in disciplined storage-placement and handling of separate waste streams. The door to door collection storage and primary transport system can be covered under the Scheme **of Urban Infrastructure Development in Satellite Towns / Counter Magnets Of Million Plus Cities**, a scheme initiated by the Government of India (GOI) for accelerating the pace of urban infrastructure development in new township / satellite towns around million plus / large cities.

8. The total capital cost for this cluster is estimated at Rs 58.24 Crores Plus contingencies. Major items of costs are as following (For all 4 ULBs).

Item / Particular	Amount Rs Crores
Waste collection and storage	5.39
Transfer stations (3)	4.76
Transportation system	13.52
Basic Infrastructure dev.	6.42
Processing i) Compost ii) RDF	 10.79 4.40
Sanitary landfill	3.73
Old garbage remediation	4.40
Env. Health, Awareness	2.64
Miscellaneous	2.19
Total	**58.24 Crores**

Project cost and means of finance

Total project cost (for cluster of 4 ULBs)	Rs 58.24 Crores
Assistance from GOI under scheme (80%)	Rs 46.60 Crores
Contribution by the State Govt (10%)	Rs 5.82 Crores
Contribution by PPP / ULB (10%)	RS 5.82 Crores
Total	**Rs 58.24 Crores**

ULB wise project component costs are as below

Rs Lacs

Item / ULB	Navghar-Manickpur	Nalasopara	Virar	Vasai
Collection & storage	**149.05**	**176.06**	**149.05**	**80.67**
Transportation	**443.30**	**452.85**	**443.30**	**89.40**
Transfer Station	**------**	**158.55**	**158.55**	**158.55**
Basic Infrastructure	**534.12**	**60.61**	**28.00**	**30.00**
Old Waste remediation	**200.00**	**120.00**	**120.00**	**------**
Awareness/Environment	**30.00**	**30.00**	**30.00**	**23.00**
Other ancillaries/utilities	**48.00**	**20.00**	**20.00**	**-----**
SLF dev. & operation	**373.00**	**50.00**	**50.00**	
Total	**1794.24**	**1068.07**	**998.90**	**381.62**

Private sector BOOT components (**M/s Hanjer Biotech Energies (P) Ltd**)

- Processing for compost 866.97
- Processing for RDF & recyclables 341.20
- SLF for process remnants 373.00

1581.17

Total of all 4ULBs

- Navghar Manickpur Rs 1794.24 lacs
- Nalasopara Rs 1068.07lacs
- Virar Rs 998.90 lacs
- Vasai Rs 381.62 lacs

  Total **Rs 4242.83 crores**
- **Private sector (BOOT)** **Rs 1581.17 lacs**

Grand Total **Rs 58.24 Crores**

The goals set for SolidWaste Management sector to be achieved within a time horizon are given below.

Table 11.10 Goals & Service outcomes in SWM System

Goal	Current Status	2012	2017	2021
Door to Door collection System	30%	50%%	75%	100%
Segregation at source	20%	50%	75%	100%

Mechanised waste handling	Nil	Nil	50%	80%
Scientific waste disposal	Nil	Nil	50%	100%
Cost Recovery of O & M	Nil	Nil	30%	70%
Private sector participation				

11.5 Power Supply

Presently, all electrical HT lines are overhead lines and power is distributed through sub-stations located in residential areas. Power is being supplied through the Vasai sub-station which has the capacity of 60 MVA. This sub-station receives power from Pelhar by 132 KV HT line. It is mainly stepped down to 22 KV and in some cases to 11 KV. This region comes under 'C' tier where electricity losses are in the range of 35 per cent. The load shedding is necessary to maintain the grid stability.

The stiff-rise in the demand is difficult to meet since the existing local arrangement made few years back is insufficient. There is a lack of proper maintenance and upgradation of existing power supply network. Major problem of the existing power supply is frequent break-down of the system and power failures which is not due to inadequacy of power but due to lack of sufficient number of sub-stations. Old and dilapidated electricity poles, sub-stations and other machinery account for losses to the tune of 15 per cent. Electricity theft also results in loss. Approval has been received for a Rs 100-crore project for replacing the old power equipment and cables which should provide some relief.

11.5.1 Non Conventional Energy

Renewable energy is derived from natural processes that are replenished constantly. In its various forms, it derives directly from the sun, or from heat generated deep within the earth. Included in the definition is electricity and heat generated from solar, wind, ocean, hydropower, biomass, geothermal resources, and biofuels and hydrogen derived from renewable resources. The United States Department of Energy (USDOE) and the Brookhaven National Laboratory (BNL) are working in collaboration with the Ministry of Urban Development, India (MoUD), to provide technical assistance on *near-zero energy community planning and implementation for satellite towns* designated under the JNNURM Scheme of Urban Infrastructure Development in Satellite Towns/Counter Magnets of Million Plus Cities. It is proposed to take advantage of this support to make MCCVV Near Zero Energy Satellite Town.The growth in MCCVV will then be energy self- sufficient, cost effective and sustainable.

WindPower - Airflows can be used to run wind turbines. Areas where winds are stronger and more constant, such as offshore and high altitude sites are preferred locations for wind farms. Typical capacity factors are 20-40%, with values at the upper end of the range in particularly favourable sites. Offshore resources experience mean wind speeds of ~90% greater than that of land, so offshore resources could contribute substantially more energy. This number could also increase with higher altitude ground-based or airborne wind turbines.The salt pan areas & wetlands areas in Vasai

Virar can be explored for development of wind farms, thus reducing dependence on conventional energy.

Solar Energy - Solar energy is the energy derived from the sun through the form of solar radiation. Solar powered electrical generation relies on photovoltaics and heat engines. A partial list of other solar applications includes space heating and cooling through solar architecture, daylighting, solar hot water, solar cooking, and high temperature process heat for industrial purposes. In Vasai Virar Region the use of solar energy can be promoted in the govrnment owned buildings, Nature Parks, Resorts. It is essential that energy conservation measures are taken up in the city. Energy Efficiency has to be made mandatory for all new buildings through DC Rules and necessary legislations have to be passed on the same. Existing building owners also should be given incentives to install solar heating systems in their buildings. This will reduce the population's demand on the conventional electric supply.

12 SOCIAL INFRASTRUCTURE

12.1 General

Examination of social facilities and amenities in Vasai Virar town would indicate the present level of the existing facilities and short falls therein.

Until the advent of mechanized transport, the size of a town was usually limited by how far people could walk to / from work, shops and in many larger towns, this leads to high residential densities and unhealthy living conditions. With the advent of increasing affluence and urban transport in the mid 19th century, people began to spread themselves and residential densities began to fall, although the towns continued to grow due to the migration from countryside.

In a developing region, economic development essentially means production and distribution of finished goods and also the availability of raw materials. Adequate transport facilities are therefore one of the essential initial triggers for economic development and is accordingly considered as the infrastructure needed for any development.

12.2 Role of Municipal Corporation

The Municipal Corporation would need to make reservations for the additional facilities required for the projected population. The construction and management of primary health and education facilities is the responsibility of the Municipal Corporation.

12.3 Housing

Due to close proximity to the Brihan Mumbai, Vasai Virar is experiencing very rapid growth resulting in unprecedented construction work in large scale housing complexes. Moreover existing old buildings in the congested area being demolished and new high-rise buildings are being constructed. In view of this tremendous housing activity taking place in recent past, housing stock is substantially increasing housing demand in the town.

The present residential properties, Commercial properties in four councils in Vasai Virar region is given in following **Table 13.1** The incremental demand in Thane, Vasai-Virar region would substantially increase from the current 276359 units to 472574 in 2021. No information on private supply in all these areas is available.

Table 12.1Properties in Vasai Virar Region

Regional Office	Residential Properties	Commercial Properties	Total Properties
Virar	72777	8371	81148
Vasai	15000	1286	16286
Nalla Sopara	111081	15653	126734
Navghar Manikpur	41224	10967	52191
Total	240082	36277	276359

Source: Data provided by MCCVV

12.4 Educational facilities

Out of total population of 7, 02,723 as per 2001census, 5, 46,049 persons are literates which give a literacy rate of 79.4% less than Brihan Mumbai (81%). Out of 79.4% total literate persons 295405(54%) are males and 250644 (46%) are females in the town.

Table 12.2: Population Data 2001

Sl no	Sex	Population 2001	Literates	Illiterates
1	*Male*	3,64,697	2,95,405	69,292
2	*Female*	3,23,411	2,50,644	72,767
3	*Total*	**7,02,723**	**5,46,049**	**1,42,059**

Education has become the basic right and necessity of each and every individual. It not only facilitates good culture but also helps in the overall sustenance of the individual in this competitive world. Vasai Virar Municipal Corporation is having educational facilities at three different levels i.e. Primary, Secondary and College.

12.4.1 Primary schools

According to the recent survey conducted, it is found that there are 33 primary schools in the Virar, 54 in Nala Sopara, 21 in Vasai and 29 in Navghar Manikpur area town. Generally it is seen that the primary schools are without play ground facility.

12.4.2 Secondary schools

The nineteen high-schools are giving secondary education in Vasai Virar and only four high schools have play ground facility.

12.4.3 Colleges

There is one college in Vasai, two in Virar and two in Nala Sopara named Kaselkar College of Arts, Commerce & Science & Kapol Junior College".

12.4.4 Technical education

There are two teachers Training Institutes in Vasai giving education to 236 students and a

fisherman Training Centre under the control of Directorate on Fisheries imparting training for 20 students. The duration of course is six months.

Table no. 12.3- Education Facilities available in Vasai Virar Municipal Corporation

Sector	Area	Primary School & Play ground	High School & Play ground with Junior College	College & Play Ground
		Provided in DP	Provided in DP	Provided in DP
I	Area under development from Villages Chandansar, Shirgaon (New Industrial Complex) and small pockets near Vaitarna Rly. station	11	8	--
II	Virar Mun. Council & its extension to the West mainly in the villages Boling, Agashi & Kofrad.	23	25	1
III	Nalla- Sopara Mun. council	15	15	2
IV	Navghar - Manikpur & it's extension 'in Sandor village. Mun. council	12	8	1
V	Area under Waliv-Gokhivare Industrial Complex.	8	5	--
VI	Area under Villages of Rajavali , Juchcndra, Tiwari & Bapane along both sides of Diva -Vasai Rly.line	18	14	3
VII	Area under Villages of Umele, Naigaon Kiravali,Wadavali, i.e. area to the West of Naigaon Rly.Stn upto Vasai M.C.	1	2	--
VIII	Area under the jurisdiction of Vasai Mun.council	-	1	--
IX	Area under the Coastal belt from Village Arnala up to the Area of Vasai Mun.con.	--	--	1
	Total	88	78	8

Source: As *per sanctioned DP*

12.5 Health and medical facilities:

Public health Facilities:

There are thirty eight Primary healthcare Centers in Vasai Virar Region and 11 hospitals.

Table no. 12.4 - Medical Facilities available

Sector	Area	Health Centre	Hospitals
		Provided in DP	Provided in DP
I	Area under development from Villages Chandansar, Shirgaon (New Industrial Complex) and small pockets near Vaitarna Rly. station	5	--
II	Virar Mun. Council & its extension to the West mainly in the villages Boling, Agashi & Kofrad.	8	3
III	Nalla- Sopara Mun. council	8	3
IV	Navghar - Manikpur & it's extension 'in Sandor village. Mun. council	5	2
V	Area under Waliv-Gokhivare Industrial Complex.	4	1
VI	Area under Villages of Rajavali , Juchcndra, Tiwari & Bapane along both sides of Diva -Vasai Rly.line	**7**	2
VII	Area under Villages of Umele, Naigaon Kiravali,Wadavali, i.e. area to the West of Naigaon Rly.Stn upto Vasai M.C.	**--**	--
VIII	Area under the jurisdiction of Vasai Mun.council	**1**	--
IX	Area under the Coastal belt from Village Arnala up to the Area of Vasai Mun.con.	**--**	--
	Total	**3**8	11

Source: A*s per sanctioned DP*

It is recommended to build ‘Super Speciality Hospital’ in Vasai Virar region to makebetter Health facility in region for the people.

Table 12.5 Amenities & Services

Sector	Area	Drama Theatres/ Labour Welfare	Sport-Complexes /Stadiums	Parks ,picnic Centres and Fair Grounds	Burial / Crematoria	Fire Brigade Centres	Bus Stations and Depots	Parking Facilities
		Provided in DP		Provided in DP			Provided in DP	
I	Area under development from Villages Chandansar, Shirgaon (New Industrial Complex) and small pockets near Vaitarna Rly. station	1	-	2	2	-	3	6
II	Virar Mun.Council & its extension to the West mainly in the villages Boling, Agashi & Kofrad.	-	2	3	3	1	7	8
III	Nalla- Sopara Mun. council	-	1	-	1	4	2	8
IV	Navghar - Manikpur & it's extension 'in Sandor village. Mun. council	1	1	-	1	1	6	7
V	Area under Waliv-Gokhivare Industrial Complex.	1	-	-	2	-	1	2
VI	Area under Villages of Rajavali , Juchcndra, Tiwari & Bapane along both sides of Diva -Vasai Rly.line	1	1	2	2	1	4	8
VII	Area under Villages of Umele, Naigaon Kiravali,Wadavali, i.e. area to the West of Naigaon Rly.Stn upto Vasai M.C.	-	-	-	-	-	2	2
VIII	Area under the	2	1	2	1	-	1	6

	jurisdiction of Vasai Mun.council							
IX	Area under the Coastal belt from Village Arnala up to the Area of Vasai Mun.con.	-	-	2	-	-	-	2
	Total	6	6	11	12	7	26	49

Source: A*s per sanctioned DP*13.6 Public Transportation

12.6 Public Transportation

Transport facilities include Railway and Bus services. Railway is the major means of mass transport of commuting and will also remain in the near future, since it provides quick access to the highly developed area of BMC. The use of railway mode will also require good facilities for the personal vehicles such as bicycles, two wheelers, cars, taxis and auto-rickshaws near the railway stations.

Besides the major railway facility, road network to the city is also equally important as far as main land connection is concerned. The National Highway NH 8 road is major district road taking off from the Western Express highway to this area over the Vasai creek bridge. This main arterial road is laden with heavy traffic. The existing carriageway width is not sufficient from traffic capacity and safety consideration.

The efficiency of any place depends upon the efficient movement of goods and people. Hence transportation and communication plays an important role in mans day to day life.

Because of the persuasiveness of transport, solutions to transport problems can have major influence upon the public. These influences are reflected in the constraints, which the society currently plays on the development and evaluation of road proposals, like, it should be analytically based, economically sound, socially credible, environmentally sensitive, politically acceptable and inquiry proof.

Maharashtra State Road Transport Corporation has provided S.T. buses in this area. Towns in this area are well connected by these buses. A bridge has been recently constructed over the Vasai Creek on Bombay Ahmedabad National Highway No. 8, which has improved road connection to Thane & Mumbai. It has also provided another link to Thane by Thane Ghodbander Road. However, the local trains of Western Railways are still the important and fast mode of transport in this area.

It is necessary to improve the Bus service for internal travel of the residents. This will improve connectivity between their residence and station, Bus Depot, water transport sites, place of work, Recreational sites, Heritage sites etc. Following Bus services are proposed from this point of view.
It is also proposed to set up Bus Authority to look after the Bus service. Bus Terminals and Bus depots will be created in suitable places and Bus Fleet will be purchased.

Bus services from Jetties to Residential area

- Intra City Bus Transport
- Inter city Bus Transport

12.6.1 Water Transport

This is another mode of Transport being developed through Sea Link Ring Road,extension of Sea Link from Bandra to Dahisar – Virar. Ferry Wharf will be created at

- Arnala
- Vasai fort
- Kalamb

And Services will be started to

- Nariman point
- Gorai
- Andheri
- Belapur
- Uran

13 URBAN HOUSING SECTOR

13.1 ResidentialArea

The existing land use of urbanisable area of Vasai Virar sub-region shows that about 1550.25 ha. (16.57%) area is under residential use. As much as over 300 hectares of area is committed for residential use in the Development Plan 2007 by way of development permissions granted either by MMRDA or by CIDCO.

Settlement pattern of this sub-region is such that larger villages are located along the coastal belt to the west of the railway line. The villages in this belt have good agricultural, horticultural and fishing base and therefore, they are distinct from the villages in the eastern part of railway line situated along and near the National Highway. These coastal villages are now more or less stagnant due to recent urban growth taking place near the railway stations as the local trains provide good commuting facilities to Mumbai. The three municipal towns near the railway stations are growing faster due to inward migration mainly of low and middle income group people who have work places in Mumbai.

The present residential properties, Commercial properties in four councils in Vasai Virar region is given in following **Table 13.1**The incremental demand in Thane, Vasai-Virar region would substantially increase from the current 276359 units to 472574 in 2021. No information on private supply in all these areas is available.

Table 13.1Properties in Vasai Virar Region

Regional Office	Residential Properties	Commercial Properties	Total Properties
Virar	72777	8371	81148
Vasai	15000	1286	16286
Nalla Sopara	111081	15653	126734
Navghar Manikpur	41224	10967	52191
Total	240082	36277	276359

Source: Data provided by MCCVV

Considering availability of open lands for development of infrastructure that could be made available, Nallasopara Municipal area is growing at a higher rate also as compared to other municipal areas. The rise in the growth rate of rural population to the east of railway line may be due to shifting of large number of cattle sheds from Mumbai to Kaman village and unauthorised development of chawls and slums in the area to the east of Nallasopara town. The Vasai Municipal area is situated in the Coastal belt and nearly 50% of this municipal area is still under Wadis. The Navghar-Manikpur Municipal area is situated at Vasai-Road Railway Station and this area as well as portion of Sandor village where town is extending shows higher growth rate.

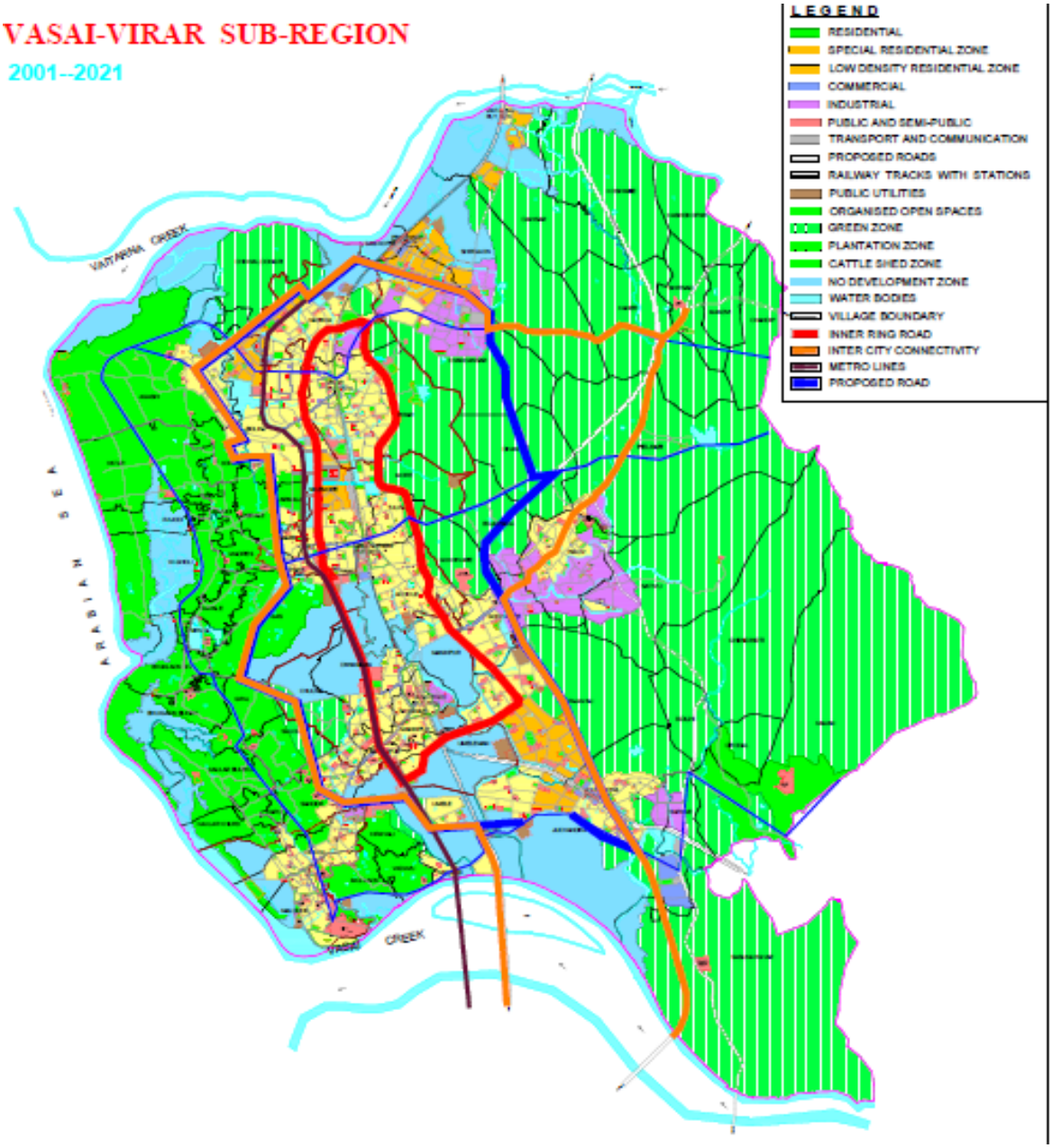
The Virar town is developed around the suburban train terminus. It has somewhat similar trend in growth as is seen for Navghar-Manikpur Municipal area. However, the town is rapidly growing in adjacent outside areas particularly in the villages of Bolinj and Kofrad to the west. Considering availability of open urbanisable lands in Bolinj and Kofrad, the Virar town and surrounding area are expected to grow at a higher growth rate than that of Navghar-Manikpur Municipal area. The remaining 'U' Zone area is spread over from north to south, but particularly more to the north-east of Virar town and to the east of Vasai-Road and Naigaon Railway Stations.

The Waliv-Gokhivare area is developing mainly due to industries during last 15 years due the fact that workers are now started residing in the sector. However, this higher growth rate would not be maintained because of location of this sector being away from Railway Station and meagre infrastructural facilities.It is proposed to develop transport facilities thus improving connectivity to Railway stations. U-Zone also extends in the southern part of Waliv-Gokhivare Industrial Complex up to and around Juchandra Railway Station. However, most of these areas are still vacant and will hold new developments during plan period. A separate new Industrial Complex at Chandansar is also expected to come up during plan period.

The most important area of improvement for a rapidly growing city is its inner city or core areas. Efforts should be made to decongest the core areas through selective relocation of commercial and trading activities, creating new residential areas and development of slums. Waste Water recycling with dual plumbing, rain harvesting & energy efficient construction to be promoted in new Townships.The following areas are recommended for development of residential complex in Vasai Virar Sub region to provide tenements to the growing population.

a) Premium Housing at
- Umle, Navghar Manikpur
- Bolinj, west of Virar
- Samele, Nalla Sopara
- Naringi, east of Virar

b) High & Middle class housing
- Sandor, Navghar Manikpur
- Kofrad, west of Virar
- Chandansar


VASAI-VIRAR SUB-REGION
2001--2021
LEGEND
RESIDENTIAL
SPECIAL RESIDENTIAL ZONE
LOW DENSITY RESIDENTIAL ZONE
COMMERCIAL
INDUSTRIAL
PUBLIC AND SEMI-PUBLIC
TRANSPORT AND COMMUNICATION
PROPOSED ROADS
RAILWAY TRACKS WITH STATIONS
PUBLIC UTILITIES
ORGANISED OPEN SPACES
GREEN ZONE
PLANTATION ZONE
CATTLE SHED ZONE
NO DEVELOPMENT ZONE
WATER BODIES
VILLAGE BOUNDARY
INNER RING ROAD
INTER CITY CONNECTIVITY
METRO LINES
PROPOSED ROAD
VATAMAN CREEK
ARABIAN SEA
CREEK

13.1.1 Rental Housing

Govt. of Maharashtra has formulated the Housing Policy for the State of Maharashtra and the main objective of this policy is to provide the affordable houses for poor on rental basis. Mumbai Metropolitan Region Development Authority (MMRDA) has formulated a proposal to built Rental houses under different models within Mumbai Metropolitan Region (MMR) including Vasai Virar Subregion.

The Mumbai Metropolitan Region Development Authority (MMRDA) intends to create housing stock for giving on rental basis in Mumbai Metropolitan Region (MMR). MMRDA intends to construct residential complexes of self-contained tenements having 160 sq.ft. (14.86 sqm) carpet area each from the interested developers / NGOs with own land / development rights or on MMRDA land (at one or more locations in Mumbai Metropolitan Region). The complex will have all basic required infrastructures such as internal roads, SWD, sewer lines, water supply lines, electricity etc. This scheme has been proposed keeping in mind the interests of Urban Poor, especially to provide them affordable housing.

13.1.2 Special residential Zone.

In the sanctioned DCR of VVSR an in built provision has been made to accommodate the housing need of EWS and LIG tenements. A separate zone has been shown in the sactioned Development Plan which covers 486.96 Ha. In this zone permissions are being granted for the tenaments having builtup area not more than 25 sq mts. The tenements for urban poor are proposed to be provided in this zone with fixed tenure and social insurance.

13.1.3 Low Density Residential Zone.

In the sanctioned Develoment Plan an area of 762.30 ha. has been shown under LDR zone. These zones are shown near vaiterna railway station in Dahiser Village and in villages of Bolinj and Naringi.

13.2 Urban Blighted Area

The urban blighted areas are situated in various parts of the towns. Migration trends in the city reflect interstate migration and also migration from Uttar Pradesh, Karnataka, Andhra Pradesh and Gujarat.

More than 13.6% population is considered to be living at varying levels of poverty. The urban blighted areas are situated in various parts of the city. Migrants from other state fall

into two broad categories, single male laborers living without their families and migrants living with their families. Though the migrants do not have a permanent base here, they are reportedly functioning from the city settlements and rented shelter within urban blighted area.

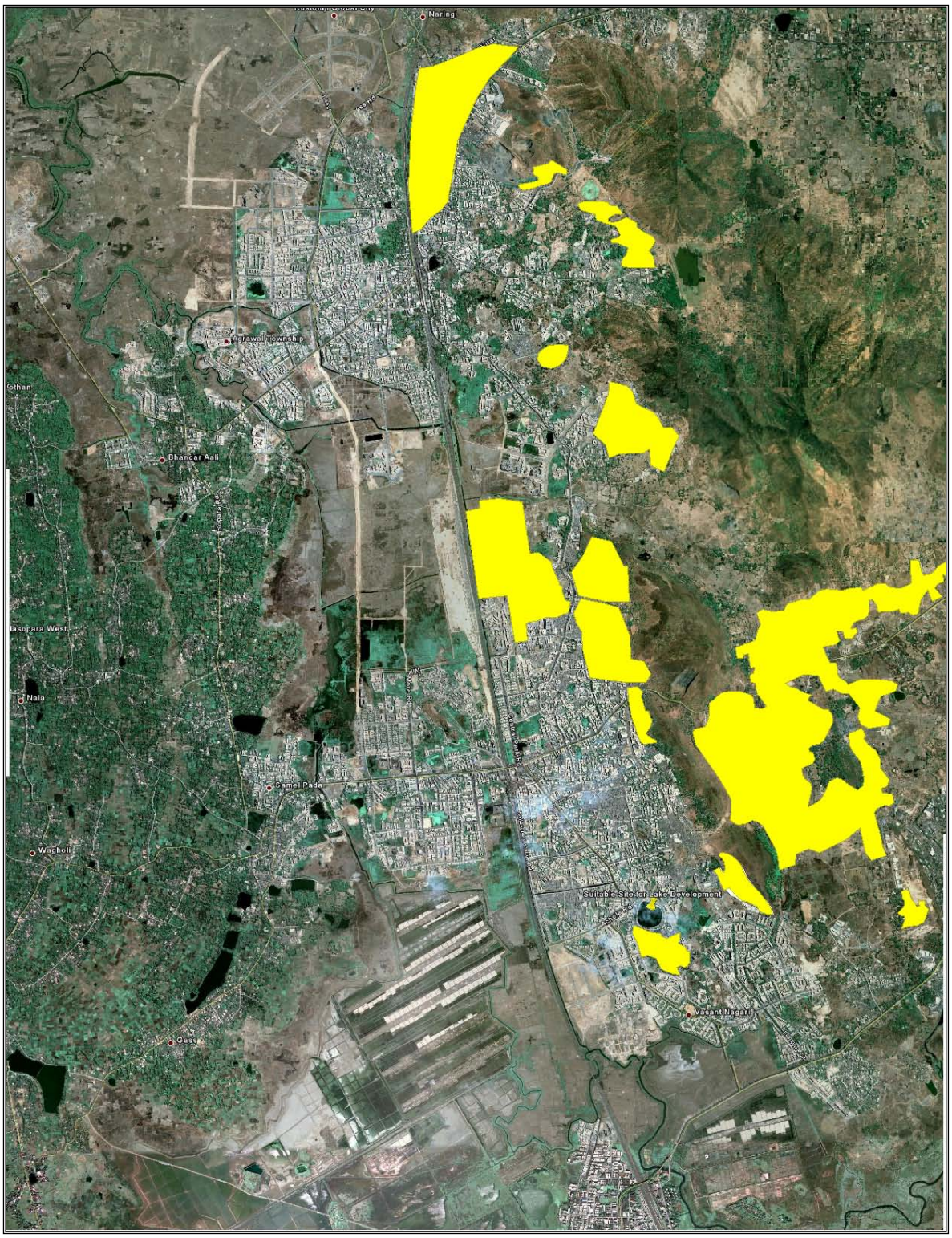
13.2.1 Urban blighted population

There are 42 urban blighted areas pockets with a population of 1,78,260 in four Municipal Councils. There are no registered urban blighted areas in this region. Populations in these areas live in very unhygienic conditions. The region wise list of urban blighted area is given below in **Table no.13.2**.

Table 13.2 Urban blighted Areas in Vasai Virar Municipal Corporation

U.L.B	Virar	Vasai	Nala Sopara	Navghar Manikpur	Total
urban blighted areas pockets	15	4	17	6	42
Number of urban blighted areas settlements on public land		4			4
Total no of HHs in urban blighted areas settlements	12050	1800	21000	802	35,652
Total population in urban blighted areas settlements	60250	9000	1,05,000	4010	1,78,260
Total no. of BPL families in the ULB		2	746		
Number of seats in community toilets (functional toilets)		0	102		
Source: Data provided by MCCVV					

Map showing Urban Blighted Areas in Yellow Hatch



The Urban Blighted Areas in Vasai Virar Municipal Corporation

13.3 Urban blighted areas Rehabilitation:

There several unplanned structures in area especially area near Nallasopra. These structures if possible can be regularized subject to the provision of permissible land use in respective Zone as mentioned in the DC regulations of VVSR. Structures not confirming to these regulations will have to be tackled separately. If regularisation is not possible in any cases a policy to rehabilitate them needs to be framed. This can be achieved by following methods.

A) The Central Sector Scheme of "Urban Statistics for HR and Assessments (**USHA**)" aims at the development and maintenance of national a database, MIS and knowledge repository relating to urban poverty, slums, housing, construction and other urbanization-related statistics. Its key objective is to support the Ministry of Housing & Urban Poverty Alleviation and other Ministries with an information base and knowledge inputs for the purpose of planning, policymaking, project design, formulation, implementation, monitoring and evaluation, particularly in the context of programmes relating to urban poverty, slums and housing. It seeks to specially support the effective implementation of Jawaharlal Nehru National Urban Renewal Mission - Basic Services to the Urban Poor (BSUP) and Integrated Housing & Slum Development Programme (IHSDP). The four pillars of "USHA" are: database including MIS & sample surveys; action research; impact assessment; and capacity building/training.USHA will coordinate applied research and capacity building activities pertaining to urban poverty, slums, housing, construction and other urbanization related statistics in collaboration with reputed research and training institutions at national, regional and state levels and experts. Taking advantage of this Scheme database for VVSR will be prepared. Also MCCVV is proposing to undertake Bio metric survey along with Base map preparation activity.

B) Under the Integrated Housing & Slum Development (**IHSDP**) Scheme the conditions of the urban slum dwellers, who do not possess adequate shelter and reside in dilapidated conditions can be improved by providing adequate shelter and basic infrastructure facilities to the slum dwellers of the identified urban areas. The scheme will apply to all cities\towns, excepting cities\towns covered under JNNURM. The Ministry of Housing & Urban Poverty Alleviation (**MoHUPA**) is the nodal Ministry for IHSDP which cater to housing and basic amenities and services to the urban poor and slum dwellers. The target group under the scheme is slum dwellers from all sections of the community through a cluster approach. Allocation of funds among States will be on the basis of the States' urban slum population in the country.

The components for assistance under the scheme will include all slum improvement/upgradation/relocation projects including upgradation/new construction of houses and infrastructural facilities, like, water supply and sewerage. Cost of land for such projects will not be provided under the programme and has to be borne by the State Government. Ceiling Cost for Dwelling Unit will be @Rs.80,000 per unit for cities other than those covered under the Jawahar Lal Nehru Urban Development Renewal mission (JNNURM). This ceiling cost will, however, be reviewed after one year.Financial support

under this Scheme may be soughted for VVSR. The MCCVV as per new housing policy of Government of Mahrashtra shall include 10-15% reservation for EWS/ LIG in DC rules.

C) In order to make India slum free, the Central housing ministry is keen to start Rajiv Awas Yojna (**RAY**), which will allow in situ development of slums in urban areas along with giving property rights to the slum dwellers. Currently the ministry has received in principle approval from the Planning Commission and is in the process of starting the preparatory works for the programme like slum survey. Under this Scheme survey of Slum Areas in this region can be undertaken to fulfill our vision ofslum free city & inclusive city. This will further facilitate implementation of poverty alleviation measures for the Urban Poor and address the issues of basic services to the urban poor. The tenements developed under Rental Housing Scheme can be used as Transit camp while the slum areas are developed.

D) Rehabilitation of slums through private initiative and
E) Rehabilitation of slums in Municipal or Govt. lands, on a PPP model.

In the case of last method, there would be no cash out-flow from VVMC due to in-built provision in the PPP model.

13.3.1 Urban blighted areas infrastructure

a) Water supply

The water is supplied through stand post. There is one connection provided @ for 5 households.

b) Drainage system

There is no drainage facility to any urban blighted areas in Vasai Virar. Presently storm water flows through open/ closed drains in the area. Public toilets with septic tank are provided to urban blighted areas. MCCVV proposes to upgrade drainage system in the Corporation area. The drainage system in these slum areas will be upgraded along with the other urban areas.

c) Nirmal MMR Abhiyan

The Central Government has decided to eradicate the practice of open defecation prior to 2009. The State Government has taken a policy decision to provide sanitation facilities (community toilet blocks) including operation and maintenance of these facilities in the jurisdiction of Municipal corporation\Municipal councils in the state except Municipal Corporation of Greater Mumbai. After detailed study of the policy of Central and State Government, MMRDA decided to implement Nirmal Mumbai Metropolitan Region Sanitation Abhiyan under the guidance, control and supervision of Urban Local Bodies, through NGO involving community participation.

It is decided to construct about 30,000 Toilet seats at the estimated cost of approximately Rs. 250 crores in the jurisdiction of 5 Municipal corporations and 13 Municipal Councils falling in jurisdiction of Metropolitan Region excluding Municipal Corporation of Greater Mumbai and Navi Mumbai Municipal Corporation.

The progress of Nirmal MMR Abhiyan in Vasai Virar Region is as follows -.

Sr. No.	Name of ULB	Actual Target		Target Achieved upto Dec. 09		Target to be Achieved	
		Sites	Seats	Sites	Seats	Sites	Seats
1	Navghar Manikpur	7	110	2	30	5	80
2	Vasai	13	180	6	72	7	108
3	Virar	9	128	5	72	4	56
Total		**19**	**418**	**13**	**174**	**16**	**244**

Source: MMRDA web site

Along with efforts to improve the sanitation facility in slums/ poor household areas special thrust should given to include urban belighted area while preparing Master plans and Detailed project reports for Sewerage , Drainage and Water Supply facility.

d) Solid Waste Management

Waste service collection - None to any urban blighted areas in Vasai Virar at present.

As discussed above in para 11.4.7 all 4 ULBs in Vasai Virar have agreed to Develop and utilize common waste processing and sanitary Land fill facilities vide their Council resolutions in Aug & Sept 2007. The processing and disposal facility is being set up under the control and supervision of Navghar Manickpur Parishad at **Gokhivare site**. The private sector participation has been worked out with M/S Hanjer Biotech Energies Vasai Pvt Ltd (HBEL).While implementing this project the slum areas will also be covered. Transfer points for solid waste shall be installed in these areas also.

13.4 Proposed Projects:

Development and Redevelopment (Urban Renewal) of Areas

One of the major constraints faced by Planning Authorities / ULB's in implementing the proposals of Development Plan (DP) is the land acquisition and high cost of implementation, which is beyond their financial capability. To overcome this constraint, the proposals of DP can be implemented by undertaking Town Planning Scheme (TPS) under the provisions of M.R. & T.P. Act, 1996, for one or more specific areas of the city, which has in-built provision for the recovery of development cost (inclusive of land cost, infrastructure cost and cost of public amenities) through levy of betterment contribution from the land-owners.

The TPS can be prepared for development of new areas as well as for re-development / renewal of already built-upon areas, to achieve planned and orderly development of a city.

The following steps are involved in the process of TPS:

1. Identification of areas / pockets for development / re-development.
2. Preparation of Draft TPS which would involve:
    - Notionally pooling of all lands together in the scheme area
    - Working out deduction of land required for public amenities from each holding in equal percentage
    - Earmarking Final Plots (FP) with proper shape and size and with proper access.
    - Proper network of roads as per DP.
    - Earmarking of land for social facilities and public amenities.
    - Framing of Special Development Control Regulations providing for Green Building Standards.
    - Fixation of value of Original Plot (OP) and Final Plot (FP)
    - Working out contribution payable by each owner based on above (subject to max. 50%).
3. Submission of Draft Scheme to State Govt.
4. Appointment of Arbitrator for the scheme after approval by State Govt.

13.5 Employment Opportunity to Urban Poor

The Urban Poor in VVSR here are mainly working as laborers in agricultural / horticulture fields, fishing activity. Following measures have been proposed to boost the employment opportunities of urban poor.

- In order to boost the fishing activity, it is suggested that MCCVV may earmark a suitable area of 50-60 Ha in the vicinity of these villages for ‘Fishing and Allied Activities’ where-in fish processing and canning units along with cold storage facilities can be developed for export of Marine Products. This will boost the economy of the area as well as generate employment for urban poor.

- Similarly, Educational insitituates are proposed in the field of Horticulture, farming, food processing and allied subjects which will also create jobs for poor people and incrasing employability. A cold storage facilty for storing perishable goods like the vegetables, fruits is proposed to increase the durability of these products.

- **Community Centre**: In the Community Centre proposed under ‘Schemes for Original Inhabitants’ details of various Schemes of Central & State Government (including Swarna Jayanti Shahari Rozgar Yojana (SJSRY)) under which funding can be made available for self employment ventures (Individual or Group) or provision of wage employment are to be given. The target population under SJSRY is urban poor living below the poverty line.

- The **Adhar Kendras** proposed to be set up would involve livelihood mapping to assess & prepare an inventory of existing skills available in the area and also assess skills requirements in terms of content, quality & quantum after assessing the market needs. Operationalising Adhar Kendra will connect the market & the skilled labour available which will generate work opportunities for local people including urban poor.

- The projects proposed for Tourism development will improve the employability of of poor households.

- The professional courses proposed to be developed in the Vocation Training Schools & Institutes With courses for Hospitality Management for the local people like 'Travel, Tourism & Hospitality' course, Food processing techniques will help them find jobs near their place of residence

- Development of storage & cottage industrial centers of local Product: With a view to give market to local products and give incentive to the cottage industry it is proposed to develop storage capacity and cottage industrial centres in the area in consultation with local people.

14 OTHER PROPOSALS

14.1 General

Vasai-Virar Municipal Corporation was established on 3rd July 2009. Total area of the Corporation is 380 Sq.km. The Limit of Corporation extends between Vasai creek in south to Vaitarna creek in the North. Population of the City as per 2001 census is 7,02,723. As on today the population has reached 13 Lakhs.

Historically, the Vasai group of islands owes its development to its strategic location along one of the two most important entry points - through Sopare Port -for Pre-Colonial sea trade on the western coast of India in the Konkan Region. This led to the development of VVSR as an Indigenous Mercantile Core trading betel nuts (Supari), spices and other goods from the hinterland with the Middle-East until the mid-sixteenth century. This strategic location along the trade route provided the context for its colonisation by the Portuguese and it served as their Military Outpost during the late sixteenth and seventeenth centuries. The growth of Mumbai since the end of the seventeenth century marked a radical shift in the regional economic relations which changed the fate, future and status of the Vasai group of islands. Apart from the brief capture of this region by the Marathas who fought against the Portuguese Inquisition, these islands transformed from being a mercantile core to a hinterland trading agrarian commodities with the city of Mumbai during the last two centuries. The pressures of development in the fringes of Mumbai have led to its urbanisation during the last two decades.

The present day fabric of the VVSR exhibits a palimpsest of six distinct phases of development. These phases can be discerned through the shifts in the economy and power centres in VVSR, which have been identified through a literature review from several secondary sources. The six phases of development that have been identified are as follows:

1. Up to mid-sixteenth century: Indigenous Mercantile Town,
2. Mid-sixteenth and seventeenth century: Portuguese Colonial Military Outpost,
3. Late-seventeenth to mid-nineteenth century: Hinterland of British Colonial Mercantile Town,
4. Mid-nineteenth to mid-twentieth century: Hinterland to a British Colonial Industrial City,
5. Mid-twentieth century to mid 1980s: Hinterland to a Post-Independence Commercial City, and
6. Mid 1980s onwards: Periphery of a Global City-Region.

The area under study, until the last two decades exhibited a strong agrarian and mercantile economic base dominated with activities like rice, vegetables, fruit production, floriculture, horticulture, fishing, salt making. This area is rapidly urbanising with the

urbanisation being supported by the development plan prepared by the State. As a result, we see the emergence of new activities - like cattle sheds, manufacturing industries, housing complexes, resorts etc. - which have grafted the VVSR in a new role in the regional economy. Due to this transformation, the entire economic base may undergo a complete transformation.

14.2 Employment Generation through Land-use Planning

Although at present taking advantage of greater avenues for jobs available in Greater Mumbai majority of its workforce in VVSR is commuting to Mumbai for their jobs, it is necessary to create more employment, which would be available locally. This would not only improve the economic health of the city but will make any city more vibrant and lively.Generation of employment in any town or city can be achieved through judicious land-use planning of its areas based on the potential for future activities maintaining sustainability in the developmental pattern of VVSR and complementing the development plan made by the State for VVSR.In the case of Vasai-Virar, there are four major sectors, which would be exploited to generate employment. These are as under:

14.2.1 Tourism:

The Vasai Virar region is naturally blessed with beautiful coastline with beaches, dense forest and hilly region and their presence makes this region very suitable for development of Tourism and recreation very close to Mumbai where people from mega city can enjoy their quiet weekends. Considering the connectivity of this region with Thane and also Gujarat state, people from these regions also can avail of facilities developed here.This will form another Tourist destination close to but outside Mumbai.

During the presentation of Collective Research Initiatives Trust (CRIT)'s study in the 'Suggestions and Objections' period, it pointed out that there were several important cultural and environmental heritage assets in VVSR that were being threatened by the new pattern of development in the VVSR. It was of the opinion that these assets - like talavs, forts which are now derelict, institutional buildings like Churches, Temples, Zilla Parishad Schools, amenities of communities like fish drying grounds, markets etc. - still hold relevance / significance in the new pattern of development. These needed to be conserved. During the presentation, the idea of Heritage Conservation in VVSR was mooted by the three member Committee formed by the Government for the scrutiny of the Draft Development Plan of VVSR. A notable precedent in this context has already been set by the State by formulating the Heritage Policy and Regulations for Mumbai (1995).

The hilly area along the western part of the city with its scenic charm has tremendous potential to be developed as ‘Tourism Zone’. The Heritage Precincts & Monuments provide great opportunity for Tourism development. Although, CIDCO has been appointed as SPA for the development of this zone, MCCVV should insist for its early development in terms of infrastructure facilities & Tourist amenities and give whatever possible help and co-operation to SPA, since development of Tourism zone will give tremendous boost to employment generation for local people, apart from their economic upliftment. Since tourism is a multi-dimensional activity, and basically a service industry, the employment

impact of tourism goes beyond employment in sectors in which tourists directly spend their money, such as hotels, restaurants and airlines. The establishments which receive tourists also buy goods and services from other sectors that generate employment in those sectors through multiplier effect. Increasing the employment of women in the tourism industry through non-traditional occupations, appointing them in managerial positions will improve employment opportunities in the area for local people.

Associations with historic buildings and precincts - The community structure of this region shows diversity in terms of religion and ethnicity due to the contests between the Buddhist, Hindus, Mughal, Portuguese, Marathas, British who emerged power centres during different historic phases. They, in turn, show diverse associations with historic buildings and precincts.

Associations with Artefacts - Many communities associate with the rich heritage that has been produced in this region in the form of artefacts. These vary from the Ashoka Stupa, to several Pre-Portuguese sculptures which can be found at several sites in this region, to the Gandhi smarak. Many of these lie in a state of disrepair and neglect.

Associations with environmental systems - The region has a large number of natural water bodies and man-made talavs which several communities consider integral to their environment and their daily life.

- These water of these talavs is not only used for used by the agrarian communities for agriculture and domestic purposes like washing clothes, utensils, cattle, bathing but are also exploited commercially for breeding fresh water fish. Most importantly, when considered as a holistic system, these talavs have been responsible for maintaining the health of the underground water table which is vital even today for the agrarian community.

- It is not only the agrarian communities which associate with these talavs but several newer migrant communities in the VVSR which depend on them for their daily domestic survival or use them as sites for passive recreation.

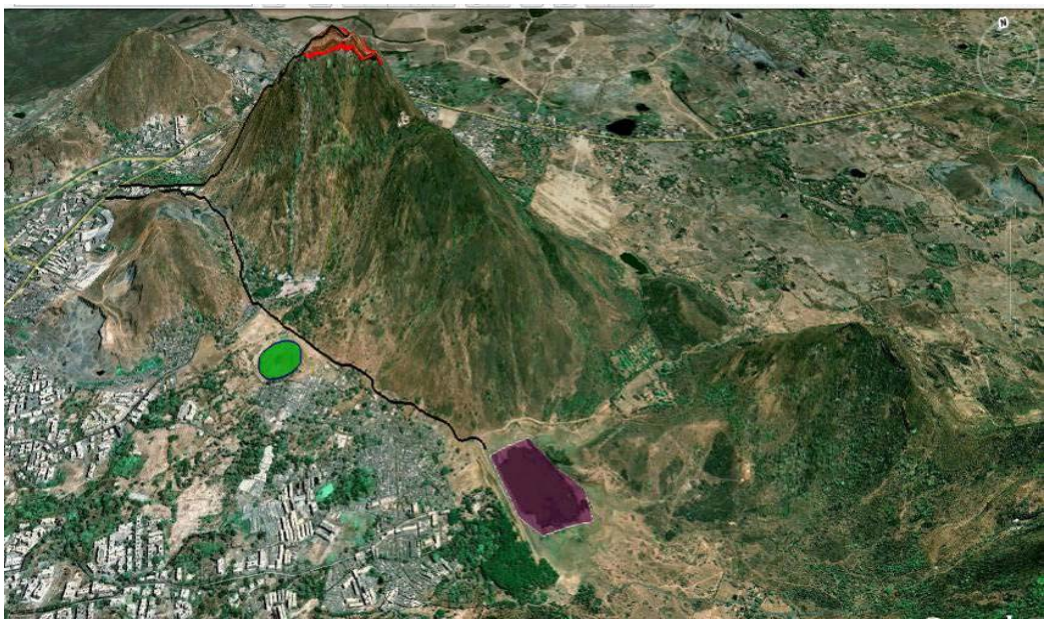
- In numerous cases, they are attached to programmes like that of a temple, dargah, church or a market etc. Thus, by being connected to the social life of communities they become important public spaces. In fact in a majority of the older settlements, the talavs have been sited at strategic locations where they become landmarks or have been used as strategic architectural devices that organise the built fabric of the settlement - thereby having immense significance even during contemporary times.

In a project sponsored by MMR – Heritage Conservation Society Heritage Buildings and Precincts in Vasai Virar Sub Region have been documented. In all 140 Heritage Assets were identified in 4 Municipal Councils & 56 Grampanchayats surveyed in VVSR. The list is attached at Annexure II.

Details of Some of the Heritage installations are -

1. **Jivdani Temple**

The ancient famous Maa Jivdani temple is located on the Jivdani hill in Virar. In 17th century there was a fort by the name of Jivdhan on this hill. Within the fortifications there are some ancient looking caves and water cisterns, most of which have now practically dried up. They are believed to be the work of Pandavas. The hill is famous for the invisible Jivdani Goddess who is believed to have fled from the niche in one of the caves.



It is proposed to develop site for tourism with Play ground, Construction of road for jivdani temple (hilly road: 637 m, plane road: 371 m) and for ground and lake: 1.84 km. The Lake at downstream side of jivdani temple will be developed.

2. **Arnala Island & Beach**

Arnala Beach Virar (W), is famous beach barely a one and half hour drive from Mumbai by Road or Rails. Many Resorts are nestled in the beautiful green palm trees, and has Arnala Beach and Fort in its Vicinity, it offers the ultimate escape. People can enjoy gracious hospitality and rustic elegance in this unforgettable natural scenic retreat. It is proposed to develop

this island for Tourism. Water Transport system will be developed between the mainland and Arnala Island for transport of tourists.

In 1516, a local chieftain in Gujarat, Sultan Mahmud Begda originally constructed the fort on the island, strategically located at the mouth of the Vaitarna River. In the 1530s, the Portuguese had established their operations in the coastal area headquartered at Fort Bassein and soon gained control of the island and controlled shipping and navigation along the northern Konkan coast. In 1737 after winning the Battle of Vasai, Marathas launched an assault on Fort Arnala, for its strategic importance to the Maratha navy in assaulting Portuguese interests. Although their first assault was routed by a superior Portuguese naval force, second assault on the fort on March 28, 1737, caught the Portuguese by surprise and forced them to abandon the fort. The victory was commemorated by a plaque installed on the northern wall of the fort and is still visible today. Marathas then rebuilt the fort, constructing three bastions Bahirav, Bhavani and Bava. The Marathas controlled the fort until 1817 but were forced to surrender the fort to the British due to their superior naval power. The Arnala and Bassien forts were returned to the Marathas by the British in the treaty of Salabai, but the forts again changed hands under the treaty of Pune. Today the fort is in a state of disrepair. There is a beautiful Kalikamata temple on the shores of the fort island

3. Vasai Fort

This Fort was initially built by Bahadurshah of Gujarat and further developed by Portugese. This is in a dilapidated state at present. The precincts will be revamped from Tourism point of view. The rampart wall with bastions and the remains of the churches form the characteristic architectural elements within the fort. The churches are typical of the Portugese churches from the 16th and 17th century having false front facades. The precinct is also characterized by large open spaces, some of which are used for mending and drying fishing nets. One temple and one church are presently in active use.

4. **Tungareshwar**

Very famous Shiv Temple located at Vasai is a very beautiful place to visit when in Bassein. Few Kilometers from vasai highway, inside Mountains and Forest where old varli and aagri people live, is well known place of Tungareshwar famous for two things, one is the Temple of Lord Shiva and other is Waterfalls at Chinchoti. As it is a hilly Mountain area, this place looks like heaven during monsoon which is best time to visit and enjoy dense green forest with Birds, Monkeys and Small Streams of flowing river. From Vasai Phata Highway, its about 45 minutes walkable distance to reach the temple and nearby waterfalls, Luckily there is also Auto facilities on this roads full of stones and mud to reach this place. During Monsoon this place is full with one day picnic groups to enjoy the Waterfalls and Mountain Greenery.
Tungareshwar Temple is Lord Shiva (shambhunath) temple here, for quite some time very well maintained, there are also other small temples like Ganapati Temple and Mata Khodiyaar Maa Mandir (Temple) here. Delighting feature of this place is the Harmless Monkeys jumping around the surrounding of the temple with small baby monkeys; it's a lovely view and feel of natural climate.

It is proposed to develop Nature Park near Tungareshwar.It can be implemented through a joint venture between the Forest Dept. and the local gram panchayat on the lines of Tourist Centre at Bordi near Dahanu.

5 Pelhar Dam

This is source of water supply to MCCVV. Pelhar Lake lies in Pelhar village, 3 km away from Vajreshwari (57 km from Mumbai on the Mumbai-Ahmedabad highway). The waterfall over the wall of the dam offers a magnificent sight during rains. Encircled by the Tungareshwar range, the reservoir is very beautiful with lush green foliage.

There are hares, foxes and wild boars in the surrounding forest. An occasional leopard can also be spotted. Vajreshwari, Virar, Vasai and Tak-Mak Fort are some among the nearby attractions.

6 Buddha Stupa

Ancient Buddha Stupa in Nalasopara (Ancient Shurparak) built by Samrat Ashoka in 3rd Century BC. Nalasopara is believed to have been Gautama Buddhas birthplace in a previous life. Some 2500 years back, the modern day region of Nalasopara was known as 'Suparak'. Trade routes to countries like China, Ceylon and Japan were well established from Suparak. A vedic trader, Purna from Suparak traveled along with some other traders of Varanasi to Shravasthi where he was stirred by a discourse of Bhagwan Gautam Buddha. He shunned away from all material belongings and became a monk.

On coming back to his home at Suparak, he along with his brothers and other traders built a Buddha vihar which was inaugurated by Buddha himself. Buddha's 'Bhiksha-Patra' was kept inside this vihar. After many years Samrat Ashoka built a Budha Stupa over this Bhiksha-Patra and the place started being known as 'Suparak Buddha Stup'. Further Ashoka's son and daughter set for Sri Lanka to spread Buddhism from Suparak.

The Stupas were first discovered during the archeological diggings conducted by Pandit Bhagwanlal Idraji in 1882. Other relics like the stone treasury containing the remains of the Bhiksha-Patra, eight bronze statutes of Buddha were also found in this place. Also in 1956 the 8th stone tablet of Ashoka was found in the neighboring area, ascertaining the fact that Suparak (modern day Sopara) has played a very important role in ancient Buddhist history.

The site for the Buddha Stupa is now under control of the ASI. Unfortunately, very little attention is given to this national monument and it waits in a dilapidated state for restoration.

7 Shankaracharya Mandir

Shankaracharya Mandir is located in Nirmal Gram Panchayat. It is constructed on Hillock in early 17th Century. This structure is the 5th Jagatguru Shankaracharya Vidyaranya Swami Samadhi Mandir. It is accessed by a grand flight of stairs similar to the ones in the Holy Cross Church. The Samadhi is constructed of stone blocks

embellished with carvings of human figures and topped with the dome and kalash. It holds historical significance due to the Samadhi taken by the 5th Shankaracharya (5th Century BC) and the 7th Shankaracharya (4th Century BC) on the hillock of Nirmal, surrounded by two lakes – Vimal & Malai.

The **Projects** proposed for **Tourism development** are -

A) Lake Development

The region has a large number of natural water bodies and man-made talavs which several communities consider integral to their environment and their daily life.

- These water of these talavs is not only used for used by the agrarian communities for agriculture and domestic purposes like washing clothes, utensils, cattle, bathing but are also exploited commercially for breeding fresh water fish. Most importantly, when considered as a holistic system, these talavs have been responsible for maintaining the health of the underground water table which is vital even today for the agrarian community.

- It is not only the agrarian communities which associate with these talavs but several newer migrant communities in the VVSR which depend on them for their daily domestic survival or use them as sites for passive recreation.

- In numerous cases, they are attached to programmes like that of a temple, dargah, church or a market etc. Thus, by being connected to the social life of communities they become important public spaces. In fact in a majority of the older settlements, the talavs have been sited at strategic locations where they become landmarks or have been used as strategic architectural devices that organise the built fabric of the settlement - thereby having immense significance even during contemporary times.

There are about 87 Lakes in this region. These have been listed in the Heritage Assets of the VVSR. Nearly each Grampanchayat has its Talav. The environmental condition of these lakes is in various stages of deterioration and needs improvement. It is proposed to develop some of these lakes which have tourism potential in consultation with local community. A provision of Rs. 52 Crores has been provided in the CDP.

B) Sea Promenade and Marina for Recreation & fisherman –

The development of Sea Promenade will allow the local residents to enjoy sea shore. It will also help the fisherman to anchor their ships for fishing. This will also provide facility for Water sports. A coastal tour to show the scenic beauty can be arranged for the Tourists which will be added attraction. A provision of Rs. 125 crores for promenade & Rs 60 crores has been made.

Nature Park near Papadkhind

A Nature Park is proposed to be developed near Papadkhind. It will be marked by it's bounty of Natural beauty, Full of and lawns, this place will be nice and cosy for children, elderly and even love-birds.They will enjoy the warmth and enjoy the difference. A mini science park along with an interpretation centre (area for display and sale) of local art as well as an information desk will be developed. A provision of Rs. 6 crores has been proposed in the CDP.

C) Development of Resorts on PPP basis

With the development of the VVSR with all its scenic beauty, touris attractions, beaches it will be essential to provide good residential accommodations to the expected tourists. Care will be taken to protect the natural beauty of the locations and laws of the Land will be adhered to. Use of non conventional energy such as solar energy, wind energy will make these projects more economical by reducing O&M cost.A provision of Rs. 25 crores has been proposed in the CDP.

14.2.2 Schemes for Original Inhabitants

A) Community Centre

Citizen participation is essential for making democratic processes effective and for strengthening them. It provides a platform to citizens to influence policy / program development and implementation. While various platforms and systems for citizen's participation have developed organically there is a need to institutionalize them to make them effective and sustainable. The implementation of Community Participation Law is a mandatory Reform under scheme of Urban Infrastructure Development in Satellite Towns. Considering this a Community Centre is proposed to be established which will give guidance to the residents on various aspects.

In this Community Centre it is proposed to enlighten the community about various Schemes of Central & State Government under which funding can be made available for self employment ventures (Individual or Group) or provision of wage employment.One of the available schemes is –

The Swarna Jayanti Shahari Rozgar Yojana (SJSRY) seeks to provide gainful employment to the urban unemployed or underemployed poor through encouraging the setting up of self-employment ventures (Individual of Group) or provision of wage employment. The target population under SJSRY is urban poor living below the poverty line. Funds are shared between the Centre and the States in the ratio of 75: 25.

The Community Centre will act as a platform for the display and sale of the products made by the beneficiaries under various poverty alleviation programmes.

The **Adhar Kendras** on the lines of Mumbai, Pune Municipal Corporations can be set up in the community centre as Citizen Facilitation Centres for the Municipal services. The functional role of Adhar Kendras would involve livelihood mapping to assess & prepare an inventory of existing skills available in the area and also assess skills requirements in terms of content, quality & quantum after assessing the market needs. Operationalising Adhar Kendra will connect the market & the skilled labour available which will generate work opportunities for local people not only in VVSR but also in nearby mega cities like Mumbai, Thane, Ahmedabad.

B) Fishing & Allied Activities

Villages in Vasai Municipal Council are traditional fishing villages in the coastal area. In order to boost the fishing activity, it is suggested that MCCVV may earmark a suitable area of 50-60 Ha in the vicinity of these villages for 'Fishing and Allied Activities' where-in fish processing and canning units along with cold storage facilities can be developed for export of Marine Products. This will boost the economy of the area as well as generate employment.

C) Horticultural & Fisheries institutes

It is also suggested to set up Institutes for providing various curriculums in the field of Horticulture, farming, food processing and allied subjects. This will give guidance to local people in setting up their own small scale business in the same area, which will not only give financial support to them but will also create jobs for other local people.

D) Vocation Training Schools & Institutes With courses for Hospitality Management

With a boost to the tourism proposed in the area there will be need for support to the tourist from various parts of our country and other countries visiting this area. The professional courses developed for the local people like 'Travel, Tourism & Hospitality' course, Food processing techniques will help them find jobs near their place of

residence and reduce hardship of commuting to distant place of work. This will reduce load on transport system.

E) Development of storage & cottage industrial centers of local Product

With a view to give market to local products and give incentive to the cottage industry it is proposed to develop storage capacity and cottage industrial centres in the area. Also Municipal Markets two each in four Municipal Councils will be developed near the railway stations with parking facilty, galas for local people to display their weirs and commercial office space in higher floors will be set up. The local residents will be consulted in developing the markets to satisfy their needs. Markets have been provided for in DP by CIDCO. Provision of Rs 20 crores has been suggested in CDP.

F) The playgrounds & Sports Complexes with swimming Pool

The playgrounds & Sports Complexes with swimming Pool will be provided in each of the four Municipal Councils in the area. A provision has been made in the DP for these facilities. A provision of Rs. 229 crores has been proposed in the CDP.

G) Development of Cold storage

A cold storage facilty for storing perishable goods like the vegetables, fruits is proposed to increase the durability of these products. Food processing and canning units along with cold storage facilities can be developed for export of agriculture Products. This will benefit local people and will lead to economical growth of the region without change in their way of living.Provision of 60 crores has been proposed in the CDP.

H) Othe facilities

The other facilities proposed to be provided are given in following **Table 14.1**.A slaughter house will be provided with effluent collection & treatment as per the requirement of Maharashtra Pollution Control Board. Community Center, Town hall & Drama Theatre, Labour Welfare Centre and Fire Stations will be provided as per Development Plan prepared by CIDCO.

Table 14.1: Proposed Other Projects

Sl No.	Project Name	Estimate Cost (in crores)
1	Development of Sea promenade	Rs 125
2	Development of Cold Storage for fishing	Rs 60
3	Development of Marina for Recreation and fisherman	Rs 60
4	Nature Park near Papadkhind Area	Rs 6
5	Lake Development	Rs. 52
6	Construction of Slaughter house	Rs 19
7	Development of Resorts on PPP basis	Rs. 25
8	Municipal market 2 near each Railway Station making total of 8.	Rs 20
9	Corporation Administrative Bldg. & rest house	Rs 97
10	Play Ground	Rs 75
11	Sports Complex with Swimming pool in four Municipal Councils	Rs 154
12	Community Centre	Rs 2
13	Town hall & drama theater	Rs 32
14	Labour Welfare centre	Rs 5
15	Fire Stations	Rs 6
	Total Proposed Projects Cost	Rs 638
Source : Analysis		

14.2.3 *Development of IT Park:*

Due to heavy pressure of population growth in Vasai-Virar area, it is inevitable that new open lands (particularly salt pans) will have to be opened-up for development. Although, large chunk of this land would be required for residential purpose, a sizeable area of 40-50

Ha should be earmarked for IT Park in the land-use plan for the extended area. This would create ample job opportunities for the young and talented people from the area.

14.2.4 Promotion of Industrial Growth:

At present, the land under 'Industrial Use' is about 922 hectares which comes out to be 2.42% of the total area and 11.08% of the total developed area. The small scale industries have come-up in this area. With the largest consumer market at its door step, Vasai-Virar area offers excellent opportunities for service industries and small scale industries to grow. The industries in Mumbai can have their ancilliary industries in this region. It is therefore necessary to re-organize the existing industries to relocate from non-confirming zones to confirming zones by earmarking additional area for 'Industries' in the future land-use plan (DP).

14.2.5 Development of Parking Plaza:

Scarcity of parking space along all roads is one of the key issues in Vasai-Virar. To tackle this problem, VVMC has earmarked plots of land near four Railway Station areas for development of parking facility. There is a strong need to develop this facility at the earliest on BOT basis or PPP model. This way there would be no cash out-flow from VVMC.

14.3 ENVIRONMENTAL MANAGEMENT

Vasai Virar Corporation Area is endowed with extensive and valuable ecological resources. The geographical setting itself, with the sea and the sea coast along the west, Vaitarna and Vasai creeks to the north and the south and forests to the east can be considered as a major environmental advantage, which needs to be put to the best use for the development of the city. Ensuring protection for these environmental features, while at the same time utilizing these resources to the optimum, is basically the key to sustainable development of the area.

The following Environmental Management Plan delineates policies for the management and conservation of the city's natural resources and the protection of the citizens from hazards and pollution. It is imperative that this plan be implemented in coordination with the sustainability and environmental management schemes of Mumbai Metropolitan Region.

The core objectives of this environmental management plan are:

- Protection and sustainable use of environmental resources in the Corporation Area
- Contribute to the sustainability endeavors of the Mumbai Metropolitan Region
- Protection of natural drainage courses
- Protection and enhancement of habitat and biodiversity
- Enhancement of air, noise water and soil quality

The above objectives can be achieved by strategies, which are broadly classified into four groups:

- Management of natural topographic features
- Management of hydrological regime
- Management of ecological resources
- Maintaining environmental quality standards

Management of Topographic Features

The Vasai-Virar Sub-region (VVSR) is bounded on the north by the Vaitarna river, on the south by the Vasai creek and on the west by the Arabian Sea. The eastern boundary is the hill ranges of Tungar full of forest extending from village Sasunavghar upto village Chandip. A number of hillocks and isolated peaks dot the region in the east.
The region on the whole, is low-lying mainly in the southern part along both sides of Western Railway line. The old village settlements in the coastal belt are slightly on higher level and moderately plain. The average elevation of the area above sea level is 1.5 to 2 m. This area known as 'Plantation Zone' which is 14.53% of the total area needs to be protected. There are many local variations caused by small hillocks scattered in the eastern and north-eastern part of the region. *Afforestation measures are strongly recommended at these slopes.* The area lying to the east of the National Highway is hilly and covered mostly by thick forests. The hill ranges of the Tungar and the above two creeks create a natural barrier separating the sub-region from the rest of the Mumbai Metropolitan Region. The 48% of the total area is forest area known as 'Green Zone'. The Chinchoti fall, Tungareshwar Temple, churches, Buddha Stupa and thick forest offer good tourism potential to this eastern part. The low-lying lands along the coast and along two creeks are marshy, khazan lands and some of them mainly to the south of Nallasopara Railway Station are still used for salt cultivation.

Vaitarna and Vasai Creeks are the most important creeks passing through the northern and southern edges of the sub-region. Along the coast there are many small creek-lets. The coastal belt of the Sub-region is full of plantation with traditional villages maintaining peculiar Konkan-type character and offers beauty to the Sub-Region. The villages in this belt have good agricultural, horticultural and fishing base and therefore, they are distinct from the villages in the eastern part of railway line situated along and near the National Highway. These coastal villages are now more or less stagnant due to recent urban growth taking place near the railway stations as the local trains provide good commuting facilities to Mumbai.

Geologically, the sub-region falls in the Deccan Lava plateau. Traces of Bauxite have been found in the Tungar Hill ranges over an area of 80 sq.kms. and have a mineral content of 30-35%. There are few stone quarries in Rajawali area. The sand is also extracted through the Vaitarna Creek as building material by dredging which helps the creek to remain desilted every year.

Beyond the developed areas, tidal flats, mangroves, salt pans and marshy are the predominant landscape features. Many of these, along with the sea coast, fall under the Coastal regulation. Details of the land under coastal regulating zone are as given below (refer figure 7):

Table 14.2 Area under Coastal Regulation Zone

Coastal Regulation Zone	Area (Ha)
CRZ I	5044
CRZ II & III	4936*
Total CRZ Area	9980

Source:CZMP Maps of CESS Kerala

**Categorisation is being Done*

It can be seen that of the total area of 38000 Ha of the Corporation, 9980 Ha is under CRZ. Out of the 5044 Ha. CRZ I area Mangroves (CRZ I (i)) cover an area of 1852 Ha., Tidal Flats CRZ I (ii) 1181 Ha., seasonal beaches CRZ I (ii) 507 Ha. and Saltpans CRZ I (ii) 1464 Ha. Any proposal for development in these areas has to be as per the provisions of the CRZ Notification.In this regard CIDCO has prepared CRZ map with help of chief hydrographer of IIT BOMBAY and submitted to state government for approval. Further State government as per instruction of Governemt of India forwarded the CRZ map to Center for Earth Sceinces studies (CESS), kerala for exact demarcation of high tide level (HTL) and ecological sensitive areas like mangroves forests and salt pans. CESS has has submitted their recommendations to state government.

The hills on the east of the city form part of the ghats and are under forests. Protection of the forest and the hill slopes are important not only because it forms a green lung for the city but also because of its importance in reducing the runoff to the low lying areas as well as recharging the ground water levels. Restricted construction shall be permissible in this area as per sanctioned DCR for VVSR. Precautions need to be taken to prevent encroachment and unauthorized construction activities, including quarrying on these slopes. Legislations may be passed to ensure the same. It can be inferred that the actual area of land that is available for residential, commercial, industrial and institutional use in the Vasai Virar Municipal Corporation Area is very limited. High Density Development in these limited stretches might be the only sustainable solution to address the increase in population and urbanization of the city. However, such a development has to be supported by adequate physical and social infrastructure. Moreover, carrying capacity studies and environmental impact assessment studies have to be undertaken to ensure that the environmental setting can sustain the city development.

Management of the Hydrological Regime

The central parts of the city are mainly associated with the hydrological regime of an estuary. Meandering streams exist in the central parts of the corporation area before emptying into the Vasai and Vaitarna creeks. These play an important role in naturally draining the area. However the rapid development of the region has not only increased the quantity of storm water but also increased the runoff. These currently flow into an inefficient drainage system consisting of a network of nallahs, which are not properly integrated with these natural streams.

The main roads of the city are provided with open gutters for collecting and carrying sullage water from individual houses. Almost all nallas are provided with gates, which get closed during high tide preventing the sea water from entering the nalla. As the tide recedes the gates get opened releasing water to the creek. Back water during high tide keeps nallas full and the water from city does not flow and remain stagnant. There is a need for design and construction of an effective pucca open drainage system and integrating it with the existing natural drainage channels. Maintaining the drainage network by regular cleaning and providing shore stabilization measures at the creeks and the natural water channels have to be taken up.

Maswan weir and Shiroli weir is the source for Piped Water Supply for the Municipal Corporation. Rapid increase in urban population in Vasai Virar Region has lead to tremendous shortage of drinking water in this area. Most of the population is dependent on tanker fed water supply. Water supply tanks of variable capacities from 0.008 - 25 MLD are located zone wise for Vasai Virar city. There are 34 tube wells at Vasai and 15 tube wells at Virar. In addition, there are 275 bore wells at Vasai. Besides, there are about 20 private tube wells (10 to 35 m. deep) at Vasai and around 220 private tube wells at Virar. Other than drinking, this water is used for miscellaneous purposes. Indiscriminate ground water extraction by tankers is reported to have affected the quality and quantity of ground water especially at the village settlements and there is a threat of salinity ingress into the ground water resources. Provision of adequate piped water supply thus assumes a high priority to check the same.

The water samples are tested regularly by Municipal Councils at the outlet of WTP/ bore wells, at intermediate (ESR) points and at consumer end.The samples are tested for Residual Chlorine, TDS and Bacteriological parameters. While all the samples met residual chlorine standards, 87% of samples met the Bacteriolocal standards and 82% of samples met TDS standards.

Based on the future population estimates, the total Water Supply Demand for the year 2031 has been estimated @ 140 lpcd and 20% extra has been added up on account of unavoidable losses through leakages. The demand thus works out to be 600 MLD. Presently water supply to the MCCVV is 130 MLD. In addition to the measures mentioned in section 7.3.9, it was imperative for CIDCO that water conservation measures are taken up in the city. The Govt. of Maharashtra has given Directives to all Authorities u/s 154 of MRTP Act to incorporate enabling provisions in DCR incorporating Rain water harvesting system. In accordance with the same CIDCO has made modification to DCR incorporating the Rain water harvesting system to be mandatorly madeapplicable to new / old buildings and the same is being ensured while granting Occupancy Certificate for the new buildings.This will not only reduce the population’s demand on the piped water supply, it would also reduce the burden on the storm water drainage system.

Conservation of Ecological Resources

The Vasai Virar Corporation Area is associated with diverse and highly productive ecosystems. It has vast stretches under wetlands, while the hills on the east are under

forests, which are part of the Sahyadris. The sandy shores along the sea coast are linked to a marine ecosystem, and the inland waste bodies are part of a rich estuarine ecosystem, replete with mudflats, creeks and salt pans. Mangrove growth is prevalent along the major creeks and water channels where tidal effects are experienced. These provide excellent habitats to a variety of organisms, including various species of benthos, fisheries and avi fauna. With rapid urbanization of the region, there is a risk of these getting destroyed. World over, planners have woken up to the importance of these ecosystems in the city's survival chances in times of adversities. All measures have to be taken to preserve these systems. It needs to be noted that these areas support large population of fish life at their early stages of growth and loss of this habitat would have a direct impact on the fisheries production at the sea and simultaneously to the livelihood of scores of fishermen, who form one of the earliest citizens of the area.

Very little studies have been done on the wetlands in the Corporation Area. Wetlands in the area range from areas that are infrequently flooded to those that are constantly flooded with deep water. Individual wetlands also have unique soil conditions as well as particular composition of hydrophytic plant species. Government of India has adopted the definition of wetlands given by the Ramsar convention on wetlands of international importance according to which "Wetland consists of areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or saltish including areas of marine water, the depth of which at low tide does not exceed six metres." Wetlands are among the most productive ecosystems providing unique habitats for a wide variety of flora and fauna. They provide wide range of functions, including food chain support, flood control, shoreline stabilization, sediment, nutrient and toxicant retention

Documentation of the wetlands in the Corporation limits and its categorization is crucial as a first step towards the preservation of these systems. The inventory of wetlands should be utilized while preparing detailed city plans, so that important wetland areas are avoided for any active development. Appropriate management strategies aimed at conservation and environmentally sustainable best use should be adopted for the different categories of wetlands.

As per the high Court Directive of October 2005, mangrove destruction is totally banned in the state**.** Government owned lands under mangroves shall be declared as "protected forests". Privately owned lands to be declared / notified as "forests" ***In respect of Government lands, the Forest Department and other authorities of the State of Maharashtra shall take steps of protection and regeneration of the areas by:***

- ***Removal of all obstructions that are impeding the growth of mangroves as also the impediments which restrict the flow of sea water in the mangrove areas;***
- ***Wherever mangrove growth is found to be sparse (i.e. with forest density less than 0.4 taking necessary steps for rejuvenation***

Mangrove locations having area more than 1000 sq meter is also required to have a buffer of 50 meters.

Garbage is presently being dumped at many locations including Navghar creek. ***Dumping of sol id w astes into t he cr eeks and t he w ater channel s have t o be i mmediately stopped. Only treated waste water shall be let into the natural water streams.***

Maintenance of Environmental Quality Standards

Water Quality

Existing sewerage scheme for the city is limited to four residential complexes. Provision of septic tanks had been made compulsory by the Municipal Corporation. The present system of sewage disposal through septic tanks and effluent disposal in surface gutters and nallas lead to pollution and unhealthy conditions, damaging the aquatic flora and fauna. There is a need for proper sewage treatment facilities for the Vasai Virar Municipal Corporation. By the year 2041 the total amount of sewage to be treated will increase to 600 MLD (i.e.80% of 750 MLD). To meet this demand for year 2041 STPs at various locations of good capacity will be generated, the development will come in phases as per the requirement. And sewerage network will be laid along with water supply network. Integrated and holistic approach will be adopted for decentralized sewerage system which takes care of collection treatment and disposal in environmentally sustainable manner. Possibility of waste water treatment plant based methane capture for energy/electricity generation or district heating/cooling for buildings/industries shall be checked. Also Re-use of treated waste water for landscaping, flushing and air conditioning make-up requirements within the town shall be implemented. All the industrial areas should implement “zero process water discharge”

The Detailed Project Report prepared for this Sewerage project and water supply projects shall include the Environment Management Plan and its cost shall be included in the project cost.

Eco Sanitation & Decentralized Waste Water Management is expected to achieve the following effluent standards:

- BOD 20 degree C- 100 Mg /Ltr.
- COD (Max) 250 Mg/ Ltr.
- Suspended Solids – 100 Mg/Ltr

Regular water quality monitoring at select points of the creek and natural channels as well as ground water shall be initiated and compared to national standards set by CPCB. Parameters to be tested for, together with specific testing frequencies and scheduling shall be arrived at based on CPCB guidelines. Whenever the quality does not meet the standards, appropriate remedial measures shall be adopted, after analyzing the potential causes for the quality deterioration.

Soil Quality

It is under stood that 310 MT/d of municipal solid waste is generated in the Corporation area. Garbage from the Corporation Area is currently collected and dumped at four

locations one each for four Municipal Councils as mentioned in para 8.4.3. It is necessary to plan and manage thorough segregation of biodegradable, recyclable, combustible and inert materials & utilize segregated materials for energy/electricity generation, if possible.

As per the Municipal Solid Waste (Management and Handling) Rules 2000, the Municipal Bodies are responsible for processing of waste and only rejects (and hazardous waste) are to be sent for landfill site. Till such time a facility is set up to process the waste to produce useful products like fertilizers, energy etc, is established, the municipal bodies are still required to process the waste before it is allowed to go into the landfill. This can be done by placing the waste on an impermeable platform and allowing the biodegradable to decompose naturally. This takes approximately 45-60 days. The process can be expedited by the use of EM fluid, etc.

The process of identifying the alternate site for solid waste disposal in scientific manner is under progress. However it is not clear whether its local groundwater and environmental survey were done before selection. It is also essential to get clearance from the Maharashtra Pollution Control Board (MPCB) before putting the land fill site into operation. ***The site is required to have proper facilities for collecting the leachate from the waste during processing so that it does not contaminate the ground water. The ground water as well as the air quality has to be frequently checked to ensure that no such contamination / pollution are taking place. The landfill site must be enclosed and trees must be planted all around.*** *The Detailed Project Report prepared for this project shall include the Environment Management Plan and its cost shall be included in the project cost.*

It is important to demarcate the area around the new sites as a buffer zone to prevent new development around it. This must be done at the earliest, and before the site becomes operational, in order to avoid conflict at a later stage. Monsoon water must be prevented from percolating through the heaps, as it can produce highly polluting black runoff (leachate), which can cause damage to the ecosystem. Waste heaps can be made convex to eliminate standing water, upslope diversion drains can prevent water inflow, down-slope diversion drains can capture leachate for recirculation onto the heaps, and disused heaps can be given soil cover for vegetative healing.

Based on preliminary understanding of the topographic and hydrologic features of the corporation, it is recommended that measures be taken to reduce the load on this land fill to the extent possible. This can be achieved by two means:

- ***Decentralised composting - small decomposing plants shall be set up in the city. These decentralized plants will be able to substantially reduce transportation costs as well as reduce the amount of waste reaching the land fill site. Vermi-composting is proposed for the processing of the waste as it is one of the most cost effective methods for processing Municipal Waste. The capital cost can be incurred by the Municipal Corporation while operation and maintenance may be handed over to a private operator.***

Another option is to go for the Biogas technology developed by Bhabha Atomic Research Centre (BARC).

- ***Leasing of areas beyond the low lying areas of the Corporation limits for use as land fills and transporting the waste to this location.***

House to house segregation of wastes at source level needs to be initiated.

As per the Bio-Medical Waste (Management & Handling) Rules 1998 it is the duty of the biomedical waste generators to segregate, store, transport, process and manage the biomedical waste without any adverse effect to human health and the environment. Hospital and hazardous wastes are currently collected, treated and disposed off by a MPCB approved agency site at Taloje. The city mostly has service industry and hence generation of industrial wastes is negligible.

Apart from the given quantity of solid waste, there is generation of inert waste from repair of houses, construction activities, silt generated out of cleaning of gutters and nallas. The quantity of inert waste varies, it is to be collected and used for filling low lying areas.

Air and Noise Quality

Vehicular traffic is a major source of air and noise pollution in the city areas near four Railway stations. Reducing automobile emissions is possible through traffic and transportation improvements. Since traffic congestion delays increase the level of emissions, congestion management has air quality benefits. *T**he City should give high priority to traffic improvements that improve vehicle operating conditions (average speed, delay) such as signal timing improvements, signal synchronization, turn lanes, etc. Tree plantation schemes shall be introduced along the major roads.The Intracity Bus Terminal in Municipal Council areas and major Truck Terminal on NH 8 at the boundary of MMR shall be set upto reduce traffic congestion.***

During festive season especially Diwali time the noise levels are very high and need to be regulated by restricting the use of crackers & the time of use. The crackers also cause air pollution.

Detailed Project Report shall be prepared for all Road infrastructure development projects in the Region which shall include the Environment Management Plan and its cost shall be included in the project cost. The Green Zone & Plantation Zone has been demarcated as No Development Zones in the DP. Extra care shall be taken for environment Protection in the developmental projects in these areas. Retain and restore tree cover, wetlands, critical slopes, flood plains and habitat for species

Institutional support

To ensure effective implementation of environmental management measures in the Corporation, a separate environmental department with clear cut responsibilities has to be established as part of the existing organizational set up of the Corporation. This department shall be headed by an environmental professional and shall be responsible for:

1. Ensure integration of environmental issues in the development proposals of the Corporation
2. Documentation of environmental resources,
3. Promote/ Carry out studies for conservation of environmental resources and sustainable use of the same.
4. Initiation of tree planting programs in the corporation. The Tree Authority shall be integrated with the Environmental Department
5. Provide environmental awareness training programs to the other departments
6. Support public initiatives towards environmental programs and activities
7. Monitoring of environmental quality in the Corporation Area
8. Support and coordination with MPCB's regional environmental quality programs

Non Conventional Energy

Renewable energy is derived from natural processes that are replenished constantly. In its various forms, it derives directly from the sun, or from heat generated deep within the earth. Included in the definition is electricity and heat generated from solar, wind, ocean, hydropower, biomass, geothermal resources, and biofuels and hydrogen derived from renewable resources.

WindPower - Airflows can be used to run wind turbines. Modern wind turbines range from around 600 kW to 5 MW of rated power, although turbines with rated output of 1.5–3 MW have become the most common for commercial use; the power output of a turbine is a function of the cube of the wind speed, so as wind speed increases, power output increases dramatically. Areas where winds are stronger and more constant, such as offshore and high altitude sites are preferred locations for wind farms. Typical capacity factors are 20-40%, with values at the upper end of the range in particularly favourable sites. Offshore resources experience mean wind speeds of ~90% greater than that of land, so offshore resources could contribute substantially more energy. This number could also increase with higher altitude ground-based or airborne wind turbines.The salt pan areas & wetlands areas in Vasai Virar can be explored for development of wind farms, thus reducing dependence on conventional energy.

Solar Energy - Solar energy is the energy derived from the sun through the form of solar radiation. Solar powered electrical generation relies on photovoltaics and heat engines. A partial list of other solar applications includes space heating and cooling through solar architecture, daylighting, solar hot water, solar cooking, and high temperature process heat for industrial purposes.Solar technologies are broadly characterized as either passive solar or active solar depending on the way they capture, convert and distribute solar energy. Active solar techniques include the use of photovoltaic panels and solar thermal collectors to harness the energy. Passive solar techniques include orienting a building to the Sun, selecting materials with favorable thermal mass or light dispersing properties, and designing spaces that naturally circulate air. The use of solar energy can be promoted in the govrnment owned buildings, Nature Parks, Resorts. It is essential that energy conservation measures are taken up in the city. Energy Efficiency has to be made mandatory for all new buildings and necessary legislations have to be passed on the same. Existing building owners also should be given incentives to install solar heating systems in their buildings. This will reduce the population's demand on the conventional electric supply.

Disaster Management Cell

Response to disasters, in the absence of a defined plan, would be arbitrary, leading to overemphasis on some actions and absence of other critical actions. The objectives of any disaster management plan should be to localise a disaster, and to the maximum extent possible contain it so as to minimise the impact on life, the environment and property. A formal plan for managing disasters is therefore necessary. It therefore includes a plan of action for the following disasters: earthquakes, floods, cyclones, epidemics, industrial and chemical accidents, road accidents and fires. At the same time disaster management plan has a strong mitigation aspect as well, which will reduce the frequency of occurrence of such disasters.

MCCVV shall therefore create Disaster Management Cell to implement the Disaster Management Plan. The Cell will be responsible for Emergency Planning which includes-

- Identification and analysis of the potential hazards, and if possible the mitigation or elimination of their consequences;
- Analysis of the resources available to cope with any potential disaster; and
- Post - disaster response and recovery planning.

The purpose of preparing this plan is:

- To understand the vulnerability of the various districts to disasters;
- To ascertain the status of existing resources and facilities available with the various agencies involved in disaster management in the state;
- Assess their adequacies in dealing with a disaster; and
- Identify the requirements for institutional strengthening, and capacity strengthening of human resources

15 Municipal Finance

The financial profile of city indicates the state of the city's finances and the capacity of the city to be able to manage its finance and mobilizing resources for maintaining infrastructural service at prescribed norms and standards. Therefore financial capacity of Municipal Corporation of City of Vasai Virar finance has been assessed on income, Expenditure, Debt service and performance.

As per Municipal Finance code the financial the Financial Accounts of the VVSR will be maintained as double entry system. Every inflow of cash and bank balance will be treated as income irrespective of the fact that whether it relates to current year or not.

The Municipal Corporation of City of Vasai Virar (MCCVV) classifies all receipts into four categories viz, revenue receipts, capital receipts, scheme receipts, and other (miscellaneous) receipts. Revenue receipts are further divided into two main heads, (i) own revenue receipts and (ii) state transfers. Own revenue receipts consist of taxes, user charges and other fees and fines that are levied and collected by MCCVV. Own resource receipts i.e. the fiscal base of MCCVV consists of consolidated property tax, theatre tax, and non-tax receipts, mainly from sale of water & rent of properties. Receipts under state transfers consist of education cess, which is returned to the Corporation either in full or part, and grants-in-aid under general purpose and specific purpose categories. Capital receipts represent loans contracted for various projects and from sale of assets. Scheme receipts are amounts that the MCCVV receives for various project specific schemes and works. Other receipts consist of deposits, advances and the like.

Expenditure heads are also divided by the MCCVV into four categories, namely revenue expenditure, capital expenditure, scheme expenditure and other expenditure (miscellaneous). Revenue expenditure has three categories; (i) expenditure on establishment, wages and salaries and (ii) expenditure on operation and maintenance, and (iii) debt servicing. Expenditure is classified for each department such as general administration, fire, lighting, public health, water supply, medical care, education, public buildings and on commercial activities. Expenditure on developmental works is shown as capital expenditure, whereas expenditure on various project specific schemes is shown under schemes.

Revenue Account

Revenue account comprises of the operating income and expenditure items which are recurring items, e.g. income from taxes, non-taxes, grants etc. and main components of revenue expenditures like expenditure on establishments, repairs & maintenance. Following paras describe marc on revenue income & revenue expenditure.

Revenue Income

The Main components of Revenue Incomes of MCCVV are:

- Property Tax (power to collect given by statute)
- Revenue Grants (assistance from govt.. other bodies)
- Miscellaneous Incomes Rent Received (from lands, property etc., possessions)
- Public Service Charges (for services provided), Other Incomes

Property Tax:

Property tax (House tax, Conservancy tax, Fire tax and Education cess) is the largest tax Revenue source and constitutes average 33.84% of the total revenue income. The There

are about 276359 built up properties which are being assessed within Vasai Virar Municipal Corporation limits. The average growth rate of assessment is about 10%. As per BPMC Act, 1949 Corporation can revise the ARV of properties once in four years however last revision was made during year 2005 The corporation levies a tax on basis of built-up area measurement and thereby finding Annual Ratable Value (ARV) of the collection of tax. The current demand of house tax is 38954.84 Lacs where as there are outstanding arrears as on 31-3-2008 is 630.59 lacs.

Table No. 15.1 Revenue Income

Revenue Income (Rupees in lacs)					
Revenue Income	*2003-04*	*2004-05*	*2005-06*	*2006-07*	*2007-08*
Property Tax	2569.59	2357.93	2769.48	3267.20	3895.24
Water Supply	305.86	326.38	399.78	2006.66	2522.40
License Fee	4.67	6.35	13.94	9.64	9.92
Income from services	330.26	457.19	654.13	860.75	1104.34
Miscellaneous Income	617.31	600.16	740.59	1133.35	1609.14
Grants & Loans	1313.95	1781.71	1556.20	3104.05	2370.16
	5141.63	**5529.72**	**6134.12**	**10381.64**	**11511.21**

Source: Data Provided by the MCCVV

Water Charges: Another important source of income is Water Charges. Total collection of MCCVV as water charges are 2522.4 Lakhs as on 31-3-2008.

Revenue Grants: (assistance from govt., other bodies) Revenue grants are one of the non-tax revenue sources of MCCVV. Revenue grants may be for general purpose or for any specific purpose. It constitutes the fourth largest source of corporations revenue income pegged at 20.59% of the total income.

Miscellaneous Incomes: Rent Received (from lands, property etc., possessions), under this head - rent received, public service charges, interest on funds invested, high school fees etc. are collected. Another source, public service charges, includes incomes from ambulance rent, garden income, swimming pool fees etc. Share of income from this source is surprisingly large at 13.97% of the total revenue income.

Revenue Expenditure: The Corporation spends the resources for establishment, operation and maintenance and debt servicing of obligatory and discretionary services provided by it. The major heads of revenue expenditure include general administration, water works, Conservancy, roads, streetlights, public health, education, garden, fire brigade etc

Table 15.2 Municipal Expenditure

Municipal Expenditure (Rupees in lacs)					
Revenue Expenditure	2003-04	2004-05	2005-06	2006-07	2007-08
Administrative Services	408.91	523.64	616.81	707.90	798.46
Public Security	258.74	306.92	437.56	536.36	633.60
Health care	2010.48	2264.04	2973.08	4917.25	5816.21
Education	30.10	34.96	40.42	47.27	62.06
Grants	33.39	3.70	6.35	5.86	7.35
Other	352.33	428.59	660.73	1251.46	901.00
Total	3093.94	3561.85	4734.96	7466.10	8218.69

Source: Data Provided by the MCCVV

Municipal Assets

The accounting system of MCCVV was assessed in pursuance of the recommendations and guidelines from C & AG'S task force committee and the final manual prepared by the NIUA and MCCVV felt the need to adopt the new accounting system. Pursuant to the decision of MCCVV to switch to accrual method of accounting, it was necessary to identify and bring within the ambit of its financial records, the entire assets and liabilities of MCCVV.

Inventory of Assets

The fixed assets have been identified and compiled based on data/information furnished by the various departments and wards of MCCVV. Fixed assets reflected in the financial statements represent assets identified, listed and measured by the wards/departments concerned. Broadly, the method adopted is in accordance with the general guidelines contained in the National Municipal Accounts Manual (NMAM). The process of physical verification has been carried out in regard to the major assets. An inventory of assets has been prepared which have reflected in the financial statements.

Valuation of Assets

The MCCVV has adopted different methodologies in regard to the valuation of various Fixed Assets, which are -

1. In determining the cost of acquisition, incidental direct costs have been considered.
2. Where specific valuation by the third partly an expert has been available, the value as given by the said valuers at the particular date has been adopted from this value.
3. Where actual cost or valuation was not available, the replacement costs have been taken.
4. Assets acquired as on or after 1.04.2001 have been taken at actual cost of acquisition as adjusted for subsequent additions, sales, improvements, etc
5. Assets acquired prior to 1.04.2001 have been recognized at replacement cost as adjusted by applicable depreciation. However, where actual cost in regard to such assets was available, the same has been recognized.
6. Where assets falling in the above category have been acquired/obtained, not by payment of monetary consideration but by surrender of valuable right such as TDR, have been reflected at the estimated market value (on date of acquisition of the new asset) of the right so surrendered.
7. As prescribed by the accounting standard (AS-10), the cost of improvements to assets resulting in enhancement of capacity or life of the assets, has been added to the cost of the assets.

8. In regard to assets, which have no cost of acquisition or have been acquired free of cost or in certain cases, where no monetary value can be determined, the same has been reflected at a nominal value of Re.1 only.
9. In case of assets which continue to be in use for numerous years and whose normal economic life may be considered to be exhausted, the cost of such assets has been taken at Re.1 in the opening statement of affairs. (e.g. plant & machinery, office fittings and furniture).
10. All assets costing less than Rs.5000/- have been reflected at nominal cost of Re.1 except where the group of assets comprising of assets individually less than Rs.5000/- but collectively having higher value.
11. Where the title of the ownership of certain assets is not clear, the capital expenditure incurred from time to time has been capitalized.
12. Trees and other horticultural assets which have been included in the inventory of assets shall be incorporated in the schedule of fixed assets at a subsequent date.

Issues & Concerns

Now, that the assets have been identified the management of these assets is the major concern. In order to develop sustainable asset management, there is a need to deal with the linkages between the investment and sustainable development. This area focuses on creating investment policies. To deliver a community service s the asset management needs to be combined with funding and human resources. Also, there is a pressing need for training and capacity building for the Corporation in asset management. The operation and maintenance of the asset is the key issues in asset management. There is a need for the asset performance assessment as well as planning and budgeting, needs to be given adequate consideration for the operation and maintenance.

Capital Account

Capital Income

Most of the capital works are finance by way of loans from finance institutes, grants from the State & Central Government, as well from sale of assets. The Corporation also uses significant amount of surplus funds from the revenue account surplus of previous years. Largely, General capital receipts are divided as follows:

1. Grants & Contribution like Sale
    a. M P grant
    b. MLA grants
    c. Finance commission grant
2. Capital profits on sale of fixed assets

3. Capital grant! Contribution,subsidies etc.

4. Borrowings / loan

5. Other Capital Receipts.

Table No. 15.3: MCCVV Capital Receipts

MCCVV Capital Receipts					
	Capital Receipts (Rs. Lakh)				
	State government (Rs. Lakhs)		Financing institutions	Market	Total
Year	Loan	Grants			
2004-05	_	453.29			453.29
2005-06	_	177.36			177.36
2006-07	_	709.88			709.88
2007-08	_	42.43			42.43
2008-09	_	2023.36			2023.36

Source: Data Provided by the MCCVV

Capital Expenditure

Capital Expenditure in absolute terms (Rs. in lakhs) shows a downward/upward trend form 2001 -02 to 2004-05.

Table 15.4 MCCVV's total Capital Expenditure

MCCVV's total Capital Expenditure (Rs in Lakhs)	
Year	Expenditure
2004-05	1435.34
2005-06	1891.72
2006-07	3617.12
2007-08	4601.30
2008-09	5306.86

Source: Data Provided by the MCCVV

Average growth rate of expenses was way higher than that of Capital Receipts.

Scheme & other Expenditure

For better financial monitoring, MCCVV has adopted process of preparing scheme budget every year. In budget for the year 2002-03 and onwards, total 4 major heads have been prepared which are as under

- Underground Drainage Project
- Water Supply Project
- Solid Waste Management
- Town Planning

General Observations of MCCVV's Budget

At the first stage of analysis, the finances of the Municipal Corporation of City of Vasai Virar (MCCVV) portray a positive profile in that

1. The corporation has a revenue account surplus in 2003/04, the revenue accounts surplus formed 39.83% of the total revenue receipts. Few municipalities in India are able to claim such surplus. The current surplus in year 2007-08 has reached 28.60% of the total revenue receipts due to better revenue realization.

2. It is not a revenue-dependent corporation, and its dependency ratio on state resources is extremely low, consisting primarily of education cess grant and other petty grants.

3. It is able to apply its surplus for capital improvement works, a distinction that is achieved by, at best, and a few municipal corporations in India.

A closer examination of MCCVV finances, however, shows several disturbing features. For instance

1. Maintaining a revenue account surplus is of little consequence when there are serious service shortages and deprivations, and the inability of MCCVV to be able to exercise enough control and regulation on land use etc. In per capita terms, the Vasai Virar Municipal Corporation (MCCVV) spends Rs.**2.05** per person per day on running the city's services which, by any reckoning, is insufficient for purposes of growth, equity, or quality of life.

2. Aggregate per capita expenditure levels have risen considerably over the past five years and have in fact, registered a increase, at 2003-04 prices, by about 9 per cent in 2005-06.Combined with the fact that expenditure levels are low and the MCCVV is unable to hold on even these levels would tend to suggest deterioration in the levels of infrastructure services in the city of Vasai Virar.

3. There appears to be no preparedness on the part of Vasai Virar Municipal Corporation (MCCVV) to operate its activities in a revenue regime without levies, a revenue source that currently accounts of 44.57 % of revenues.

4. Property tax is the most likely alternative for municipal corporations to at least partially offset octroi levies. Therefore, the MCCVV has shown evidence of thinking ahead to build up the property tax regime and its efficiency ahead of abolition of octroi. There are several possible areas for proactive steps. First, the MCCVV could consider shifting from the ARV method of assessment to a more manageable and transparent unit area based system. Last and arguably most significant, collection efficiency is poor and needs to be improved. The MCCVV has intended to start GIS based property tax assessment & collection system and floated tenders for procurement of Software and carrying out comprehensive surveys.

5. The water account: another disconcerting feature of the finances of MCCVV. Water provisioning is perhaps the most important function of MCCVV, more so as Vasai Virar is located in a water-scarce region. The MCCVV spends approximately 28.66 per cent of its total budget on water, inclusive of expenditure on establishment, operation and maintenance including electricity charges and augmentation of water supplies. While there is no consistency in the pattern of expenditure, expenditure on electricity appears to be on the rise it is one component, which is exogenous to the MCCVV's operations.

Financial Performance Assessment

The performance indicators shall indicate the ideal level of service that MCCVV must attempt to achieve. To assess the financial performance of the Vasai Virar Municipal Corporation major heads viz. Resource Mobilization, Expenditure Management and debt Management as discussed above were taken as financial indicators.

1."Resource Mobilization: The term "Resource Mobilization" also means "Funds Management" which essentially covers the management of (a) Procurement of Funds & (b) Utilization of Funds. MCCVV is established under the BPMC Act, 1949 from which it

derives its "OBJECTIVES". Resource mobilization essentially reflects the income status of the city. Actual figures for two financial years, 2003-04 & 2007-08 have been analyzed. Per capita income figures have been considered for analysis as Per capita revenue shows how revenue is changing relative to the changes in relation to population.

2. Expenditure Management: The first issue to consider is the ratio of revenue expenditure to its revenue income (operating ratio) to determine whether the City is living within its resources. Personnel costs (establishment costs) are a major portion of the City's operating budget. An increase in the employees to population ratio may indicate that the city is more labor intensive or that the productivity is declining. Sectoral analysis compares the per capita expenditure as well as percentage expenditure on various sectors of total revenue expenditure.

3. Debt Management: Share of loan repayment in revenue income and revenue expenditure has been calculated. Debt Service Ratio of 0.05% is considered as healthy while value above it should be seen as a caution.

Table 15.5: Performance assessment: Municipal Finance

Performance assessment: Municipal Finance			
		2003-04	2007-08
Attributes	**Component**	*(Population –8 lakhs)*	*(Population – 11 lakhs)*
Per Capita	Per Capital Revenue Income	**Rs.642.7**	**Rs.1046.47**
Overall Expenditure	Per capita revenue expenditure	**Rs. 386.74**	**Rs.747.15**
Establishment Expenditure	% of Establishment Exp. to Total Revenue Exp.	**27.98%**	**17.50%**
Efficiency	Operating ratio= Revenue Expenditure / Revenue Income	**0.6**	**0.71**
Debt Service Ratio	Debt service ratio (Income)- Total Loan Repayment / Revenue Income	**0.02%**	**0.05%**

Source: Analysis

15.1 Capital Investment Plan CIP

The City will use fiscal notes and policy analysis to assist in making informed capital investment choices to achieve the community's long-term goals. This Process provides guidance for capital budgeting and long-term capital facilities planning across all the city departments, for identifying and balancing competing needs, and for developing short and long term capital finance plans for all of the City's Capital Investments.

Basis for CIP

Capital Investment Plan is an operational action plan to achieve Goals and Strategies of City Development. The Capital Investment Plan (CIP) is the multi year scheduling of public physical improvements and investments. The scheduling or phasing of the plans is based on assessment of fiscal resources availability (for new investments and O&M), technical capacity for construction and O&M, and the choice of specific improvements planned for

the future five years.

As part of the CIP, the Vasai-Virar Municipal Corporation has

- Analyzed the existing applicable norms and standards for infrastructures services, considering low, medium, high and mixed options
- Discussed, agreed the public priorities and expectations and recommended a reasonable / realistic options
- Justified and provided rationale when the chosen option is not within the existing service level standards.
  In determining the long-term financial strategy the Municipal Corporation plans to get funds from JnNURM GOI & GOM contributions.

The phasing and scheduling of investments have been carried out through an interactive process and the principles of phasing have taken into account.

- Priority needs with developed areas getting priority over future development areas.
- Inter and Intra service linkages, viz., investments shall be complemented by Sewerage/ sanitation improvements.
- Size and duration of the requirements, including preparation and implementation period,
- Project linked implications such as installing house connections where supply and distribution capacities have been increased.

CIP – Process

The capital investment plan involved the identification of public capital facilities to cater to the demand of the city populace by the year 2031. The phasing is however done keeping in mind the funding pattern under JnNURM over a period of ten years from 2010 to 2020. The CIP has been phased out in the following stages:

Project Identification

Project Identification is an interactive process, where in the key actors of city planning and development are consulted to form a long list of projects, which are then short-listed based on the situational analysis of basic services and assessment of the municipality. In the initial stages of project identification during this work and the inception report submitted to MCCVV an exhaustive consultation process has been carried out with the officials of the Corporation.

Project Screening and Prioritization

In the second stage of CIP, the list of projects emerged during the consultation process are evaluated in relation to the service levels, growth trends and future needs of the city.

As brought out in the basic services section, Vasai-Virar City needs up gradation and improvement apart from the accommodating the needs of incremental population.

MCCVV needs to strengthen its financial capacity and adequate delivery of services to provide a better level of service.

Based on the long list of projects and direct consultation with the officials & officers of MCCVV a detailed list of projects to be executed along with the implementation priorities was prepared. The general criteria used in identifying projects were the department's goals of efficient service delivery; prompt customer service, environmental sustainability, and strategic implementation of projects, community benefits, infrastructure maintenance needs, and meeting growing demand.

MCCVV shall also create “P’ Budget by earmarking 20-25% of total revenue expenditure for providing services and creating infrastructure in urban poor areas.

Estimation of Capital Investments and Project Phasing

Broad cost estimates of the proposed projects were prepared based on the unit costs and the phasing Scheduling of investments is done through an iterative process and the principles of phasing have taken into account:

- Priority needs, with developed areas getting priority over future development areas
- Inter- and intra service linkages, investments to be complemented by sanitation improvements
- Size and duration of the projects, including preparation and implementation period
- Project linked service implications, such as installing house connections where supply and distribution capacities have been increased.

Institutionalizing the CIP process

The Capital Improvement Program is an important element and is significant in terms of the city's management process and sustainability with regard delivery of basic services. While the CIP provides a framework for the annual budget cycle, for that purpose alone the CIP would be updated and rolled on for a further ten years period.
The need for updating arises on account of

- Reassessment of the city growth and infrastructure needs to be carried out once in seven years)
- Detailed feasibility engineering studies carried out of new projects.
- Rescheduling of investment on ongoing projects due to cost and/ or time overruns
- Reassigning priorities within the constraints of available financial resources.

Forecast of Capital Facilities & Investment Requirement

Vasai-Virar is an urbanized area with a fairly developed citywide network of capital facilities necessary to accommodate growth. New households that are projected to locate in Vasai-Virar could occupy existing dwel1ings or new buildings while provisions are being made to cater to the infrastructure requirements of the additional households, plans are being drafted to meet the requirements of future Growth. Forecasted future needs for

water, wastewater, solid waste facilities, roads, storm water drainage and street lighting. The capital programs to meet these forecasted ten years needs are included in the 2010-20 Capital Investment Plan (CIP).

Multi-Year Investment Plan

Multiyear investment Program has been prepared by involving following Tasks.

- Making Appraisal of MCCVV's priorities for funds for various infrastructure sectors and levels of funding in the next five years.
- Apprising the funding potential on the basis of financial projections
- Preparation five years Financial and Operating Plan (FOP) (2010-20) for the Corporation with a view to identify the financial strength of the same and to support projects.
- Appraising the institutional capabilities of the organization for implementing and maintaining projects.
- Examined the prospects of additional resource mobilization from the existing or new sources within the urban area.

As assessed in the development of strategies and programs, based on the demand of services for the population in year 2006 and the existing supply, gaps have been identified in the basic service. The phasing has been worked out by MCCVV. The estimated capital investment is phased more or less over a 5-year period (2006-07 to 2011-12) so as to enable capital investment identified for the 2011 populations to be complete before the beginning of Financial Year 2011-12.

The total investment identified for Vasai Virar Municipal Corporation for 2009-10 to 2023-24 is as follows –

Table 15.6: The total investment identified for Vasai Virar Municipal Corporation as 2009-10 to 2023-24

List of Major Project	Total Cost	2010 – 11	2011 – 12	2012 – 13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Augmentation of Water Distribution System	600	150	150	100	100	100									
Development of Water Sources	1200		100	100	100	100	50	50	50	50	100	100	100	100	200
Under ground sewerage scheme	557.68	100	100	100	100	100	57.68								
Solid Waste Management	58.24	19	19	19											
Construction of Ring road and Connectors	561	45	20	12	12	12	12	12	12	12	12	100	100	100	100
Bus Services	125		25		25		25		25		25				
Development of Parking Facilities	25	5		5		5		5		5					
Station Area Transport Improvement	52		8.7	8.7	8.7	8.7	8.7	8.7							
Development of Sea promenade	125												41.67	41.67	41.67
Development of Cold Storage for fishing	60										20	20	20		
Development of Marina for Recreation and fisherman	60						10	10	10	10					20
Nature Park near Papadkhind Area	6					3	3								
Construction of Slaughter house	19					9.5	9.5								
Development of Resorts on PPP basis	25												8.33	8.33	8.33

List of Major Project	Total Cost	2010 – 11	2011 – 12	2012 – 13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Municipal market 2 near each Railway Station making total of 8.	20			2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5				
Corporation Administration Building & rest house	97								32.33	32.33	32.33				
Play Ground	75	6	6	6	6	6	5	5	5	5	5	5	5	5	5
Lake Devlopment	52	17.33	17.33	17.33											
Sports Complex with Swimming pool	154			38.5	38.5	38.5		38.5							
Community Center	2				1		1								
Town hall & drama theater	32			8	8	8	8								
Labour Welfare centre	5	0.25	0.25	0.5	0.5	1	1	1	0.5						
Fire Stations	6	1	2	2	1										
GIS Development & geo spatial & ground level surveys	10	2.5	5	2.5											
Computerisation of Municipal records & departments	1	0.5	0.5												
Implementation of Financial Accounting system & SAP	5	2.5	2.5												
Upgradation of Cess & property tax	2	0.25	0.25	0.5	0.5	0.5									
Development of Web based online systems	1	0.5	0.5												
Conduction of studies for urban governance & benchmarking	3	0.5	0.5	1	1										
Capacity Building Programs & Public Sensitization projects	3		1	1	1										

Source: Analysis

The breakup of first seven years are given in the table below from 2010-17

Table 15.7 – Breakup of Investment from 2010 – 20

List of Major Project	2010 – 11	2011 – 12	2012 – 13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	Investment Required
Augmentation of Water Distribution System	150	150	100	100	100						600
Under ground sewerage scheme	100	100	100	100	100	57.68					557.68
Solid Waste Management	19	19	19								58.24
Bus Services		25		25		25		25		25	125
Lake Devlopment	17.33	17.33	17.33								52
Station Area Transport Improvement		8.7	8.7	8.7	8.7	8.7	8.7				52
Nature Park near Papadkhind Area					3	3					6
Municipal market 2 near each Railway Station making total of 8.			2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	20
Corporation Administration Building & rest house								32.33	32.33	32.33	97
Sports Complex with Swimming pool							38.5	38.5	38.5	38.5	154
Town hall & drama theater				8	8	8	8				32
Labour Welfare centre	0.25	0.25	0.5	0.5	1	1	1	0.5			5
Fire Stations	1	2	2	1							6
GIS Development & geo spatial & ground level surveys	5	5	5	5	5						25
Total Cost	293.00	327.66	255.41	250.67	228.17	105.85	58.67	98.83	73.33	98.33	1789.92

Source: Analysis

Financial & Operative Plan

Based on the Capital Investments proposed a Multi- Year Investment Plan was prepared involving a seven years Financial and Operating Plan (FOP). A separate FOP is generated for accounts. However project sizing is done based on the overall financial sustainability.

The guiding criterion for project sizing is that in no year should the Corporation have a negative opening balance. The FOP process involves the following steps:

1. Projection of yearly revenue under various heads and alternative assumption.
2. Projection of expenditure for existing levels of services.
3. Estimation of capital expenditure for providing infrastructure at different service-levels.
4. Estimation of additional O & M cost due to the new schemes.
5. Estimation of annual debt servicing burden under alternative scenarios of loan / grant mix.

Revenue Income

Income and Expenditure are forecasted based on the past trends or assuming a nominal growth rate of 10 per cent per annum. Where past trend is inconsistent revision will be made.

1. Property Tax is projected on the basis of current ARV at nominal growth rate of 10% and revision at every four years

2. Other revenue income heads are forecasted based on average growth rate of 10%.

Table: 15.8 Revenue income projections for MCCVV

REVENUE INCOME												
Income Head	**PROJECTIONS for Yearly Income Rs. in Lacs**											
Revenue Income	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Property Tax	4284.76	4713.24	5184.57	5703.02	6273.32	6900.66	7590.72	8349.79	9184.77	10103.25	11113.58	12224.93
Water Supply Chareges	2875.54	3278.12	3737.05	4260.24	4856.67	5536.61	6311.73	7195.38	8202.73	9351.11	10660.26	12152.70
License Fee	11.41	13.12	15.09	17.35	19.95	22.95	26.39	30.35	34.90	40.13	46.15	53.07
Income from services	1270.00	1460.50	1679.57	1931.50	2221.23	2554.41	2937.58	3378.21	3884.95	4467.69	5137.84	5908.52
Miscellaneous Income	1770.05	1947.06	2141.76	2355.94	2591.53	2850.69	3135.76	3449.33	3794.27	4173.69	4591.06	5050.17
Grants & Loans	2607.18	2867.90	3154.69	3470.16	3817.17	4198.89	4618.78	5080.66	5588.73	6147.60	6762.36	7438.59
Total T1	12818.94	14279.93	15912.73	17738.22	19779.89	22064.20	24620.96	27483.72	30690.34	34283.47	38311.25	42827.99
				Proposed New sources of Municipal revenue								
Total T2												
Recovery Under Special Act	0	0	100	120	144	172.8	207.36	208.36	209.36	210.36	211.36	212.36
Pollution Charges	0	0	50.00	60.00	72.00	86.40	103.68	124.42	149.30	179.16	214.99	257.99
Water Benefit @ %	0	0	1555.37	1710.91	1882.00	2070.20	2277.22	2504.94	2755.43	3030.98	3334.07	3667.48
Sewerage Benefit @ %	0	0	1121.12	1278.07	1457.00	1660.98	1893.52	2158.61	2460.82	2805.33	3198.08	3645.81
Tourism Fees	0	0	0.00	10.00	12.00	14.40	17.28	20.74	24.88	29.86	35.83	43.00
Total T2	0	0	2826.49	3168.98	3555.00	3990.38	4481.78	4996.33	5574.91	6225.83	6958.50	7783.64
Total T1 + T2	12818.94	14279.93	18739.21	20907.19	23334.89	26054.58	29102.73	32480.05	36265.25	40509.30	45269.76	50611.63

Source: Analysis

Four new sources of income are suggested for revenue income. Modification in water tax for Sustainability of water service is also suggested. These will make MCCVV more financial sustainable and to allow the implementation of Development Plan and to confirm JnNURM reforms.

Pollution Charge to industries: Industrial waste & liquid waste from commercial establishment are responsible for increase in BOD load. On the principle of polluter Pays, it has been suggested to levy Pollution Charge to such pollution creator units which do not have facilities for treatment before disposal. It is proposed to levy charges at a flat rate of Rs.10000 per annum on such 500 units. This will add Rs.50 Lakhs to the municipal finance.

Increase in water Tax: MCCVV is spending huge amount for water supply with very moderate subsidy to the user. Now as MCCVV shall start bulk water purchase at rate of Rs.7.5 per KL, the level of subsidy will be increased. Looking to this additional burden, it is proposed to increase water charges from Rs.7 KL to 7.70 Kl. per connection per annum and to collect additional revenue income of Rs. 1500 lakhs from the year 2008 as water infrastructure cess to create new water assets of the city. It is also proposed, as discussed in water supply, to introduce telescopic water tariff which will generate 32% more revenue in next five years.

Betterment charges: Since housing industry is the biggest industry in the corporation with lot of new developments coming up in the city, it is proposed that Corporation shall increase the betterment charges levied on the new development projects to provide better infrastructure to them which shall increase the salability of the projects.

Capital Receipts

Receipts towards capital improvement are primarily classified into_

1. Loans borrowed for capital improvement / Grants form Govts.,

2. Identified proportion of investment on capital improvement from Corporation funds,

The details are as described below:

1. Capital Income (Own Sources) : The amount realized under own sources contribute mainly from betterment charges, nonrefundable registration, permit fee, sale of capital assets. A standard nominal growth rate of 10 per cent per annum over the average realization during the last five years has been assumed.

Satalite Twon Grant - Capital Income (Regular Scheme Based-Capital Grants): MCCVV receives capital grants from the State Government under various state and Central Government sponsored schemes for specific capital works. The income under such grants does not show specific trends during the last five years. 70% of identified investment under infrastructure and governance sectors is proposed for

grants from GoI and GoM under the, JnNURM framework.

Other Capital Income: The other income realized under capital accounts head is from borrowings from government and other institutions. It is assumed that other capital income would have a growth rate of 10 per cent per annum on the average realization of last five years.

Projected Revenue, Capital & Scheme Expenditure

Projection of expenditures for service delivery includes establishment expenditure, regular operation and maintenance and debt servicing of existing loans. In addition, it also takes into consideration monies to cater to additional 0 & M and debt arising from investments on capital works. MCCVV's present loans and debt services and also super imposed. It is assumed that the identified investment will be financed by Way of loan, own share and grants, if any depending on the project. It is also assumed that the terms of financing for loans disbursed is at an interest rate of 8 % cent per annum repayable in 15 years with a moratorium of one year.

Based on projected expenditure growth rate 10% for establishment and 10% of O & M up to year 2009-10 & then at the rate of 12% while 15% rise for debt servicing and rate of 15 % for present liabilities including deposits are estimated. It is super-imposed for Capital improvement Plan.

Source: Data provided by MCCVV & Analysis

The Total projected expenditure are estimated as under																					
Income and Expenditure Statement																				Com. Annual Growth (%)	
Sources	Actual					Projection															
	2004-05	*2005-06*	*2006-07*	*2007-08*	2008-09	**2009-10**	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2004-09	2010-21
Opening Balance	-	2,144.69	4,523.32	6,310.33	11,596.99	29,526.29	35,607.59	30,953.75	27,374.65	22,035.13	14,858.54	9,007.19	5,579.33	4,874.38	6,349.39	13,288.58	20,554.97	28,507.69	31,361.41	40,924.07		
Opening Balance (CIDCO)	-	-	-	-	13303.40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Development Charges (CIDCO) *	1273.7	2712.07	1993.24	6687.99	4616.05	5,077.66	5,585.42	6,143.96	6,758.36	7,434.19	8,177.61	8,995.38	9,894.91	10,884.40	11,972.84	13,170.13	14,487.14	15,935.86	17,529.44	19,282.39	37.98	10
Revenue Surplus	1967.87	1399.16	2915.54	3292.53	3824.03	4433.42	5131.85	5932.03	6848.48	7897.79	9098.94	10473.57	12046.41	13845.75	15903.86	18257.63	20949.23	24026.82	27545.43	31567.95		
Net Income /Grant	453.29	177.36	709.88	42.43	2,023.36	2,225.69	2,448.26	2,693.09	2,962.39	3,258.63	3,584.50	3,942.95	4,337.24	4,770.97	5,248.06	5,772.87	6,350.16	6,985.17	7,683.69	8,452.06	45.35	10
Capital Income	6.07	37.47	18.69	118.98	15.90	16.69	17.53	18.40	19.32	20.29	21.30	22.37	23.49	24.66	25.90	27.19	28.55	29.98	31.48	33.05	27.22	5
Satalite twon Grant	-	-	-	-	-	-	25,807.20	34,807.20	30,307.20	27,000.00	27,000.00	9,691.20	4,500.00	4,500.00	4,500.00	9,000.00	9,000.00	5,000.00	5,000.00	10,000.00		
Loans	-	-	-	-	-	-	2,867.47	3,867.47	3,367.47	3,000.00	3,000.00	1,076.80	500.00	500.00	500.00	1,000.00	1,000.00	1,000.00	1,000.00	2,000.00		
Total Sources T 1	**3700.92**	**6470.76**	**10160.67**	**16452.26**	**35379.72**	**41279.75**	**77465.31**	**84415.90**	**77637.87**	**70646.04**	**65740.89**	**43209.45**	**36881.39**	**39400.16**	**44500.05**	**60516.40**	**72370.05**	**81485.52**	**90151.44**	**112259.51**		
						Proposed New sources of Municipal revenue																
Recovery Under Special Act	-	-	-	-	-	-	100	120.00	144.00	172.80	207.36	248.83	298.60	358.32	429.98	515.98	619.17	743.01	891.61	1069.93		20
Pollution Charges	-	-	-	-	-	-	50.00	60.00	72.00	86.40	103.68	124.42	149.30	179.16	214.99	257.99	309.59	371.50	445.81	534.97		20
Water Benefit @ %	-	-	-	-	-	-	0.00	1710.91	1882.00	2070.20	2277.22	2504.94	2755.43	3030.98	3334.07	3667.48	4034.23	4437.65	4881.42	5369.56		
Sewerage Benefit @%	-	-	-	-	-	-	0.00	1278.07	1457.00	1660.98	1893.52	2158.61	2460.82	2805.33	3198.08	3645.81	4156.22	4738.10	5401.43	6157.63		
Tourism Fees	-	-	-	-	-	-	0.00	10.00	12.00	14.40	17.28	20.74	24.88	29.86	35.83	43.00	51.60	61.92	74.30	89.16		20
Total T2	-	-	-	-	-	-	150.00	3,178.98	3,567.00	4,004.78	4,499.06	5,057.53	5,689.03	6,403.65	7,212.96	8,130.26	9,170.81	10,352.18	11,694.56	13,221.25		
Total T1 + T2	3,700.92	6,470.76	10,160.67	16,452.26	35,379.72	41,279.75	77,615.31	87,594.87	81,204.87	74,650.82	70,239.95	48,266.98	42,570.42	45,803.81	51,713.00	68,646.66	81,540.86	91,837.69	101,846.00	125,480.76		
Applications																						
Expenditure																						
Gen Admn.Expences	20.61	21.75	44.40	57.10	189.49	208.44	229.28	252.21	277.43	305.18	335.70	369.27	406.19	446.81	491.49	540.64	594.71	654.18	719.59	791.55	74.13	10
Street Lighting	36.06	135.07	118.48	43.88	23.51	24.68	25.91	27.21	28.57	30.00	31.50	33.07	34.73	36.46	38.29	40.20	42.21	44.32	46.54	48.87	-10.14	5
Fire Fighting	-	8.46	15.74	2.05	0.62	0.65	0.68	0.72	0.75	0.79	0.83	0.87	0.92	0.96	1.01	1.06	1.11	1.17	1.23	1.29	58.14	5
Public Health,Hosp. & Other	47.08	57.57	93.47	86.49	128.74	141.62	155.78	171.36	188.49	207.34	228.08	250.89	275.97	303.57	333.93	367.32	404.05	444.46	488.91	537.80	28.60	10
Garden	45.76	25.53	78.39	113.91	2,052.15	2,093.19	2,135.06	2,177.76	2,221.31	2,265.74	2,311.06	2,357.28	2,404.42	2,452.51	2,501.56	2,551.59	2,602.62	2,654.68	2,707.77	2,761.93	158.79	2
Public Works	1,018.91	1,513.62	2,857.37	4,029.37	2,385.92	2,624.51	2,886.96	3,175.65	3,493.22	3,842.54	4,226.80	4,649.47	5,114.42	5,625.86	6,188.45	6,807.30	7,488.03	8,236.83	9,060.51	9,966.56	23.70	10
Water supply	266.92	129.73	409.26	268.49	526.43	579.08	636.98	700.68	770.75	847.82	932.61	1,025.87	1,128.45	1,241.30	1,365.43	1,501.97	1,652.17	1,817.39	1,999.12	2,199.04	18.51	10
CDP Projects Capex	-	-	-	-	-	0	35325	46141	42491	40567	39467	19335	13267	13733	11433	19433	22500	27500	25500	37500		
O & M of new projects @ 5% of cost						0.00	1766.23	4073.30	6197.87	8226.20	10199.53	11166.27	11564.27	12113.60	12570.93	13348.27	14248.27	15623.27	16898.27	18773.27		
Total Capital Expenditure	**1,435.34**	**1,891.72**	**3,617.12**	**4,601.30**	**5,306.86**	**5,672.17**	**43,161.56**	**56,720.23**	**55,669.74**	**56,292.28**	**57,732.76**	**39,187.65**	**34,196.04**	**35,954.42**	**34,924.43**	**44,591.69**	**49,533.17**	**56,976.28**	**57,421.94**	**72,580.30**		
Loan Repayment	120.89	55.71	233.23	253.96	546.57	0	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500		
Total Applications	**1,556.23**	**1,947.44**	**3,850.35**	**4,855.26**	**5,853.43**	**5,672.17**	**46,661.56**	**60,220.23**	**59,169.74**	**59,792.28**	**61,232.76**	**42,687.65**	**37,696.04**	**39,454.42**	**38,424.43**	**48,091.69**	**53,033.17**	**60,476.28**	**60,921.94**	**76,080.30**		
Closing Balance	**2,144.69**	**4,523.32**	**6,310.33**	**11,596.99**	**29,526.29**	**35,607.59**	**30,953.75**	**27,374.65**	**22,035.13**	**14,858.54**	**9,007.19**	**5,579.33**	**4,874.38**	**6,349.39**	**13,288.58**	**20,554.97**	**28,507.69**	**31,361.41**	**40,924.07**	**49,400.46**		

Annexure I

Questionnaire for stakeholder's meeting:

1.	What is your vision about your own city?	
2.	Which sector of physical infrastructure you feel to be dealt on priority – for eg. 1,2,3,4,5	
	a) Water supply i) Source ii) Storage iii) Distribution network	
	b) Sewerage i) Collection ii) Treatment	
	c) Storm water i) drainage ii)	
	d) Solid Waste i) Collection ii) Disposal	
	e) Roads i) Surface improvement ii) Widening iii) ROB/RUB iv) New links v) Parking	
	f) Public Transport i) Railway	
3	Which sector of social infrastructure need tobe improved now? a) School i) Numbers ii) Strength	
	b) Colleges – General Profession i) Sufficient ii) Insufficient	
	c) Community Centres – Regional Cultural Hall	
	d) Library	
	e) Entertainment	
	f) Swimming Pool	
	g) Health - i) Primary hospital ii) Indoor hospital	

4.	Commercial i) Shopping centre ii) Markets –Big Hawkers	
5.	Gardens & Play ground - No is sufficient - Maintenance - Any comments	
6.	Do you have any other suggestions	

Annexure II

List of Heritage Assets in Vasai Virar Sub Region

Sr. No.	Name	Location	Condition
I	**Virar Municipal Council**		
1	Naringi Talav	Naringi Gaothan, Virar (W)	Good
2	Naringi Zilla Parishad School	Naringi Gaothan, Virar (W	Poor
3	Dongarpada Gav Talav	Dogarpada Gaothan Virar (W)	Poor
4	Vartakwada Talav	Vartakwada Gaothan Virar (W)	Good
5	Totale Talav	Virar Bazar Road, Virar (E)	Good
6	Manvelpada Talav	Manvelpada Gaothan, Virar (E)	Good
7	Ranele Talav	Ranele Talav Road, Virar (E)	Poor
II	**Nala Sopara Municipal Council**		
1	Chakreshwar Talav	Sopare- Ghas Road, Nala Sopara(W)	Poor
2	Sopare Zilla Parishad School	Sopare- Ghas Road, Nala Sopara(W)	Poor
3	Burhanpur Chowk Market Precinct	Idgah Road, Nala Sopara (W)	Poor
4	Rehmatulla Alleya Dargah	Station Dargah Road, Nala Sopara (W)	Poor
5	More Talav	More Achole Road, Nala Sopara (E)	Poor
6	Nagela Talav	Nagela Talav Road, Nala Sopara (E)	Poor
7	Achole Talav	Achole Gaothan Road, Nala Sopara (E)	Good
III	**Navghar Manikpur Municipal Council**		
1	Chulne Talav	Chulne Road	Fair
2	Khargoda Talav	Chulne Road	Good
3	Nazareth Talav	Off Chulne – Manikpur Road	Fair
4	Diwanman Talav	Manikpur Diwanman Road	Good
5	St. Michael Church Precinct	St. Michael Church Road	Good
6	St. Michael Church	St. Michael Church Road	Good
7	Father Benedict Talav	Off Chulne – Manikpur Road	Good
8	St. Phelomena School	St. Michael Church Road	Fair
9	Umeleman Talav	Umelemam – Manikpur Road	Good
IV	**Vasai Municipal Council**		
1	Holy Market Precinct	Remedy –Par Naka Road	Poor

2	Our Lady of Remedies Church	Remedy –Par Naka Road	Good
3	R.P.Wagh School	Remedy –Par Naka Road	Fair
4	Patil Wada	Remedy –Par Naka Road	Good
5	Matkari Wada	Remedy –Par Naka Road	Good
6	Gavankar Wada	Par Naka – Dhuolu Road	Fair
7	Vasai Court	Killa Bunder Road	Fair
8	Bohra Masjid	Devi Talav Road, Vasai	Fair
9	Vasai Market	Off Zenda Bazaar Road, Vasai (W)	Poor
10	Sir D.M. Petit Municipal Dispensary	Zenda Bazaar Road, Vasai (W)	Fair
11	Zilla Parishad School	Zenda Bazaar Road, Vasai (W)	Poor
12	Shri Swami Siddeshwar Mandir	Zenda Bazaar Road, Vasai (W)	Poor
13	St. Peters Church	Killa Bunder Road, Vasai (W)	Good
14	Vasai Fort Precinct	Par Naka – Killa Bunder Road	Poor
15	The Rampart Wall	Par Naka – Killa Bunder Road	Poor
16	St. Anthony's Church	Par Naka – Killa Bunder Road	Ruin
17	The Church of the Holy Name of Jesus	Internal Road of Fort formerly known as Royal Street	Fair
18	The Citadel	Killa Bunder Road	Ruin
19	Our Lady of Life Church	Killa Bunder Road	Ruin
20	The Jail	Killa Bunder Road	Ruin
21	Chimaji Appa Temple (Nageshwari and Vajreshwari)	Killa Bunder Road	Fair
22	The Church of Blessed Gonsalvo	Killa Bunder Road	Ruin
23	Martiz of St. Joseph	Killa Bunder Road	Ruin
24	Vasai Fishing Jetty & Drying Grounds	Pachu Bunder	Poor
25	Papdy Talav Precinct	Vasai Station – Par Naka Road	Poor
26	Papdy Talav	Papdy – Par Naka Road	Poor
27	Ram Mandir	Off Papdy Market Road	Poor
28	Bondali Talav	Papdy Market Road	Poor
29	Govardhan Vidyalaya	Papdy Road	Poor
30	Mahanlal Vakil Bungalow	Papdy Road	Poor
31	Shah Wada	Main Remedy Road, Vasai (W)	Fair
32	Our Lady of Grace Church, Papdy	Papdy – Par Naka Road	Good
33	Thomas Baptista School	Papdy – Par Naka Road	Fair
34	Taam Talav	Papdy – Par Naka Road	Poor
V	**Agashe Grampanchayat**		
1	Agashe Talav	Off Agagshe – Arnala Road	Fair

	Precinct		
2	Hanuman Mandir	Off Agagshe – Arnala Road	Good
3	Sarvajanik Vachnalaya	Off Agagshe – Arnala Road	Poor
4	Agashe Talav	Off Agagshe – Arnala Road	Fair
5	Bhawani Shanker Mandir	Off Agagshe – Arnala Road	Fair
6	Khanolkar House	Off Agagshe – Arnala Road	Good
7	Vishnu Mandir	Off Agagshe – Arnala Road	Fair
8	Ram Mandir	Off Agagshe – Arnala Road	Fair
9	St. James Church	Agashe Market Road	Good
10	Phadkewada	Agashe – Nirmal Road	Poor
11	Zilla Parishad School	Agashe – Nirmal Road	Poor
VI	**Arnala Grampanchayat**		
1	Arnala Market	Agashe – Arnala Road, Near Bus Stand	Poor
2	Zilla Parishad School	Agashe Arnala Road	Poor
3	Grampanchayat Office	Agashe – Arnala Road, Near Bus Stand	Fair
4	St. Peters Church	Agashe – Arnala Road, Near Bus Stand	Fair
5	Ram Mandir	Agashe Arnala Road	Good
6	Gandhi Smarak	Agashe – Arnala Road, Near Bus Stand	Poor
7	Arnala Jetty & Fish Drying Grounds	Agashe – Arnala Road, Near Bus Stand	Poor
VII	**Arnala Fort Grampanchayat**		
1	Arnala Fort Precinct	Path from Kalika Mata Mandir	Ruin
2	Arnala Fort Wall	Path from Kalika Mata Mandir	Ruin
3	Hajarat Shah Ali Shah Baba Dargah	Arnala Fort	Good
4	Arnala Fort Bastion	Southern wall of Fort	Ruin
VIII	**Vatar Grampanchayat**		
1	Don Talav	Arnala – Nirmal Road	Poor
2	Bhongale Talav	Off Jaladi – Bhongale Road	Poor
IX	**Satphale Grampanchayat**		
1	Satphale Gav Talav	Satphale – Jaladi Road	Poor
2	Sambhale Talav	Satphale – Jaladi Road	Good
3	Satphale Talav	Arnala – Vasai Road	Poor
X	**Kofrad Grampanchayat**		
1	Kofrad Talav Precinct	Nandakhal Road	Good
2	Kofrad Talav	Nandakhal Road	Good
3	Holy Spirit Church	Nandakhal Road	Good

XI	**Bolinj Grampanchayat**		
1	Bolinj Talav	Virar -Agashe Road	Good
2	Zilla Parishad School	Virar -Agashe Road	Fair
3	Manukarnika Devi Talav	Cross Road	Poor
4	Karnale Soneri Talav	Virar -Agashe Road	Good
XII	**Umbrale Grampanchayat**		
1	Kudhvat Talav	Umbrale – Kofrad Road	Fair
2	Umbrale Talav	Umbrale – Karnala Road	Poor
XIII	**Nale-RajodiGrampanchayat**		
1	Nale Talav	Arnala Vasai Road	Good
XIV	**Vagholi Grampanchayat**		
1	Bhandale Talav	Off Nirmal – Aghase Road	Good
2	Nirmal Bazaar	Nirmal – Kalamb Road	Poor
3	Madres Talav	Sopara – Nirmal Road	Fair
4	Ashoka Stupa	Madres – Sopare Road	Poor
XV	**Madres Grampanchayat**		
1	Madres Talav	Sopara – Nirmal Road	Fair
2	Ashoka Stupa	Madres – Sopare Road	Poor
XVI	**Navale Grampanchayat**		
1	Navale Talav	Nirmal – Navale Road	Fair
XVII	**Ghas Grampanchayat**		
1	Ambat Bav Talav	Sopara - Ghas Road	Poor
2	Andala Talav	Sopara – Ghas Road	Fair
3	Ghas Mothe Talav	Sopara – Ghas Road	Fair
4	Kalunj Talav	Sopara – Ghas Road	Fair
5	Shirmoli Talav	Sopara – Ghas Road	Poor
6	Batela Talav	Sopara – Ghas Road	Poor
7	Dargah and Idgah Grounds	Sopara – Ghas Road	Fair
8	Indani, Golai and Varala Talav	Sopara – Ghas Road	Fair
XVIII	**Nirmal Grampanchayat**		
1	Holy Cross Church	Vasai Agashe Road	Fair
2	Shankaracharya Mandir Precinct	Vasai Agashe Road	Fair
3	Shankaracharya Mandir	Vasai Agashe Road	Fair
4	Vimal Talav	Vasai Agashe Road	Fair
5	Malai Talav	Vasai Agashe Road	Fair
XIX	**Bhuigaon Khurd Grampanchayat**		

1	Kumbhar Talav	Bhuigaon Khurd Road	Poor
2	Khurd Talav	Bhuigaon Khurd Road	Poor
XX	**Bhuigaon Budruk Grampanchayat**		
1	Bhola Talav	Church Champavati Mandir Road	Poor
2	Gorlai Talav	Joshudi Ally	Fair
3	Dongri Talav	Ambedkar Nagar Road	Poor
XXI	**Girij Grampanchayat**		
1	Girij Grampanchayat Office	Vasai – Nirmal Road	Fair
2	Girij Talav	Vasai – Nirmal Road	Fair
3	St. Francis Xavier Church	Vasai – Nirmal Road	Good
XXII	**Kaular Khurd Grampanchayat**		
1	Motha Talav	Off Augustine Kulas Road	Fair
2	Our Lady of Merces Church	Augustine Kulas Road	Good
XXIII	**Kaular Budruk Grampanchayat**		
1	Rangaon Talav	Rangaon Road	Poor
2	Hanuman Mandir	Rangaon Road	Poor
3	Devali Talav	Rangaon Road	Poor
4	Zilla Parishad School	Rangaon Road	Fair
XXIV	**Saloli Grampanchayat**		
1	Barmala Talav	Saloli Gav Road	Fair
2	Saloli Talav	Saloli Gav Road	Fair
XXV	**Sandor Grampanchayat**		
1	Relba Talav	Dev Talv – Babhola Naka Road	Poor
2	Dev Talav	Off Vasai – Nirmal Road	Fair
3	Hanuman Mandir	Off Vasai – Nirmal Road	Fair
4	Grampanchayat Office	Off Vasai – Nirmal Road	Poor
5	St. Thomas Church	Sandor – Saloli Road	Good
XXVI	**Mulgaon Grampanchayat**		
1	Mulgaon Talav	P. J. D'mello Road	Fair
XXVII	**Kiravali Grampanchayat**		
1	Chaubare Talav	Smashan Bhumi Marg	Fair
XXVIII	**Vadavali Grampanchayat**		
1	Vadavali Talav	Papdy – Naigaon Station Road	Poor
2	Mother of God	Papdy – Naigaon Station Road	Good

	Church		
3	Pali Dargah	Papdy – Naigaon Station Road	Poor
4	Pali Masjid	Papdy – Naigaon Station Road	Good
XXIX	**Umele Grampanchayat**		
1	Umele Talav	Umele Gav Road	Fair
XXX	**Naigaon Grampanchayat**		
1	Naigaon Bazar	Papdy – Naigaon Station Road	Fair
XXXI	**Juchandra Grampanchayat**		
1	Gode Talav	Juchandra Naka	Good
2	Gandhi Talav	Juchandra Naka – Gandhi Talav Road	Poor
3	Juchandra Zilla Parishad School	Juchandra Naka – Gandhi Talav Road	Poor
XXXII	**Sasunavghar Grampanchayat**		
1	Portugese Hambara	Off National Highway - 8, Sasunavghar	Ruin
XXXIII	**Kaman Grampanchayat**		
1	Peerancha Talav	Off Vasai Bhiwandi Highway	Poor
2	Ambe Talav	Off Vasai Bhiwandi Highway	Poor
XXXIV	**Rajavali Grampanchayat**		
1	Rajavali Gav Talav	Rajavali – Vagrapada Road	Poor
2	Vagrapada Vanicha Talav	Rajavali – Gokhivare Road	Fair
3	Vagrapada Peerancha Talav	Rajavali – Gokhivare Road	Fair
4	Vagrapada Sonucha Talav	Rajavali – Gokhivare Road	Poor
XXXV	**Gokhivare Grampanchayat**		
1	Gokhivare Talav	Vasai Station – Gokhivare Road	Poor
XXXVI	**Waliv Grampanchayat**		
1	Waliv Talav	Sant Tukaram Marg, Waliv Naka	Fair
XXXVII	**Sativli Grampanchayat**		
1	Sativili Talav	Off National Highway – 8, Sativli	Poor
XXXVIII	**Pelhar Grampanchayat**		
1	Khadik Talav	Vakanpada Road	Poor
XXXIX	**Dhaniv Grampanchayat**		
1	Dhaniv Gav Talav	Pelhar – Nala Sopara Station Road	Fair

2	Dhaniv Baugh Talav	Pelhar – Nala Sopara Station Road	Fair
XXXX	**Chandansar Gas- Kopri Group Grampanchayat**		
1	Ghanicha Talav	Veer Savarkar Road	Fair
2	Kopri Talav	Behind Chandansar Gaothan	Fair
XXXXI	**Shirgaon Grampanchayat**		
1	Raipada Talav	Off Chandansar – Shirgaon Road	Fair
2	Shirgaon Gav Talav	Off Chandansar – Shirgaon Road	Fair
XXXXII	**Kaner Shirsad Grampanchayat**		
1	SAmantpada Talav	Virar Phata – Samantpada Road	Fair
2	Dharavi Talav	Bhavkal	Fair
XXXXIII	**Mandvi Grampanchayat**		
1	Mandvi Talav	Mandvi Gaothan	Poor
2	Aseri Fort	Mandvi Gaothan	Ruin
XXXXIV	**Kashid Kopar Grampanchayat**		
1	Kashid Talav	Kashid Gaothan	Poor
XXXXV	**Koshimbe Grampanchayat**		
1	Khardi Talav	Koshimbe Gaothan	Fair
2	Koshimbe Talav	Koshimbe Gaothan	Poor
XXXXVI	**Dahisar Grampanchayat**		
1	Dahisar Gav Talav	Jambhulpada Road	Poor
2	Dahisar Talav	Dahisar Gaothan	Poor

Vasai Virar City Development Plan under Scheme of Urban Infrastructure Development in Satellite Towns / Counter Magnets of Million plus Cities

Executive Summary

Vasai Virar which is part of Thane district is located at the north of greater Mumbai. **Vasai - Virar Sub-Region** is situated in the north-west corner of the Mumbai Metropolitan Region and covers 380sq.km. and includes 4 Municipal Councils (virar, Vasai, Nallasopara &Navghar - Munikpur) & 53 villages. The Vasai-Virar Sub-region is separated from Greater Mumbai and Mira-Bhayander by the Vasai Creek. However, due to development of road and rail network, it is strategically linked to Mumbai. It is also linked by road and rail to other major centres in the Mumbai Metropolitan Region, such as, New Mumbai (via Vasai-Diva Railway Line), Panvel, Thane, Bhiwandi and Kalyan. This area which has been identified as one of the growth centers around Mumbai is well connected with the metropolis by suburban commuter rail and Mumbai Ahmadabad National Highway.

Satellite Town of Municipal Corporation of city of Vasai Virar has a significant growth potential due to close proximity to Brihan Mumbai and is experiencing very rapid urban growth. With prohibitive land prices in Mumbai low and middle income households are shifting to the Vasai Virar. Improving the affordable housing stock in VVSR will help reduce the slum pockets in MMR. The people of VVSR have their work places located in Mumbai. About 60% of workers commute to Mumbai in the morning & return in the evening putting pressure on Public Transport system. Secondly the industrialist and builders and developers are staying in Mumbai City and carrying their business in VVSR. VVSR presently serves as a growing dormitory town to the Mumbai city. The concentration of economic activities and population growth in Mumbai has put tremendous strain on the delivery of infrastructure services. At the same time there has been growing realization that there is a need for decentralization of activities so as to reduce the burden on Mumbai. Considering these aspects the GOI has selected the city of Vasai virar for funding for the infrastructure development under satellite towns.

Vasai Virar region has great potential for urbanization and keeping in view the state govt has stationed the development plan for this area admeasuring 380 sq km. Out of which 8324 ha area is proposed for urbanization. Tourism with its Heritage installations & scenic beauty available in the area will improve the Tourism potential of the region by developing the infrastructure facilities. Tourist amenities will not only improve economic status of VVSR but also reduce strain on adjacent highly urbanized areas like Mumbai and Thane. The local people as well as residents of nearby areas will have weekend outing place available very close at hand in VVSR. There is good scope for industrialization of VVSR

with availability of land and proximity of market for the products. It offers excellent opportunities for service industry & small scale industry as ancillary to industries in MMR.

The Government of India (GOI) has initiated Scheme of Urban Infrastructure Development In Satellite Towns / Counter Magnets Of Million Plus Cities, for accelerating the pace of urban infrastructure development in new township / satellite towns around million plus / large cities. In the light of above it is proposed to cover VVSR under this Scheme. The preparation of City Development Plan is an obligatory function for accessing the grant under various government funds. For MCCVV, GOI and GOM grants will fund 90% of the total plan and it will therefore need to generate the remaining 10% of the funds, which it proposes to fund through borrowings.

1. The Scheme of Urban Infrastructure Development in Satellite Towns / Counter Magnets of Million Plus Cities

The main objective of the above scheme is to promote the Urban Local Bodies (ULB) level reforms. The Scheme of Urban Infrastructure Development in Satellite Towns / Counter Magnets of Million plus Cities provides both incentive as well as support for undertaking reforms at State and Cities level, thus creating right development framework for enhancing creditworthiness of Municipal Governments and equitable distribution of resources for Urban Society at large. The towns may be planned for a population of 3-5 lakh in case of million plus cities and 5-10 lakh in case of Mega cities (4 million plus cities).

2. City Development Plan for Satellite Town

The CDP is a necessary step for accessing funds under Scheme of UID in Satellite Towns. A City Development Plan (CDP) is both, a perspective and a vision for the future development of a city on the concept of continuity, compactness and self –containment. It also suggests ways to make each part of the township self-sufficient in itself while forming an integral part of the town as a whole having clear functional linkages with the mother city and other urban centers in the respective region. It also suggests alternative routes, strategies, and interventions for bringing about the change. It provides a framework and vision within which projects need to be identified and implemented. It establishes a logical and consistent framework for evaluation of investment decisions.

3. Demographic Profile

Long range comprehensive planning cannot be undertaken in rational and realistic manner unless it bases itself upon the fundamental facts of population growth. The Vasai Virar city has been considered as one of the growth centers in the regional plan for Mumbai metropolitan region. The population was 194262 during 1971(census1971). With a decadal growth rate of 32%, 58%, 70% for 1971-81, 1981-91, 1991-2001 respectively the population for the region reached 7,02,723 in 2001. Based on projections by various agencies, projected population for 2001- 2041 has been worked out. These population

projections form the basis for working out the infrastructure requirements of the area such as water supply, sewerage system, storm water drainage and solid waste generation & disposal area and transportation facilities. The sub region wise population analysis has also been carried out.

4. Landuse

Urban lands are subjected to multifarious land uses which form intricate and complicated mixture in city. For the purpose of study, the land uses have been classified into residential, commercial, industrial, public semi- public, transport and communication, public utilities, recreation, cremation and agricultural with allied activities.

4.1 Existing Land Use Pattern

The total area in Vasai Virar municipal limits is about 380 sq. km. According to final development plan existing land use 78.09% of the total area is non-developable and is covered by forest, agriculture land, hills, salt pans, water bodies and vacant lands etc. In the Green Zone which surrounds the urbanisable area, the development is scattered. The developable area is nearly 21.91%, out of which nearly 9.59% is under residential use and 5.52% is under transport and communication. The industry occupies 2.42% of the total area, 1.11% denotes organized open spaces, play fields etc. and 2.46% is under public and semi public use, area covered under commercial is 0.31%. Since the present day population of Vasai Virar has exceeded the projected population as per sanctioned Development Plan-2007, the Municipal Corporation should undertake a revision of the DP.

5. Vision Statement

Based on the several workshops conducted to inform various stakeholders the objective of the Schemes of urban infrastructure Development in satellite towns / counter magnets of Million plus cities and process of preparing a City Development Plan and their vision of city's strengths, current issues, concerns, problems, and areas that need to be focused, a Vision statement for Vasai Virar was formulated by SWOT (Strength Weakness Opportunities Threats) analysis.

The vision Statement formulated for the MCCVV is as follows –

- Satellite Town having Net-Zero Energy Community consuming substantially low energy and producing at least as much renewable energy as it uses in a year with very efficiently planned and operated sectors
- Transition from dormitory town to Self sustainable City with polycentric development.
- to strive for holistic slum development with a healthy and enabling urban environment by providing adequate shelter and basic infrastructure facilities to the slum dwellers of the identified urban areas.
- Satellite Township attracting Investment in form of IT back offices / BPOs and KPOs.
- Transit Hub providing linkage between Western India and Southern Coastal region.

- Recreational Hub of Mumbai Metropolitan Region.

Commensurate with the aforesaid vision, investment plan has been formulated in the areas of roads and storm water drains, water supply and sewerage, solid waste management, Link roads and waterways. It is aimed to achieve 50% coverage of urban curium in the next 2 years (2011) and 100% coverage in further 5 years (2016) Augmentation of social infrastructure and Environmental improvement measures would be taken-up in subsequent years. Within the frame work of reforms for Scheme of Urban infrastructure Development in satellite towns / counter magnets of Million plus cities and looking to the people's

6. Municipal Infrastructure

Present status of infrastructure, gaps and future requirements strategies and investment requirements in the areas of water supply, sewerage, storm water, solid waste management, Power supply, traffic and transportation are discussed.

6.1 Roads

Total length of road 1275.37 km includes 669.33 km of road length and 606.04 km of DP roads. The existing roads of Vasai Virar cover NH 8, arterial roads and minor roads including internal roads. At present the road net work occupies only 21.38% of the developed area of the city. Due to inadequate road space, heavy congestion of roads in inner areas, lack of footpaths of adequate width and parking spaces along the roads in city and near the railway station and also inadequate cross-over points, across railway line it would be necessary to augment road infrastructure in terms of new roads, up-gradation of existing roads, widening of interior roads, improvement of junctions, creation of parking spaces, construction of flyovers, roads for easy circulation and to minimize traffic congestion.

Based on the Comprehensive Transport Study for MMR conducted by M/s Lea Associates infrastructure projects to be undertaken in VVSR have been suggested. These projects are being undertaken by MMRDA under Mumbai Infrastructure Project. MMRDA has also proposed Transport projects in this region at the cost of Rs 12562 crores which include widening of NH 8, Metro Line, Suburban line extension and Western Sea Link North Extension. The cost of extending the Metro Rail from Dahisar to Virar (Length of 23 Kms) is Rs. 4321 crores. SPA CIDCO has also proposed upgradation & new links of Arterial Roads at a cost of Rs. 7801.4 crores.

In the light of the development of the recommended metro corridors/ lines, suburban rail corridors/lines and highway corridors in the North South direction it is also necessary to provide connectivity between these with the objective of strengthening and augmenting the capacity of the existing road network, mainly in the interior, where the congestion levels and intensity of traffic demands had increased significantly. Considering this Inner & Outer

Ring Roads and connectors to National Highway No. 8, (Nirmal to Nallasopara to Pelhar) projects are suggested in City Development Plan. The VVSR has good coast line and can be used for development of water transport. With a view to augment the Road transport system Water Transport facilities of Ferry Warf at Arnala, Vasai fort , Kalamb and services to Nariman point, Gorai , Andheri , Belapur , Uran are proposed to be developed on the lines of facility presently available at Gateway of India.

With a view to improve connectivity between their residence and station, Bus Depot, water transport sites, place of work, Recreational sites, Heritage sites, jetties etc. Intra city & inter city Bus services are proposed. Some of the transit corridors and higher order highway corridors should be planned as multi-modal transport corridors i.e. transit and highways sharing the same right of way. It is also proposed to set up Bus Authority to look after the Bus service. Bus Terminals and Bus depots will be created in suitable places and Bus Fleet will be purchased.

7. Water Supply

Now Vasai Virar municipal corporation limit covers around 380 sq km with population of 7,02,723 lakhs (census 2001). The present sources of water are Usgaon Scheme 24.5 mld, Pelhar Dam 14 mld, Papadkhind dam 1.5 mld and Surya dam 100 mld. Besides 30 mld of water is supplied through well and tankers.

7.2.1 Water Distribution system

There are three Water Treatment Plants (WTP) supplying water to this area. The water from WTP comes to the MBRS/ESRs in the Municipal Councils from where water is distributed to people through pipeline. The quantum of water supply is only in the range of 100 ltrs /capita /day. The water charges are on the basis of diameter of the pipeline. At present there is no metering system and the volumetric tariff is not implemented and hence the quantity of Non-Revenue Water and Un-accounted for Water cannot be assessed. Leak Detection system and Water Audit is yet to be conducted.

MCCVV will have to take action to develop its own new water sources by completing small schemes like Wandri (96mld), Ghateghar (8mld), Kaman(52mld), Kholsapada(34.55mld), Rajiwali – Sativali (10mld) with help of other Agencies like CIDCO, MMRDA to augment the water supply. It is also essential to set up effective water distribution system simultaneously to cover larger area. The reduction of water leakage during transportation & distribution, leak detection system and water Audit should be undertaken periodically to achieve optimum use of available water supply. There shall be 100% house connections with metering system to achieve improved revenue collection. MCCVV will also have to introduce telescopic rates & water user cess to ensure collection of full O&M cost, financing projects like development of own water source & laying of transmission main and to encourage water conservation. The estimated cost of augmentation of water distribution system is 600 crores.

7.2.2 Projected water demand 2001-2041

With growth in the population from 13.07 lakhs in 2011 to 41.67 lakhs in 2041 the water demand will increase from 235 mld to 750 mld @ 150 lpcd. As present water supply is 130 mld the new water sources have been identified by CIDCO in the DP with total capacity of 933.55 mld. The major source being Surya (200mld) and Pinjal (533 mld). The estimated cost of development of new water sources 1200 crores. It is proposed to achieve the water sector goal of 100% network coverage to household @ 135 lpcd for 24/ 7 potable water supply by 2021. It is also proposed to achieve 100% Metering by 2021 and reduce Non revenue water to 10%.

7.3 Sewerage System

Underground sewerage system does not exist anywhere in the sub-region. The house owners are dependent on their individual septic tanks. The effluent from these septic tanks is discharged into soak pits. Thus present System comprises of septic tanks and effluent disposal in surface gutters and nallas. The increase in water supply will increase the sewage generation and will further deteriorate the situation. With increase in water supply to 750 mld in 2041 the sewage generation will increase to 600 mld by 2041.

7.3.1 Proposed Projects

It view of the problem of fast increasing population, it is decided to have underground Sewage System and STP for the City. CIDCO have surveyed and carried out the studies for setting of STP and collection system in 4 Municipal Councils. The **M/S Kirloskar Consultants Ltd., Pune** has prepared the master plan of sewerage system for the city and cost is estimated to Rs. 557.68 crores. It is proposed to achieve the sewerage & sanitation sector goal of 100% sewer network coverage to household and safe sanitation facilities by 2021. It is also proposed to achieve 100% treatment & disposal arrangements against collection and 80% recycling and reuse by 2021.

7.4 Storm Water Drainage

Meandering streams exist in the central parts of the corporation area before emptying into the Vasai and Vaitarna creeks. These play an important role in naturally draining the area. Presently, the storm water flows through closed drains and open drains. The total length of closed drain in 4 ULBs is 217.06 kms. and open drain is 43.1 kms while the area covered by closed drain is 35.28 sq. Kms and open drain is 14.67 sq. Kms. These drains are mainly responsible to restrict the storm water from entering the residential areas of the region. However the rapid development of the region has not only increased the quantity of storm water but also increased the runoff. These currently flow into an inefficient drainage system consisting of a network of nallahs, which are not properly integrated with these natural streams. There is a need for Storm Water Drainage Rehabilitation Plan as per norms of CPHEEO.

7.5 Solid waste management

The approximate solid waste generation of the city with a population of 13 lakhs, the average domestic solid waste generation rate of 0.45 kg / capita / day, works out to be 588 MT / day. Hospital waste generated is being collected and treated by private agency. There is door to door collection of solid waste and transported in vehicles called “ghanta gaadis”to dumping sites. At present solid waste from 4 Municipal Councils are disposed at four different locations.. Apart from the given quantity of solid waste, there is generation of inert waste from repair of houses, construction activities, silt generated out of cleaning of gutters and nallas which is transported to land fill sites. The Tariff Structure for Sewerage & Solid Waste Management is based on type of user but varies for all Municipal Councils. With increase in population to 41.67lakhs in 2041 the solid waste generation will increase to 1875 Mt by 2041.

There is proposal to establish new sanitary landfill site for 4 Municipal Council areas at **Gokhivare site** measuring **19.33 hectare** on BOT basis through M/s Hanjer Biotech Energy Vasai Pvt. Ltd (HBEL). The HBEL will be processing between 150 to 200 tpd MSW received from Navghar Manickpur, Vasai, Nalasopara and Virar in the Phase I. The facility will be expanded as per Projected MSW quantity during 2012 and 2017. The quantity reduced through segregation at source, disposal of re-usables and recyclables at the transfer stations as well as separate handling of debris by each ULB, processable MSW will be delivered at Gokhivare site.The Gokhivare site will take care of processing facilities for entire period of 30 years with possible extension. Space for Sanitary landfill is available only for 10 to 15 years. Hence after 12 years additional 10 Ha area needs to be acquired. Due to double digit growth rate of population and large number of migrants, the capacity for MSW processing has to be doubled every 7 years. The total capital cost for this cluster is estimated at Rs 58.24 Crores Plus contingencies. 80% of the total cost will be received as assistance from GOI under the Scheme, 10% contribution from GOM and 10% contribution will be by PPP / ULBs.

8 Social Infrastructure

8.1 Housing

Presently there are 240082 residential properties and 36277 Commercial properties in four councils in Vasai Virar region. The incremental demand in Thane, Vasai-Virar region would substantially increase from the current 276359 units to 472574 in 2021. Efforts should be made to decongest the core areas through selective relocation of commercial and trading activities, creating new residential areas and development of slums. Areas for residential complexes have been proposed.

Development and Redevelopment (Urban Renewal) of Areas

One of the major constraints faced by Planning Authorities / ULB’s in implementing the proposals of Development Plan (DP) is the land acquisition and high cost of

implementation, which is beyond their financial capability. To overcome this constraint, the proposals of DP can be implemented by undertaking Town Planning Scheme (TPS) under the provisions of M.R. & T.P. Act, 1996, for one or more specific areas of the city, which has in-built provision for the recovery of development cost (inclusive of land cost, infrastructure cost and cost of public amenities) through levy of betterment contribution from the land-owners. The TPS can be prepared for development of new areas as well as for re-development / renewal of already built-upon areas, to achieve planned and orderly development of a city. The MCCVV as per new housing policy of Government of Maharashtra shall include 10-15% reservation for EWS/ LIG in DC rules.

The Urban Poor in VVSR here are mainly working as laborers in agricultural / horticulture fields, fishing activity. Measures have been proposed in the CDP to boost the employment opportunities of urban poor.

8.2 Education Facilities

In Vasai Virar Region out of total population of 7, 02,723 as per 2001census, 5, 46,049 persons are literates which give a literacy rate of 79.4%. Out of 79.4% total literate persons 295405(54%) are males and 250644 (46%) are females in the town. Vasai Virar Municipal Corporation is having educational facilities at three different levels i.e. Primary, Secondary and College. 88 Primary Schools with playgrounds, 78 High Schools & playground with Junior college and 8 Colleges with playground are provided for in Development Plan 2007.

8.3 Health and medical facilities:

There are thirty eight Primary healthcare Centers one each in Vasai Virar Region and 11 hospitals. It is recommended to build ‘Super Specialty Hospital’ in Vasai Virar region to make better Health facility in region for the people.

9 Urban Blighted Area

The urban blighted areas are situated in various parts of the towns. Migration trends in the city reflect interstate migration and also migration from Uttar Pradesh, Karnataka, Andhra Pradesh and Gujarat. More than 13.6% population is considered to be living at varying levels of poverty. There are 42 urban blighted areas pockets having 35,652 hutments with a population of 1,78,260 in four Municipal Councils. Out of 42, 4 are on public land. There are no registered urban blighted areas in this region. Populations in these areas live in very unhygienic conditions.

9.1 Infrastructure in Urban Blighted areas

The water is supplied through stand post. There is one connection provided @ for 5 households. There is no drainage facility however public toilets with soak pits are provided. Solid waste collection facility is not provided to this area.

9.2 Urban blighted areas Rehabilitation

There several unplanned structures in area especially area near Nallasopra. These structures if possible can be regularized subject to the provision of permissible land use in respective Zone as mentioned in the DC regulations of VVSR. Structures not confirming to these regulations will have to be tackled separately. If regularization is not possible in any cases a policy to rehabilitate them needs to be framed. This can be achieved by following methods.

- Under the Integrated Housing & Slum Development (**IHSDP**) Scheme the LIG / EWS population from all sections of the community of the identified urban areas. The scheme will apply to all cities\towns, excepting cities\towns covered under JNNURM. Allocation of funds among States will be on the basis of the States' urban blighted population.
- The Central Sector Scheme of "Urban Statistics for HR and Assessments (**USHA**)" seeks to specially support the effective implementation of JnNURM - Basic Services to the Urban Poor (**BSUP**) and Integrated Housing & Slum Development Programme (IHSDP). The four pillars of "USHA" are: database including MIS & sample surveys; action research; impact assessment; and capacity building/training.
- In order to make India slum free, the Central housing ministry is keen to start Rajiv Awas Yojna (**RAY**), which will allow in situ development of slums in urban areas along with giving property rights to the slum dwellers. Under this Scheme survey of Slum Areas in this region can be undertaken to fulfill our vision of slum free city & inclusive city.

- Rehabilitation of urban blighted areas through private initiative and

- Rehabilitation of urban blighted areas in Municipal or Govt. lands, on a PPP model. In this case there would be no cash outflow from VVMC.

10 Employment generation through land use planning

Many projects have been proposed in the CDP from the point of view of creating economically productive, efficient equitable and responsive city. Generation of employment in any town or city can be achieved through judicious land-use planning of its areas based on the potential for future activities maintaining sustainability in the developmental pattern of VVSR and complementing the development plan made by the State for VVSR. In the case of Vasai-Virar, there are four major sectors, which would be exploited to generate employment. These are as under:

- Tourism
- Schemes for Original Inhabitants
- Development of IT Park
- Promotion of Industrial Growth
- Development of Parking Plaza

The estimated cost of the projects proposed is Rs 638 crores

12 Municipal Finance

The Sub Vision is *'A city with financial propriety and high level accountability'*

Key Issues are,

• Municipal expenditure is increasing day-by-day; and
• Need for increasing the revenue to sustain costs of development activities.

Strategy include
• Shift to accrual based double accounting system;
• Overall expenditure control;
• Preparation of balance sheets;
• Budgetary control to be enforced strictly; and
• Efficient management of assets and debts and Introduce private sector participation in service delivery.

Financial Outlay of the CDP

A consolidated statement of the year wise expenditure proposed under different sectors from 2010-11 to 2016-17 is given below –

List of Major Project	Total Cost	2010 – 11	2011 – 12	2012 – 13	2013-14	2014-15	2015-16	2016-17
Augmentation of Water Distribution System	600	100	80	80	80	90	90	80
Underground sewerage scheme	557.68	100	100	100	100	100	57.68	
Solid Waste Management	58.24		19.41	19.41	19.41			
Bus Services	125	25	25	25	25	25		
Municipal market 2 near each Railway Station making total of 8.	20	2.5	2.5	2.5	2.5	2.5	2.5	2.5

GIS Development & geo spatial & ground level surveys	25	5	5	5	5	5		
Total	**1385.92**	**232.5**	**231.91**	**231.91**	**231.91**	**222.5**	**150.18**	**82.5**